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Statement of Basis for EPA’s Proposed 2020 Revisions to the Remedial Action for the Housatonic River “Rest of River”

THE RIVER The Housatonic River is contaminated with polychlorinated biphenyls (PCBs) released from the General Electric Company (GE) facility in Pittsfield, MA. The entire site consists of the 254-acre GE facility; the Housatonic River and its banks and floodplains from Pittsfield, MA, to Long Island Sound; and other contaminated areas. Under a federal Consent Decree, GE is required to address contamination throughout the site, including in the River.



YOUR OPINION COUNTS: OPPORTUNITIES TO COMMENT ON THE PROPOSED PLAN

EPA participated in three public information sessions in February and March 2020 in Lee, Great Barrington, and Pittsfield. At those meetings, EPA outlined the changes reflected in this document and the Draft Revised 2020 Permit and answered questions from the public on the plan. EPA is seeking the public’s comments on the proposed changes to the 2016 Permit, which are outlined in this Statement of Basis and shown in redline/strikeout in the Draft Revised 2020 Permit. EPA is accepting public comment on remedy changes outlined in this proposal from July 14 through August 28, 2020. EPA’s proposal is based on current information and the proposal could change in response to public comment or new information. EPA will also hold an on-line virtual Public Hearing on Wednesday, August 26, 2020, where the public will have an opportunity to make oral comments for EPA to consider. You may also submit written comments—see page 37 to find out how. Note: For comments to be considered for purposes of EPA’s Response to Comments on the Final Revised Permit, comments must be received in writing during the public comment period or orally at the formal Public Hearing.

For further information about public hearing logistics, see epa.gov/ge-housatonic or call ZaNetta Purnell of EPA’s Community Affairs office at (617) 918-1306.

WHAT’S INSIDE	PAGE
A Closer Look at EPA’s Proposed Revisions	9
Why EPA is Proposing This Revised Cleanup Plan	17
Comparative Analysis.....	20
Sediment/Floodplain Alternatives	20
Treatment/Disposition Alternatives	28
Public Comment Period.....	35
Proposed Regulatory Determinations	38

SUMMARY OF THE PROPOSED REVISED CLEANUP PLAN

After continued careful study of the impacts of PCBs released to the Housatonic River from the GE-Pittsfield/Housatonic River site in Pittsfield, MA, and in consideration of the 2018 EPA Environmental Appeals Board Order Remanding in Part and Denying Review in Part and the Settlement Agreement reached in February 2020 regarding certain aspects of the cleanup plan EPA selected in 2016, EPA is proposing amendments to cleanup actions, known as Performance Standards and Corrective Measures, or remedial action, for the “Rest of River” component of the GE-Pittsfield/Housatonic River site. EPA’s Proposed Revised Remedial Action was developed after a lengthy period of mediated discussions with a variety of stakeholders, and consultation with Massachusetts and Connecticut environmental agencies. The changes proposed herein reflect the agreements reached during such negotiations and consultation. Unless otherwise discussed herein, the remedial action selected in 2016 remains unchanged.

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STATEMENT OF BASIS

This Statement of Basis, in conjunction with the Draft Revised Modification to the 2016 Reissued RCRA Permit or “Draft Revised 2020 Permit”, set forth EPA’s proposed changes to the Remedial Action for the Rest of River and Operation and Maintenance (O&M) as prescribed by Paragraph 22.n. of the Consent Decree (termed the “Proposed Revised Remedial Action” or “Proposed Revised Cleanup Plan” throughout this document) to address polychlorinated biphenyl (PCB) contamination in river sediment, banks and floodplain soil, and biota that poses an unacceptable risk to human health and the environment.

The cleanup approach for the Draft Revised 2020 Permit outlined in this document is being proposed to address issues raised as part of EPA’s Environmental Appeals Board (EAB) decision in 2018 as well as agreements reached in February 2020 regarding other changes or “enhancements” to the cleanup plan issued in 2016. The two primary sets of changes being proposed concern disposal of materials generated as part of the cleanup, and enhancements to the cleanup itself.

First, rather than a single solution to dispose of contamination either on-site or off-site, the Draft Revised 2020 Permit calls for a two-pronged solution. Specifically, the most contaminated soils and sediments—those soils/sediments regulated as hazardous waste under the federal Resource Conservation and Recovery Act (RCRA) as hazardous waste or as PCB wastes averaging equal to or greater than 50 milligrams per kilogram (mg/kg, or parts per million (ppm))—requiring disposal in a chemical waste landfill under the Toxic Substances Control Act (TSCA) will be shipped out of state for disposal, while the remaining excavated soils and sediments will be consolidated into a protective local Upland Disposal Facility. This “Hybrid Disposal” approach continues to protect human health by ensuring the worst sediment and soil is transported out of state while allowing for the lower level material to be disposed of on-site in a secure location.

Second, the Proposed Revised Cleanup Plan also outlines a number of improvements to the cleanup plan to remove additional contamination from the river system, lessen the burden on adjacent property owners, and improve the overall performance of the cleanup, including the following:

- Eliminate almost 100 acres of capping of river sediments—1/3 of the capping in original plan—by removing more contaminated sediments in six different reaches of the River.
- Remove two dams downstream of Woods Pond (Columbia Mill Dam and Eagle Mill Dam).
- Following sampling, conduct a review of riverbank concentrations and erodibility in upper river reaches to consider whether additional bank soil removal is appropriate.
- Broaden the approach to remediation of vernal pools by testing methods for excavation and restoration of vernal pools as well as use of innovative non-invasive methods of cleanup.
- Conduct additional floodplain remediation on specific residential properties to eliminate the need for use restrictions called for in the original plan.
- Conduct additional cleanup for heavily used areas of the Massachusetts Audubon Society’s Canoe Meadows property.
- Clarify certain Permit provisions regarding “Legally Permissible Future Projects or Work.”

- Provide for a hydraulic dredging and/or hydraulic pumping approach with material from Reach 5C, Woods Pond and potentially from backwaters adjacent to Reach 5C and Woods Pond pumped directly to the Upland Disposal Facility, in order to limit truck traffic as part of the remedy.
- Provide for an enhanced Quality of Life Compliance Plan, which specifies five separate areas to be addressed during remediation: noise; air; odor; light; recreational activities; road use and transport-related impacts; coordination with impacted residents/landowners; and, community health and safety.
- Require GE to work cooperatively with Massachusetts, the City of Pittsfield, and Berkshire County towns to facilitate their enhancement of recreational activities in areas slated for remediation.

All other cleanup requirements in the 2016 Permit remain unchanged in the Draft Revised 2020 Permit. These requirements include:

- Removing and capping PCB-contaminated sediment in some reaches in the Housatonic River.
- Monitoring natural recovery in some reaches in the Housatonic River.
- Removing PCB-contaminated soil from some areas in the floodplain adjacent to the river, including vernal pools, and restoring affected areas.
- Removing/Stabilizing PCB-contaminated erodible river banks that are a source of PCBs that could be transported downstream, focusing on the use of bioengineering techniques in restoring any disturbed banks.
- Placing restrictions (Institutional Controls) on eating fish, waterfowl, and other biota where PCB tissue concentrations pose an unacceptable risk unless/until such consumption advisories are no longer needed, as well as restricting other activities that could potentially expose remaining contamination.
- Establishing procedures to address PCB contamination associated with future work.
- Maintaining remedy components and monitoring over the long-term to assess the effectiveness of the cleanup and recovery of the river and floodplain.
- Establishing mechanisms for additional response actions if land uses change (e.g. dam removal, changes in floodplain land use).
- Conducting periodic reviews following the cleanup to evaluate the effectiveness and adequacy of the cleanup in protecting human health and the environment.

For additional information on site history, risks, and EPA's original cleanup plan, see EPA's [Statement of Basis for EPA's Proposed Remedial Action for the Housatonic River "Rest of River", June 2014](#), and the [2016 Permit](#), both available on EPA's website.

The estimated total cost for the Proposed Revised Cleanup Plan, including sediment and floodplain remediation, off-site transportation and disposal at facilities approved to receive such soil and sediment, as well as operation, maintenance, and monitoring is \$576 million in current year dollars (which is equal to \$456 million in 2010 dollars when comparing against the 2016 Permit using an escalation rate of 26.26%) and will take approximately 13 years to implement (a similar duration to the 2016 Permit). In current year dollars, the 2016 Permit estimated clean-up costs are \$774 million (or \$613 million in 2010 dollars as reflected in the 2016 permit). This is a decrease in cost of \$198 million versus the cleanup outlined in the 2016 Permit (or a change of \$157 million when comparing in 2010 dollars). A more detailed description of the Proposed Revised Remedial Action begins on page 9.

SCOPE OF THIS DOCUMENT

This document, in conjunction with the proposed revisions to the 2016 Reissued RCRA Permit (“Draft Revised 2020 Permit” or “Draft Permit”), satisfies the requirements set forth in the law, regulations, and Consent Decree governing this matter, *United States, et. al., v General Electric Company*, CA No. 99-30225 (D. Mass) (entered Oct. 27, 2000) (“CD” or “Decree”) for a RCRA “Statement of Basis,” 40 C.F.R. §124.7. Namely, this document, together with the Draft Permit, describes the derivation of any new or modified Performance Standards in the Draft Permit and the associated remedial action or Corrective Measures necessary to meet the Performance Standards to address PCBs and any other hazardous waste, constituents or substances that have migrated from the GE facility to surface water, sediment, floodplain and bank soil, and biota in the Rest of River. The Draft Permit also includes the identification of the new or modified applicable or relevant and appropriate requirements (ARARs) under federal or state law that must be met by such Corrective Measures, and where EPA proposes to waive any such ARARs, the basis for such waiver.

The Proposed Revised Remedial Action is based upon the information included in EPA’s Administrative Record which can be reviewed online and at the information repositories identified on page 37 of this document. An index of the Administrative Record can be found at epa.gov/ge-housatonic.

Using the information in the Administrative Record, EPA has evaluated two cleanup alternatives for river sediment/banks and floodplain soil to remove, contain, monitor and/or treat PCB contaminated material to protect human health and the environment from exposure to contaminated soil, sediment, surface water and biota, control sources of releases, and attain (or waive) ARARs. A comparison between the alternative selected in the 2016 Permit and the modifications that are now being proposed is summarized in this document beginning on page 20. Additionally, using the information in the Administrative Record, EPA has evaluated three alternatives for treatment and disposition of the material excavated in the cleanup; that comparison is summarized beginning on page 28.

WHERE ARE WE IN THE CLEANUP PROCESS?

EPA proposed the site to the Superfund National Priorities List (NPL) in September 1997. The federal and state government agencies, the City of Pittsfield, the Pittsfield Economic Development Authority, and GE entered into negotiations late in 1997 in an attempt to reach a comprehensive settlement to address contamination at and from the GE facility. These negotiations resulted in a CD approved by the court on October 27, 2000. This CD governs the cleanup of the site.

In the CD, the river is to be addressed in three stages:

1. The first half-mile cleanup area adjacent to GE's former Pittsfield plant, completed by GE in 2002;
2. The next one and one-half miles (1.5 mile), which was cleaned up by EPA with a cost-sharing agreement with GE, completed in 2007;
3. The "Rest of River", extending from the end of the 1.5 mile cleanup, at the confluence of the East and West Branches of the Housatonic River at Fred Garner Park in Pittsfield, through Massachusetts and Connecticut. This third stage is the subject of this Proposed Revised Cleanup Plan.

The CD did not include a specific cleanup plan for Rest of River but rather identified in a RCRA Corrective Action permit a process for selecting a remedial action (the "2000 Permit"). As part of this process, a Statement of Basis along with a Draft Permit, and EPA's Proposed Remedial Action were issued for public comment in 2014. Following the public comment process and other requirements outlined in the CD, EPA then issued a response to public comments and a final Modification of the Reissued RCRA Permit in 2016 (the "2016 Permit"). That 2016 Permit was appealed by five parties. The EPA Environmental Appeals Board (EAB) listened to the arguments by all of the parties and made a ruling in January 2018. In its decision, the EAB agreed with EPA on all cleanup issues (with the exception of one issue concerning future work provisions,) but raised questions for EPA to consider regarding EPA's decision to dispose of all the sediment and floodplain soils outside of Massachusetts.

The EAB's decision and the challengers' comments on the 2016 Permit gave EPA insight into the various stakeholders' views regarding potential improvements to EPA's original decision. Based on the EAB's decision, EPA and a number of stakeholders used mediated discussions to see if there was one solution that all the parties could agree with, and that made for a faster and better cleanup. The following parties—EPA, GE, the Towns of Lee, Lenox, Stockbridge, Great Barrington, and Sheffield, the City of Pittsfield, the State of Connecticut, the Massachusetts Audubon Society, the Berkshire Environmental Action Team, and C. Jeffrey Cook—reached a Settlement Agreement, which was announced to the public in February 2020. This Proposed Revised Cleanup Plan and Draft Revised 2020 Permit outline the changes to the 2016 Permit that were agreed to in that Settlement Agreement. See **Figures 1 and 2** for a map depicting the key elements of that Settlement Agreement and this proposed modification.

The changes to the 2016 Permit are the actions on which EPA is seeking public comment at this time. Consistent with RCRA Permit regulations and guidance, EPA's comment period is limited to the proposed changes to the 2016 Permit outlined in this document and shown in redline/strikeout in Draft Revised 2020 Permit.





