UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1

Date: February 29, 2016

From: Bryan Olson, Director, Office of Site Remediation and Restoration

To: Carl Dierker, Regional Counsel

Subj: GE-Housatonic Dispute Resolution – EPA Statement of Position

Pursuant to the Consent Decree governing investigation and response at the GE-Pittsfield/Housatonic River Site, EPA notified General Electric Company ("GE"), the Settling Defendant in September of EPA's Intended Final Decision for the Rest of River response action. Per the Decree, Paragraph 22.o, GE invoked dispute resolution on that notification.

That dispute is currently in the formal dispute resolution stage under the Decree, and, on January 19, 2016, GE submitted its Statement of Position on the dispute. Attached is EPA's Statement of Position for your consideration. Under the Decree, GE now has an opportunity to file a Reply by March 15, 2016. Following those submittals, an EPA decision-maker is to resolve the dispute. Per his memorandum dated January 21, 2016, Regional Administrator Curt Spalding has designated you, per Paragraph 136.b. of the Decree, to issue a final administrative decision resolving the dispute in accordance with the procedures in the Decree. This administrative decision is not subject to further appeal under the Decree. CD ¶ 141(b)(i).

EPA has used its scientific and technical expertise to thoroughly consider GE's technical positions at multiple points in the Rest of River decision-making process. Moreover, EPA has subjected its own analyses to further scrutiny, including review by experienced EPA scientists and engineers nationally, and independent scientific peer review. Furthermore, EPA has afforded GE and the public with an extraordinary degree of participation and input on the Rest of River cleanup decision. Based on that substantive expertise and multiple process opportunities, EPA proposed a remedy that is best suited for the Rest of River.

GE challenges EPA's Intended Final Decision for one reason – to reduce its costs in cleaning up its PCBs. GE attempts to justify its challenge with three main claims: (1) GE allegedly knows better than EPA how to select a remedy in the public interest; (2) GE is allegedly entitled to virtually total certainty and finality in the cleanup, with uncertainties and additional costs all to be borne by the public; (3) EPA allegedly misinterpreted the Decree in requiring restoration of natural resources; and (4) EPA inappropriately applies ARARs. None of these claims are

justified and should be rejected. EPA's decision thoroughly considered GE's and others' viewpoints, and fairly balances all the relevant factors under the Decree to produce a remedy that protects the overall public interest, not just GE's bottom line.

In short, our Statement of Position demonstrates that, contrary to GE's assertions, EPA correctly interpreted the Consent Decree, followed the appropriate process for selecting a remedy and made the right decision based on the relevant factors. Indeed, while GE objects that the remedy is too expensive, many others have commented that the remedy should go farther in removing contaminated PCB material even if it costs more to do so. At the end of the day, EPA has selected a remedy somewhere in the middle that is implementable and that provides GE with a level of certainty supported by the Consent Decree, RCRA, and CERCLA, without subjecting the public to unnecessary risks or costs. It should be clear that EPA – not GE – is in the best position to judge the appropriate level of analysis for selecting a remedy for the Rest of River that is in the public interest and protective of human health and the environment. The remedy outlined in our Intended Final Decision should be upheld so that we may move forward with this important decision to address the PCB contamination in the Housatonic River and floodplain. Now is the time for GE to step up and honor its commitment to proceed with this important cleanup.

We look forward to your decision on this dispute. Please contact me if you have further questions in this regard.

cc: (by email)
Susan Peterson, CT DEEP
Betsey Wingfield, CT DEEP
Betsy Harper, MA AG
Mike Gorski, MA DEP
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Dean Tagliaferro, EPA
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STATEMENT OF POSITION OF THE U.S. ENVIRONMENTAL PROTECTION AGENCY

IN SUPPORT OF INTENDED FINAL DECISION ON THE MODIFICATION TO THE REISSUED RCRA PERMIT AND SELECTION OF CERCLA RESPONSE ACTION

REST OF RIVER REMEDY, GE-PITTSFIELD/HOUSATONIC RIVER SITE

February 29, 2016

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EXECUTIVE SUMMARY OF THE ARGUMENT

The United States Environmental Protection Agency ("EPA") is charged with enforcing federal environmental laws to protect human health and the environment. Under this authority, EPA seeks to hold General Electric Company ("GE") accountable for contaminating over a hundred miles of the Housatonic River system (an area referred to as "Rest of River") with toxic polychlorinated biphenyls ("PCBs"). From 1998 to 2000, the United States, the Commonwealth of Massachusetts, the State of Connecticut, and GE negotiated a Consent Decree ("the Decree" or "CD") requiring GE to clean up its contamination. The Decree was approved by a federal court on October 27, 2000. GE committed to clean-up the Rest of River based upon the remedy selected by EPA through the process outlined in the Decree.

EPA has followed this exhaustive remedy selection process, which has included over a decade of expert information-gathering and technical analysis, to make its Intended Final Decision for the Rest of River remedy. EPA reached its Intended Final Decision based upon an analysis of the relevant criteria in the Decree and information in the Administrative Record. The remedy EPA selected includes a combination of excavation and capping of PCB-contaminated material, and disposal of that material at a suitable off-site landfill. In balancing the relevant factors under the Decree, the Intended Final Decision represents the best alternative to protect human health and the environment for the Housatonic River. GE now challenges EPA's Intended Final Decision for one reason – to reduce its costs in cleaning up its PCBs.

GE attempts to justify its challenge with three main claims: (1) GE knows better than EPA how to select a remedy in the public interest; (2) GE is entitled to virtually total certainty and finality in the cleanup, with uncertainties and additional costs all to be borne by the public; (3) EPA misinterpreted the Decree in requiring restoration of natural resources; and (4) EPA inappropriately applies the statutorily required applicable or relevant and appropriate environmental requirements (ARARs). None of these allegations are justified and should be rejected. EPA's decision thoroughly considered GE's and others' viewpoints, and fairly balances all the relevant factors under the Decree to produce a remedy that protects the overall public interest, not just GE's bottom line.

a. EPA Followed the Consent Decree Process for Selecting a Remedy and made the Right Decision When Selecting the Remedy Based on the Relevant Factors

GE incorrectly contends that it knows better than EPA how to select an appropriate remedy for the Housatonic River to protect human health and the environment. This contention contradicts well-established principles of administrative law affording deference to environmental agencies based upon agency expertise in selecting corrective measures to benefit the public. Indeed, the Decree provides that EPA's Final Permit decision may only be overturned if it is arbitrary, capricious or otherwise not in accordance with the law. Here, EPA followed the process set forth in the Decree to reach the Intended Final Decision. Consistent with CERCLA and RCRA, this process included over a decade of gathering and analyzing

information from: (1) independent third party scientists, including peer review of EPA's risk assessments and EPA's computer modeling work related to fate, transport and bioaccumulation of PCBs in the River; (2) citizens, neighborhood groups, non-governmental organizations, local government officials, and local businesses, including multiple opportunities for comment, public meetings, public workshops and a public hearing; (3) GE, including its submission of a Corrective Measures Study ("CMS") and a Revised CMS of remedy alternatives, its comments at every decision point, and its technical discussions with EPA during a more-than-one-year period; and (4) state environmental agencies, including multiple opportunities for comment and feedback at every decision point, and its technical discussions over many months regarding EPA's remedy proposal.

All this information was included in the Administrative Record and was considered and evaluated by EPA before reaching its Intended Final Decision. EPA weighed all the relevant information under the governing process set forth in the Decree, considering the nine criteria and all the relevant information in the Administrative Record, and reached its Intended Final Decision with significant input from the state environmental agencies. Therefore, the Intended Final Decision is a quintessential Agency decision entitled to deference under principles of administrative law. Moreover, the Intended Final Decision is the best suited alternative -- and is in the middle of the range of alternatives in terms of costs and intrusiveness - to address contamination in the River considering the multiple complexities and factors presented in the Administrative Record.

Two examples illustrate that GE is not in a better position than EPA to evaluate the remedy selection criteria and other relevant information in the Administrative Record to select a remedy: namely EPA's selection of off-site disposal for contaminated soils and sediments and the remedy for Woods Pond. GE objects because off-site disposal is more expensive than on-site disposal. However, EPA evaluated all disposal alternatives, including more expensive potential treatment technologies, which EPA rejected. Nonetheless, GE failed to establish that any of its proposed on-site disposal locations, although cheaper, would be equally suitable compared to established off-site landfills. For example, the Decree specifically provides that one of the selection decision factors for EPA's selection of a remedy is "implementability," which includes, among other things, coordination with other agencies, availability of suitable landfills, and consideration of regulatory and zoning restrictions. GE claims that the outpouring of public and governmental opposition to on-site disposal is irrelevant to EPA's decision making under the Decree. GE is mistaken because of these implementability concerns. On-site disposal is opposed by many local residents and community advocacy groups, every Berkshire County city or town along the Housatonic, and at least seven state offices within Massachusetts. Community members have already petitioned the Commonwealth successfully to designate the area as an ACEC, affording the area heightened protection under the law, including prohibitions on siting landfills. Several community advocacy groups have used legal action to oppose EPA's work at the Consent Decree site directly. EPA's experience at other cleanup sites supports the concern that coordinated opposition to on-site disposal at the Housatonic will unduly delay implementation and completion of the remedy. The Decree also directly refutes GE's claim that EPA's decision making process should have ignored local and state opinions. The Decree requires public comment on many aspects of EPA's remedy selection process and that these comments be part of the Administrative Record supporting EPA's Intended Final Decision. The Decree

explicitly authorizes EPA to consider all "relevant information in the Administrative Record," including public comments. Public participation would be meaningless if EPA could not consider public comments when selecting a remedy.

Further contributing to the implementability difficulties associated with on-site disposal, GE seeks to permanently locate a PCB landfill along the River in an area with no known contamination, where such location, by GE's own admission, would require waiving permanently numerous environmental laws and regulations designed to protect the environment and natural resources, such as wetlands, floodplains, and a State-designated Area of Critical Environmental Concern ("ACEC"). GE's quest to permanently site a PCB landfill along the Housatonic cannot be justified because a practicable alternative – namely off-site disposal – already exists. While CERCLA and the Decree allow environmental requirements to be waived in certain prescribed situations, waiver for the sole purpose of saving costs for a responsible party is not such a situation.

Accordingly, EPA's approach balances the relevant criteria, including protectiveness, cost, short-term impacts and implementability, and concludes that compared to on-site disposal, off-site disposal is more likely to be promptly, properly and safely implemented, and is therefore more suitable, outweighing the higher costs. Indeed, at many other similar sites, EPA has also chosen off-site disposal. Nonetheless, GE seeks to construct a new PCB landfill in a potentially unsuitable location. This would save GE money, but would shift the burden and risks of PCB contamination onto the Berkshires.

Similarly, to save money, GE objects to the removal of over 285,000 cubic yards ("CY") of PCB contaminated sediment from Woods Pond. Instead of removing this material and permanently eliminating the risk of transport to downstream receptors in the event of Woods Pond dam breach or failure, GE seeks to shift the burden and risk onto the public through a shallower removal of the PCB contaminated material followed by capping. GE focuses entirely on the cost of properly remediating Woods Pond and ignores the benefits of source control. The mass of PCBs in Woods Pond at issue here represents approximately 25% of total PCB contamination in sediment in the entire River, in an area that does not provide priority habitat for any state-listed species, and that is amenable to traditional open water dredging technologies. There is no other area on the River where it is possible to remove over 285,000 CY of PCB contaminated material from a single location with fewer negative impacts to habitat. Based on the Administrative Record and the relevant factors under the Decree, EPA reached the proper conclusion that the benefits of permanently remediating Woods Pond by removing a significant mass of PCBs simply outweigh the additional cost.

b. EPA Selected a Remedy that Provides a Level of Certainty Supported by the Consent Decree, RCRA and CERCLA

GE also demands a level of certainty, detail, and finality regarding the ultimate *implementation* of the remedy that is unreasonable and is inconsistent with the Consent Decree. GE demands virtual certainty regarding its future obligations in cleaning up its contamination throughout a complex river system spanning over a hundred miles of river and floodplains, and in so demanding, seeks to shift uncertainty or risk related to the cleanup of its own contamination onto the public. However, nothing in the Decree, law, regulation, or EPA policy or guidance requires EPA to cabin GE's future risk at the expense of the environment or public interest.

c. EPA Correctly Interprets the Consent Decree and GE Cannot Shirk its Liabilities

GE also argues that EPA incorrectly interpreted the Decree and Permit by requiring GE to restore natural resources damaged during implementation of the cleanup. Yet GE's covenant not to sue for future liability for natural resource damages is not effective under the Decree until after GE has implemented the remedial action required by EPA's Intended Final Decision, including compliance with federal and state regulations that require restoration of certain natural resources. Clearly, the United States would not agree to a settlement that included the selection of a remedy for a complex hundred mile river system without requiring any natural resources that were damaged by the clean up to be restored. Such a hypothetical agreement would cost GE less but violates EPA practice, and the terms of the Decree.

d. EPA Correctly Designated ARARs and ARAR Waivers

CERCLA, the Decree and the Permit require the remedy to comply with all applicable or relevant and appropriate environmental requirements ("ARARs"), unless a reason for a waiver exists. Consistent with its efforts to minimize cleanup and costs, GE seeks to avoid its obligations regarding ARARs.

Overall, a remedy must be protective of human health and the environment. Because of GE's focus on its costs, GE cannot neutrally evaluate the merits of the multiple and complex factors under the Decree that shape and determine the selection of a remedy. Under sound principles of administrative law, EPA is best positioned to make such decisions and has done so here to protect health and the environment.

I. BACKGROUND

This Statement of Position responds to GE's arguments set forth in its January 19, 2016 Statement of Position for this dispute over EPA's proposed cleanup. The following background provides supporting background. This dispute is not subject to further review following the decision this dispute.

A. Consent Decree and RCRA Permit

The current dispute has arisen under the October 27, 2000 Consent Decree ("the Decree" or "CD"), entered into by the United States (through the U.S. Environmental Protection Agency or "EPA"), the State of Connecticut, and the Commonwealth of Massachusetts as Plaintiffs, and General Electric Company ("GE") as Defendant.[1] The Decree provides for investigation and cleanup of polychlorinated biphenyls ("PCBs")[2] that were released into the environment from GE's former facility in Pittsfield, Massachusetts and migrated to areas of the GE-Pittsfield/Housatonic River Site (see Site History and Background in Section I.C below). Amongst the jurisdictional bases for the Decree are the Resource

[1] The City of Pittsfield, Massachusetts, and the Pittsfield Economic Development Authority are also parties to the Decree, but not as Plaintiffs or Defendants.

[2] PCBs are classified as a known human carcinogen, a known carcinogen in animals, and have been linked to a number of other adverse health effects. See discussion below in Section III.B.2.a.

Conservation and Recovery Act ("RCRA") and the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"). CD ¶ 1.[3]

The Decree, *inter alia*, requires GE to complete response actions at over twenty-five separate areas contaminated by GE's PCBs, CD §§ VI-IX, to reimburse the Plaintiffs for their costs incurred in responding to the PCB threats CD § XX, and to provide compensation and perform activities to address natural resource damages. CD § XXI. The Decree also provides GE with covenants not to sue by the Plaintiffs, and recognizes the protection for GE from contribution actions based on GE's commitment to perform the cleanups. CD §§ XXVI (Covenants by Plaintiffs) and XXIX (Contribution Protection). The subject of this dispute is the "Rest of River" area, which is described below.