WILL THE UPLAND DISPOSAL FACILITY BE SAFE?

Contaminated soil and sediment are being removed, via excavation/dredging from the floodplain and river bottom where they pose unacceptable risks to human health and the environment. Since there is current exposure to PCBs, they pose threats to humans through direct contact and fish consumption and pose an environmental threat via uptake to ecological receptors. In essence, the sediments are being removed from an area where they are causing impacts to humans who use the floodplain/river or consume fish and to the environment, to an area that is designed to prevent environmental and human health impacts. The contaminated soils and sediments will be sequestered in an engineered containment cell that will be maintained and monitored to ensure that it is protective of human health and the environment.

The composite liner system proposed for the Upland Disposal Facility (UDF) is an engineered barrier system that has been used for many decades at landfills across the nation. This type of system has been found to be effective at containing a wide range of waste materials. The liner system proposed for the UDF will be evaluated by EPA to confirm it is chemically compatible with the materials to be dredged. When two geomembrane liners are used in conjunction with a drainage layer designed to limit liquid head (pressure) on the liner system, studies have demonstrated that the liner efficiency is 99.9% or better. Both the liner and final cover system like the one proposed have been designed using well-established engineering procedures to provide a containment system meeting acceptable factors of safety and to provide adequate isolation of the sediments from the environment and human exposure. The composite liner system is recognized as a best available liner technology to contain waste materials and has been shown to have a service life of 400-800 years. During construction, the installation of the UDF liner and cover systems will be subjected to construction quality control and construction quality assurance monitoring. Following the installation of the liner system and the drainage layer, the UDF liner system will be subjected to a liner integrity test to identify, locate and repair any construction related defects or leaks prior to placing the UDF into service. Once the UDF is filled and the final cover system is installed, infiltration into the UDF will be essentially cut off, thereby further eliminating a primary potential pathway for any future source of leakage and reducing the amount of leachate that will be generated. While differential settlement can be a challenge for landfill cover systems, in this case, the UDF will be accepting a single waste stream of similar material that shouldn't be subject to challenges often caused by a wide array of wastes, as in a municipal landfill. The integrity of the cover will be maintained by a post-closure maintenance program which requires regular monitoring and inspections; maintenance and repairs would be made as needed. The Draft Revised 2020 Permit also includes provisions limiting the height and maximum capacity of the UDF.

A CLOSER LOOK AT EPA'S PROPOSED REVISIONS TO THE CLEANUP PLAN

The Rest of River at the GE-Pittsfield/Housatonic River Site is broken into a series of reaches, designated as Reaches 5 through 16, that contain sediment and riverbank soil contaminated with PCBs. In addition, areas with PCB-contaminated soil greater than 1 milligram per kilogram (mg/kg) in the floodplain adjacent to these reaches are also included in the Rest of River study area. **Figures 3 and 4** show the location of the various river reaches and the floodplain areas of the site.

Based on EPA's careful evaluation of alternatives using the nine criteria specified in the 2000 Permit and other relevant information, EPA is proposing for public comment the changes to the Rest of River cleanup outlined below. EPA's Remedial Action outlined in the 2016 Permit was Combination Alternative 9 (SED 9/FP 4 MOD with TD 1 RR). The modifications proposed herein have been termed SED 9/FP 4 MOD 2 combined with TD 6, a "hybrid approach" combining both on-site and off-site disposal. The proposed changes to the Performance Standards and Corrective Measures required to implement this cleanup are outlined in the Draft Revised 2020 Permit and highlighted in redline/strikeout text. EPA is only soliciting public comments on the changes to the 2016 Permit.

RIVER SEDIMENT AND BANKS

The following changes to the Performance Standards and Corrective Measures for river sediment, floodplain and banks are being proposed by EPA. As was the case with the original remedy outlined in the 2016 Permit, the purpose of the cleanup is to: reduce risks to humans from consumption of fish and waterfowl; reduce risks from direct contact to sediments and floodplain soil; reduce ecological risks; and control the sources of releases to reduce downstream transport of PCBs.

Excavation in Lieu of Capping in Certain Reaches; Dam Removal

In the 2016 Permit and in this revised plan, removal of PCB-contaminated sediment is required in a number of areas followed by the placement of an engineered cap designed to physically and chemically isolate the residual PCBs in sediment and provide habitat for aquatic plants and animals and reduce downstream transport of PCBs. However, in several areas previously slated for capping, for the Proposed Revised Cleanup Plan, EPA will now require excavation to meet an average 1 mg/kg PCB cleanup level, reducing the remedy's overall reliance on capping by approximately 100 acres, a one-third reduction in the amount of capping from the 2016 Permit. This approach will be used in Reach 5C, Columbia Mill Impoundment (Reach 7B), Eagle Mill Impoundment (Reach 7C), and in portions of Willow Mill Impoundment (Reach 7E), Glendale Impoundment (Reach 7G), and Rising Pond (Reach 8). For the Reach 7 and 8 areas, the 2016 Permit only provided as an option, in lieu of capping, to allow GE to excavate the sediment in each impoundment to meet an average of 1 mg/kg PCBs. This option has now been converted to a requirement.

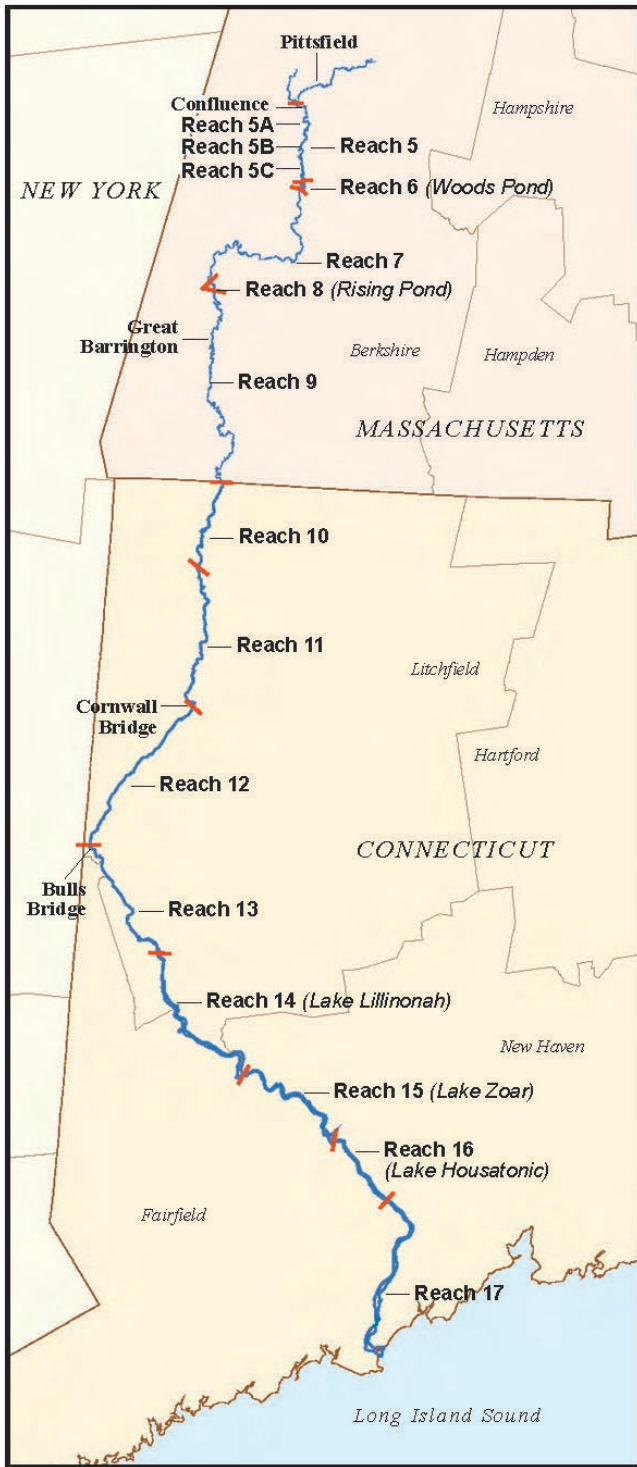
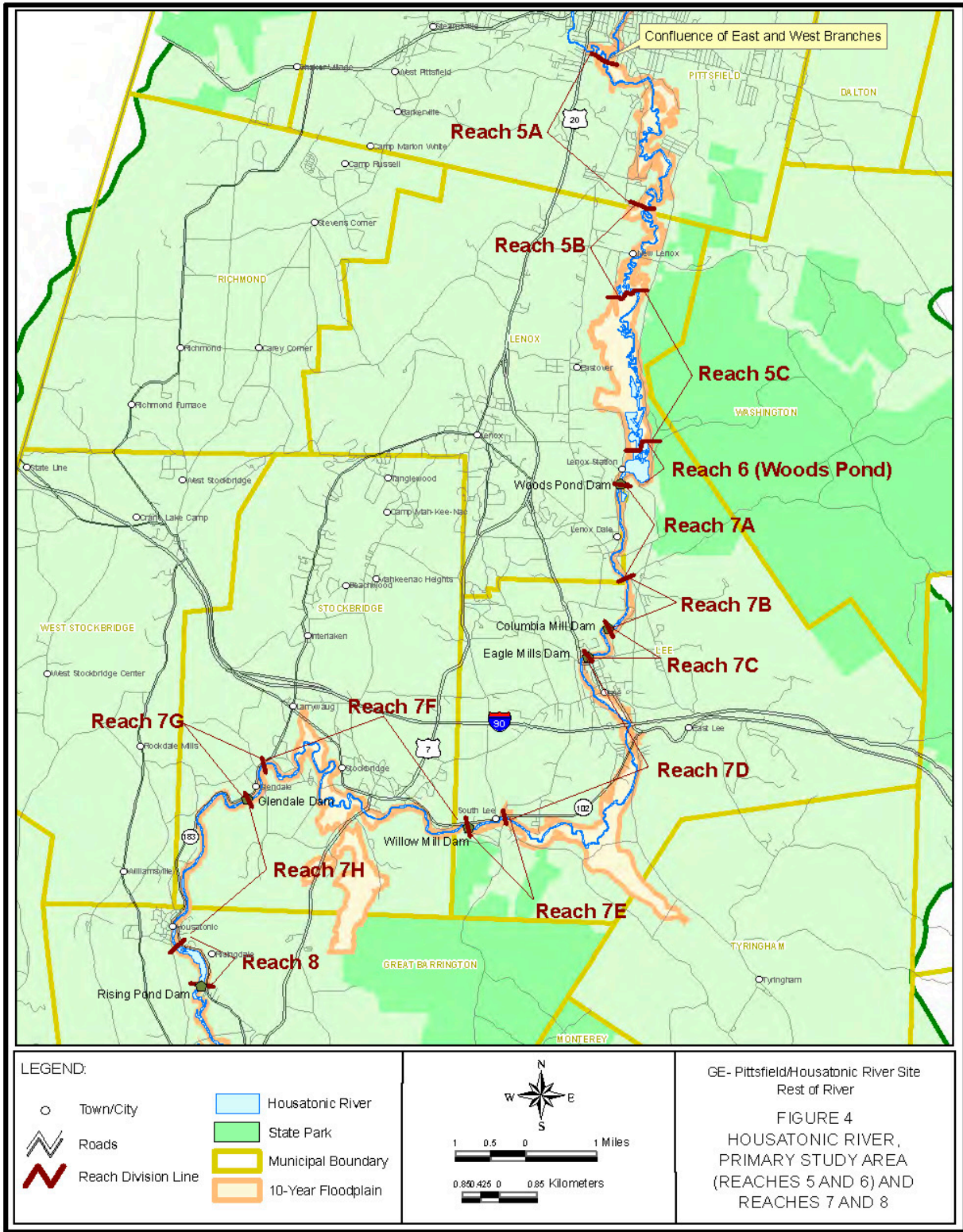


FIGURE 3 HOUSATONIC RIVER, REACHES 5 THROUGH 17

In addition, the remedy for Columbia Mill Impoundment (Reach 7B) and Eagle Mill Impoundment (Reach 7C) now includes the removal of the current dam and dam remnants at these two impoundments. The 2016 Permit provided for coordination with third parties wishing to fund and conduct dam removal, while the Draft Revised 2020 Permit requires GE to remove the dam/dam remnants in these two impoundments.

Consideration of Additional Riverbank Remediation

The 2016 Permit calls for remediation and stabilization of certain erodible riverbanks in Reaches 5A and 5B exceeding cleanup standards outlined in the 2016 Permit. The Draft Revised 2020 Permit adds to those requirements for Reach 5A and 5B banks that do not otherwise require remediation pursuant to the 2016 Permit, provisions for GE to evaluate PCB data, erosion potential, the adjacent floodplain removal (if any), constructability issues, and potential impact to PCB downstream transport should such banks erode and, based on these factors, consider supplemental bank removal. This would provide for the potential remediation of additional riverbank areas that could contribute to downstream transport of PCBs.



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FLOODPLAINS AND VERNAL POOLS

The 2016 Permit included cleanup in floodplain and vernal pool areas concurrent with the nearby sediment cleanup activities in order to reduce ecological risk and direct contact risk to humans. The specific risk-based cleanup standards that apply to each exposure area within the floodplain are identified in the Permit. In that original approach, portions of residential parcels near the river that weren't actively being used for residential purposes were slated for less cleanup based on a recreational exposure scenario, instead of a residential exposure scenario. The Proposed Revised Remedial Action changes this approach on 22 residential parcels in Pittsfield, specifying that they must be cleaned up to a more stringent residential standard, eliminating the need for land use restrictions on any part of those parcels. This approach may also be extended to six parcels in Lenox, at the option of the property owners.

Furthermore, the Draft Revised 2020 Permit includes a change relative to Exposure Area 10, which is at the Massachusetts Audubon Society's Canoe Meadows property. Specifically, the proposal expands the Exposure Area (EA) 10 boundary to the east so that the EA incorporates the area with PCBs greater than 1 mg/kg in the top foot of soil. This expansion would also allow evaluation of the trail in this area. The proposal also provides for an additional subarea, beyond that included in the 2016 Permit, requiring remediation of additional floodplain soils to meet the applicable floodplain soil Performance Standards. These changes are outlined in a revised table and figure in the Draft Revised 2020 Permit.

For cleanup of vernal pools, this Proposed Revised Cleanup Plan includes a more flexible pilot project and cleanup framework. Two different approaches would be implemented concurrently in an initial subset of vernal pools (not more than ten pools will be evaluated at the outset):

- Conventional cleanup methods (e.g., excavation and reconstruction) in a group of pools would be used to achieve the vernal pool soil/sediment cleanup level of 3.3 mg/kg followed by active restoration.
- A pilot study would be conducted in a second group of vernal pools to evaluate the effectiveness of a sediment amendment such as activated carbon in reducing the bioavailability of PCBs to biota and the impacts of the amendment on these pools. This is the approach called for in the 2016 Permit.

Based on the outcome of the first phase of vernal pool remediation and restoration, EPA will determine how and where additional vernal pool remediation will occur to meet the vernal pool-specific cleanup level of 3.3 mg/kg PCBs in soil/sediment.

OTHER REVISED PROVISIONS IN THE DRAFT REVISED 2020 PERMIT

In response to the EAB Remand, all "Legally Permissible Future Project or Work" provisions in the 2016 Permit will be retained, but the related Corrective Measures provision of the Revised Permit will be modified to require that the specified "further response actions" (i) will be in accordance with and pursuant to the Consent Decree; (ii) will be consistent with the scope of the response actions selected in the Revised Permit; and (iii) clarified to

require that Permittee's responsibility for the costs of said further response actions will be limited to those costs solely related to the presence of PCBs.

Also, for the remediation of Reach 5C, Woods Pond and potentially in backwaters adjacent to Reach 5C and Woods Pond, GE shall implement, if feasible, a hydraulic dredging and/or hydraulic pumping approach with material from these areas pumped directly to the Upland Disposal Facility described below and depicted in Figure 5. To the extent that the hydraulic dredging and/or hydraulic pumping approach is not feasible, GE shall transport material from Reach 5C and Woods Pond to the Upland Disposal Facility while avoiding driving on public roads to the maximum extent practical. Although PCBs from Reach 5C, Woods Pond and potentially in backwaters adjacent to Reach 5C and Woods Pond at any concentration may be pumped or trucked to the Upland Disposal Facility (as described in this paragraph) for temporary processing, all material permanently disposed of at the Upland Disposal Facility shall meet the standards described in this document.

As outlined in the Draft Revised 2020 Permit, GE is required to submit to EPA, for review and approval, a Quality of Life Compliance Plan, which specifies five separate areas to be addressed during remediation: noise, air, odor, light; recreational activities; road use and transport—related impacts; coordination with impacted residents/landowners; and community health and safety. EPA will solicit input on this plan from local governments, impacted residents/landowners, neighborhoods in the vicinity of the cleanup, and other interested stakeholders. Section C of the Quality of Life Compliance Plan will include, among other requirements, consideration of methods to reduce residential impacts where practical, including remediation techniques that further restrict transport of waste material through residential areas. Examples of roads that would warrant such further restrictions include: Brunswick, Kenilworth, Warwick, Noblehurst, Chester, and Revilla Terrace; Shetland, Clydesdale, Pinto, and Palomino Drives; and Anita, Lucia, Quirco, Joseph, and Eric Drives. GE agrees to work with the City of Pittsfield, affected towns, and the landowners to take reasonable steps to minimize the adverse impact of the work activities by, among others, coordinating work activities, scheduling and traffic routing.

GE will be required to work cooperatively with the City of Pittsfield, the Towns of Great Barrington, Lee, Lenox and Stockbridge, and the State of Massachusetts to facilitate their enhancement of recreational activities, such as canoeing and other water activities, hiking, and bike trails in the Rest of River corridor. Such opportunities are possible on properties where remediation will occur and/or where temporary access roads are constructed. GE will also coordinate with municipal officials and affected landowners regarding work activities, schedules and traffic routes. GE's coordination with officials and landowners shall be described in the relevant work plans submitted to EPA.

DISPOSAL OF CONTAMINATED SEDIMENT AND SOIL

Rather than a single solution to dispose of contamination either on-site or off-site, the Proposed Revised Cleanup Plan calls for a two-pronged, or hybrid, solution. Specifically, the most contaminated soils and sediments (those soils/sediments regulated as hazardous waste under the federal Resource Conservation and Recovery Act (RCRA) as hazardous waste or as PCB wastes exceeding an average of 50 ppm requiring disposal in a chemical waste landfill under

the Toxic Substances Control Act (TSCA)) will be shipped out of state for disposal at a facility that is licensed/permited to accept such waste and will accept it, so long as it is in compliance with EPA facility requirements. Under this proposal, at least 100,000 cubic yards of contaminated soil/sediment will be disposed of off-site. The remaining excavated soils and sediments will be consolidated into a protective local Upland Disposal Facility as shown in **Figure 5** and described below.

For these lower level contaminated materials, a single disposal location called the Upland Disposal Facility will be sited at a portion of an operating gravel pit property at the Lee/Lenox line, over 1000 feet from the river, and over 15 feet above the water table. (EPA proposes not to use the other two landfill locations previously evaluated by GE for disposal of PCB material.) The average concentrations of PCBs to be placed in the Upland Disposal Facility are estimated to be 20 to 25 ppm, well below the 50 ppm federal criterion for commercial PCB chemical waste landfills. Segregation of the material will be based on sampling protocols that are also outlined in the Draft Revised 2020 Permit.

Despite the Upland Disposal Facility only accepting lower-level material, the Draft Revised 2020 Permit requires it to be designed for added protection, with a double liner under the landfill, leachate collection, a groundwater monitoring network, and a multi-layer low permeability engineered cap/cover on top of the landfill. A typical cross-section of the Upland Disposal Facility is shown in **Figure 6**. The Draft Revised 2020 Permit is clear that no one can use the Upland Disposal Facility for taking any materials beyond those that are part of the Rest of River cleanup.

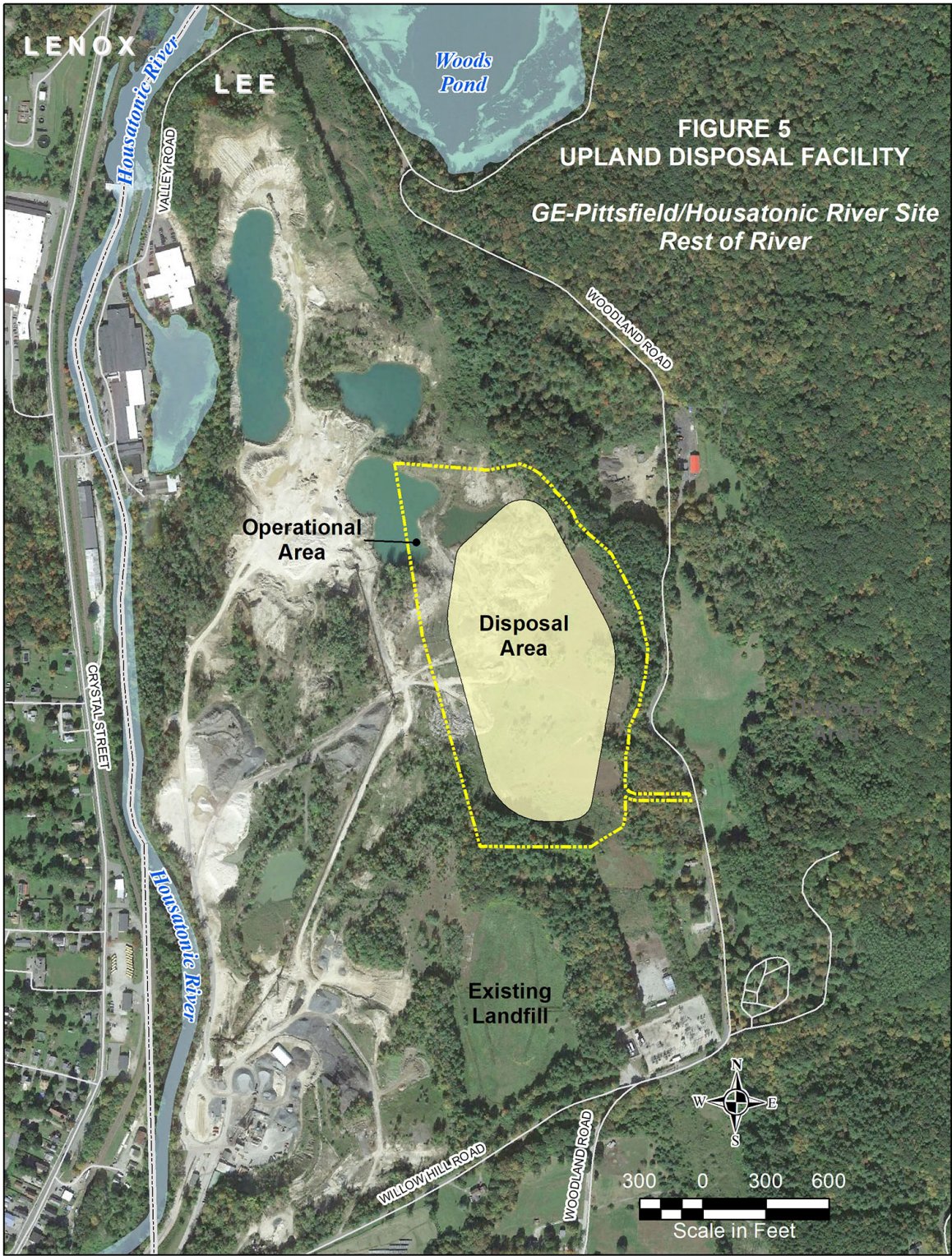
OPERATION & MAINTENANCE, MONITORING, INSPECTIONS, PERIODIC REVIEWS, AND INSTITUTIONAL CONTROLS

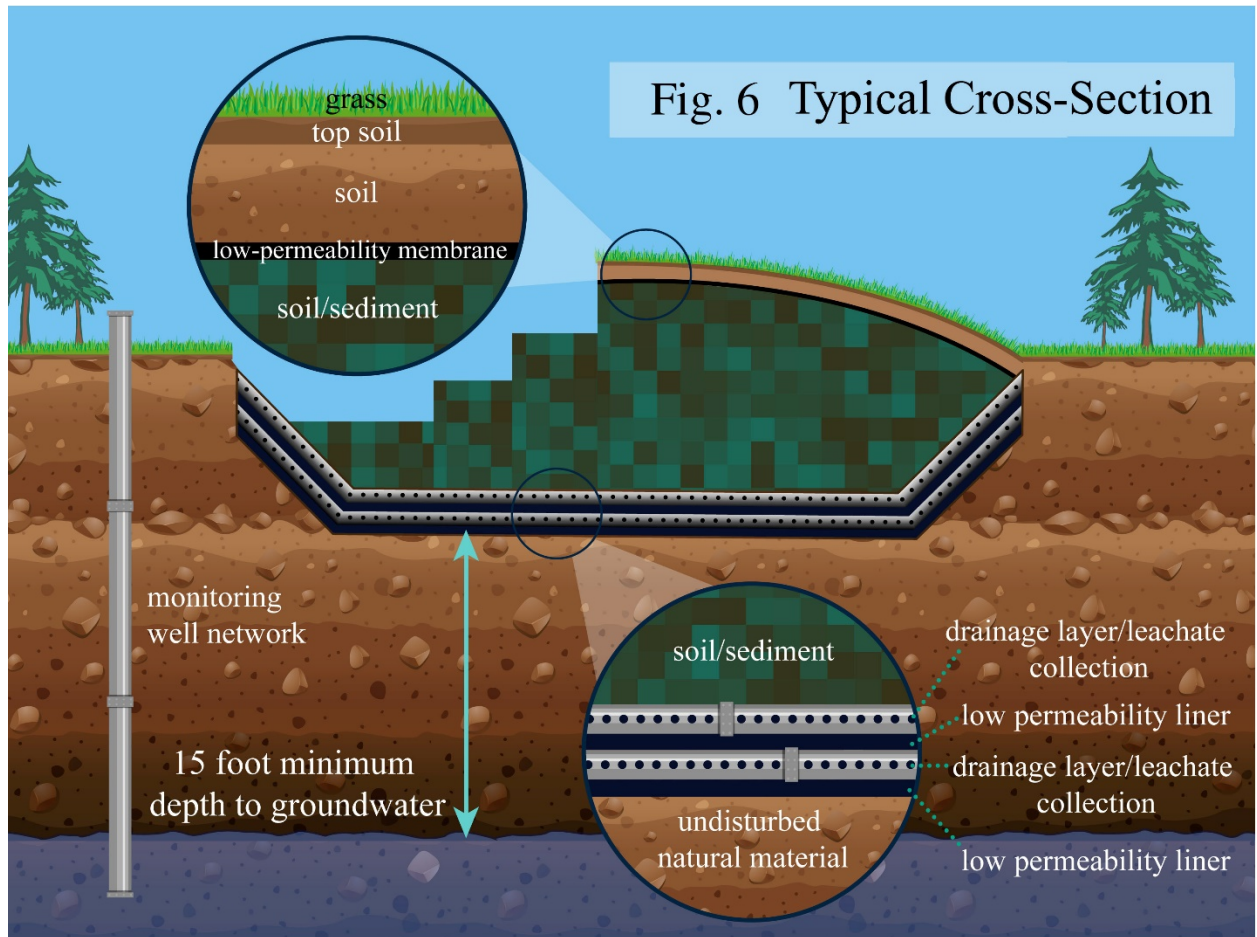
In addition to the maintenance, monitoring, and inspection requirements outlined in the 2016 Permit, additional provisions have been proposed to address the long-term operation, maintenance, and monitoring for the Upland Disposal Facility now being proposed. Institutional controls governing the future land and groundwater use at that facility will also be required. As outlined in the 2016 Permit and in accordance with CERCLA and the Consent Decree, periodic reviews (every five years) will also be conducted to evaluate the effectiveness and adequacy of the remedial measures in protecting human health and the environment.