EPA and GE agreed that the Decree and the RCRA Corrective Action Permit, Appendix G to the Decree, would govern the Rest of River investigation, corrective measures alternatives analysis and remedy selection process. CD ¶ 22.[4] EPA and GE also agreed that, following remedy selection and any challenges to that selected remedy, GE is obligated to perform the selected Rest of River Remedial Action and operation and maintenance, pursuant to CERCLA and the Decree. CD ¶ 22.p.

B. Site History and Background

GE used PCBs at its 254-acre facility in Pittsfield, Massachusetts from 1932 to 1977. During this time, the Transformer Division manufactured and repaired transformers containing dielectric fluids, some of which included PCBs. PCBs and other hazardous substances were released to soil, groundwater, Silver Lake, the Housatonic River and were disposed of within and around the facility in landfills, former river oxbows, and other locations. The Decree for the GE-Pittsfield/Housatonic River Site ("the Site") was approved by the federal court in October 2000. The Decree segregated the Site into 28 separate cleanups. Twenty-seven of the Site cleanups (20 Removal Actions Outside the River, 5 Groundwater Management Areas, the Upper-½ Mile Reach of the Housatonic River, and the 1½-Mile Reach of the Housatonic River), are CERCLA removal actions. The remaining cleanup area in the Site is Rest of River, which is the subject of this dispute.

Rest of River includes approximately 125 miles of river in Massachusetts and Connecticut and the associated floodplain. Reaches 5 through 8 flow through the City of Pittsfield and the towns of Lenox, Lee, Stockbridge, and Great Barrington, Massachusetts. There are also approximately 100 acres of backwaters adjacent to Reaches 5 and 6. In addition, there are six dams with impoundments behind them in Reaches 5 through 8. The first dam is Woods Pond, also referred to as Reach 6, and is owned by GE. There are four privately owned dams in Reach 7, and GE owns Rising Pond Dam, which is also referred to as Reach 8. Reach 9 flows through Sheffield, Massachusetts. Reaches 10 through 16 are in Connecticut, from Canaan downstream to Derby. See Figures 1 and 2.

C. Statutory and Regulatory Background

[3] *Citing* CERCLA, 42 U.S.C. §§ 9606, 9607, 9613(b); RCRA – 42 U.S.C. §§ 6928, 6973.

[4] The RCRA Permit is incorporated into the Decree as Appendix G to the Decree. *See* Paragraph 212 of the Decree ("[t]he following appendices are attached to and incorporated into this Consent Decree… "Appendix G" is the Draft Reissued RCRA Permit.")

In 1980, Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"),[5] in response to the serious environmental and health risks posed by industrial pollution.[6] CERCLA was designed to promote the "'timely cleanup of hazardous waste sites'" and to ensure that the costs of such cleanup efforts were borne by those responsible for the contamination. *Consolidated Edison Co. of N. Y. v. UGI Util., Inc.*, 423 F.3d 90, 94 (2d Cir. 2005); *see also Meghrig v. KFC Western, Inc.*, 516 U. S. 479, 483 (1996); *Dedham Water Co. v. Cumberland Farms Dairy, Inc.*, 805 F. 2d 1074, 1081 (1st Cir. 1986), as stated in *Burlington Northern and Santa Fe Railway Company, et al., Petitioners v. United States et al.*, 556 U.S. 599 (2009). CERCLA is to be implemented by EPA.[7] CERCLA is essentially a remedial statute designed by Congress to protect and preserve public health and the environment.[8]

Enacted in 1976, the Resource Conservation and Recovery Act ("RCRA") empowers EPA "to regulate hazardous wastes from cradle to grave…"[9] *City of Chicago v. EDF*, 511 U.S. 328, 331 (1994). As part of RCRA, Congress established a permitting program for facilities that treat, store or dispose of hazardous waste and directed EPA to implement the program.[10] The 1984 Hazardous and Solid Waste Act amendments to RCRA added Section 3004(u) and (v) to RCRA, providing that any person seeking a RCRA permit must perform any "corrective action" necessary to clean up releases of hazardous wastes or hazardous constituents from any solid waste management unit at the facility.

D. Rest of River Process

As described in more detail below in Section III.A.1, the Decree established an extensive, thorough process for selecting a cleanup for Rest of River. This process that spanned over a decade included extraordinary efforts to solicit and respond to the views of the public, including GE. For more details on the specific public involvement steps, see Attachment A, Timeline for Opportunities for GE and the Public to Comment during Rest of River Process. Steps included EPA's computer river modeling, Human Health Risk Assessment and Ecological Assessment, and five independent peer reviews of the modeling and risk assessments. Also included were GE's analysis of the nature and extent of Rest of River contamination (RCRA Facility Investigation), its identification of preliminary cleanup standards (Interim Media Protection Goals), and, in 2008 and 2010, two versions of a Corrective Measures Study to analyze different alternatives for addressing GE's PCB contamination.

Based on that work and other information in the Administrative Record, EPA in 2011 presented a potential remedy for review by two national EPA advisory review boards. Following that review, and prior to soliciting public comment on a proposal, EPA entered into technical discussions with the States of Massachusetts and Connecticut (collectively the

[5] 94 Stat. 2767, as amended, 42 U. S. C. §§ 9601–9675.
[6] *See United States v. Bestfoods*, 524 U. S. 51, 55 (1998).
[7] 42 U.S.C. § 9621.
[8] "We are therefore obligated to construe its provisions liberally to avoid frustration of beneficial legislative purposes." *Dedham Water Co*., at 1081.
[9] *City of Chicago v. EDF*, 511 U.S. 328, 331 (1994).
[10] 42 U.S.C. § 6925

"States"). The EPA/States' discussions yielded, in May 2012, a Status Report of potential remediation approaches for Rest of River.[11] Following issuance of the Status Report, at GE's request, EPA and GE entered into over a year of remedy discussions, concluding those discussions in December 2013.

Based on that exhaustive set of information gathering, alternatives analysis and technical discussions, EPA, in May 2014, proposed a Rest of River remedy for public comment as set forth in the Draft Modification to the RCRA Permit.[12] The rationale for the Draft Permit is documented in EPA's Comparative Analysis of Remedial Alternatives ("Comparative Analysis") and the Statement of Basis for EPA's Proposed Remedial Action for the Housatonic River "Rest of River" ("Statement of Basis"). [13]

EPA evaluated a wide range of alternatives to address the unacceptable risks posed by GE's PCB contamination. The Permit describes nine criteria for consideration: three overarching "General Standards," including: (1) Overall Protection of Human Health and the Environment; (2) Control of Sources of Releases; and (3) Compliance with ARARs,[14] and six additional "Selection Decision Factors," including: (1) Long-Term Reliability and Effectiveness; (2) Attainment of Interim Media Protection Goals;[15] (3) Reduction of Toxicity, Mobility, or Volume of Wastes; (4) Short-Term Effectiveness; (5) Implementability; and (6) Cost. Permit II. G. EPA evaluated all the corrective action alternatives against these criteria, and any other relevant information in the Administrative Record. These factors are often referred to in short-hand as the "nine criteria" or the "nine criteria analysis."

E. EPA's Intended Final Decision

Following consideration of the public comments received on the Draft Permit Modification, further consultation with Massachusetts and Connecticut, and based on the same evaluation criteria as discussed immediately above, EPA modified its proposed remedy. To address GE's concerns on the Draft Permit Modification, EPA made several modifications to the remedy, including changing the Vernal Pool cleanup requirements to potentially less costly and intrusive measures, and eliminating certain obligations for GE to make direct payments to third parties that remove PCBs from their properties. With those modifications, EPA, in

[11] EPA Status Report entitled "Potential Remediation Approaches to the GE-Pittsfield-Housatonic River Site 'Rest of River' PCB Contamination" ("Status Report"), released May 2012.

[12] Permit Section II.J. provides as follows: Based on the information that [GE] submits pursuant to this Permit and any other relevant information in the Administrative Record for the modification of this Permit, EPA will propose Performance Standards, and the appropriate corrective measures necessary to meet the Performance Standards, to address PCBs and any other hazardous waste and/or hazardous constituents that have migrated from the GE Facility to the surface waters, sediments, and floodplain soils in the Rest of River area. Permit II J. at 25. The Decree provides that all comments received on the CMS "and other documents considered or relied on by EPA will become part of the Administrative Record for the Rest of the River Remedial Action." CD ¶ 22.m.

[13] The Draft Modification to the RCRA Permit and the Statement of Basis were issued to the public June 2014. EPA held a public hearing, and a public comment period until October 27, 2014. The Comparative Analysis of Remedial Alternatives is in the EPA Administrative Record for the Rest of River.

[14] ARARs are Applicable or Relevant and Appropriate state and federal Requirements, ARARs are discussed in detail below, including in Section III.A.7, Section III.C.2, and Section III.D.

[15] Interim Media Protection Goals, or "IMPGs", are media-specific protection goals to be used in the Corrective Measures Study as part of the evaluation of remedial alternatives.

September 2015, notified GE pursuant to Paragraph 22.o of the Decree of EPA's Intended Final Decision on the modification of the RCRA Permit.

EPA's evaluation has yielded a balanced, reasonable approach to addressing the unacceptable risks posed by GE's PCBs in Rest of River. After a thorough evaluation of the Permit criteria, EPA's proposed remedy is best suited to meet the General Standards for Corrective Measures in consideration of the Selection Decision Factors, including a balancing of those Factors against one another.

The proposed remedy includes specific activities to address PCB contamination in river sediment, banks and floodplain soil, and biota, to reduce downstream transport of PCBs, allow for greater consumption of fish, and avoid, minimize or mitigate impacts to sensitive areas, species and habitats. The proposed remedy relies on a combination of cleanup approaches, as generally described below:

-Removing PCB-contaminated sediment and capping residual contamination.

-Monitoring natural recovery of the river.

-Removing 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.

- Removing PCB-contaminated material from the floodplain soil and replacing with clean backfill.

- Treating sediment in certain Vernal Pools, Backwaters and Reach 5B with activated carbon or other suitable sediment amendment.

- Restoring areas disturbed by the remediation.

-Transporting and disposing of all excavated contaminated soil and sediment off-site at existing licensed facilities approved to receive such soil and sediment.

- Establishing Performance Standards for the downstream transport of PCBs and the concentration of PCBs in biota.

-Reinforcing restrictions on eating fish, waterfowl and other biota where needed, as well as restricting other activities that could potentially expose remaining contamination.

-Establishing procedures to address PCB contamination associated with future work, and mechanisms for additional response actions if land uses change.

-Maintaining remedy components and monitoring over the long-term to assess the effectiveness of the cleanup and the recovery of the river and floodplain.

-Conducting periodic reviews post-cleanup to assess effectiveness and adequacy of the cleanup.

F. Current Dispute Resolution

After receiving EPA's Intended Final Decision, GE, on October 29, 2015, invoked its right to administrative dispute resolution under the Decree on EPA's Intended Final Decision. CD ¶ 22.o. In the current dispute resolution, EPA, GE, Massachusetts and Connecticut participated in mediation as part of informal dispute resolution pursuant to Paragraph 134 of the Decree. Per a letter agreement dated December 9, 2015, the parties agreed to extend the informal dispute resolution until March 15, 2016, and to proceed at the same time with formal Dispute Resolution under Paragraph 135 of the Decree. Per the formal Dispute Resolution procedures, GE filed its Statement of Position (GE "SOP") on January 19, 2016. In response, EPA is hereby submitting EPA's Statement of Position. GE may file a Reply by March 15, 2016.

II. STANDARD OF REVIEW

This dispute, governed by Paragraphs 22.o, 136, and 141(b) of the Decree, concerns the proposed remedy for the Rest of River site, as described in EPA's Intended Final Decision on the modification of the Reissued RCRA Permit. The Decree vests EPA with the authority to select the Intended Final Decision. CD ¶ 22.o.[16] Paragraph 136 of the Decree sets forth procedures for "disputes pertaining to the selection or adequacy of any response action[17] and all other disputes that are accorded review on the administrative record under applicable principles of administrative law."[18]

The Permit explains that EPA shall reach its decision based upon information that GE submits to EPA and any other relevant information in the Administrative Record. In accordance with Paragraph 136.a, the Administrative Record for this dispute contains all statements of position, including supporting documentation.[19]

The decision-maker[20] is charged, under Paragraph 136.b of the Decree, with issuing "after reasonable opportunity for review and comment by the State, a final administrative

[16] Paragraph 22.o provides "Following the close of the public comment period, EPA will notify [GE] of its intended final decision on the modification of the Reissued RCRA Permit."
[17] Paragraph 136 defines "adequacy of any response action" to include, without limitation: "(1) the adequacy or appropriateness of plans, procedures to implement plans, or any other items requiring approval by EPA under this Consent Decree; and (2) the adequacy of the performance of response actions taken pursuant to this Consent Decree."
[18] To the extent this dispute on the Intended Final Decision for the selection of the remedy for the Rest of River on the Administrative Record involves any embedded question of contract interpretation, any such embedded question may be governed by governing principles of contract law.
[19] The Administrative Record for Rest of River is available on-line at https://semspub.epa.gov/src/collections/01/AR/MAD002084093 and all publically available documents for the entire Site are available on-line at https://semspub.epa.gov/src/collection/01/SC31186.
[20] On January 21, 2016, Curt Spalding, Regional Administrator of EPA Region 1, designated Carl Dierker, Region 1 Regional Counsel, per Paragraph 136.b of the Decree, to issue a final administrative decision resolving the dispute, in accordance with the procedures in the Decree.

decision resolving the dispute based on the administrative record[.]" *Under the Decree, the decision on this dispute based on the Administrative Record is not entitled to judicial review*.[21]

Following the final administrative decision, pursuant to Paragraph 22.p of the Decree, the next formal process step is for EPA to issue a modification of the Reissued RCRA Permit ("Final Permit Modification"), including a response to public comments received. Upon EPA's issuance of the Final Permit Modification, GE and any person who filed comments on the draft permit or participated in a public hearing on the draft permit may seek review of the modification by the EPA Environmental Appeals Board (the "EAB" or the "Board"). Decree, ¶ 141.b(ii) of the Decree; 40 C.F.R. § 124.19. Before the Board, the petitioner would bear the burden of demonstrating that EPA's decision is based on: (1) a finding of fact or conclusion of law that is clearly erroneous; or (2) an exercise of discretion or an important policy consideration that the Board should, in its discretion, review. 40 C.F.R. § 124.19(a). This standard of review is "applied stringently in practice" and the Board will grant review infrequently. *In re Knauf Fiber Glass, GmbH*, 9 E.A.D. 1, 6–7 (EAB 2000). "[W]hen a petitioner seeks review of a permit based on issues that are fundamentally technical in nature, the Board assigns a particularly heavy burden to the petitioner." *In re Peabody Western Coal Company*, CAA Appeal No. 04-01, 12 E.A.D. 22, 32 (Feb. 18, 2005) (citations omitted).

If the Board grants review of one or more petitions, GE or "any interested person" may seek review of that decision in the United States Court of Appeals for the First Circuit. Decree, ¶ 141.b(iii); RCRA § 7006(b). The Court of Appeals "may only overturn Board's [decision] . . . if it was 'arbitrary, capricious, an abuse of discretion or otherwise not in accordance with law.'" *City of Pittsfield, Mass. v. U.S. E.P.A.*, 614 F.3d 7, 10 (1st Cir. 2010) (citing 5 U.S.C. § 706(2)(A); *Adams v. EPA*, 38 F.3d 43, 49 (1st Cir.1994)). Under this narrow scope of review, the Court would defer to EPA on statutory interpretations and scientific matters within EPA's expertise and would uphold the decision unless it lacked a rational basis. *Adams v. U.S. E.P.A.*, 38 F.3d 43, 49 (1st Cir. 1994). Questions of contract interpretation, however, are subject to plenary review by the Court. *Farmers Ins. Exch. v. RNK, Inc.*, 632 F.3d 777, 783 (1st Cir. 2011).