POTENTIAL COMMUNITY IMPACTS

While many of the cleanup areas in Rest of River are located in relatively undeveloped areas, there are some that are in close proximity to residential neighborhoods where the proposed work would temporarily impact the surrounding neighborhoods and communities.

During remedial design, various measures will be evaluated and subsequently implemented to reduce these potential impacts on surrounding neighborhoods and communities. For example, instead of having all neighborhoods affected at once, the work would be done in phases working generally north to south, and temporary haul roads would be built to limit use of local roads and reduce construction traffic as much as possible.





Proposed language within the Draft Revised 2020 Permit also imposes limitations on the transport of waste material on small residential streets. If feasible, GE is required to transport sediments from Woods Pond and some areas north of the pond by hydraulically pumping it through pipes rather than trucking it, thereby eliminating nearly 50,000 truck trips from the roads of Lee and Lenox.

As part of the February 2020 Settlement Agreement, and as required in the Draft Revised 2020 Permit, GE has also committed to engage with property owners, Native American tribes, local governments, communities, affected property owners and other stakeholders to ensure that their input is included in the design process and coordinate with municipal officials and affected landowners regarding the work activities, schedule and traffic routes, and incorporate this information into work plans submitted to EPA prior to the work. GE will inventory the condition of all roads to be used during the remediation and will repair any significant damage attributable to the remediation work. GE will work cooperatively with stakeholders to enhance recreational activities such as canoeing, other water activities, hiking, and bike trails in the Rest of River corridor within the City and other impacted municipalities. GE has also committed to coordinate with municipalities regarding the upgrade of stormwater outfalls in the river as they are encountered during cleanup work.

EPA is committed to working with the neighborhood surrounding the Upland Disposal Facility to ensure that work schedules, transportation routes, as well as air, noise, and dust monitoring are adequate to ensure the protection of residents, but also ensure that disruptions are minimized to the maximum extent practicable.

GENERAL IMPLEMENTATION SCHEDULE AND COST

As part of the February 2020 Settlement Agreement, GE agreed to immediately initiate the planning, sampling, and design process for the cleanup—those efforts have already begun. For example, on June 9th, GE submitted a proposed Statement of Work pursuant to Section II.H of the Draft Permit. Construction is estimated to take 13 years to complete once remediation is underway. The construction timeline did not change as a result of the changes outlined in the Draft Revised 2020 Permit. The estimated total cost for the Proposed Revised Cleanup Plan, including sediment and floodplain remediation, off-site transportation and disposal at facilities approved to receive such soil and sediment, as well as operation, maintenance, and monitoring is \$576 million in current year dollars (which is equal to \$456 million in 2010 dollars when comparing against the 2016 Permit using an escalation rate of 26.26%). In current year dollars, the 2016 permit estimated clean-up costs are \$774 million (or \$613 million in 2010 dollars as reflected in the 2016 permit). This is a decrease in cost of \$198 million versus the cleanup outlined in the 2016 Permit (or a change of \$157 million when comparing in 2010 dollars).

WHY EPA IS PROPOSING THIS REVISED CLEANUP PLAN

Based on the information in the Administrative Record, including the RCRA Facility Investigation (RFI) and Corrective Measures Study (CMS), as well as supplemental information prepared in support of this proposal, EPA believes that the Proposed Revised Remedial Action (also referred to as the Proposed Revised Cleanup Plan) is the best suited alternative under the 2000 Permit evaluation criteria. The Draft Revised 2020 Permit includes the Performance Standards and Corrective Measures necessary to meet the Performance Standards to address unacceptable risks to human health and the environment, and reduce the potential for downstream transport of PCBs, while minimizing adverse impacts to state-listed species and their habitats and being sensitive to the characteristics of the Rest of River and related biodiversity. The Proposed Revised Remedial Action also removes and disposes off-site a significant volume of the highest concentrations of PCB-contaminated sediment and soil, from both the River itself, and the associated floodplain, while consolidating lower level contaminated sediment and soil in a secure Upland Disposal Facility. The Proposed Revised Cleanup Plan provides for the isolation (capping) of a portion of PCB contaminated sediments in the river to reduce the risk to human health and the environment, though the Draft Revised 2020 Permit provides for significantly more sediment removal and less reliance on capping in the river than the 2016 Permit. Any remaining contamination will be monitored over the long term to evaluate the continued effectiveness of the remedy. Through the Settlement Agreement, this Proposed Revised Cleanup Plan, combines the Hybrid Disposal approach discussed below with significantly enhancing the cleanup in the river and floodplain, and providing other key benefits to local communities.

Based on information currently available, EPA believes the Proposed Revised Remedial Action meets the General Standards for Corrective Measures and provides the best balance of tradeoffs among the other alternatives with respect to the relevant criteria. EPA also expects the Proposed Revised Remedial Action to (1) control the sources of releases so as to reduce or eliminate, to the maximum extent practicable, further releases that may pose a threat to human health and the environment; (2) attain the Performance Standards; (3) comply with applicable standards for management of wastes; and (4) be protective of human health and the environment; (5) comply with ARARs (or justify a waiver); (6) be cost-effective; (7) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and (8) satisfy the preference for treatment as a principal element, or explain why the preference for treatment will not be met.

EXPECTED OUTCOME OF THE PROPOSED REMEDIATION

The cleanup is expected to reduce unacceptable human health risks from direct contact with sediment and floodplain soil. In addition, the cleanup is expected to result in reductions in biota concentrations to allow increased human consumption of fish and other biota taken from the river within a short time after remediation is completed, and to greatly reduce the downstream transport of PCBs. This should result in further reductions in PCB levels in fish in both Massachusetts and Connecticut, which, over time, should allow the consumption of additional fish meals or increased consumption of other biota. The additional cleanup actions in the floodplain will further reduce risks from direct exposure and eliminate the need for land use restrictions in a subset of parcels.

The sediment and river bank cleanup will reduce risk to ecological receptors from exposure to PCBs by capping and removal of PCBs and thereby reducing the exposure of ecological receptors to PCBs. The floodplain and vernal pool remediation components of the Proposed Revised Cleanup Plan are designed to reduce risk for ecological receptors while being sensitive to adverse impacts to state-listed species and their habitat.

EPA's Proposed Revised Cleanup Plan will require restoration to address the adverse impacts to the river bed, banks, wetlands and floodplain caused by the remediation. Engineered Caps in the river bed, where necessary, will be required to include a habitat layer to assist the recovery of aquatic organisms. Impacted river banks will be restored using bioengineering wherever possible and appropriate. Areas of the floodplain that are cleaned up or that are disturbed for temporary remedial infrastructure (such as access roads) will be restored. Vernal pools will be carefully monitored prior to and following cleanup to assess recovery and the need for further work. Restoration of impacted wetland habitat is expected to be effective and reliable. Specific restoration techniques will be implemented, evaluated and assessed and modified as necessary using an adaptive management approach.

SITE DESCRIPTION/PERMIT HISTORY

The Rest of River includes approximately 125 miles of river over 12 river reaches (Reaches 5 through 16, as shown in Figures 3 and 4) in Massachusetts and Connecticut and associated floodplain within the 1 mg/kg isopleth (approximated

by the 10-year floodplain within the first 10 ½ miles). Reaches 5 through 8 flow through the towns of Pittsfield, Lenox, Lee, Stockbridge, and Great Barrington, Massachusetts (upstream to downstream). Reach 9 flows through Sheffield, Massachusetts and Reaches 10 through 16 are in Connecticut, from Canaan downstream to Derby.

The first 10 ½-mile stretch starting at the confluence of the East and West Branches to Woods Pond Dam is referred to as Reaches 5 and 6. Downstream of Reach 6, the impoundments along Reach 7 and 8 also include Columbia Mill Impoundment (Reach 7B), Eagle Mill Impoundment (Reach 7C), Willow Mill Impoundment (Reach 7E), Glendale Impoundment (Reach 7G), and Rising Pond (Reach 8).

Pursuant to the Decree and the 2000 Permit, EPA, in October 2016, issued the 2016 Permit, with concurrence from Massachusetts. Five parties challenged the 2016 Permit before the EAB. Connecticut, Massachusetts and other parties also participated in the EAB process. The EAB issued a decision in January 2018, denying the challengers' review in part and remanding to EPA on two issues challenged by GE. EPA, Berkshire Environmental Action Team, C. Jeffrey Cook, GE, the Housatonic Rest of River Municipal Committee, the Housatonic River Initiative, the City of Pittsfield, Massachusetts Audubon Society, and the State of Connecticut subsequently engaged in mediated discussions concerning the 2016 Permit. The Parties entered into the negotiations with the objective of identifying whether there was one negotiated resolution of the permit dispute before the EAB that would result in a protective cleanup that is more comprehensive and faster, that minimizes the disputes and litigation going forward concerning the cleanup, and that is consistent with the overall Consent Decree for the Site. In February 2020, all Parties, with the exception of the Housatonic River Initiative, entered into a Settlement Agreement which, among other provisions, included agreements on the specific items that form the basis of this Proposed Revised Remedial Action.

For further site description and site history, see the 2014 Statement of Basis.

COMMUNITY INVOLVEMENT

Throughout the duration of the Rest of River project, EPA has kept the local community and other interested stakeholders up to date on various project investigations and activities. There was substantial community involvement leading up to the release of the 2016 Permit and, most recently, in February/March 2020, EPA participated in three informational sessions held by local officials regarding the February 2020 Settlement Agreement and the remedy changes outlined herein.

EPA holds regular meetings with the Citizens Coordinating Council to update them on the Rest of River as well as the other activities at the GE site. EPA has held an informal public input period for each deliverable generated for Rest of River and continues to place documents for the entire site on its website and to maintain repositories throughout the affected communities.

EPA has committed to provide contractor support to provide technical assistance to the City of Pittsfield and the Towns of Lenox, Lee, Stockbridge, Great Barrington, and Sheffield. The contractor will be funded by EPA and

can provide support for the communities' oversight of design documents and the work. EPA will ensure that schedules for submissions and reviews take into account any necessary local government and stakeholder reviews.

WHY CLEANUP IS NEEDED

Past practices at the GE facility resulted in contamination of Housatonic River sediment, floodplain soil, and biota including fish and other animals. PCBs contaminated the floodplain by the movement of contaminated sediment onto the floodplain during times of high water. Based upon risk assessments conducted by EPA, PCBs in the Housatonic River sediment, floodplain soil, and biota pose unacceptable risks to both human and ecological populations. More detailed information on site risks, cleanup objectives, and alternatives previously considered can be found in the Administrative Record and is summarized in EPA's 2014 Statement of Basis.

HOW DOES EPA CHOOSE A FINAL CLEANUP PLAN?

EPA uses the nine criteria that were established in the Permit and other relevant information to compare alternatives and propose and select a final cleanup plan. Of the nine criteria, Overall Protection of Human Health and the Environment, Compliance with Applicable or Relevant and Appropriate Federal and State Requirements (known as "ARARs"), and Control of Sources of Releases are the three General Standards for Corrective Measures. In addition, EPA considers six Selection Decision Factors: Long-Term Reliability and Effectiveness, Attainment of Interim Media Protection Goals; Reduction of Toxicity, Mobility or Volume; Short-Term Effectiveness; Implementability; and Cost. Definitions and more details regarding the nine criteria from the Permit are provided in the 2014 Statement of Basis.

In addition to the criteria enumerated above, other relevant information, including formal input on the Proposed Revised Cleanup Plan on the proposed changes from the 2016 Permit received during the public comment period, will be considered prior to EPA issuing a final Revised Cleanup Plan.

COMPARATIVE ANALYSIS OF COMBINED SEDIMENT/FLOODPLAIN 2016 AND 2020 ALTERNATIVES

This section presents a summary of a comparative evaluation of two combination cleanup alternatives for river sediment and floodplain soil using the Permit criteria: the alternative selected in the 2016 Permit (termed the "2014 Alternative") and EPA's new Proposed Revised Cleanup Plan as described herein (the "2020 Alternative"). A more detailed evaluation of the Permit criteria is contained in EPA's July 2020 *Determination on Remand and Supplemental Comparative Analyses of Remedial Alternatives* ("Comparative Analysis"), which is in the Administrative Record. In 2014, a Comparative Analysis was performed for several cleanup alternatives. The information contained in the 2014 Comparative Analysis is not meant to be superseded by this current analysis

except for the specific comparative analysis between the 2014 Alternative and the 2020 Alternative. Please refer to the 2014 Comparative Analysis for additional details. The differences between the two alternatives are summarized in **Table 1**.

Overall Protection of Human Health and the Environment

The evaluation of whether a particular remedial alternative would provide overall human health and environmental protection draws on the evaluations under several other permit criteria, including but not limited to the following: (1) attainment of Interim Media Protection Goals (IMPGs), (2) compliance with ARARs, (3) long-term reliability and effectiveness, and (4) short-term effectiveness. In the 2014 Comparative Analysis, the 2014 Alternative was judged to provide the best overall protection of human health and the environment because it achieved the important balance between short- and long-term risks and long-term benefits.

Table 1 Alternatives Summary and Comparison

Media	Reach	2016 Permit Remedy ¹	Draft Revised 2020 Permit
Sediment/ Riverbank	Reach 5A (Sediment)	2.5 ft removal and capping	Unchanged
	Reach 5B (Sediment)	Removal and backfill of areas >50 mg/kg (1 ft) and EMNR in remainder of reach	Unchanged
	Reaches 5A & 5B (Banks)	Removal/stabilization of erodible river banks with PCBs >5 mg/kg in Reach 5A (1 ft), and banks in reach 5B with PCBs >50 mg/kg (1 ft)	Same as 2016 Permit Remedy plus evaluate the PCB data, erosion potential, the adjacent floodplain removal (if any), constructability issues, and the potential impact to PCB downstream transport should such banks erode, and, based on these factors, consider supplemental bank removal
	Reach 5C (Sediment)	2 ft removal with capping	Removal of sediment and backfill to achieve 1 mg/kg average
	Reach 5 Backwaters	Combination of removal and capping to achieve 1 mg/kg average, excluding certain high-priority habitat, plus removal of PCBs >50 mg/kg (1 ft)	Unchanged
	Reach 6 Woods Pond	Combination of removal with capping, resulting in a post-capping minimum water depth of 6 feet	Unchanged
	Reach 7 Impoundments	Removal and capping to achieve 1 mg/kg average, plus removal of PCBs >50 mg/kg (1 ft); coordinate with dam removal	Removal and backfill at CMD/FEMD impoundments to achieve 1 mg/kg average; removal and backfill/capping at WMD/GD impoundments to achieve 1 mg/kg average (maximum 3 and 6.5 acres of capping in these impoundments, respectively); remove CMD and FEMD
	Reach 7 Channel	MNR	Unchanged
	Reach 8 Rising Pond	Removal and capping to achieve 1 mg/kg average, plus removal of PCBs >50 mg/kg (1 ft)	Same as 2016 Permit Remedy, but maximum capping area of 31 acres
	Reaches 9–16	MNR	Unchanged
Floodplain	Reaches 5–8	Remove/replace top 1 ft to achieve primary standards except in high-priority habitat areas, where top 1 ft will be removed/replaced to achieve secondary standards; in Frequently Used Subareas remove/replace top 3 ft to achieve standards; treat or remove/replace vernal pool soils to achieve 3.3 mg/kg	Same as 2016 Permit Remedy, with addition of new subarea in Canoe Meadows; plus, cleanup of up to 22 residential properties in Reach 5A and potentially 6 additional properties in Lenox to residential standards; pilot study on up to 10 vernal pools to evaluate removal and amendment
Treatment/ Disposition	--	Off-site disposal in existing licensed landfill(s), maximizing transport of material by rail to extent practicable (TD 1 RR)	Hybrid disposal: disposal of material meeting PCB criteria in Att. C to Settlement Agreement in UDF; off-site disposal of remaining material (minimum 100,000 cy) in existing licensed landfill) (TD 6)

Notes:

¹ Sediment removal depths specified previously by EPA for the 2016 Permit Remedy (summarized in this table) are approximate and were used for volume/cost estimation and for comparison purposes only.

CMD: Columbia Mill Dam

cy: cubic yard

EMNR: enhanced monitored natural recovery

FEMD: Former Eagle Mill Dam

ft: foot

GD: Glendale Dam

mg/kg: milligram per kilogram

MNR: monitored natural recovery

PCB: polychlorinated biphenyl

UDF: upland disposal facility

WMD: Willow Mill Dam

The 2020 Alternative attains the same IMPGs as the 2014 Alternative. Compliance with ARARs—discussed in more detail below—is essentially the same for both the 2014 and 2020 alternatives. The ARARs related to sediment/floodplain remediation are described more fully below. With respect to long-term effectiveness and permanence, as discussed more fully below, the replacement in the 2020 Alternative of containment/capping of PCBs with PCB removal and potential additional bank soil removal make the 2020 Alternative better. Regarding short-term effectiveness, the 2020 Alternative includes several upgrades from the 2014 Alternative including the commitments toward implementation of the Quality of Life Compliance Plan, the enhancement of recreational activities, and coordination regarding work activities, schedules and traffic routes. These upgrades will benefit the communities significantly in comparison to the 2014 alternative.

Control of Sources of Releases

The extent to which the two alternatives reduce or minimize further PCB releases was evaluated. As described in the 2014 Comparative Analysis, the sediment and riverbank components of the two alternatives are most relevant to this evaluation. The 2014 and 2020 Alternatives perform similarly with respect to downstream transport of PCBs. In addition, as described in the 2014 Comparative Analysis, the 2014 Alternative was expected to provide adequate protection from extreme flood events in all reaches except for Reach 5B (but the remaining PCB concentrations in 5B were low enough that the flooding impacts were not expected to be unacceptable). The 2020 Alternative has two elements that would lead to greater resilience to extreme flood events: first, as described above, supplemental bank removal is to be considered for the Reach 5A and 5B banks, which, if implemented, would likely result in reduced bank erosion and associated reduction in the release of PCBs into the river during an extreme storm event; second, with respect to the uncertainty in simulating high-flow events, the 2020 Alternative's increased reliance on removal instead of capping would reduce that uncertainty. Based on those differences, the 2020 Alternative would likely have a better response to an extreme flood event.

The 2014 Alternative and the 2020 Alternative are very similar on the issues of bank stabilization and operation, maintenance and monitoring, which can reduce the potential for large amounts of PCBs in soils eroding from the banks and floodplain. The potential additional bank removal in the 2020 Alternative could reduce the amount of PCB-contaminated banks in Reach 5A and 5B, and supplemental bank removal would be considered in the context of erosion potential and the potential impact to PCB downstream transport among other factors.

The 2014 Comparative Analysis stated that the potential for short-term releases during implementation would be a function of the duration of the remedy and the overall extent of open excavation/dredging areas. The 2014 and 2020 Alternatives would function similarly for the most part, as the remedy duration estimate has not changed. However, engineering controls and best management practices will be necessary for the additional cleanup work under the 2020 Alternative. Overall, the net result of the increased remediation on short-term releases during implementation is expected to be minimal.

Compliance with Federal and State ARARs

A full description of the proposed changes to ARARs can be found in Attachment C to the Draft Revised 2020 Permit. Attachment C to the 2016 Permit provides the ARARs related to the 2014 Alternative. Below is a summary of some of the more significant ARARs for the two alternatives being evaluated.

Neither of the alternatives would achieve the federal and state water quality standards and criteria for consumption of organisms in any of the Massachusetts reaches, and the model indicates that the alternatives may not meet the criteria in all Connecticut reaches. However, both alternatives would likely improve water quality in significant segments of the river (greater than 50% of the impoundments) in Connecticut. Achievement of the water quality standards and criteria were waived as part of the 2016 Permit decision.

In the 2014 Comparative Analysis, the 2014 Alternative was the least damaging practicable alternative with respect to temporary disturbance of wetlands and a discharge of dredged or fill material into waters of the state and/or the United States. The 2020 Alternative is an even less damaging practicable alternative given its significantly reduced reliance on permanent capping, thus allowing for an increase in habitat restoration in Reaches 5C, 7 and 8. In addition, the removal of two dams will greatly increase long-term habitat quality by restoring the river to its natural state before these impoundments were built, providing unimpeded fish passage within these sub-reaches. The 2020 Alternative does call for increased remediation in the floodplains of Reach 5A and potentially more remediation of the banks in Reaches 5A and 5B, but the increase in acreage of floodplains remediated is from 45 to 47 acres, a four percent increase and potential additional banks removal will be minimal compared to the 2014 Alternative. Also see EPA's Clean Water Act Section 404 Wetlands and Floodplains Analysis in the 2020 Comparative Analysis. The 2020 alternative will also comply with Massachusetts Office of Dam Safety regulations for the removal of the Columbia Mill Dam and the Eagle Mill Dam remnant.

Long-Term Reliability and Effectiveness

The 2020 Alternative, through more PCB-contaminated sediment removal, is favored over the 2014 Alternative because the 2020 Alternative reduces the magnitude of residual risk. The amount of PCB residuals remaining in the sediment is significantly reduced in the 2020 Alternative due to the replacement of 96 acres of capping with additional excavation of PCB material; consequently, the risks posed by remaining PCBs, in the event of the cap not working as designed, would be less. Similarly, if the potential additional removal in the Reach 5 banks occurs, that also would reduce the amount of residuals, and the possible risk posed thereby.

With respect to the potential residual risks associated with floodplain soil, the evaluation of the 2020 Alternative would be similar to that in the 2014 Comparative Analysis except that a minimum of 22 floodplain properties would receive additional cleanup in the 2020 Alternative, as well as the Canoe Meadows property. Based on those enhancements, the 2020 Alternative is more protective against residual floodplain risks than the 2014 Alternative.

The 2014 Comparative Analysis provides an analysis of the use of technologies under similar conditions. There is no difference between the alternatives relative to this sub-criterion; the 2020 Alternative's addition of, if feasible, hydraulic dredging and pumping has been used effectively at numerous other sites. Both alternatives would incorporate reliable long-term maintenance and/or monitoring following remediation, with the extent of such maintenance and/or monitoring generally increasing as the extent of capping and bank stabilization increases. The added PCB removal in the 2020 Alternative, would lead to less Operation, Maintenance and Monitoring (OMM) due to the nearly 100-acre reduction in capping. For the floodplain, the type of monitoring would be similar for the two alternatives except that remediating a minimum of 22 properties in Reach 5A and 5C to residential (i.e., unrestricted use) standards precludes the need for institutional controls and operation, maintenance and monitoring requirements on these properties.

The 2014 Alternative and the 2020 Alternative have similar impacts on floodplain habitats over similarly estimated timeframes. The 2014 Comparative Analysis provides specificity on the 2014 Alternative's impact on Aquatic Riverine Habitat, Riverbank Habitat, Impoundment Habitat, Backwater Habitat, Floodplain Wetland Forest Habitat, Shrub and Shallow Emergent Wetlands in Deep Marshes, Vernal Pools and Surrounding Habitat, and Upland Habitat. The 2020 Alternative's impacts would be similar to those of the 2014 Alternative, with a few differences: (1) Riverbank Habitat: the 2020 Alternative requires GE to consider supplemental bank removal as outlined above. If such supplemental bank removal occurs, that could lead to temporary disturbance of more than the 0.2 linear miles of Reach 5B riverbank disturbed by the 2014 Alternative. (2) Vernal Pools and Surrounding Habitat: the 2020 Alternative allows more flexibility for EPA to consider the most appropriate approach for vernal pool remediation, as outlined above. Whether that will make for greater or lesser impacts on the habitat will depend on the specific technique(s) evaluated and used.

The analysis in the 2014 Comparative Analysis of the floodplain impacts of the 2014 Alternative applies also to the 2020 Alternative. The 2020 Alternative has additional floodplain remediation in Reach 5A at a minimum of 22 residential properties and at Canoe Meadows. That additional remediation will increase the acreage of floodplain remediated from 45 acres to 47 acres but is not expected to impact any Core Area 1 priority habitat of state-listed species and is estimated to impact only an additional 1.7 and 0.4 acres of Core Area 2 and 3 habitat, respectively.

Attainment of IMPGs

As part of the Corrective Measures Study (CMS) process, human health Interim Media Protection Goals, or IMPGs, were developed to address the cancer risk and non-cancer risk for the following three major routes of exposure: direct contact with sediment and floodplain soil, consumption of fish and waterfowl, and consumption of agricultural products. The CMS also evaluated several IMPGs for ecological receptors. The 2014 Comparative Analysis provided a detailed review of how eight alternatives, including the 2014 Alternative, fared with respect to the IMPGs. Comparing the 2014 Alternative with the 2020 Alternative, the 2020 Alternative attains the same IMPGs and on the same timeframe as the 2014 Alternative. For all of these metrics, the values are unchanged between the 2016 Permit and the 2020 Alternative. This is because, although the modifications made to the remedy generally result in a greater depth of removal (and larger mass removal of PCBs), the spatial footprint of remediation (which determines the various metrics described in this section) is generally unchanged. From a human health perspective, the 2020 alternative achieves additional risk reductions by expanding certain areas to be remediated. Specifically, certain residential floodplain properties as well as the floodplain property EA 10 at Canoe Meadows will receive a more stringent cleanup in the 2020 Alternative and will get closer to the 10^{-6} cancer risk human health IMPG in these exposure areas.