If either the Board or the Court of Appeals vacates or remands all or part of EPA's permit modification, EPA may revise its decision. Decree, ¶ 22.t. To the extent consistent with 40 C.F.R. § 124.19, GE and other persons may seek review of the revised permit first before the Board and then before the Court of Appeals. Decree, ¶ 141.b(iv).

III. ARGUMENT

GE disputes the decision that EPA reached after EPA faithfully followed the extensive processes outlined in the Decree, including years of information gathering and consideration of scientific and public input. EPA's remedy will remove PCB contaminated soil and sediment from the River, and floodplain and dispose of the material in a pre-existing off-site suitable landfill, without prior treatment of the material. EPA considered and rejected more costly alternatives, such as treating PCB contaminated material prior to removal, as well as less protective and less costly alternatives. In the end, EPA proposes a remedy that appropriately

[21] Paragraph 141(b)(i) provides that GE "shall not have the right to seek judicial review of the administrative decision on EPA's notification of its intended permit modification pursuant to this subparagraph."

balances all the relevant factors, including GE's financial concerns, with EPA's obligation to assure protection of public health and the environment in and around the Housatonic River.

By contrast, GE's dispute of EPA's Intended Final Decision is driven only by GE's motivation to reduce costs and risks to GE. While GE claims willingness to clean up the River using a less expensive solution, it writes even of its own proposal: "this conclusion is subject to GE's reservations of rights, including its appeal rights, and thus *does not constitute a proposal to implement these alternatives*."[22] GE's dispute should be rejected because : (1) EPA, with its objectivity and technical expertise, is better positioned to select a remedy under the Decree to be protective of human health and the environment; (2) GE unfairly seeks to shift the risks of uncertainty and unknown expenses to the public and is not entitled to the level of detail, certainty and finality it unreasonably demands; (3) GE's bias to save costs renders a distorted interpretation of the Decree; and (4) EPA complies with its statutory obligations to comply with ARARs. Each of GE's challenges to each component of the remedy is resolved by these four points. .

First, EPA, as the Agency guided by scientific and technical expertise, is better positioned than GE to weigh and evaluate the host of complex scientific information and other relevant criteria in the Administrative Record -- including cost and consideration of public comments submitted to EPA during the remedy selection process -- that lead to the selection a remedy for the Rest of River under the Decree that is the public interest. This fundamental principle of administrative law applies to GE's dispute for the following components of the Intended Final Decision: EPA's risk assessments; EPA's selection of a remedy for Woods and Rising Ponds, Reach 7 impoundments, and backwaters; EPA's decisions regarding engineered caps; and EPA's selection of off-site disposal.

Second, in an effort to reduce its own risks, and shift risk to the public, GE demands a degree of certainty and finality that is inconsistent with the Decree and unreasonable in the context of selecting a cleanup for over a hundred miles of River and hundreds of acres of floodplains. EPA has already reduced GE's exposure to certain future liabilities by capping certain categories of response costs for which GE is liable. The Decree does not provide for GE to shift the risk of future PCB cleanup expenses to the public.

GE's unreasonable demands to reduce future uncertainties is shown for the following components of the Intended Final Decision: the PCB Downstream Transport and Biota Performance Standards; certain future floodplain activities and uses; inspection and maintenance of certain dams; and additional response actions for future dam failure or breach.

Third, GE misconstrues the Decree. This point is shown in GE's arguments to eliminate the responsibility and cost of restoring natural resources impacted by remediation. Under GE's theory, GE would have no obligation to return the Rest of River to pre-remediation condition and could simply leave the river, floodplains and vernal pools as open trenches.

Finally, GE's interpretation of ARARs is incorrect. .For simplicity, each component of GE's argument is organized by the above issues. Many of the issues overlap or are

[22] GE Revised CMS at 28 (emphasis added).

intertwined, but for the sake of simplicity and organization, the components of the remedy disputed by GE are grouped and organized by these four issues.

A. EPA Followed the Consent Decree Process for Selecting a Remedy and Made the Right Decision When Selecting the Remedy Based on the Relevant Factors.

After years of exhaustive study, public comment, and independent peer review, EPA determined, based upon the Administrative Record, that the Intended Final Decision best satisfies the relevant Decree criteria. EPA is the Agency vested with expertise and authority to select a remedy that is in the public interest based upon the Administrative Record. As shown below, EPA followed the process set forth in the Decree and made a remedy selection consistent with the Decree, Administrative Record, CERCLA, RCRA, and the relevant EPA guidance documents. GE's argument turns on the contention that EPA—after following the process set forth in the Decree—evaluated all the facts and allegedly reached the wrong conclusion. And that is exactly the kind of decision making that is vested squarely within EPA's expertise and that courts are reluctant to overturn, especially where the decision is the result of years of consensus building efforts among EPA and state regulators.

The following describes in more detail the process undertaken by EPA pursuant to the Decree to reach its Intended Final Decision based on the Administrative Record.

1. EPA Followed the Decree Process for Selecting the Remedy

a. Process for Gathering Scientific Information and Analysis under the Decree.

The Decree establishes an exhaustive process for EPA to study, gather, and analyze scientific information regarding the River. This near-decade-long process began with EPA and GE conducting additional studies from 1998 to 2002. The results of these studies were summarized in GE's 2003 RCRA Facility Investigation ("RFI") Report. CD ¶ 22.a. At that time, EPA also completed its initial Human Health Risk Assessment ("HHRA"), pursuant to CD ¶ 22.b, followed by independent expert peer-review, CD ¶ 22.c, and a revised HHRA, was completed in 2005. In 2003, EPA also completed its initial Ecological Risk Assessment ("ERA"), pursuant to CD ¶ 22.b, followed by independent expert peer review, CD ¶ 22.d, and a revised ERA in 2004. Similarly, from 2001-2006, EPA developed computer modeling documents to study fate, transport, and bioaccumulation of PCBs in Reaches 5 through 8 of Rest of River, CD ¶ 22.g, and this computer modeling work was subject to three rounds of peer review by a panel of independent modeling experts.[23] CD ¶ 22.h. Throughout this process GE submitted comments to EPA which EPA considered, accepted, modified, or rejected. Many of these same comments are rehashed in this dispute.

In 2008, GE submitted its CMS evaluating the alternative measures to be implemented as a remedial action under CERCLA to clean up the River. *See* Permit II. E-G. Following comment on the CMS, GE submitted a Revised CMS in 2010. Under the Permit, the Revised CMS was required to consider the corrective measures alternatives based upon nine Permit criteria described above in Section

[23] Modeling Documents and Peer Review consisting of 3 peer reviews—Modeling Framework Design; Model Calibration; and Model Validation (all are for Watershed, Fate & Transport, and Food Chain Models)

In 2011, EPA presented a potential proposed remedy to EPA's National Remedy Review Board ("NRRB") and Contaminated Sediments Technical Advisory Group ("CSTAG").[24] EPA considered comments from the NRRB and CSTAG and responded to those comments in August 2012.[25]

All this information and analysis gathered over the years is contained in the Administrative Record for the Rest of River Remedial Action. CD ¶ 22.m. GE cannot dispute that EPA followed *the process* set forth in the Decree for gathering scientific information and analysis for the Administrative Record.

b. Process for Gathering Community Input under the Decree

The Decree also establishes an exhaustive process for EPA to gather information from the community. For over a decade EPA has made extraordinary efforts to involve the public and to solicit and respond to the views of GE, other stakeholders, and the other members of the public on the Rest of River. The community has been provided the opportunity to comment upon EPA's draft permit modification decision as well as upon the RFI Report, CMS, Revised CMS, HHRA, ERA, each of EPA's river modeling documents, and other similar documents. CD ¶ 22.m, n, o. These Comments are part of the Administrative Record for the River. In addition, the Citizens Coordinating Council ("CCC") and community relations are both formal components of the Decree requiring cooperation and participation, including from GE. CD ¶ 213. The CCC is made up of over 30 environmental, business and community leaders from Berkshire County and Connecticut. In particular, EPA has supported the CCC since its formation in 1998, as a meaningful opportunity for citizens to keep involved in the Site cleanups. In addition, in 2011, EPA held a series of workshops and a meeting known as a "charrette" to further engage the community in the remedy selection process.

Community members have successfully petitioned the Commonwealth to designate certain portions of the Housatonic River as part of an ACEC. This designation affords the area heightened protection under the law.

EPA's actions taken under the Decree have also been consistent with CERCLA's and RCRA's statutory provisions contemplating consideration of community input through the comment process as well as regulation and guidance documents recognizing community acceptance as a factor in the remedy selection process. CERCLA, 42 U.S.C. § 9617; RCRA, 42 U.S.C. §6974; National Contingency Plan, 40 C.F.R. § 300.430(f)(3); RCRA Regulations, 40 C.F.R. 256.63; *see also RCRA Public Participation Manual*, EPA, EPA 530-R-96-007 (1996), *A Guide to Selecting Superfund Remedial Actions*, EPA, OSWER 9355 0-27FS.

GE cannot contend that EPA acted inconsistently with the process set forth in the Decree for gathering community input for the Administrative Record.[26]

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[24] EPA presents potential proposed remedy to EPA's National Remedy Review Board (NRRB) and Contaminated Sediments Technical Advisory Group (CSTAG)—June 2011.

[25] EPA issues regional response to NRRB/CSTAG Comments—August 2012.

[26] GE argues about the substantive impact of EPA's information gathering from the community, including that EPA allegedly provided too much weight to community input. This issue is addressed below in more detail at Section III.A.7, but such claims are different from arguing that EPA violated the process set forth in the Consent Decree for gathering information from the community and maintaining this information in the Administrative Record.

c. Process for Collecting Public Comment from GE, and State Regulators

Following EPA's submission of the proposed permit modification to the NRRB and CSTAG, in August 2011, the States requested facilitated discussions with EPA regarding the proposed Remedy. EPA and the States then engaged in a series of scientific/technical discussions in an effort to build consensus about a remedy that would be protective of human health and the environment under the relevant Decree criteria based on the Administrative Record. In May, 2012, EPA released a Status Report representing a potential approach to the remedy that would not be objectionable to the States or EPA, subject to completion of the public comment process set forth in the Decree.

In September 2012, GE requested a series of technical discussions with EPA to determine whether GE and EPA might resolve any differences regarding an appropriate remedy for the Rest of River ("Technical Discussions"). These Technical Discussions concluded in December 2013 without complete resolution of the issues.

GE cannot dispute that the process of considering public comment from itself and the States is consistent with the Decree, and represents an extraordinary effort by EPA to hear all viewpoints prior to proposing a remedy.

d. EPA's Substantive Decision is Entitled to Deference

Because GE cannot object to the lengthy and thorough process that EPA followed under the Decree, GE may only object to the conclusions that EPA reached after this process. Yet, it is clear that EPA is vested with authority and discretion in evaluating the relevant factors set forth in the Decree for selecting a remedy.[27] Here EPA's analysis of the relevant factors and its decision on the Administrative Record is entitled to deference, is supported by the States, and is a sound resolution of the multiple and complex factors that shape remedy determination under the Decree.[28] EPA considered and rejected more intrusive, more costly alternatives as well as less protective and less costly alternatives, and proposes a remedy that holds the right balance in weighing all the relevant criteria under the Decree.

As discussed below, EPA's technical determinations are science-based and in accordance with the Decree and applicable agency guidance. While GE disagrees with many of EPA's determinations, GE has not shown and cannot show any compelling reason to set EPA's determinations aside.

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[27] As noted in RCRA guidance, the exact emphasis placed on these decision factors, and how they will be balanced by EPA in selecting the most appropriate remedy for a facility, will necessarily depend on the types of risks posed by the facility, and the professional judgment of the decision-makers. 55 Fed. Reg. 30798, 30825 (July 27, 1990).

[28] *Adams v. U.S. E.P.A.*, 38 F.3d 43, 49 (1st Cir. 1994)("An agency is entitled to deference with regard to factual questions involving scientific matters in its own area of expertise"); *see also SEC v. Chenery Corp.*, 318 U.S. 80, 94 (1943)("If the action rests upon an administrative determination—an exercise of judgment in an area which Congress has entrusted to the agency—of course it must not be set aside because the reviewing court might have made a different determination were it empowered to do so."); *SEC v. Chenery Corp*., 332 U.S. 194, 209 (1947) (holding agency decisions are "entitled the greatest amount of weight" when they are the product of administrative experience, appreciation of the complexities of the problem, realization of the statutory policies, and responsible treatment of the uncontested facts").

2. EPA Made the Right Substantive Decisions When Selecting the Remedy

a. Health Basis for Overall Remedy and Ecological Issues:

i. The Proposed Remedy Provides Long-term Protection of Human Health and the Environment

The proposed remedy is necessary to protect human health and the environment from PCB contamination released by GE's Pittsfield facility. Peer-reviewed risk assessments have concluded that PCBs and other contaminants of concern pose unacceptable risks to human health and the environment at in Rest of River. The remedy employs a variety of mitigation tools to remove PCBs and reduce the exposure risks, including excavating contaminated soils and sediments and isolating contaminated materials under engineered caps. In some areas, construction of the proposed remedy will have unavoidable short-term impacts, but the design of the remedy limits those impacts, particularly in habitats of sensitive species. The remedy also requires GE to restore all disturbed areas. Due in part to this restoration requirement, the long-term benefits of the remedy far outweigh the short-term impacts.

Contrary to GE's arguments, the Human Health Risk Assessment ("HHRA") and Ecological Risk Assessment ("ERA") show that the PCB contamination in the Housatonic River poses unacceptable risks to human health and the environment. EPA performed the HHRA and the ERA using the best available science and the risk assessment process outlined in 40 C.F.R. Part 300, which are the Superfund regulations called the National Contingency Plan ("the NCP")[29] and agency guidance. The development processes that EPA employed for the Rest of River HHRA and ERA were more comprehensive, detailed, and inclusive of public input than is typical for hazardous waste sites.

Unlike most CERCLA/RCRA sites, the Rest of River HHRA and ERA were reviewed by review panels comprised of independent risk assessment experts. CD ¶¶ 22.c, d. The panel members were selected not by EPA but by a selection contractor mutually agreed upon by GE and EPA. Before the peer reviewers commenced their panel discussion at each peer review, GE and members of the general public, including the States, were provided opportunities to submit written comments and make oral presentations to both peer review panels. CD Appendix J, Step 1 and Step 3. While critical of some specific aspects of the assessments, the peer reviewers' comments were generally supportive of both the HHRA and the ERA.[30]

GE had many opportunities to review and comment on the risk assessments as they were developed. Based on its comments on the Draft RCRA Permit Modification and its SOP, GE plainly disagrees with the conclusions of those risk assessments, and it continues to re-argue many of the same points that received independent scientific review over ten years ago.

ii. EPA's toxicity values for PCBs are supported by scientific consensus and were vetted through public comment and peer review

[29] 40 C.F.R. § 300.430(d).

[30] Responsiveness Summary to the Peer Review of the HHRA, USEPA, March 2004, and Responsiveness Summary to the Peer Review of the ERA, USEPA, June 2004.

GE disputes EPA's toxicity values for PCBs used in the HHRA. The HHRA uses published toxicity values for each contaminant of concern. These toxicity values quantify the relationship between the average daily doses calculated in the exposure assessment and the potential cancer risks and non-cancer health effects. GE claims that these values substantially overstate the cancer and non-cancer human health risks of PCBs. While GE may disagree with the values selected, it has not shown any credible evidence that EPA abused its discretion in setting these values or that the values lack a rational basis.