Reduction of Toxicity, Mobility, or Volume of Wastes

As with the alternatives in the 2014 Comparative Analysis, treatment is not part of any of the major components of the 2020 Alternative, except to the extent that activated carbon, another amendment, or another treatment approach is used to reduce toxicity in soils or sediment. The use of an amendment is expected to be irreversible; if another treatment approach is used, the irreversibility of it will depend on what approach is selected.

Reduction of Toxicity: Both the 2014 and 2020 Alternatives include treatment to reduce the toxicity of PCBs with the addition of an amendment such as activated carbon or another approach in certain components of the remedy, including vernal pools, Reach 5B sediment, and Backwaters. There is no difference in the reduction of toxicity between these two alternatives.

Reduction of Mobility: Both the 2014 and 2020 Alternatives reduce mobility to similar extents. The additional floodplain removal and possible bank removal in the 2020 Alternative could provide a slight edge on the amount of reduction of mobility.

Reduction of Volume: The 2020 Alternative reduces the volume of PCBs remaining in the river system more than the 2014 Alternative by the shift from the option for capping in the 2014 Alternative to removal and additional floodplain removal. As **Table 2** illustrates, the 2020 Alternative removes an additional 143,000 cubic yards (14 percent increase) and additional 3,530 lbs of PCBs (7.5 percent increase) beyond the 2014 Alternative. With respect to the type and quantity of residuals remaining after treatment, there is no substantive difference between the two alternatives.

Table 2 Comparison of Quantities for Alternatives

	2016 Permit Remedy	Draft Revised 2020 Permit
Sediment Removal Volume (cy)	889,500	1,029,500
Bank Soil Removal Volume (cy)	25,500	25,500
Sediment Capping After Removal (acres)	298	202
Sediment Backfill After Removal (acres)	0	96
Floodplain Soil Removal Volume (cy)	75,000	78,000
Floodplain Acres Excavated (acres)	45	47
Total Soil/Sediment Volume Removal (cy)	990,000	1,133,000
Estimated PCB Mass Removed (pounds)	46,970	50,500
Estimated Time to Implement (years)	13	13

Notes:

Volumes and areas specified in this table are approximate and are for volume/cost estimation and for comparison purposes only.
cy: cubic yards

Short-Term Effectiveness

The 2014 Comparative Analysis contained an analysis of the short-term effectiveness of the 2014 Alternative and seven other combination alternatives. The 2020 Alternative is very similar to the 2014 Alternative in many respects related to short-term effectiveness, but with slightly more areas of removal, it will have slightly more short-term effects due to remediation. Regarding short-term environmental impacts, the two alternatives are very similar. While major differences are few, particular variations are discussed below.

The approach to bank remediation in the 2014 Alternative considers both the erosion potential and the PCB concentrations in bank soil, which reduces the amount of bank remediation by focusing only on banks that have both high erosion potential and high PCB concentrations, and even less remediation in Reach 5B. The 2020 Alternative has the potential for additional bank remediation after considering a number of factors, and if that remediation occurs, that alternative will have more impact than the 2014 Alternative.

The two alternatives have similar levels of floodplain soil removal; however, the 2020 Alternative has additional removal at a minimum of 22 specific properties as well as at Canoe Meadows, which will marginally increase the short-term impacts above the 2014 Alternative. There will be an increase in the acreage of floodplain removal by about 4% (47 acres compared to 45 acres). See **Table 2**. With respect to impacts on Vernal Pools, the 2020 Alternative retains the iterative pilot-study-based approach to vernal pools from the 2014 Alternative, so both alternatives have that positive approach.

Regarding carbon footprint, due to the increase in soil/sediment removal, the 2020 Sediment/Floodplain Alternative component would increase the estimated greenhouse gas emissions from 171,000 to 196,000 tonnes. This 14% increase is proportional to the 14% increase in soil/sediment to be removed. This increase does not take into account any decrease related to the revised disposal alternative (TD 6) discussed below, which leads to an overall decrease in the impact. Combining the floodplain/sediment remediation with the Hybrid Disposal approach, the total estimated greenhouse gas emissions for the 2020 remedy is 227,000 tonnes compared to 335,800 tonnes for the 2014 Alternative using trucking or 241,000 tonnes using rail. Thus, the overall impacts from greenhouse gas emissions is approximately 6% to 32% less for the 2020 Proposed Revised Remedial Action compared to the 2016 Permit remedy.

With regard to impacts on local communities and communities along truck transport routes, the differences between the 2020 and 2014 Alternatives, for the Sediment/Floodplain Alternatives only, the 2020 Alternative has 52,800 truck trips compared to 68,800 for the 2014 Alternative. This does not take into account any decrease in trucking related to the revised disposal alternative (TD 6) discussed below, including the reduced amount of truck traffic assuming hydraulic dredging/pumping. Combining the floodplain/sediment remediation with the Hybrid Disposal approach, the total estimated number of truck trips for the 2020 remedy is 102,900 total trips (approximately 7,900 trips per year) compared to 151,700 total trips (11,700 trips per year) for the 2014 Alternative. Thus, the overall impacts to the local communities from truck traffic are approximately one-third less for the 2020 Alternative compared to the 2014 Alternative.

With similar size/scope and duration, the two alternatives would have similar community impacts. One benefit for the 2020 Alternative is the robust Quality of Life Compliance Plan that requires GE to submit plans on how to avoid, minimize or mitigate impacts to the community.

The risk of non-fatal injuries and fatal injuries to implement the 2020 Floodplain/Sediment Alternative due to implementation of the remedy (excluding transport of excavated material) is 14 and 0.14 respectively. This is slightly higher than the 2014 Alternative estimate of 9.2 (12 with rail) and 0.10 (0.12 with rail) respectively. This does not take into account any decrease in trucking related injuries/fatalities to the revised disposal alternative (TD 6) discussed below.

Implementability

Comparing the 2014 Alternative to the 2020 Alternative on capping/backfill/stabilization material measures is somewhat uncertain as described in the 2014 Comparative Analysis, and also because of the sampling to be performed during remedial design that could affect the degree of capping/backfill/stabilization. Since there is reduced capping material, the uncertainty in obtaining large quantities of backfill/capping material is less for the 2020 Alternative

compared to the 2014 Alternative, approximately 625,000 cubic yards of material for the 2020 Alternative vs. approximately 800,000 cubic yards in the 2014 Alternative (20% less material). Overall, for remediation and habitat restoration, both alternatives would be implemented using well-established and available methods and equipment, and remedial components selected have been used in similar applications. Both alternatives use reliable technologies that are readily available. Additionally, the hydraulic dredging/pumping approach in the 2020 Alternative is a reliable technology that has been successfully used at other sediment remediation sites and is scalable and adaptable to the proposed use in Rest of River.

Neither alternative has regulatory or zoning restrictions that would affect implementability, neither alternative would preclude implementation of additional corrective measures or the ability to monitor the effectiveness of the remedy. Both alternatives would include coordination with state agencies, and since the type of cleanup and estimated duration are similar between the two alternatives, they would not differ significantly on this sub-criterion.

Cost

The estimated cost for the 2020 Alternative for sediments and floodplain is approximately 3% less than the 2014 Alternative. The 2014 Alternative (in 2010 dollars) is \$326 million for sediments and floodplain compared to \$315 million for the 2020 Alternative (also in 2010 dollars). See **Table 3** for full cost comparisons and costs in 2020 dollars.

COMPARATIVE ANALYSIS OF TREATMENT/DISPOSITION ALTERNATIVES

This section presents a summary of a comparative evaluation of three alternatives for treatment and/or disposal of excavated contaminated river sediment and floodplain soil using the same criteria that were used for the sediment/floodplain combination alternatives. The three alternatives compared below are TD 1/TD 1 RR (off-site disposal in permitted landfill(s)), which was the alternative selected in the 2016 Permit, TD 3 (on-site disposal of all materials in an upland disposal facility or facilities, though EPA's analysis below focuses only on the Woods Pond facility location), and TD 6, the Hybrid Disposal alternative, which is EPA's new Preferred Alternative.

Overall Protection of Human Health and the Environment

The evaluation of whether a particular treatment/disposition alternative would provide overall human health and environmental protection draws on evaluations under several other permit criteria, notably long-term reliability and effectiveness (including long-term adverse impacts), compliance with ARARs, and short-term effectiveness. In the 2014 Comparative Analysis, TD 1 and TD 3 (Woods Pond location) were both viewed to provide high levels of protection to human health and the environment because the excavated material would be either removed from the site or contained in an upland disposal facility, although TD 3 would require the proper Operation, Maintenance, and Monitoring (OMM) to maintain its protectiveness. TD 6, being a hybrid of the TD 1 and TD 3 alternatives, would provide similarly high levels of such protection, and would also require the proper OMM to maintain its protectiveness. For long-term reliability and effectiveness, all three alternatives are strong, with TD 1 strongest due to the ability to isolate all the material from the Housatonic River watershed, and TD 3 less strong than TD 6 because TD 6 includes off-site disposal of a minimum of 100,000 cubic yards of the most highly contaminated material.

Evaluation of short-term effectiveness is described more fully below. Among the distinctions are as follows. All three alternatives have GHG emissions, with TD 1 having the most emissions, followed by TD 6 and TD 3 the fewest. For impacts on local communities, all of the alternatives will have short-term impacts to the local communities in the Rest of River area, such as disruption, noise, other impacts, truck traffic and potential remediation-related injuries/fatalities. TD 3 has the most truck traffic, followed by TD 1/TD 1RR and TD 6 has the least. Similarly, TD 1/TD 1RR has the most remediation-related injuries/fatalities, followed by TD 6 and TD 3 has the least. Impacts related to having an on-site landfill would be greatest with TD 3 due to the high-level contamination that would be placed on-site, and TD 1 would have the fewest impacts.

As to compliance with ARARs, TD 1 has the fewest ARARs with which to comply. TD 3 and TD 6 both would need to comply with, or waive, specific ARARs related to an on-site landfill. TD 3 also would necessitate compliance or waiver for state hazardous waste disposal regulations for permanent disposal, an issue not associated with TD 6 because of the segregation and off-site disposal of higher-level PCB waste and all federal RCRA-hazardous waste. See ARARs section below for additional discussion.

TD 6 is part of a Settlement Agreement that includes numerous enhancements to the floodplain and sediment remedies, an expedited start to implementation, and community coordination and benefits. These benefits serve to further protect human health and the environment and provide better short- and long-term protectiveness when compared to the two other TD alternatives which do not include such benefits.

Control of Sources of Releases

As to the potential for PCB-contaminated sediment and soil to be released and transported within the river or onto the floodplain, all three of the alternatives meet the criterion. In the 2014 Comparative Analysis, TD 1 best met the criterion, followed by TD 3 on the basis that TD 1 effectively isolated the materials from being released into the environment through removal to the off-site location. For the current evaluation TD 6 would also satisfy this criterion: it would be less effective than TD 1 but more effective than TD 3 in light of TD 6's off-site isolation of at least 100,000 cubic yards of the most highly contaminated materials, a component that TD 3 does not have. TD 6 and TD 3 would share the potential for releases to the Housatonic River watershed if, in the long term, the facility, including the handling and treatment of leachate, is not properly operated and maintained. However, this potential is mitigated by the selection of a single disposal location over 1,000 feet from the River outside of the 500-year floodplain.

Compliance with Federal and State ARARs

A full description of the proposed changes to ARARs can be found in Attachment C to the Draft Revised 2020 Permit. Attachment C to the 2016 Permit provides the ARARs related to TD 1. Below is a summary of some of the more significant ARARs for the three alternatives being evaluated.

The three alternatives would involve moving the sediment, bank soil, and floodplain soil from the point of excavation to the treatment/disposition point, and each TD alternative would attain the ARARs, except as discussed below. TD 1 would attain the requirements. TD 6 has ARARs associated with the Upland Disposal Facility. TD 3 has those ARARs plus those associated with being a hazardous waste disposal site and a TSCA chemical waste landfill.

For TD 6, both the on-site and off-site disposal of PCBs are addressed pursuant to the EPA risk-based determination in Attachment D to the Draft Revised 2020 Permit. The Commonwealth of Massachusetts has promulgated certain Site Suitability Criteria for solid waste landfill facilities (310 CMR 16). EPA believes that the remedy can comply with all provisions of 310 CMR 16 except for the provisions of 310 CMR 16.40(4)(d). For each provision in 310 CMR 16, to the extent that it is deemed to be an ARAR but cannot be met at the Upland Disposal Facility, including restrictions on siting solid waste facilities in an Area of Critical Environmental Concern (ACEC), EPA would invoke a waiver of the provision pursuant to CERCLA 121(d)(4)(B); 40 C.F.R. 300.430(f)(1)(ii)(C)(2) since compliance with the requirement will result in greater risk to human health and the environment than the proposed cleanup plan in the Draft Revised 2020 Permit. Furthermore, to the extent any material averaging below 50 mg/kg is deemed to be Massachusetts hazardous waste solely because of the presence of PCBs, EPA has determined that the requirements are not appropriate for the Upland Disposal Facility because compliance will create greater risk to human health and the environment than implementation of the remedy set forth in the Draft Revised 2020 Permit. However, if hazardous waste facility siting requirements in 310 CMR 30 are deemed an ARAR, EPA would also invoke the CERCLA waiver pursuant to CERCLA 121(d)(4)(B); 40 C.F.R. 300.430(f)(1)(ii)(C)(2). In the 2016 Permit, EPA waived restrictions on temporary management of solid and hazardous wastes within the ACEC for TD 1, and those waivers would remain in place under TD 6.