In fact, the HHRA PCB toxicity values are based on sound, peer-reviewed scientific inquiry. The HHRA used toxicity values published in EPA databases and reports.[31] Specifically, the HHRA used, where possible, toxicity values published in EPA's Integrated Risk Information System ("IRIS"). These IRIS values have undergone extensive scientific peer review. For contaminants of concern for which toxicity values are not published in IRIS, provisional values were obtained from the Health Effects Assessment Summary Tables (HEAST).[32] EPA derived these IRIS and HEAST toxicity values in accordance with all applicable EPA guidance.[33]

EPA issued its initial HHRA in June 2003 and in July 2003 GE submitted comments to the peer review panel that, *inter alia*, argued that EPA's toxicity values were overly conservative.[34] The initial HHRA and the comments on the HHRA received from the public (including GE) were subjected to peer review by a panel of independent risk assessment experts. The peer review panel was specifically charged with evaluating the toxicity assessment.[35] While the peer reviewers generally agreed with the toxicity assessment in the initial HHRA,[36] EPA chose to exercise its option to revise and reissue the document to explicitly address comments from the peer reviewers.

The revised HHRA, issued in February 2005, included an expanded discussion of toxicity values,[37] and summarized additional toxicity studies.[38] The revised HHRA also summarized an exposure study of Housatonic River area residents and a study comparing cancer rates in the Housatonic River area with the rest of Massachusetts.[39] EPA solicited a second round of public comments on the new information provided in the revised HHRA. GE's April 2005 comments asserted that EPA should clarify its summary of the study comparing cancer rates and criticized EPA's approach for calculating certain toxicity values.[40] EPA responded to these comments in June 2005 but determined that no additional revisions were necessary.[41]

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[31] Initial HHRA, Vol. I at 2-4.
[32] U.S. EPA, Health Effects Assessment Summary Tables, 1997.
[33] *See* Attachment A. Response to GE's Comments on Toxicity Values Used to Evaluate Human Health Risks
[34] Comments of GE on USEPA's HHRA for the Housatonic River Site, Rest of River, GE, July 28, 2003. Section 6.
[35] Charge for HHRA Peer Review for Rest of Housatonic River, USEPA, June 2003, Page 2.
[36] HHRA Responsiveness Summary.
[37] Changes / Additions to the HHRA Report, USEPA, February 2005, at 2,
[38] *Id.*
[39] Changes / Additions to the HHRA Report.
[40] GE Comments on EPA's revised HHRA (April 5, 2005),
[41] Responsiveness Summary to Public Comments on New Information for the HHRA, USEPA, June 1, 2005,

Notwithstanding the studies cited by GE,[42] the overall scientific consensus remains: PCBs can cause cancer and many other health impacts.[43] Notably, EPA has not re-assessed the IRIS toxicity factors for PCBs at any point since the HHRA was issued. Additionally, since that time, the World Health Organization officially reclassified PCBs a known human carcinogen as opposed to a probable human carcinogen.[44] Thus, the Agency's toxicity values used in the HHRA remain well-supported.

iii. The proposed remedy is necessary to reduce human exposure to PCBs through consumption of fish

Of all the exposure pathways in the Rest of River, fish consumption poses the greatest risk to human health. To reduce PCB concentrations in fish tissue and the overall environment, the proposed remedy requires GE to remove a substantial volume of river sediments, install engineered caps, and take other actions. GE argues that these remedial actions are not necessary to protect human health.

The NCP directs EPA to select remedies that result in human cancer risks that fall within the risk range of 1 in 1,000,000 (expressed as 1×10^{-6}) to 1 in 10,000 (1×10^{-4})[45] and that do not pose unacceptable non-cancer risks. Where the cumulative risk to an individual exceeds this range, i.e., greater than 10^{-4}, action is generally warranted, and EPA's "point of departure" for remedy selection is at the more stringent, or protective, (*i.e.*, 10^{-6}) end of the risk range.[46] Under this approach, EPA favors the most stringent (10^{-6}) end of the range and will not as a matter of course select a remedy that barely achieves the least stringent (10^{-4}) requirement.[47] Fish consumption risks from PCBs exceed this risk range in the Rest of River, from the confluence downstream into Connecticut.[48] For persons at the high-end of exposure projections, the fish consumption risks range above 1 in 1,000 (1×10^{-3}) for PCBs, and are even higher for dioxin/furan toxic equivalent risk (up to 1 in 100).[49] Thus, the cancer risks

[42] Attachment J to GE's Comments on the RCRA Permit Modification contains several papers and reports that relate to toxicity and cancer risk in the Housatonic River area. Most of these documents were published after the HHRA was issued. EPA notes that researchers have written numerous studies on the toxicity of PCBs since the HHRA process completed in 2005. The conclusions of these studies vary, and it is unsurprising that GE was able to select several studies that purportedly minimize the risks posed by PCBs.

[43] PCBs have been demonstrated to cause a wide variety of adverse health effects, including cancer. PCBs also cause serious non-cancer health effects in animals, including effects on the immune system, reproductive system, nervous system, endocrine system and other organs. Studies in humans provide supportive evidence for potential carcinogenic and non-carcinogenic effects of PCBs. *See* EPA, Understanding PCB Risks at the GE-Pittsfield / Housatonic River Site, available at http://www.epa.gov/region1/ge/understandingpcbrisks.html#WhatArePCBs.

[44] In 2012, the World Health Organization's (WHO) International Agency for Research on Cancer (IARC), changed the carcinogenicity category of PCB-126, one of the 209 different PCB molecules, from Group 2A – Probably Carcinogenic to Humans, to Group 1 – Carcinogenic to Humans. And in 2013, IARC changed the category for PCBs in general and all dioxin-like PCB congeners to Group 1. Polychlorinated biphenyls and polybrominated biphenyls / IARC Working Group on the Evaluation of Carcinogenic Risks to Humans (2013: Lyon, France), as published in IARC Monographs On The Evaluation Of Carcinogenic Risks To Humans, Volume 107. 2015.

[45] 40 C.F.R. § 300.430(e)(2)(i)(A)(2); Preamble to the NCP, 55 Fed. Reg. 8666-01, 8718–19 (March 8, 1990).

[46] Role of the Baseline Risk Assessment EPA, 1991

[47] 55 Fed. Reg. 8666-01, 8718–19 (March 8, 1990).

[48] Statement of Basis at 15.

[49] Revised Human Health Risk Assessment, Rest of River, USEPA, February 2005, Volume IV, Appendix C, Consumption of Fish and Waterfowl Risk Assessment at page ES-15 and Table 5-1.

posed to people consuming fish from Rest of River are well beyond the risk threshold in the NCP.

Fish consumption also poses significant and unacceptable non-cancer human health risks. EPA utilizes a hazard index approach to evaluate systemic toxicants (non-cancer effects) and considers a response action to be generally warranted if the non-carcinogenic hazard index is greater than one.[50] For Rest of River, non-cancer hazard indexes are as high as 120 in some reaches.[51] GE's comments on the RCRA Permit Modification concede that, according to EPA's probabilistic risk model, the selected remedy will achieve a non-cancer Hazard Index of 1 for Adults with Central Tendency Exposure ("HI = 1 CTE adults") (which corresponds to 1.5 mg/kg in fish fillets) and achieve at least the cancer CTE of 1 in 10,000 in all Massachusetts reaches except one (Reach 5B) within the 52-year model projection period.[52] In fact, in most reaches, the proposed remedy achieves these particular Interim Media Protection Goals ("IMPGs") more rapidly than all but one other alternative.[53] Attainment of IMPGs is one of the six remedy selection decision factors in the Decree, and "the time period in which each alternative would result in the attainment of the IMPGs" is important to EPA's evaluation of this factor.[54]

Despite the risks posed by its contamination in Rest of River, GE argues that the amount of sediment remediation included in the proposed remedy is unnecessary, because it will not reduce PCB concentrations in fish to levels that would allow for fish consumption advisories to be discontinued.[55] In fact, under all alternatives, Institutional Controls (including but not limited to fish consumption advisories) would likely be needed to protect human health for a period of time following remediation. As documented in the Comparative Analysis, despite the need for continuing some level of Institutional Controls for some period of time after remedy implementation, the proposed remedy results in significant risk reduction.

GE argues that a less extensive remedy would also achieve a particular non-cancer IMPG (Hazard Index of 1 for an adult with Central Tendency Exposure, or "HI=1 CTE adult") for fish consumption in Massachusetts. In particular, GE asserts in its SOP that SED 5 would achieve this IMPG (HI=1 CTE adult) in all but one Massachusetts reaches within the model projection period, and would achieve other CTE IMPGs in more reaches than the proposed

[50] *See*, *e.g.*, Rules of Thumb for Superfund Remedy Selection, OSWER Directive 9355.0-69, August 14, 1997; *see also* 40 C.F.R. § 300.430(e)(2)(i)(A)(1) ("For systemic toxicants, acceptable exposure levels shall represent concentration levels to which the human population, including sensitive subgroups, may be exposed without adverse effect during a lifetime or part of a lifetime, incorporating an adequate margin of safety").

[51] Final HHRA, Volume IV, Appendix C, Table 8-2, page 8-5.

[52] GE Comments on EPA's Draft RCRA Permit Modification and Statement of Basis for Proposed Remedial Action for the Housatonic River - Rest of River, GE, October 27, 2014, Page 28.

[53] Comparative Analysis of Remedial Alternatives for the Housatonic River, Rest of River, USEPA, May 2014, Attachment 10. IMPGs are defined in the RCRA Permit as "media-specific protection goals for the Rest of River area, as established pursuant to . . . this Permit. The Interim Media Protection Goals shall be used in the CMS, as provided in this Permit". Permit at 6.

[54] RCRA Permit para. G.2.b.

[55] GE Comments on Draft RCRA Permit Modification at 28.

remedy.[56] But SED 5 employs thin-layer capping in backwaters and Reach 8. The many shortcomings of thin-layer capping, including uncertainty, long-term ineffectiveness, loss of flood storage capacity, and permeability, are discussed below, in Section III.A.2.c.[57]

GE also argues that EPA's predictions of future PCB levels in fish tissue in the Connecticut reaches are uncertain and unreliable, and that all of the alternatives would achieve similar reductions of the Connecticut PCB fish consumption advisory. In fact, GE developed a model (CT 1-D model) as part of the CMS to predict fish tissue concentrations in Connecticut in order to compare the effectiveness of remedial alternatives.[58] GE concluded that even given the large uncertainty in the CT 1-D methodology, the level of combined accuracy/precision was considered acceptable and that the model can be used to develop future predictions in the Connecticut portion of the river.[59] According to GE's CT 1 D model, the proposed remedy reduces PCB concentrations by a factor of ten compared to MNR.[60] Compared to GE's preferred alternative cited in its Revised CMS[61] (SED 10), the proposed remedy reduces fish tissue in Connecticut concentrations by a factor of five.[62] The model was used for its intended purpose, which is comparing between remedial approaches, and in this case was relevant to EPA proposing a remedy approach that was more likely to result in appropriate reductions in fish tissue contamination as compared with other alternatives preferred by GE.

iv. The direct contact exposure assumptions for sediment and floodplain soil in the HHRA are reasonable estimates of risks to average and high-end users.

GE asserts that exposure assumptions in the HHRA are unrealistic and overstate exposures and human health risks.[63] In fact, the exposure assumptions properly estimate levels of exposure for human populations, including persons most at risk. Under the NCP, "acceptable exposure levels" must "represent concentration levels to which the human population, including sensitive subgroups, may be exposed without adverse effect during a lifetime or part of a lifetime, incorporating an adequate margin of safety."[64] In accordance with this regulation and Agency guidance, the HHRA evaluated the central tendency exposure

[56] GE Comments on Draft RCRA Permit Modification at 28–29. EPA notes that GE has not previously favored SED 5. In its 2010 Revised CMS, GE concluded that a combination of SED 10—not SED 5—and FP 9 is "best suited to meet the General Standards, including protection of human health and the environment, in consideration of the Selection Decision Factors." Revised CMS at 28.

[57] GE's support for SED 5 in this context is curious because GE objects to several aspects of SED 5, such as excavating and capping of the entirety of Reach 5B. In addition, SED 5 has other components that go well beyond EPA's proposed remedy, such as excavation and stabilization with hard armoring of all banks in Reaches 5A and 5B.

[58] GE Revised CMS at 3-45.

[59] GE Revised CMS, Appendix J at J-15.

[60] Statement of Basis for EPA's Proposed Remedial Action for the Housatonic River Rest of River, USEPA, June 2014, Page 33 and Table 4. and at Comparative Analysis at 22 & Table 4.

[61] In its 2010 Revised CMS, GE concludes that a combination of SED 10/FP9 is best suited to meet the General Standards, including the consideration of the Selection Decision Factors . Revised CMS at 28).

[62] EPA Statement of Basis at 33 & Table 4; Comparative Analysis at 22 & Table 4.

[63] GE Comments on Draft RCRA Permit Modification, at 30-32.

[64] 40 C.F.R. § 300.430(e)(2)(i)(A)(1) (emphasis added).

risks for persons with "average" exposure, as well as reasonable maximum exposure ("RME") for "high-end" or "maximally exposed" persons.[65]

The exposure assumptions used in the HHRA were established following the procedures outlined in EPA guidance.[66] The basis for and derivation of each exposure assumption used in the HHRA is described in detail in both the initial and revised Phase 2 Direct Contact Risk Assessment HHRA (Volume IIIA, Appendix B). All exposure assumptions, including assumptions about recreational use, dirt biking and sediment exposure scenarios, and soil ingestion rates, were derived from site-specific information when available or Agency guidance.[67]

The exposure assumptions used in the initial HHRA were among the subjects reviewed by the Peer Review Panel. As summarized on page 16 of the HHRA Responsiveness Summary, five of the seven members of the Peer Review Panel for the HHRA commented that the approach, including the selection of exposure scenarios, receptors, exposure parameters, and risk estimates used to estimate risk from direct contact, was reasonable and consistent with EPA policy.[68] EPA agrees with the majority of the Peer Review Panel members that the assumptions used to estimate risk from direct contact were reasonable and consistent with EPA policy.

v. The proposed remedy is necessary to reduce human health risks due to direct contact exposure to PCBs

GE argues that, even accepting EPA's exposure assumptions, a less disruptive remedy would still achieve acceptable cancer range levels and an acceptable non-cancer hazard index for direct contact exposure. In particular, GE asserts that alternative FP-9 would achieve the "RME IMPGs based on a 10-4 cancer risk and a non-cancer [hazard index] of 1 in all of the flood plain [exposure areas], and . . . based on a 10-5 cancer risk and a non-cancer [hazard index] of 1 in a majority (about two-thirds) of the direct-contact floodplain [exposure areas]."[69]

First, EPA notes that attainment of IMPGs, including direct contact IMPGs is only one of the decision factors that EPA balanced in selecting the remedy, and GE only discusses the

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[65] Final HHRA, Section 7.1.

[66] The Guidance for Risk Characterization (EPA, 1995) states that the "high end [RME] descriptors are intended to estimate the exposures that are expected to occur in small, but definable, "high end" segments of the subject population." The Guidelines for Exposure Assessment (EPA, 1992) defines the RME as "… a plausible estimate of the individual risk for those persons at the upper end of the risk distribution. The intent of this description is to convey an estimate of risk in the upper range of the distribution, but to avoid estimates which are beyond the true distribution." EPA's Risk Assessment Guidance for Superfund (EPA, 1990) notes that "The intent of the RME is to estimate a conservative exposure case (i.e., well above the average case) that is still within the range of possible exposures." The RME risk serves as the point of departure in remedy selection as outlined in the NCP. The CTE exposure was also evaluated consistent with EPA's Risk Characterization Policy and Handbook to provide the risk manager with additional information to consider while making decisions.

[67] *See* Final HHRA, Volume IIIA, Appendix B, Section 4. In particular, incidental ingestion rates and recreational exposure assumptions are based on information discussed in Subsections 4.5.2 and 4.5.3.

[68] One reviewer considered the selection of exposure parameters reasonable, but thought that the combination of exposure parameters resulted in overly conservative risk estimates for most of the scenario/receptor combinations. Another reviewer commented that individual exposure parameters were too high and the combination of exposure parameters resulted in extreme estimates of risk, rather than risk to an RME.

[69] Statement of Position (SOP) of General Electric Company In Support of Dispute of EPA's Notification of Intended Final Decisions on Rest of River Remedy, GE, January 19, 2016, at 13-14.

least stringent cancer risk IMPG for protection of human health from the direct contact pathway and completely ignores the attainment of ecological IMPGs. Second, GE argues in essence that EPA should select the least costly alternative that would achieve the least stringent human health risk levels allowable under the NCP, and that EPA erred in selecting a remedy that achieves more stringent levels.

The NCP provides that the most stringent cancer risk level (10^{-6}) is the "point of departure for determining remediation goals for alternatives when ARARs are not available or are not sufficiently protective because of the presence of multiple contaminants at a site or multiple pathways of exposure."[70] The preamble to the NCP explains that this "point of departure,"

> expresses EPA's preference for remedial actions that result in risks at the more protective end of the risk range, but this does not reflect a presumption that the final remedial action should attain such a risk level. Factors related to exposure, uncertainty and technical limitations may justify modification of initial cleanup levels that are based on the 10-6 risk level. The ultimate decision on what level of protection will be appropriate depends on the selected remedy, which is based on the criteria described in § 300.430(e)(9)(iii).[71]

Thus, EPA begins its evaluation at the most stringent end of the risk range (10^{-6}), and adjusts that target downward only where necessary given site-specific factors.

With respect to the specific cancer risk IMPG raised by GE, which again is the least stringent, the SED 10/FP 9 proposal favored by GE achieves the 10^{-5} cancer risk level in fewer of the floodplain areas than the proposed remedy, which achieves the 10^{-5} risk level in all of the frequently used subareas and from 71% to 100% of the floodplain/sediment exposure areas, depending upon the extent of remediation conducted in NHESP Core Areas 2 and 3, to be decided on a case-by-case basis.

Other alternatives may achieve less stringent IMPGs as GE claims. But the proposed remedy best meets the Permit's general standards, in consideration of the selection decision factors, including a balancing of those factors against each other. The proposed remedy achieves a non-cancer hazard index of one, provides more protection against cancer risks, and ensures long-term protection of the environment from risks posed by PCBs.

This conclusion is supported by the Administrative Record, including without limitation the Comparative Analysis.

vi. PCBs pose unacceptable risks to the environment in Rest of River

GE incorrectly characterizes the ecological risks posed by PCBs in the Rest of River area as "tenuous and uncertain"[72] and argues that EPA overstates the impacts of PCBs on the local population of wildlife species.[73] In fact, PCBs pose significant risks to the health of local population of species, such as amphibians, insectivorous and piscivorous birds, and piscivorous

[70] 40 C.F.R. § 300.430(e)(2)(i)(A)(2).
[71] 55 Fed. Reg. 8666-01, 8718–19 (March 8, 1990).
[72] GE Comments on RCRA Permit Modification at 37.
[73] GE SOP at page 16, GE comments on RCRA Permit Modification at pages 38 and 39.

mammals.[74] The risks posed in the Primary Study Area ("PSA")—the roughly 11 mile portion of the river from the confluence, two miles below the GE facility, to Woods Pond Dam—and downstream areas between the PSA and the Derby-Shelton Dam in Connecticut were thoroughly evaluated in EPA'sERA.

The ERA characterized and, where appropriate, quantified the risks to biota that are exposed to PCBs and other contaminants of concern that are found in the sediment, surface water, riverbank and floodplain soil, and tissue in the Rest of River area.[75] Using a weight-of-evidence approach, EPA considered several lines of evidence and evaluated whether significant risk is posed to the environment.[76] Risks to several types of biota were assessed: benthic invertebrates, amphibians, fish, birds (including insectivorous and piscivorous birds), mammals (including piscivorous and omnivorous/carnivorous mammals), and threatened and endangered species.[77] Where possible and/or appropriate, three lines of evidence were evaluated for each species: field studies, site-specific toxicity studies, and a comparison of exposure and effects.[78]

The weight-of-evidence assessments indicated that aquatic life and wildlife in the PSA are experiencing unacceptable risks as a result of exposure to PCBs and other contaminants of concern.[79] Confidence in this conclusion is high for benthic invertebrates, amphibians, and piscivorous mammals, based on multiple lines of supportive evidence.[80] Downstream of the PSA, PCBs could potentially be causing adverse effects to benthic organisms in depositional areas as far as Reach 8, amphibians in floodplain areas as far as Reach 8, trout in Reaches 7 and 9, mink as far as Reach 10, and river otter as far as Reach 12.[81]

In July 2003, EPA issued the initial draft of the ERA and solicited comment from GE and the general public. GE's 2004 comments on initial ERA included arguments similar to those in GE's 2016 SOP. For example, GE asserted that "[o]verall, the evidence does not show adverse impacts on local populations and communities of ecological receptors despite 70 years of PCB exposure."[82] However, the risk assessment considered substantial evidence which showed that unacceptable adverse impacts were occurring and would continue to occur without remediation activities. This evidence includes the adverse effects observed in site-specific field and laboratory studies conducted for the ERA (*e.g.*, the mink feeding study) as well as the comparison of the numerous known adverse effect levels published in the scientific literature with site-specific contaminant concentrations.[83]

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[74] *See* Attachment C. Responses to GE's Comments on EPA's Ecological Risk Assessment and Development of IMPGS for Amphibians, Insectivorous and Piscivorous Birds, and Mink

[75] Charge for the Ecological Risk Assessment Peer Review for the Rest of the Housatonic River, USEPA, July 2003, at 1.

[76] Initial ERA, July 2003 at ES-12.

[77] ERA Peer Review Charge at 1–2.

[78] ERA Peer Review Charge at 1–2.

[79] Initial ERA at pages ES-43, ES-50.

[80] Initial ERA at ES-50

[81] Initial ERA at ES-50

[82] Comments of the General Electric Company on USEPA's Ecological Risk Assessment for the Housatonic River Site, Rest of River, January 13, 2004, at 76 of Presentation.

[83]Initial ERA, Risk Characterization Sections 3.4, 4.4, 5.4, 6.4, 7.4, 8.4, 9.4, 10.4, 11.4.

GE also argued in 2004 (and continues to argue) that the ERA improperly focused on effects to individual organisms instead of local populations and communities.[84] While EPA disagreed with GE's premise, it agreed to clarify that, in accordance with EPA guidance,[85] "impacts at lower levels of organization (*e.g.*, adverse effects on survival of individuals) are often used to infer possible impacts at higher levels of organization (*e.g.*, persistence of local populations)."[86] The final ERA, issued in November 2004, explained that "[a]lthough many of the endpoints[87] presented are linked to organism-level effects (e.g., survival and reproduction), these endpoints are expected to be strong indicators of potential local population-level effects," and "[e]xtrapolation from organism-level to population-level effects may be logically achieved based on the predictive nature of the endpoint and/or through the use of process-based models."[88]

The initial ERA and the public comments (including GE's 2004 comments) were subject to peer review by a panel of independent risk assessment experts. Although the peer reviewers did provide critical comments on some aspects of the ERA, their comments were generally supportive of the ERA's conclusions and methodology.[89]

In short, the ERA shows that GE's PCBs generate significant and unacceptable risks to the ecosystem and biota. Accordingly, the PCB contamination must be remediated to protect the environment.

vii. The remedy's long-term benefits to human health and the environment outweigh any short-term ecological impacts, which GE is required to mitigate.

Of all the alternatives, the proposed remedy best balances remediating the contamination with minimizing and mitigating the ecological impacts of constructing the remedy.[90] GE alleges, incorrectly, that the benefits of the proposed remedy are outweighed by the ecological harms associated with implementation. On this basis, GE argues that EPA's selection of the remedy is arbitrary and capricious, does not provide "overall protection of the environment" as required by the Decree, and does not properly balance short-term impacts and long-term harms as required by EPA guidance.[91] On the contrary, EPA has determined that the proposed remedy provides the best balance in terms of reducing residual risk and minimizing long-term ecological impacts.[92] As crafted, the proposed remedy limits short-term impacts to key habitats and ensures that disturbed areas will be restored after remediation. Thus, EPA's proposed remedy reasonably accepts some short-term impacts in favor of long-term protection of the environment.

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[84] GE 2004 ERA Comments Presentation at page 6, and restated in GE's SOP at 16.
[85] EPA 1997 Ecological Risk Assessment Guidance for Superfund
[86] Responsiveness Summary to the Peer Review of the ERA at 30 and 31.
[87] Endpoints refer to the Assessment and Measurements Endpoints identified during the Problem Formulation stage of the ERA development.
[88] Final ERA at page 2-68.(citing Ecological Risk Assessment and Risk Management Principles for Superfund Sites. OSWER Directive 9285.7-28P; EPA (U.S. Environmental Protection Agency). 1992. Framework for Ecological Risk Assessment. Risk Assessment Forum, Washington, DC. EPA/630/R-92/001).
[89] Responsiveness Summary to the Peer Review of the ERA.
[90] Statement of Basis at 31.
[91] GE Dispute Letter (Jan. 19, 2016) at 14.
[92] Statement of Basis at 31.

There are specific provisions in the proposed remedy to avoid impacts to key habitats designated as "Core Area 1" by the Massachusetts Division of Fish and Wildlife. Core Area 1 includes the "highest quality habitat for species that are most likely to be adversely impacted by PCB remediation activities."[93] GE must avoid excavation in Core Area 1 habitat except in limited areas where necessary to meet Secondary Floodplain Performance Standards.[94] Additionally, no excavations shall occur in Vernal Pools or backwaters (unless PCBs are greater than 50 ppm) in Core Area 1.[95] In addition, bank excavation is significantly limited in Reach 5B and limited in Reach 5A to a lesser extent.[96] Furthermore, in Core Areas 2 and 3[97] impacts will be minimized and, on a case-by case basis, avoided.[98] Phasing the work will also disperse the effects of the construction activities over time (the remedial action period is estimated to be 13 years) and space (a distance of over 30 miles).[99] These and other restrictions will limit the short-term ecological impact of implementing the remedy.

In the long-term, the reduction in PCB exposures and the active restoration that will occur after implementing the proposed remedy ensure that the permanent benefits of remediation will far exceed the short-term harm. Performance Standards set forth in Paragraph II.B.1.c(1) of the modified permit require GE to:

> (a) Implement a comprehensive program of restoration measures that addresses the impacts of the Corrective Measures on all affected ecological resources, species and habitats, including but not limited to, riverbanks, riverbed, floodplain, wetland habitat, and the occurrence of threatened, endangered or state listed species and their habitats, and,
>
> (b) Return such areas to pre-remediation conditions (e.g., the functions, values, characteristics, vegetation, habitat, species use, and other attributes), to the extent feasible and consistent with the remediation requirements.

Paragraph II.B.1.c.(2) requires GE to follow a four-step restoration process. GE must assess pre-remediation conditions; develop restoration criteria for Corrective Measures; develop a restoration coordination plan to be performed during the implementation of the Corrective Measures; and, finally, design and implement a Restoration Plan for all areas disturbed by the remediation activities.

Remediating and restoring Rest of River is necessary to ensure the long-term health of the ecosystem. As discussed above, PCBs pose significant risks to aquatic life and wildlife in the Housatonic River, particularly in the PSA. While elements of the ecosystem that are unaffected by PCBs continue to function (*e.g.*, the plant community), pollution from GE's Pittsfield facility has significantly degraded many aspects of the Housatonic River

[93] Mass. DFW, Core Habitat Areas in the Primary Study Area (2012) at 1-2.
[94] Intended Final Decision at 47.
[95] Intended Final Decision at 28, 50.
[96] Intended Final Decision at 24.
[97] Core Area 2 and 3 are defined in the 7/31/12 Letter from Jon Regosin (MADFW) to Robert G. Cianciarulo (USEPA), Re: Housatonic River, Core Habitat Areas in the Primary Study Area.
[98] Intended Final Decision at footnote 11.
[99] Statement of Basis

environment. Left alone, the ecosystem will not repair itself for several decades or even centuries. [100] The restoration component of the remedy will support and accelerate natural ecosystem recovery processes.[101] While remediation of the river and floodplain at this scale cannot be accomplished to any meaningful level without impacts to the present state of the river and floodplain, the restoration activities will mitigate impacts caused by the remediation.[102] Over the long-term, restoration activities will return the processes sustaining diverse river and floodplain communities.[103]

Ecosystem restoration is an emerging science that has been practiced successfully at many large riverine sites.[104] EPA has published specific guidance on aquatic restoration.[105] In addition, several federal agencies, including the National Research Council, Natural Resources Conservation Service and the Fish and Wildlife Service have published guidelines for river restoration projects.[106] Additional guidelines are available from non-profit organizations, such as the Society for Ecological Restoration—a non-profit organization comprised of individuals and organizations from around the world representing the public, private, and non-profit sectors. Scientific literature and the work of restoration practitioners provides additional information and specific technical guidance.[107] In recent years, the number of river restorations has grown exponentially, and restoration techniques are used to achieve a wide array of goals, such as removing contaminants, and supporting fisheries and wildlife.[108]

Examples of riverine restoration projects include a 35-acre contaminated wetland and stream remediation and restoration project at Loring Air Force Base in Maine. After only 6 years, large areas of remediation were virtually indistinguishable from the areas prior to disturbance.[109] Another example is the remediation of the Clark Fork River in Montana, where hazardous mining waste contaminated 43 miles of river bed sediments and the floodplain. The state developed a restoration plan to restore river and floodplain habitats, maximize the long-term beneficial effects and cost-effectiveness of restoration activities, and improve natural aesthetics. Remediation and restoration activities have begun, with contaminated soil being removed and replaced with clean soil, and streambanks stabilized and replanted with native vegetation.[110] While rivers are unique and restorations vary depending on the setting, these and other example projects show that restoration on the scale of the Rest of River ecosystem is feasible.