Long-Term Reliability and Effectiveness

This assessment of the three alternatives included an evaluation of the magnitude of residual risk, the adequacy and reliability of the alternatives, and the potential long-term impacts on human health and the environment. Placement of PCB-contaminated sediment/soil in off-site permitted landfills (TD 1) or in an upland disposal facility (TD 3) would permanently isolate those materials from direct contact with human and ecological receptors. TD 6, being made up of elements of TD 1 and TD 3, would also permanently isolate the materials, bolstered by the fact that it would be designed to be generally equivalent to a facility permitted to accept much higher concentration materials. Due to TD 3 and TD 6 using on-site disposal in whole or in part, the magnitude of residual risk and potential for exposure in the long-term due to a possible release would favor TD 1, then TD 6, then TD 3.

Use of off-site disposal facilities, as TD 1 does, and TD 6 does for the highest-contaminated materials, is a common and effective means for permanent disposition of PCB-contaminated material. On site-disposal – as used in whole by TD 3, and in large part by TD 6 (for the less-contaminated material) – is an effective and reliable means for permanently isolating such materials, provided the facility, including the handling and treatment of leachate, is properly constructed, monitored and maintained. If a release were to occur from an on-site facility or handling of leachate, the risks posed by TD 3 would be greater than for TD 1 and TD 6 (because for TD 6, higher-concentration PCB materials will be sent off-site for disposal). However, while there is the potential for leachate to be generated from the landfill in TD 6, by virtue of the highest levels of contamination being shipped off-site, the potential concentration of contaminants in any such leachate would be expected to be lower than that of TD 3. Thus, the risks for TD 3 are greater than for TD 6. Similar to TD 3, the design of TD 6 would have to consider whether any such leachate requires treatment and, if so, whether such treatment would be

conducted at the landfill location, at GE's Pittsfield water treatment facilities, or at an off-site location, all of which are expected to be viable options.

TD 1 and the portion of TD 6 requiring off-site disposal both have very little long-term adverse impact on human and ecological receptors on the site. TD 3, and the on-site portion of TD 6 would isolate the removed sediment/soil from exposure because of the structures built specifically for the purpose of containing them. The 2014 Comparative Analysis notes two other distinctions: first, that TD 1 would not have long-term environmental impacts on the site, TD 1 RR, despite building a rail loading facility, would also not result in adverse long-term environmental impacts because the rail yard and loading facility would be demobilized following completion of the remedy and the area restored to its former condition; and second, that depending where the TD 3 location was built, there was the potential for alteration in habitat due to the operation of the facility. In TD 6, the Woods Pond location has been specified for the Upland Disposal Facility. The Upland Disposal Facility's operational footprint is part of an existing sand and gravel facility in close proximity to two other solid waste disposal facilities, with less impact to habitat than the other two potential upland disposal facilities evaluated under TD 3 (the two other GE-proposed sites were "Forest Street" site in Lee, and the "Rising Pond" site in Great Barrington; see the GE 2010 Revised CMS for details). Therefore, TD 1/1 RR would have the least impact on habitat. TD 3 and TD 6 would have a similar impact assuming Woods Pond was the TD 3 location.

In summary, the long-term adverse human health and environmental impacts would be least with TD 1, next least with TD 6, followed by TD 3.

Attainment of IMPGs

Attainment of IMPGs is directly applicable to the sediment and floodplain remediation approaches outlined and evaluated for the various Combination Alternatives discussed earlier in this document. IMPG attainment is not directly applicable to the transportation and disposal alternatives, thus EPA did not conduct a comparative analysis for these alternatives for this criterion.

Reduction of Toxicity, Mobility, or Volume

Neither TD 1, TD 3, nor TD 6 would include any treatment processes that would reduce the toxicity of, or directly affect, PCB concentrations in the removed sediment and soil, except as part of Adaptive Management requirements outlined in the Permit.

Reduction of Toxicity: TD 1, TD 3, and TD 6 would not in the first instance include any treatment processes that would reduce the toxicity of, or directly affect, PCB concentrations in the removed sediment and soil.

Reduction of Mobility: TD 1, TD 3, and TD 6 would all reduce the mobility of PCBs in the sediment and soil. In TD 1 and TD 6 some or all of the materials would be removed and disposed of in off-site permitted landfill(s) or permanently contained within an upland disposal facility (TD 3, and TD 6 in part).

Reduction of Volume: TD 1, TD 3 and TD 6 would not reduce the volume of contaminated material in the first instance.

WHAT ABOUT TREATMENT?

Many stakeholders have advocated for use of innovative treatment technology that might render the PCBs harmless or inert or otherwise destroy contamination. As part of their Corrective Measures Study (CMS), GE evaluated a number of treatment technologies, conducted bench-scale tests on one chemical extraction technology, and did a detailed evaluation in the CMS on two treatment technologies: chemical extraction and thermal desorption. EPA also did a detailed evaluation of those two technologies based on the Permit decision-making criteria and other relevant information. However, EPA did not choose either technology in its 2016 Permit, or as the selected treatment/disposition technology as part of this Proposed Revised Remedial Action. See the Administrative Record for the 2016 Permit for more detail on those evaluations. EPA's decision to not require treatment was upheld by the EAB after being challenged.

Numerous challenges remain regarding the use of innovative treatment technologies. No viable in-situ method that would avoid excavation of soil and sediment in the first place has been proven. Ex-situ methods like chemical extraction, thermal desorption, or even incineration, can often present operational challenges and leave treatment residuals that would still require land disposal after treatment, as they would likely not meet criteria for unrestricted reuse. Thus, it is likely that, if a treatment approach were selected here, the Upland Disposal Facility would likely still be required to contain treated soil/sediment containing residual contamination, bringing into question the cost-effectiveness of this added step.

Notwithstanding, the 2016 Permit contained a number of "Adaptive Management" principles, including the continued evaluation of innovative treatment technologies. EPA reiterated and augmented that commitment as part of the February 2020 Settlement Agreement to facilitate opportunities for research and testing of innovative treatment and other technologies and approaches for reducing PCB toxicity and/or concentrations in excavated soil and/or sediment before, during, or after disposal in a landfill. These opportunities may include: (1) reviewing recent and new research; (2) identifying opportunities to apply existing and potential future research resources to PCB treatment technologies, through EPA and/or other Federal research programs; and (3) encouraging solicitations for research opportunities for research institutions and/or small businesses to target relevant technologies. The research may focus on soil and sediment removed (or to be removed) from the Housatonic River or similar sites to ensure potential applicability to the permit/selected remedy. GE and EPA will continue to explore current and future technology developments and, where appropriate, will collaborate on on-site technology demonstration efforts and pilot studies, and, consistent with the adaptive management requirements in the Final Permit together, will consider the applicability of promising research at the Housatonic Rest of River site.

Short-Term Effectiveness

With regard to impacts to the environment, the 2014 Comparative Analysis stated that of the alternatives evaluated at that point, TD 1 would have the least impact, requiring only access roads and staging areas for loading of vehicles for off-site transport. TD 1 RR would require construction of a temporary rail yard and loading facility along with access roads and staging areas, and TD 3 would have impacts depending on the habitat and operational footprint of the facility chosen among GE's three proposed sites. TD 6, being a hybrid of TD 1 and TD 3, would have the relatively lower impact of TD 1 for the materials being taken off-site, and slightly more impact than TD 3 because TD 6 has a larger footprint. All the TD alternatives have risk of accidental releases of PCB-contaminated materials. The use of hydraulic dredging and pumping, if feasible, for TD 6 would significantly reduce its impact on the environment by minimizing the truck transport of waste to the Upland Disposal Facility.

Regarding carbon footprint and greenhouse gas (GHG) emissions for transport to final disposal facility, excluding the construction of the rail facility or upland disposal facility, the calculated GHG emissions anticipated to result from treatment/disposition alternatives are in the Administrative Record. TD 1 (164,800 tonnes) and TD 1 RR (70,000 tonnes) both are estimated to generate more GHG emissions than TD 6 (31,000 tonnes). TD 3 is estimated to generate the least amount of GHG emissions at 6,600 tonnes. For overall combined remedy GHG, see page 27.

All of the alternatives will have short-term impacts to the local communities in the Rest of River area, such as disruption, noise and other impacts. TD 6, due to its use of hydraulic pumping of excavated material, if feasible, can eliminate nearly 50,000 truck trips to the Upland Disposal Facility. For truck trips, the estimated total and annual number of trips are 81,700 (6,100 average annual trips) for TD 1, with an additional 1,200 trips to construct the rail facility for TD 1RR, 81,700 (6,100 annual average) truck trips for TD 3, with an additional 2,400 truck trips to construct the disposal facility, and 47,000 (3,800 annual trips) for TD 6, and an additional 3,100 truck trips to construct the Upland Disposal Facility. Thus, TD 1 would have the highest number of truck trips, followed by TD 1 RR and TD 3, with TD 6 having the lowest estimated number of truck trips. For overall combined remedy truck counts, see page 27.

As with the 2014 Comparative Analysis's description, TD 1's mitigation measures related to increased truck traffic, TD 3's would address the increase in truck traffic as well as impacts associated with construction and operation of the disposal facility. TD 6 would similarly include efforts to avoid, minimize or mitigate impacts, including the hydraulic pumping component to reduce truck traffic, and the Quality of Life Compliance Plan, which will ensure that GE's work planning addresses potential impacts on communities. EPA has committed to have public and stakeholder input on this plan. Those two items are improvements to the measures taken in TD 1 and TD 3.

The estimated risk to remediation workers and transportation related injuries and fatalities associated with the transport of waste to the Upland Disposal Facility and/or off-site disposal were estimated as follows: 44 injuries and 2.1 fatalities for TD 1, (39 and 6.75 for TD 1RR), 7.5 and 0.35 for TD 6, and 5.4 and 0.25 for TD 3. Based on that information, the incidence of potential injuries and fatalities resulting from accidents associated would be greatest for TD 1 and TD 1RR, followed by TD 6 and then TD 3.

Implementability

Each of the technologies can be constructed and operated as necessary. Landfills designed to accept remediation waste are routinely constructed and operated; techniques are well known and demonstrated as effective. For TD 3 and TD 6,

landfills have been proven to be reliable in reducing and/or eliminating exposure to hazardous materials. Transportation of hazardous and non-hazardous material by truck or rail (TD 1) is a routine technology with appropriate controls to safeguard public and workers. Overall, TD 1 would be easiest to implement relative to regulatory and zoning restrictions, followed by TD 1 RR and TD 6. TD 3, with a hazardous waste landfill, would be the most difficult and time consuming from an administrative perspective. The zoning issues related to TD 6 as described above, are equally applicable to TD 3 for the Woods Pond Site.

For TD 3 and TD 6, the capacity of the Upland Disposal Facility is known and is sufficient to receive a volume of material greater than the proposed remedy. However, that capacity is finite and if there is any additional remediation that is very large and the capacity of either TD 3 or TD 6 is exceeded, then off-site disposal would be necessary. TD 1, and TD 6, to a much lesser extent, would have some uncertainties related to potential issues if the capacity of off-site landfills is less in the future.

All of the alternatives can readily be monitored with existing and well-established techniques and monitoring is included in the Draft Revised 2020 Permit as part of any comprehensive OMM program. Alternative TD 3 encountered substantial local and state opposition, even though it was not EPA's selected remedy in the 2016 Permit. In contrast, TD 6 has been endorsed by local municipalities, including all but one of the stakeholder groups that took part in mediated settlement (i.e., GE, the Towns of Lee, Lenox, Stockbridge, Great Barrington, and Sheffield, the City of Pittsfield, the State of Connecticut, the Massachusetts Audubon Society, the Berkshire Environmental Action Team, and C. Jeffrey Cook), but some stakeholders are not satisfied with the approach outlined in TD 6. TD 1 RR has the least concerns from agencies/stakeholders due to disposal off-site, and use of rail to minimize truck traffic. TD 1 is equivalent to TD 1RR on this metric but for the use of rail.

TD 1, TD 1 RR and TD 6 all have elements of off-site disposal. There are uncertainties about the future availability of necessary capacity in off-site landfills, however, there doesn't appear to be any current shortage of off-site capacity. For TD 3, construction and use of an on-site facility for all of the materials, regardless of concentration, would be technically implementable, but perhaps difficult to implement for other reasons. To a certain extent, TD 6 would face similar concerns as TD 3, but these concerns are reduced by TD 6's requirement that only low level soil and sediment are allowed in the on-site location, and the support of municipal organizations as documented in the Settlement Agreement. Moreover, TD 6 will save capacity (to the extent that it does become limited) in those off-site permitted landfills for material that is required to be disposed of in such a manner.