It is important to note that the Commonwealth of Massachusetts supports the proposed remedy, despite the short-term impacts to the environment. Throughout its 2014 comments and SOP, GE misleadingly suggests that the Commonwealth does not support EPA's proposed

[100] Comparative Analysis, Attachment 12 at 1.
[101] Comparative Analysis, Attachment 12, at 6.
[102]Comparative Analysis, Attachment 12, at 6.
[103] Comparative Analysis, Attachment 12, at 6.
[104] Comparative Analysis, Attachment 12 at 8.
[105] USEPA, 2000. Principles for the Ecological Restoration of Aquatic Resources. EPA841-F-00-003. Office of Water (4501F), United States Environmental Protection Agency, Washington, DC. 4 pp.
[106] *See* NRRB Site Information Package (Att. 12 to Comp. Analysis) at 4, *e.g.*, NRCS, 2001; NRCS, 2007; USFWS, 2008.
[107] *See, e.g.*, Fischenich and Dudley (2000) (river hydraulics).
[108] Comparative Analysis, Attachment 12, at 5.
[109] Comparative Analysis, Attachment 12, at 9.
[110] Comparative Analysis, Attachment 12, at 9–10 (citing CFRTAC, 2009).

remedy. While in 2011 the Commonwealth did express concerns about potential impacts of the remediation on the ecosystem when commenting on GE's Revised CMS, EPA and Massachusetts subsequently addressed those concerns through a series of technical discussions culminating in the 2012 status report that outlined a conceptual framework for the remedy, which explicitly focuses on avoiding, minimizing and mitigating impacts to Core Areas.[111] In its 2014 comments, the Commonwealth—specifically the Executive Office of Energy and Environmental Affairs and its Department of Environmental Protection ("MA DEP") and Department of Fish and Game—expressly stated its support for the proposed remedy, which is "protective of human health while employing a remediation framework developed in consultation with the Commonwealth and the State of Connecticut that is directed at preserving the dynamic character of the river ecosystem and avoiding, minimizing and mitigating remedy impacts to the affected wildlife and their habitats, with a particular focus on protecting state-listed species."[112]

The Massachusetts Fisheries and Wildlife Board ("MA FWB"), which oversees the Division of Fisheries and Wildlife (the largest landowner in the Rest of River area), also supports the proposed remedy.[113] The FWB recognizes that the PCB contamination at Rest of River "poses a public health risk that must be addressed."[114] While noting that there is no "silver bullet solution" for sites contaminated with PCBs and that crafting the Rest of River remedy has been a "difficult balancing act," the FWB acknowledged that the proposed remedy "has been crafted to responsibly address the public health risks while responsibly maintaining the natural and recreational values of this section of the Housatonic."[115]

Finally, none of GE's specific technical criticisms[116] demonstrate that EPA acted unreasonably in selecting the remedy for the Rest of River site. EPA's responses to these specific criticisms are presented in Attachment C.

As described above, EPA carefully crafted the proposed remedy to address the ecological risks posed by PCBs and to balance short-term harm to the environment with substantial long-term benefits. Despite temporary disruption of some ecosystems, in the long-term the remedy will provide overall protection of the environment in Rest of River.

[111] Commonwealth of Massachusetts' Comments on EPA's Proposed Cleanup Plan for Rest of River. October 27, 2014, at 4.
[112] Commonwealth of Massachusetts Comments, at 2.
[113] Comment Letter from Joseph S. Larson (Mass Fisheries and Wildlife Board) from the Public Hearing conducted by EPA for Draft RCRA Permit Modification. Lenox Memorial Middle/High School, Lenox, MA. September 23, 2014.
[114] Comments of Joseph Larson, Mass. Fisheries and Wildlife Board (2014).
[115] Comments of Joseph Larson, Mass. Fisheries and Wildlife Board (2014).
[116] *See* GE SOP at 12-16; GE Comments on the Draft RCRA Permit Modification (2014) at 34-37 and Attachments C, D and E.

b. Woods Pond

Requirement: The Intended Final Decision requires removal of approximately 285,000-340,000 cubic yards ("CY")[117] of PCB contaminated sediment and placement of an engineered cap in Woods Pond (Reach 6) . [118]

GE Position: The intended remedy for Woods Pond requires unnecessary removal and provides insufficient risk-based benefits compared to a smaller, less disruptive, and less costly alternative.

EPA Position: At issue here is the opportunity to permanently remove the risks posed by approximately 285,000-340,000 CY (depending upon EPA's or GE's respective calculations)[119] of PCB-contaminated sediment. Woods Pond sediment contains approximately 25% of the mass of PCBs present in the Housatonic River,[120] and does not provide priority habitat for state-listed species.[121] Accordingly, the remedy in the Intended Final Decision for Woods Pond represents the opportunity to remove a significant mass of PCBs from the river system, thereby reducing the potential for downstream transport of PCBs, and significantly reducing the bioavailability and exposure of PCBs to human and ecological receptors (including but not limited to the consumption of contaminated fish) with minimal short- or long-term impacts to the environment from the remediation itself. EPA's remedy selection for Woods Pond is supported by the Administrative Record, and falls within EPA's expertise in evaluating all the relevant factors in selecting a remedy for the Rest of River.

In terms of procedure, EPA followed the decision-making process outlined in the Decree and Permit in reaching its proposal for Woods Pond, and GE is not in a better position than EPA to evaluate the relevant considerations. EPA evaluated the relevant criteria based upon the Administrative Record, including comments received from GE and other members of

[117] The removal volume estimates are based on the requirements of the Intended Final Decision, which generally calls for removal of sediment throughout the pond and an Engineered Cap placed to result in a residual depth of 6 feet, except in shallower areas.

[118] For each remedy component, the Statement of Position provides a general description of the remedy requirements. For the specific requirements, consult EPA's September 30, 2015 Intended Final Decision.

[119] GE and EPA differ on the volume of material required to be excavated from Woods Pond under the Intended Final Decision. EPA based its calculations of 285,000 CY on a minimum water depth of six feet, not an average depth of six feet as GE mistakenly claims. Comparative Analysis, Attachment 6; GE SOP at 16, n. 17. GE provided no support for its 340,000 figure so it is difficult to comment upon its accuracy. Further, GE's "preferred remedy" as briefly described in its SOP would likely involve the removal of approximately 100,000 CY or more. The 100,000 CY estimate is based on a 1.0 to 1.5 foot excavation (not 9 inches, which was not contemplated in GE's Revised CMS – See Table 6-1) in both the shallow and deep portions of Woods Pond. Excavation in the deep part of Woods Pond may be necessary to avoid the loss of flood storage capacity in the Woods Pond area. Therefore, the difference between EPA's Intended Final Decision and GE's SOP preferred remedy is 185,000 CY, a smaller differential than portrayed by GE. But even if GE's figures were correct, EPA's analysis would not change for all the reasons set forth herein. GE's SOP position was not included in the series of remedial options evaluated by GE in its Revised Corrective Measures Study ("Revised CMS"), so GE's SOP position has not been fully evaluated by EPA against the remedy selection criteria. Significantly, GE in its Revised CMS, opined that the alternative known as SED 10 best met the permit criteria. For Woods Pond, SED 10 required the removal of 169,000 CY in the top 2.5 feet of sediment without the placement of an Engineered Cap.

[120] GE's RCRA Facility Investigation Report for the Rest of River, 2003. Table 4-11. This does not include the PCB mass in the floodplain.

[121] Commonwealth of Massachusetts' Comments (2014) at 6.

the public in selecting the proposed remedy for Woods Pond. In doing so, EPA relied upon its technical expertise to evaluate the merits of the multiple and complex factors that shape and determine the selection of remedy that is in the public interest to protect human health and the environment. The soundness of EPA's decision is contrasted with GE's bias favoring its own bottom line as shown below.

GE ignores or discounts the many benefits of removing significant quantities of PCB contaminated sediment from Woods Pond.[122] For example, the Woods Pond represents a significant percentage of the total PCB contamination, in an area that does not provide priority habitat for any state-listed species, and that is amenable to traditional open water dredging technologies. Therefore, there is an opportunity at Woods Pond to remove a significant source of PCBs without impacting the state Core Habitats and by using relatively straightforward engineering methods. Once dredging of the Pond is initiated, continuing deeper dredging to remove a significant mass of PCB contaminated material from the Pond will result in minimal additional natural resources being disrupted while providing the benefit of greater removal. There is no other point on the River where it is possible to remove over 285,000 CY of PCB contaminated material from a single location with fewer negative impacts to habitat.[123]

GE claims that a shallow removal followed by capping would provide almost the same level of protection to human health and the environment, in part because it is the owner of Woods Pond dam and therefore there is unlikely to be any dam breach or failure resulting in significant releases of PCBs. EPA does not disagree with GE's assertion that sediment removal sufficient to place a properly designed, constructed, operated and maintained Engineered Cap in perpetuity might achieve the same reductions as this greater PCB removal for certain risks, such as fish consumption, direct contact, and ecological risk in Woods Pond itself. However, this conclusion assumes that such a cap will be achieved and be properly maintained and operated to resist floods and ice-scour in perpetuity and that there is no breach or failure of Woods Pond Dam. In making these arguments, GE discounts the benefits of more effective source control through the permanent reduction in the bioavailability of PCBs to human and ecological receptors through removal. Here the more extensive source control – removal – leads to the twin benefits of risk reduction, including reduction of the risk of downstream transport, and increased long-term effectiveness. In Woods Pond, there is a significant benefit to removal of the large amount of PCBs in the event of breach or failure of Woods Pond Dam.[124] After all, even with the best intentions and significant resources, it is impossible to guarantee that there will never be a dam breach or failure in perpetuity,[125] even if GE remains the Dam owner in perpetuity, including unknowns or uncertainties associated with potential climate change. In contrast, removing sediment from behind the dam and disposing of it in a secure landfill guarantees that such sediment cannot be reintroduced into the environment and transported downstream in the event of cap or dam breach or failure. GE simply fails to account for the benefits provided by the finality in risk reductions and source

[122] This position contradicts its earlier view as set forth in its Revised CMS that the best alternative for Woods Pond was removal of 169,000 CY of sediment. Revised CMS at 28 and table 6-1.
[123] This is not to say that other portions of the River do not also require cleanup to address the ongoing risks posed to the River and floodplains.
[124] *Also see* EPA SOP III. B.5.
[125] The PCB contamination caused by the 1992 partial breach of the Rising Pond dam, described further in Section III.A.2.e, is a relevant example.

control related to actually removing 285,000-340,000 CY of PCB-contaminated material from the River.

In its SOP, for the first time,[126] GE also attempts to discount the value of removing Woods Pond sediment as EPA proposes by suggesting that most of the deeper sediments (more than two feet below the sediment surface) contain PCB concentrations less than 1 mg/kg. Even if most of the deeper concentrations (more than two feet below the sediment surface) are less than 1 mg/kg more than two feet below the sediment surface, which is uncertain,[127] far higher levels of PCB concentrations are also present more than two feet below the sediment surface. For example, PCB concentrations as high as 273 mg/kg are located from 2 to 2.5 feet deep; as high as 152 mg/kg from 2.5 to 3 feet deep; as high as 21.5 mg/kg from 3 to 3.5 feet deep; and as high as 146 mg/kg from 5.5 to 6 feet deep.[128] In addition, GE ignores the fact that, according to the data presented in Table 4-10 of GE's RFI Report, approximately 75% of the PCB mass in Woods Pond is contained in sediment from one to six feet deep.[129] Thus, removing sediment from one to six feet deep beneath the current pond bottom results in the removal of a significant mass of PCBs from the Pond, and thereby reduces future risks of PCBs becoming bioavailable and/or being transported downstream.

In addition, GE exaggerates the downsides of the EPA proposal for Woods Pond, by arguing that other remedies would be almost as good and cost far less. EPA believes that GE's cost discrepancies are inflated. While GE infers a cost difference of approximately $130 million, EPA believes a more accurate cost difference is likely to be approximately $80 million.[130] Regardless of the exact figures, EPA considered the magnitude of any additional cost when evaluating all the relevant factors for its Intended Final Decision.[131]

Similarly, GE argues that the benefits provided by a deeply dredged Woods Pond in its capacity to serve as a PCB trapping mechanism to prevent PCB transport downstream are allegedly immaterial. GE acknowledges that the proposed deepening increases the PCB trapping efficiency compared to remedies that do not deepen the Pond. Accordingly, at issue is the significance of the increased trapping. GE's own modeling shows that as a result of the increase in trapping efficiency, the incremental reduction in downstream transport, or flux, over Woods Pond is 0.1 kg/year and over Rising Pond is 0.2 kg/yr. GE SOP at 18. These reductions in flux are significant relative to the Downstream Transport Performance Standards.. If these trapping related reductions were not achieved it would decrease the likelihood of GE achieving the Downstream Transport Performance Standard. Furthermore, the pond and dam have historically been an effective trap as a significant amount of PCB mass

[126] First, it should be noted that GE's latest proposed remediation is to a depth of only nine inches (in the shallow areas of the Pond only), and GE's comment refers to sediment more than *two* feet below the surface.
[127] For information on sediment heterogeneity, see 2004 ERA, Appendix D, Sections D.2.4.4 and D.2.4.6 and Model Calibration Report, Appendix B, Pages B.1 to 10.
[128] Rest of River Site Investigation Data Report.
[129] GE RFI Report, Table 4-10. In Table 4-10, GE does not present the estimate of the average pounds of PCB mass for each depth interval. The percentage calculated is based on GE's +2 Standard Error estimate.
[130] If the volume of material is only 285,000 CY as EPA believes, the cost of excavation and disposal will be proportionately reduced compared to 340,000 CY. EPA believes the cost difference between the Intended Final Decision and a GE's proposed shallow remedy in its SOP is around $80 million.
[131] Even if GE's cost figures and assumptions are accurate, EPA's proposal for Woods Pond would remain the preferred alternative based upon a full evaluation of all the relevant factors, including the objective of eliminating risks related to source control and downstream transport.

has been retained in the pond. Increased trapping combined with future periodic removal of PCB-contaminated sediment from the pond, as required by the Intended Final Decision, at 29-30, will reduce downstream flux of PCBs in two ways. One, removing future sediment accumulation will eliminate the opportunity for PCBs to dissolve off the solids and into the water column, and two, will prevent the PCBs attached to the solids from migrating downstream due to erosional forces and/or dam breaches or failure. Accordingly, the benefits of additional trapping efficiencies favor the Intended Final Decision.

Pursuant to the process set forth in the Decree, EPA considered all public comment on the proposal, including those from GE, Massachusetts, and Connecticut. As stated in its October 27, 2014 letter expressing support for the Proposed Cleanup Plan, the Commonwealth strongly favors the proposed remediation approach to Woods Pond for the reasons identified by EPA. GE suggests that the Commonwealth favors the Intended Final Decision to improve the pond's capacity as a recreational fishery. This is not accurate. While the Commonwealth noted, after summarizing the remediation objectives and benefits of the proposal, that it will also have the *secondary* benefit of enhancing the public's safe, recreational use of the Pond: the latter was not the basis for the Commonwealth's support or a factor in EPA's decision. Statement of Basis; Comparative Analysis. Similarly, GE cites additional truck traffic for deeper removal of PCB contamination from Woods Pond as a negative issue due, in part, to its impact on the community. However, the Commonwealth and, in general, the community support the Intended Final Decision for Woods Pond, including willingness to accept any additional truck traffic for deeper removal of PCB contamination from the Pond, and this support contributes to the implementability of the alternative.[132]

Finally, the proposal to remove 285,00-340,000 CY of PCB contaminated sediment from Woods Pond cannot be considered in isolation from the other components of the Rest of River response action proposal. In evaluating all the relevant factors for all the relevant components of the Rest of River, including floodplains, vernal pools, individual reaches, EPA considered the totality of the proposal from a holistic perspective. For example, EPA's initial proposal before the National Remedy Review Board included considerably more removal of contaminated PCBs from other portions of the River and floodplains, resulting in the total removal of approximately 1,080,000 CY of contaminated sediment or soil with the approximate cost of $677 million.[133] In contrast, the Intended Final Decision is somewhat less costly overall, and while it includes far less removal from other portions of the River and floodplains, especially Reach 5B, where the reduction is 88,000 CY, it does require the removal of additional PCB contaminated sediment from Woods Pond. The net change represented by the Intended Final Decision involves removal of approximately 90,000 CY less material than originally recommended to the NRRB and a savings of over approximately $50 million.

Overall, as the Comparative Analysis demonstrates, EPA considered all the relevant factors, and for Woods Pond, proposed an alternative best suited to addressing these criteria based on all the information in the Administrative Record. EPA's decision to remove a

[132] To the extent that any additional truck traffic contributes to additional greenhouse gas emissions, even if rail cannot be utilized, EPA believes that any negative impacts of such emissions are offset by other relevant factors including the value of removing significant quantities of PCBs from the River.
[133] Submittal from EPA Region 1 to NRRB, June 2011, at ES-21.

significant portion of PCB contaminated sediment from Woods Pond and control the sources of PCB releases is a sound decision under the Decree and in the public interest.

c. Reach 7 Impoundments:

Requirements: Reach 7 consists of an approximate 18 mile stretch of free-flowing River interspersed with impoundments behind the Columbia Mill, Eagle Mill, Willow Mill and Glendale dams. GE's PCB contamination has been deposited in sediment, and is posing unacceptable risks to human health and the environment, at these impoundments (collectively, the "Reach 7 Impoundments").

EPA's proposed approach to the Reach 7 Impoundments employs a combination of excavation of contaminated sediment and the placement of an Engineered Cap to isolate the remaining PCBs.[134] EPA's proposal also provides GE with significant flexibility in how the PCB contamination is addressed, including excavating sediment to achieve an average of 1 mg/kg PCBs without capping and alternatives in the event of parties seeking removal of one or more Reach 7 dams. In addition, it requires that there be no net loss in flood storage capacity or an increase in water surface elevation.

GE Position: GE argues that EPA's proposal is unjustified, claiming that a less extensive and less costly remedy can achieve similar results. First, in its SOP, GE primarily focuses on its proposal for thin-layer capping ("TLC") in the Reach 7 Impoundments, namely the placement of a 6-inch layer of clean material with no removal.[135] Second, in its 2010 Revised CMS and its 2014 Comments, GE had focused on its proposal for Monitored Natural Recovery (MNR), which uses naturally occurring processes to reduced bioavailability or toxicity, and monitoring of contaminant levels over time, with no current excavation or containment of PCBs.

EPA Position: Neither TLC nor MNR would be suitable for the Reach 7 Impoundments. TLC is different from Engineered Capping.[136] Engineered Capping reduces risks posed by contaminants by physically isolating the contaminated sediments from human or animal exposure, by chemically isolating the contaminated sediments from being transported up into the water column, and by stabilizing contaminated sediment to protect it from erosion, particularly in high-flow situations.[137] On the other hand, TLC is not designed to provide long-term isolation of contaminants, but rather is a form of Enhanced Monitored Natural Recovery

[134] For the flowing subreaches of Reach 7, the Intended Final Decision provides for use of Monitored Natural Recovery. II.B.2.h.
[135] *See* GE SOP at 19-20. In its SOP, GE also references that there is more detailed support in Section IV.B.2 of GE's October 2014 comments on EPA's Draft RCRA Permit. Section IV.B.2 focuses primarily on MNR being GE's preferred remedy for the Reach 7 Impoundments. Also, SED 10, which GE identified as the remedy that best meets the Permit criteria in its 2010 Revised CMS, calls for MNR in these impoundments.
[136] Engineered Capping is discussed below in Section III.A.2.f of this Statement of Position.
[137] *See* EPA's Contaminated Sediment Remediation Guidance at Section 5.1, December 2005,

("Enhanced MNR") in which a thin layer of clean material mixes with or dilutes the existing contaminated sediments to help the natural sedimentation processes.[138]

In response to EPA comments on GE's 2008 CMS, GE appears to acknowledge this distinction. In its October 2010 Revised CMS, GE defines TLC as the "Placement of a thin-layer (e.g., 3 to 6 inches) of clean material over PCB containing sediment to provide an immediate reduction of PCB concentrations in the biologically active zone and to accelerate natural recovery."[139] However, despite this acknowledgement, GE, in its SOP and comments, continues to claim, based solely on model runs, that TLC is equivalent to Engineered Capping.

In its September 9, 2008 letter responding to GE's Corrective Measures Study submittal, EPA expressed concern regarding GE's characterization of TLC, its applicability for use in the conditions present in Rest of River, the uncertainty of model predictions of its effectiveness, and the lack of evaluation of boat traffic and biota on the stability of material.[140]

More recently, in its analysis of alternatives and its review of public comments, EPA considered the use of TLC in the Reach 7 impoundments.[141] However, EPA continues to have serious reservations about the overall suitability for TLC under the conditions in these impoundments[142] as well as how GE evaluated TLC, and therefore discounted GE's projected model results due to uncertainty in its effectiveness in this scenario. Specifically:

- GE essentially modeled TLC under that assumption that it would effectively isolate and contain PCBs, when in reality, by definition, it is Enhanced MNR or dilution. That is why the modeling results are almost identical. If GE modeled TLC as dilution, the results would be significantly different.
- Although GE used EPA's model to evaluate the physical stability of the placement of a six-inch layer of material, the model only addresses large-scale hydrodynamic erosional forces and shear stresses, and does not account for the variation in shear stresses in smaller-scale areas. Furthermore, the model does not evaluate the effects of the following, all of which need to be evaluated as part of an Engineered (or isolation) Cap:[143]
    - Mixing of the placed material with underlying sediment;
    - Inclusion/effects of a chemical isolation layer;

[138] EPA's Contaminated Sediment Remediation Guidance at Section 4.5, states, "Thin-layer placement [capping] normally accelerates natural recovery by adding a layer of clean sediment over contaminated sediment. The acceleration can occur through several processes, including increased dilution through bioturbation of clean sediment mixed with underlying contaminants. Thin-layer placement is typically different than the isolation layer caps discussed in Chapter 5, In-Situ Capping, because it is not designed to provide long-term isolation of contaminants from benthic organisms."

[139] GE Revised CMS at 1-18

[140] September 9, 2008 letter from Susan Svirsky to Andrew Silfer, RE: EPA comments on GE's March 2008 Corrective Measures Study report, at 5-7.

[141] Moreover, EPA's proposed remedy includes Enhanced MNR for Reach 5B sediments and for the Vernal Pools, proposing the use of Activated Carbon or a comparable sediment amendment to promote the natural recovery processes.

[142] EPA September 9, 2008 letter on GE's March 2008 CMS Report, at 6.

[143] Intended Final Decision, at Section II.B.2.1.

  - Effects of bioturbation, wind-generated waves, motor boat wakes and ice impacts;
  - The geotechnical stability of caps (e.g., bearing capacity, slope stability, ebullition)

- TLC is not Engineered Capping, so there can be no inspection and maintenance requirements to ensure its long-term effectiveness.
- TLC does not include any sediment removal, and could result in the loss of flood storage capacity in each of the Impoundments.

Furthermore, there has been preliminary interest in removing at least one of the dams in Reach 7.[144] Adding six inches of material to the existing system without any sediment removal would only add to the volume of material to be removed should future dam removal occur.

In essence, in its SOP, GE is agreeing with EPA's remedy for capping these impoundments to isolate the PCBs (although GE concurrently incorrectly equates TLC with Engineered Capping) and GE's disagreement is really with (a) the need to remove sufficient sediment for an Engineered Cap prior to capping and (b) the requirement to follow the design criteria, specifications, and long-term inspection and monitoring requirements for Engineered Caps (as discussed below in Section III.A.1.f of this Statement of Position)

With respect to MNR,GE argues in its Revised CMS in 2010 and in Section IV.B.2 its October 2014 comments, which are referenced in its SOP[145], that the model projections show only small incremental reductions in fish PCB concentrations in the Reach 7 Impoundments compared to MNR. GE then argues that MNR would achieve similar reductions in PCB concentrations in the impoundments and downstream, as well as an equivalent reduction in downstream PCB transport.

EPA does not agree that the results of the modeling carried out by GE indicate "only small incremental reductions" when the proposed alternative is compared with MNR. On the contrary, GE's modeling results (fish fillet PCB concentrations at the end of the 52-yr modeling period) clearly indicate the markedly lower fish tissue concentrations achieved by the proposed remedy as opposed to an MNR-only approach. At the Columbia Mill impoundment, fish tissue concentrations achieved by the proposed remedy are projected by the model to be 0.6 mg/kg while MNR achieves a concentration of 2.0 mg/kg, over three times higher. In the Eagle Mill and Glendale impoundments, the concentrations projected to be achieved through MNR are over double those achieved by the proposed remedy. Only in the Willow Pond impoundment do these two alternatives achieve similar concentrations, but even there fish tissue concentration projected with MNR is still over 10% higher than the concentration achieved by the proposed remedy.

These differences matter. The current PCB concentrations in the edible tissues (fillet) of fish inhabiting these impoundments are significantly elevated and the concentrations achieved by MNR in 52 years would be cause for concern if they were encountered in other

[144] Columbia Mill Dam Sediment Management Study, by Tighe and Bond, For the Commonwealth of Massachusetts, June 2011. Also, Lee, Lenox Assessment Report and & recommended Action Plan Housatonic River, Lee Lenox Stream Team 2014 by the Housatonic Valley Association, at 9 and 10.

[145] By responding to this comment from the 2014 Comment letter, EPA is not waiving its ability to argue that GE's including in its Statement of Position a blanket reference to another documents warrants a response from EPA on such documents in this dispute.

water bodies. Not only are the concentrations achieved by MNR projected to be above or close to the Short-Term Biota Standard of 1.5 mg/kg in all but one impoundment, but more importantly, the proposed remedy makes it clear that the goal is to achieve a PCB concentration of 0.064 mg/kg in Massachusetts, or at a minimum, monitor progress towards those goal. EPA's proposed remedy achieves significantly more progress towards this goal. Furthermore, the added reduction can be very significant for purposes of whether a consumption advisory needs to be maintained by the Massachusetts Department of Public Health, which is set at 1 mg/kg.[146] In addition, as shown in Attachment F to GE's Comments on the Draft RCRA Permit, EPA's proposed remedy achieves several more IMPGs compared to MNR in the Impoundments.[147] Lastly, the proposed remedy achieves concentrations below 1 mg/kg in all four of the Reach 7 impoundments while MNR barely achieves this level in only a single impoundment (Willow Mill). These are not "small incremental reductions" and they have important implications for public health as they significantly reduce the health risk associated with the consumption of fish in these reaches, as well risk to ecological receptors.

GE also claims EPA's proposed remedy does not show a significant incremental decrease in the PCB flux over Rising Pond compared to MNR. GE's own analysis does not support this conclusion. GE estimates that when EPA's upstream remedy is combined with MNR in the Reach 7 Impoundments, the PCB flux is projected to be 2.6 kg/yr. This compares to a projected flux of 2.3 kg/yr for EPA's proposed remedy.[148] The difference -- a greater than 10% reduction in flux -- is indeed significant.

Furthermore, regardless of the uncertainty of the model in predicting absolute values, GE acknowledges that the model can be used to compare remediation alternatives. Comparing the model results, it is clear that EPA propose remedy of sediment removal followed by the placement of Engineered Capping performs better than MNR with regard to fish tissue concentrations, regardless of whether or not it performs exactly three times higher or twice as high as GE claims[149], and it performs better in reducing the downstream flux of PCBs.

In sum, for Reach 7 Impoundments, EPA properly analyzed the suitability of different alternatives (including requiring removal of contaminated sediment above 1 mg/kg) considering the risks posed by the high concentrations of PCBs in the Reach 7 sediment, and an evaluation of the relevant permit criteria, including the long-term reliability and performance of different options. EPA considered the increase in greenhouse gases, truck traffic and cost of its proposed remedy compared to TLC (or MNR). In its evaluation of the Permit criteria, EPA concluded that the benefits of the proposed remedy outweigh these considerations and the best suited remedy based on an evaluation of all of the remedy selection criteria is excavation sufficient to allow for Engineered Capping, along with flexibility for GE to propose different excavation approaches or to respond to proposals for dam removal.[150]

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[146] *See* September 9, 2008 letter from Susan Svirsky to Andrew Silfer, RE: EPA comments on GE's March 2008 Corrective measures Study report, at 5, footnote 1

[147] Attachment F to GE's Comments, Figures F2a through F2d. For example, at the Glendale impoundment, an additional three IMPGs are achieved with EPA's proposed remedy compared to MNR in Reach 7.

[148] GE's October 2014 comments on EPA's Draft RCRA Permit at IV.B at 49.

[149] GE 2014 Comments, at 46 (Table).

[150] Intended Final Decision, Section II.B.2.f.

d. Rising Pond:

Requirements: Rising Pond is approximately 32 miles downstream from the confluence of East and West Branches, immediately downstream of Reach 7. Rising Pond Dam is the last significant dam in Massachusetts prior to the River flowing into Connecticut. GE's PCB contamination has been deposited in sediment behind the Rising Pond dam, is posing unacceptable risks to human health and the environment, and is contributing to the downstream transport of PCBs.

EPA's proposal for addressing GE's PCB contamination in Rising Pond (which is known also as Reach 8) includes a combination of sediment excavation and Engineered Capping to achieve average concentrations of 1 mg/kg; the option for GE to excavate sediments to a 1 mg/kg average level without capping; ensuring protectiveness through monitoring and potential excavation if over time sediments accumulate in Rising Pond; and ensuring that remediation activities do not result in a loss of flood storage capacity or increase in water surface elevation.[151]

GE Position: GE argues that the remedy does not have significant risk-based benefits compared to a remedy that removes less sediment than proposed by EPA. In its SOP, GE suggests an alternate remedy of sediment removal of six inches in the shallow area of the Pond followed by placement of an Engineered Cap over the entire Pond.[152] With respect to fish consumption risks and downstream transport of PCBs, GE argues that the proposed remedy is not significantly better than GE's suggested alternative, has more short-term impacts, and higher costs. GE also questions EPA's asserted concern about the potential breach or failure of Rising Pond dam.

EPA Position: EPA concurs that GE's alternative of partial dredging and installation of an Engineered Cap performs similarly to EPA's proposed remedy of dredging sufficient sediment to place an Engineered Cap back to existing grade. This is because they are essentially the same remedy, with the only differences being that (a) GE wants to lock in an Engineered Cap thickness of six inches in the Permit, as opposed to determining the cap thickness in accordance with the Engineered Cap Performance Standards during design,[153] and (b) GE resists removing sediment prior to capping, which would increase potential for flooding.

EPA disagrees with both of these concepts. Placing the Engineered Cap on top of existing sediment could change the hydrodynamics of the system, result in the loss of flood storage capacity and increase water surface elevations and associated flooding. With regard to

[151] Intended Final Decision, II.B.2.g. Description in this Statement of Position is general; see Intended Final Decision for precise details.
[152] GE SOP, at 21, with additional information at 50-51 of Section IV.C of GE's October 2014 comments on EPA's Draft RCRA Permit. However, note that in GE's 2010 Revised CMS, GE stated that it believed SED 10 best met the Permit Criteria. SED 10 calls for MNR in Reach 8, not the capping remedy GE mentions in its SOP.
[153] In estimating volumes and cost for its proposed remedy, EPA estimated cap thicknesses, and associated sediment removal depths, of 1 foot low shear stress areas and 1.5 feet in high shear stress areas. (Attachment 6 of Comparative Analysis). However, as required by the permit, actual cap thicknesses will be determined during design.

locking in Engineered Cap thicknesses as part of the Permit, see EPA's response in this Statement of Position in Section III.A.2.f (Engineered Cap).