Alternative technologies (soil washing and thermal desorption) were evaluated as part of the Revised CMS and, for the reasons cited in the 2014 Comparative Analysis, were not selected. Appeals to the EAB challenged EPA's decision not to select the specific treatment technologies. The Board upheld EPA's decision not to select the treatment technologies for the Site. However, as was the case in the 2016 Permit, the Draft Revised 2020 Permit includes an Adaptive Management provision to allow EPA to take advantage of any new innovative technologies. Additionally, in the 2020 Settlement Agreement, EPA has committed to significant steps to help solicit new research in PCB remediation technologies. There is no difference among the technologies for the three alternatives being evaluated.

Cost

The estimated cost ranges for the treatment/disposition alternatives, including total capital cost, estimated annual OMM cost, and total estimated present worth are summarized in **Table 3**. Overall, TD 3 is the least costly at \$63 million, TD 6 second-least costly at \$141 million, with TD 1 (\$308 million) and TD 1 RR (\$287 million) more costly. For total remedy costs and costs in 2020 dollars, see **Table 3**.

PUBLIC COMMENT PERIOD

EPA will accept public comments during a formal comment period on the changes in the Proposed Revised Remedial Action from the 2016 Permit. These changes are noted in redline/strikeout text in the Draft Revised 2020 Permit. Comments are limited to the proposed changes to the 2016 cleanup plan outlined in this document and shown in redline/strikeout in Draft Revised 2020 Permit. This comment period is currently slated to run from **July 14 through August 28, 2020**. EPA considers these comments to improve its cleanup approach. During the formal comment period, EPA will accept written comments via mail, email, and fax. Additionally, verbal comments may be made during the formal Public Hearing, during which all offered comments during the hearing will be recorded. EPA will hold a brief informational presentation prior to the start of the formal Public Hearing. EPA will not respond to comments during the formal Public Hearing. See the cover page of this document for information regarding the Public Hearing.

EPA will review the transcript of formal comments received during the Public Hearing, and written comments received during the formal comment period, before making a final cleanup decision. EPA will then prepare a written response to the formal written comments and oral comments on changes to the 2016 Permit. Any formal comments will become part of the official public record. The transcript of comments and EPA's written responses will be issued in a document called a Response to Comments when EPA releases the Final Revised RCRA Permit. The Response to Comments and Revised Final Permit will be made available to the public on-line, accessible at the Information Repositories, and at the EPA Records Center (see addresses page 37). EPA will announce the final decision on the cleanup plan through the local media and via EPA's website.

Table 3

Cost Summary for Remediation & Treatment/Disposition Alternatives

		2016 Permit Remedy with Rail ^{1,2}	2016 Permit Remedy with Trucking	2016 Permit Remedy w/TD 3 (WP) ³	Draft Revised 2020 Permit w/TD 6 (UDF)
Sediment/ Floodplain Remediation Alternative ^{4,5}	Capital Costs	\$314 M	\$314 M	\$314 M	\$303 M
	OM&M Costs	\$12 M	\$12 M	\$12 M	\$12 M
	Total Cost	\$326 M	\$326 M	\$326 M	\$315 M
	Total Present Worth	\$228 M	\$228 M	\$228 M	\$214 M
Treatment/ Disposition Alternative ^{6,7,8}	Capital Costs	\$0.3 M	\$0 M	\$33 M	\$35 M
	Disposal, OM&M Costs	\$287 M	\$308 M	\$30 M	\$106 M
	Total Cost	\$287 M	\$308M	\$63 M	\$141 M
	Total Present Worth	\$183 M	\$196 M	\$38 M	\$96 M
Total Remedy Cost Estimate ⁹	Capital Costs	\$314 M	\$314 M	\$347 M	\$338 M
	Remediation & Disposal OM&M Costs	\$299 M	\$320 M	\$42 M	\$118 M
	Total 2010 Cost	\$613 M	\$634 M	\$389 M	\$456 M
	Total Present Worth	\$411 M	\$424 M	\$266 M	\$310 M
	Total 2020 Cost ¹⁰	\$774 M	\$800 M	\$491 M	\$576 M

1. All costs are in 2010 dollars. \$ M = million dollars, except as otherwise noted.
2. Total present worth cost is based on using a discount factor of 7%.
3. The TD 3 costs are only for the Woods Pond disposal location, not the other two locations identified in the Revised CMS. This is the same location used for the TD 6 (UDF).
4. Total capital costs are for engineering, labor, equipment, and materials associated with implementation, and do not include costs for disposition of sediment or soil removed. Total OM&M costs include monitoring, post-construction inspections and repair activities (if necessary), long-term monitoring (fish, sediment, water column, visual), and for the maintenance of institutional controls and EREs.
5. Costs for the Draft Revised 2020 Permit are from GE's Summary and Evaluation of Settlement Agreement Remedy Report (June 2020).
6. Total capital costs are for engineering, labor, equipment, and materials associated with implementation. Total disposal and OM&M costs consist of the total of the average annual costs for construction, operation, placement, and/or disposal of sediment and/or soil as well as post-closure monitoring and maintenance program of 10 years for TD 3 and 100 years for TD 6.
7. The estimated disposal costs for the 2016 Permit Remedy do not include the Massachusetts hazardous waste transport fee. At the time of EPA's 2014 Statement of Basis for EPA's Proposed Remedial Action, the fee was \$56.25 per ton, including a vehicle identification fee, resulting in a total estimated fee of \$31.3 M. The fee is not applicable to off-site disposal via rail. The 2016 Permit TD 3 costs are from GE's Summary and Evaluation of Settlement Agreement Remedy Report (June 2020).
8. Costs for TD 6 for the Draft Revised 2020 Permit are from GE's Summary and Evaluation of Settlement Agreement Remedy Report (June 2020) and include the Massachusetts hazardous waste transport fee of \$56.25 per ton for the 100,000 cy of material to be disposed off-site via truck.
9. Certain elements of the Settlement Agreement that are not part of the revised Remedial Action have not been included in the cost estimates.
10. Estimated costs in 2020 dollars are calculated using an escalation rate of 26.26%.

OM&M: operation, monitoring, and maintenance

TD: Treatment/Disposition

WP: Woods Pond Location,

UDF: Upland Disposal Facility, also at the Woods Pond disposal location identified in the Revised CMS

FOR MORE DETAILED INFORMATION

The Administrative Record, which includes all documents that EPA has considered or relied upon in proposing these revisions to the cleanup plan, is available for public review and comment at the following locations (please check operational status of this facility prior to visiting):

EPA Records and Information Center
5 Post Office Square, First Floor
Boston, MA 02109-3912
617-918-1440

The Administrative Record will also be accessible via computer at the following locations (please check operational status of these facilities prior to visiting):

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

David M. Hunt Library
Falls Village, CT 06031
(860) 824-7424

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

Information is also available for review on-line at epa.gov/ge-housatonic

Key Contact: ZaNetta Purnell, EPA Region 1 - New England
Superfund Community Involvement
Ph: (617) 918-1306 email: purnell.zanetta@epa.gov

SEND US YOUR COMMENTS

Provide EPA with your written comments about the Proposed Revised Cleanup Plan.

Please email, fax or mail comments, dated or postmarked (as applicable) no later than August 28, 2020 to:

Email (r1housatonic@epa.gov)

Fax (617) 918-0028

GE-Housatonic River Site Public Comments
EPA Region 1
5 Post Office Square (Mail Code SEMD-07-01)
Boston, MA 02109-3912

EPA IS ASKING FOR PUBLIC COMMENT ON THE FOLLOWING PROPOSED REGULATORY DETERMINATIONS:

Wetland Impacts

In conjunction with the 2016 Permit, EPA made a determination, in accordance with Section 404 of the Clean Water Act and other federal requirements, that there was no practicable alternative to conducting work that will impact wetlands, and that the selected alternative in the 2016 Permit was the least environmentally damaging practicable alternative.

The impacts to wetlands in the Proposed Revised Cleanup Plan are very similar to those in the 2016 Permit so EPA's determinations in the 2016 Permit do not change in this Proposed Revised Cleanup Plan.

A more detailed discussion of this determination is in the Wetlands/Floodplain Analysis that is part of the Administrative Record.

Floodplain Impacts

For any cleanup alternative with impacts on the floodplain, EPA is required to determine whether the activities proposed will result in occupancy or modification of the floodplain, and if so, before EPA can select such a cleanup alternative, federal regulations require EPA to make a determination that there is no practicable alternative to doing so. EPA made such a determination with respect to the 2016 Permit's cleanup plan.

A very large percentage of the work in floodplains from the 2016 Permit as described in the Administrative Record, remains in the Draft Revised 2020 Permit. Additionally, as referenced above, the 2020 Alternative for sediment and floodplain remediation includes potential additional remediation on

Massachusetts Audubon Society Property and more stringent environmental cleanup on 22 properties with contaminated floodplain in Pittsfield, and possibly also at up to six properties with contaminated floodplain in Lenox. Such additional activities serve to provide more thorough floodplain cleanup at over 20 properties and represent a four percent increase of floodplain to be impacted. As with the 2016 Permit, for other components of the Proposed Revised Remedial Action, such as excavation and capping of the riverbed sediments, support activities are proposed to take place in the floodplain, such as use of temporary access roads to access the contaminated riverbed and to transport contaminated soil and sediment away from the project areas, as well as establishing staging areas for contaminated material. These features would not be permanent and would be restored after remediation.

Based on its evaluation of alternatives and review of the findings for the 2016 Permit, EPA has determined that there is no practicable alternative to the activities that take place in the floodplain in the Draft Revised 2020 Permit. To the extent that the very limited additional activities to remove PCB contamination from

the floodplain, and the support activities for other proposed Rest of River remediation activities are

considered occupancy and modification of the floodplains, EPA has determined there is no practicable alternative to occupancy and modification.

A more detailed discussion of this determination is in the Wetlands/Floodplain Analysis that is part of the Administrative Record.

Potential New or Modified Waivers of Applicable or Relevant and Appropriate Requirements

As described more fully in Attachment C to the Draft Revised 2020 Permit and the administrative record, EPA has determined that the proposed changes to the cleanup plan will comply with ARARs, or waive such requirements as appropriate. Most notably, the siting of the Upland Disposal Facility meets the substantive requirements of relevant and appropriate provisions of 301 CMR 12 (Area of Critical Environmental Concern regulations) and 310 CMR 16 (Solid Waste Facility Site Assignment regulations), and the siting requirements at 310 CMR 30 (Hazardous Waste Facility Requirements) are not triggered because the cleanup plan provides for off-site disposal of PCB materials averaging equal to or greater than 50 milligrams per kilogram (mg/kg, or parts per million (ppm)). However, to the extent that these requirements are deemed to be ARARs and cannot be complied with, EPA would invoke a waiver under CERCLA 121(d)(4)(B) and 40 C.F.R. 300.430(f)(1)(ii)(C)(2) since compliance with the requirement will result in greater risk to human health and the environment than the proposed cleanup plan in the Draft Revised 2020 Permit. EPA is seeking comments from the public regarding any such potential waiver.

Proposed Finding: PCB Cleanup is Protective

Pursuant to regulations implementing the Toxic Substances Control Act at 40 C.F.R. Section 761.61, EPA has made a draft determination that the proposed manner of sampling, storage, cleanup and disposal of PCBs outlined in the Draft Revised 2020 Permit, including the Performance Standards and associated Corrective Measures to meet the Performance Standards outlined therein, will not pose an unreasonable risk of injury to health or the environment. See Attachment D to the Draft Revised 2020 Permit for the draft revisions to the TSCA determination.

EPA is proposing a revised cleanup plan consisting of a combination of targeted soil and sediment removal, riverbed capping, and monitored natural recovery to address risks posed by PCBs. This Proposed Revised Cleanup Plan includes the following changes to the 2016 Plan:

- Hybrid Disposal approach, with the most contaminated waste transported out of state and the remainder consolidated safely on-site in a lined Upland Disposal Facility;
- immediate start to work on investigation and design of the cleanup;
- significant cleanup enhancements to the remedy, including a reduction of sediment capping;
- reduced impact to the community and enhanced coordination with stakeholders;
- removal of the Columbia and Eagle Mill dams;
- commitment to further research on innovative technologies, demonstration efforts and pilot studies; and,
- although not part of the Permit, in the Settlement Agreement GE committed to providing a substantial economic development package to municipalities of \$63 million, along with land transfers, and other community benefits.

This Proposed Revised Cleanup Plan is expected to achieve the following outcomes:

- reduce risks to children and adults from direct contact with soil and sediment;
- reduce soil contamination in the floodplain to levels which allow continued recreational or residential use without unacceptable risk;
- reduce PCB concentrations in fish to levels that allow increased consumption of fish caught from the River in Massachusetts and Connecticut, and reduce impact to affected communities relying on the fish for economic considerations or cultural practices;
- reduce the potential movement of PCBs from the river onto the floodplain, from the banks into the River, and from upstream to downstream locations, including the downstream transport into Connecticut;
- reduce contamination and risk for ecological receptors (fish, wildlife, and other organisms) in the river, backwaters, floodplain, and vernal pools;
- reduce PCB surface water and sediment concentrations by addressing PCB sources in sediment and soil to advance future compliance with water quality standards in Massachusetts and Connecticut and attainment of the highest possible use of the River consistent with the Clean Water Act;
- reduce the mass of PCBs in Housatonic River sediment and floodplain soil available for exposure and downstream transport;
- provide flexibility to address changes in floodplain use over time, and consideration of new technologies that may be useful in the future;
- protect and preserve the unique ecological characteristics of the Upper Housatonic Watershed in conducting remedial efforts; and,
- establish procedures to address PCB contamination associated with future work.