GE also downplays the potential for dam breach or failure due to its current ownership of Rising Pond. But Rising Pond Dam itself, in 1992, had a significant release of PCBs downstream into Connecticut. This event, demonstrates that dam breach or failure is a serious risk that EPA was correct to consider.[154] While the dam was not under GE ownership at the time of the breach, it was subject to management under the terms of the Massachusetts dam regulations which GE has claimed prevent such an event. In fact, there have been subsequent issues regarding the stability of the dam since GE became the owner.[155] Given the catastrophic and unexpected infrastructure failures observed during Hurricanes Katrina and Sandy as well as other concerns regarding climate change, this is not the unrealistic concern that GE claims.

GE also points to potential adverse effects of the proposed remedy, such as greenhouse gas emissions, truck traffic and cost. Admittedly those are higher for the proposed remedy than other, less active alternatives. At the same time, those adverse effects and costs are even higher for other alternatives that EPA has analyzed and not proposed. EPA evaluated those effects, and other relevant Permit criteria in proposing a remedy to address the risks of PCB contamination in Rising Pond. EPA's proposal includes significant reduction in PCB risks in Rising Pond and in the downstream transport of PCBs, in combination with flexibility for GE to propose an alternative approach to remediation, and without the drawbacks associated with locking in cap thicknesses prior to a design evaluation, and lack of accounting for flood storage capacity water elevation.

To address the risks posed by the high concentrations of PCBs in Rising Pond sediments, EPA properly analyzed the suitability of different alternatives in its Comparative Analysis, including alternatives requiring removal of considerably more or considerably less sediments than the proposal. The remedy proposed by GE in its Statement of Position is new, and therefore it has not been analyzed to the same degree as the alternatives reviewed by EPA in the remedy proposal. However, as described above, the unique components of the GE approach ("locking in" cap thicknesses now, and placing a cap on top of sediments without taking flood storage capacity or water elevation into account), while likely making the approach cost less, also make it less well suited as a potential remedy. Based on its evaluation, EPA continues to believe that the proposed remedy is the best suited remedy based on an evaluation of all of the remedy selection criteria.

e. Backwaters adjacent to Reaches 5, 6, and 7:

Requirements: The PCB contamination from GE's facility extends into the backwaters of the Housatonic River ("Backwaters"), resulting in unacceptable human health and ecological risks. EPA's proposed remedy includes three main elements: excavation and capping of Backwaters to achieve a Surface Weighted Average Concentration (SWAC) of 1.0 mg/kg; limited excavation and capping of Core Area 1 habitat coupled with use of Activated

[154] *See* discussion in this Statement of Position regarding Rising Pond Dam breach, at 21.
[155] Right Embankment Sinkhole Investigations and Test Pit Explorations, prepared by GZA for GE, 2009.

Carbon to reduce risks; and ensuring that the remedy activities cause no net loss of flood storage capacity.

GE Position: GE seeks a less costly remedy that provides fewer risk-based benefits than EPA's proposal. GE argues as follows: (1) that the fish habitat in the Backwaters is poor, including an argument that EPA's model results show similar fish PCB concentrations in the main stem regardless of whether Backwaters sediment is remediated; (2) that EPA should have proposed a less extensive removal and capping alternative (i.e., removal and Engineered Capping to achieve a SWAC of 3.3 mg/kg)[156] that would achieve Short-Term Biota Performance Standard, would be protective of human direct contact with sediments, and provides for protection of amphibians, with fewer adverse impacts and at less cost.

EPA Position: Overall, EPA's remedy is a reasonable solution to addressing the PCB risks posed by GE's PCBs in the Backwaters, with significantly greater risk reduction than GE's approach while concomitantly minimizing adverse impacts. More specifically, EPA disagrees with GE's assertions.

First, EPA disagrees with GE on the quality of the Backwaters as a fish habitat based on fish collections and other field work conducted during the course of the Housatonic River Project. In 2000, EPA conducted a study to determine fish biomass in the various subreaches of the river between the Confluence of the East and West Branches (the starting point for the "Rest of River" area) and Woods Pond Dam.[157] The study used standard fish capture methods and established statistical techniques to estimate biomass by species and size (fish length; largemouth bass estimates were made by age class) for Reaches 5A, 5B, 5C, Backwaters (subsequently designated Reach 5D) and Reach 6 (Woods Pond). Two field collections were made, one of which was conducted at the end of August, a period of annually elevated temperatures and associated low dissolved oxygen levels in the Backwaters. The results of the study clearly indicated that the Backwaters support substantial species richness and biomass (per unit area, expressed in grams per square meter [g/m^2]) of fish species. For example, largemouth bass biomass in the Backwaters was estimated at 1.88 g/m^2, which was more than Reach 5A (1.65 g/m^2) and nearly triple the largemouth bass biomass per unit area found in Woods Pond (0.71 g/m^2). Highest densities of largemouth bass, both of which were less than double the biomass supported in the Backwaters, were in Reaches 5B (2.28 g/m^2) and 5C (2.89 g/m^2).

The Backwaters were similarly shown to support considerable biomass of yellow perch (1.51 g/m^2); lower than the biomass in Reach 5B (2.7 g/m^2), but comparable to the biomass in Reach 5C (1.9 g/m^2) and Woods Pond (1.61 g/m^2), and higher than Reach 5A (0.92 g/m^2). For sunfish (bluegill and pumpkinseed combined), the Backwaters supported the highest biomass of all reaches (3.91 g/m^2), greater than Woods Pond (2.45 g/m^2) and all of Reach 5 combined. The Backwaters also provide habitat for brown bullhead (0.97 g/m^2) – less than the biomass supported by Woods Pond for this species (1.68 g/m^2) but much greater than all of Reach 5 which is generally not good habitat for brown bullhead. These survey results clearly indicate

[156] Note that in GE's Revised CMS, GE's selected alternative SED 10 as the remedy that best meets the permit Criteria. SED 10 called for Monitored Natural Recovery in Backwaters. GE's remedy of 3.3 mg/kg with Engineered Capping was not included in GE's Revised CMS, so was not evaluated along with the other alternatives in the Revised CMS.

[157] Woodlot Alternatives. 2002. *Fish Biomass Estimate for Housatonic River Primary Study Area*.

that, far from not providing good habitat for fish, the Backwaters provide very good habitat and support significant biomass of the species typically sought by anglers, and therefore the species most likely to be consumed.

GE performed its own study during June and late-July/August 2000 of the distribution and characteristics of the largemouth bass population throughout the Upper Housatonic River. The report states that:

> "As discussed in Section 4.2, a detailed aquatic habitat assessment was conducted in 2000 for the mainstem Housatonic River and its associated Backwaters, the three main branches to the upper Housatonic River, and the major tributaries. This assessment focused in particular on evaluating the suitability of the habitats for largemouth bass.…This assessment showed that, within the mainstem Housatonic River, suitable largemouth bass habitat is abundant in Woods Pond, *in shallow backwater areas*, and in the ponds and wetlands that are hydrologically connected to the river (Figure 5-1) …The distribution of largemouth bass was consistent with our delineation of identified largemouth bass habitat. Largemouth bass were found throughout the mainstem habitats and in the study sites in the East and West branches of the Housatonic River (Appendix D, Table D-2). Largemouth bass were most abundant within these sites *in shallow backwater areas* and near or in accumulations of downed wood…Overall, CPUE [catch per unit effort] of young-of-year *largemouth bass in backwater habitats* was greater than 6 times the CPUE in main channel habitats." [158] (Emphases added).

Furthermore, even if temperature and dissolved oxygen conditions result in the Backwaters becoming unacceptable habitat during some small portion of the year, an assessment that EPA does not necessarily agree with, fish are free to move from the Backwaters to the main stem and then return to the Backwaters when conditions improve. Remediation of the main stem alone, therefore, would not be sufficient to adequately reduce the exposure of fish to PCBs.

In addition, the EPA model alone is not determinative on the fish tissue concentrations. The model does not simulate migration of fish to and from the Backwaters. Thus, the only effect on tissue concentrations of fish resident in the main stem that would be seen in a model simulation would be from movement of PCBs from the Backwaters into the adjacent sections of the main stem, which would not be expected to affect the fish tissue concentrations significantly. Therefore, because fish do in fact spend time in the Backwaters and move back and forth into the main stem, the model projections for the main stem would underestimate the PCB concentrations in fish if Backwaters were not remediated.

In response to GE's second argument, EPA disagrees with GE's characterization. EPA's proposal provides significantly improved protection from fish consumption risks, while at the same time including multiple measures to reduce adverse effects.

[158] R2 Resource Consultants, Inc. 2002. Evaluation of Largemouth Bass Habitat, Population Structure, and Reproduction in the Upper Housatonic River, Massachusetts.

The comparison in average fish fillet concentrations between EPA's proposal and GE's alternative is 0.3 ppm versus 0.8 ppm, respectively,[159]which is very significant in terms of risk to human health from fish consumption as well as to ecological receptors. That comparison shows that GE's alternative would result in almost three times the concentration of PCBs in fish compared to EPA's alternative. In addition, while both alternatives meet the Short-Term Biota Performance Standard of 1.5 mg/kg, EPA's proposal makes much more progress toward achieving the Long-Term Biota Monitoring Performance Standard levels of 0.064 mg/kg in Massachusetts and 0.00018 mg/kg in Connecticut. (Intended Final Decision, at II.B.1.b.(1)(b)),

Admittedly, achieving those significant risk-based benefits does require more truck traffic and more cost than a less protective remedy. However, EPA's evaluation of remediation alternatives,[160] including more extensive remediation approaches, against the Permit decision-making criteria was not limited to those two items. Based on that reasoned evaluation, EPA has proposed an approach that leads to significant reduction in fish consumption risks and significant progress toward the Permit's Long-Term Biota Monitoring Performance Standards, while demonstrating a sensitive approach toward reducing adverse effects of the cleanup.

f. Engineered Cap:

Requirements: Properly designed and constructed Engineered Caps reduce risks posed by contaminants by physically isolating the contaminated sediments from human or animal exposure, by chemically isolating the contaminated sediments from being transported up into the water column, and by stabilizing contaminated sediment to protect it from erosion, particularly in high-flow situations.[161] In the Intended Final Decision, for each remedy component that calls for Engineered Capping, EPA requires that GE design and construct all Engineered Caps consistent with the Performance Standards, including the principles presented in pertinent EPA or U.S. Army Corps of Engineers guidance such as EPA's 2005 "Contaminated Sediment Remediation Guidance for Hazardous Waste Sites", and the U.S. Army Corps of Engineers' 1998 "Guidance for In-Situ Subaqueous Capping of Contaminated Sediments."

The Intended Final Decision further provides that GE's design include a set of layers or functions commonly part of cap designs, including the following: a Mixing Layer; a Chemical Isolation Layer; an Erosion Protection Layer; a Geotechnical Filter Layer; a Bioturbation Layer; a Habitat Layer; and other consider design considerations.[162]

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[159] EPA cannot independently verify the accuracy of GE's model runs, however, since GE ran the model consistently for both alternatives, the relative performance of EPA's proposed remedy vs. GE's alternative is likely accurate, even if the predictive fish tissue results vary from GE's figures.

[160]As noted above, GE's remedy of 3.3 mg/kg with Engineered Capping was not included in GE's Revised CMS, so was not evaluated along with the other alternatives in the Revised CMS. However, as discussed in the text, EPA continues to believe the proposed remedy for Backwaters is still the best suited alternative.

[161] EPA Contaminated Sediment Remediation Guidance, Section 5.1, December 2005.

[162] Intended Final Decision at II.B.2.i.(1) and (2). This Statement of Position provides a general description of the Intended Final Decision Performance Standards and corrective measures; for precise requirements, see Intended Final Decision.

GE Position: GE argues that EPA's proposal is deficient because of the following: (1) EPA failed to account for GE information that thinner caps than EPA estimated could be sufficient, and (2) EPA failed to agree with specified target thicknesses that GE has proposed.[163]

EPA Position: EPA disagrees. EPA did consider the information GE presented, however, it chose not to incorporate GE's proposal to lock in thinner cap layers or set target cap thicknesses in the Permit. EPA believes, and has consistently held, that it is critical that the decisions on the thicknesses of different cap components take place during the design of the remedy. The design phase is the appropriate time for determining Engineered Cap thicknesses because it is expected that the design will occur in phases, thereby providing sufficient time to collect additional data. Additional data will contribute to an adaptive management approach that can be used to incorporate lessons learned, and/or new materials, techniques, and/or equipment that become available in the future to improve the cap design.

EPA noted in its September 9, 2008 comments on GE's CMS that "EPA recognizes that it was appropriate to evaluate remedy components on a reach-wide basis in the CMS but notes that it will be necessary and appropriate in the final design to implement different remedies for smaller sections of a floodplain area or reach with unique characteristics." Further, EPA noted that

> the thickness of an engineered cap (and associated depth of excavation, if required), whether placed with or without prior removal, should be determined in final design based on site-specific requirements using factors such as described in White Paper No. 6B – In-Situ Capping as a Remedy Component for the Lower Fox River (Palermo et al, 2002) and other applicable guidance. The design should consider the underlying sediment PCB profile and associated needs for chemical isolation as well as the need for physical stability. GE shall provide a description of the design process (such as that described in Palermo et al, 2002) that will be used to determine the appropriate cap materials and thickness of materials to be placed.

In addition, in May 2012, EPA's Status Report on potential remediation approaches to the Rest of River provided: "In any proposed remedial approach, EPA would tend to specify certain cap design principles and performance standards, but not a particular material thickness."[164]

Thus, EPA has been clear throughout the CMS and remedy selection process of its expectations regarding the appropriate time and scale for the details of cap designs. GE

[163] In its 2014 Comments on the Draft Permit Modification, GE advocated for its target thicknesses, and implied that EPA also had proposed target cap thicknesses in its proposed remedy. While GE acknowledges in that submittal that "[t]he Region indicates that the actual design and thickness of caps would be determined during remedial design", GE suggests that EPA has its own target thicknesses in the Comparative Analysis. However, EPA only included any thicknesses "for purposes of this comparative analysis" to compare alternatives and to develop cost estimates. Comparative Analysis at 2. In any event, the Intended Final Decision does not include any suggested or target cap thicknesses.

[164] EPA 2012 Status Report at 6.

essentially acknowledged this approach in its Revised CMS. Various parameters for Engineered Capping were described by GE in Section 3.1.3 of the Revised CMS, and values for cap thickness and cap composition (materials) were assumed for the caps in various reaches of the river and for various alternatives evaluated to provide the basis of comparison of the alternatives. These assumptions, which included cap thickness ranging from 1.5 to 2 feet, were used to estimate sediment removal volumes, cap material volumes, costs, construction timelines, and other considerations for comparison of the alternatives. At the feasibility stage of evaluation, it is standard procedure to use assumptions regarding the cap design in order to evaluate the feasibility and potential cost of capping components of a remedy. This feasibility evaluation provides the basis for comparing the alternatives against the criteria and selecting a proposed plan. During the technical discussions between GE and EPA in 2012/2013, GE raised the issue of potentially establishing thinner caps in the Permit, including potential caps as thin as six to nine inches, as opposed to making cap thickness decisions during the design stage.

During design, it will be necessary to include the timely collection of information on an appropriate scale for the detailed engineering evaluations needed to support the design. For example, in a given mile or two stretch of the river there can be significant variation in sediment bottom topography and substrate type, water depth, PCB concentrations, and aquatic habitat that currently exist and which may also change over the course of remedy implementation. These fine-scale details need to be identified, researched through data collection, and then the appropriate engineering considerations need to be applied to derive a cap design for each area that best meets the Engineered Cap Performance Standards for those conditions.

EPA also disagrees on the appropriateness of setting 'target thicknesses" in the Permit for "confirmation" during remedial design. That approach would establish expectations that would not be consistent with performing an unbiased review during remedial design of the important considerations for protective and functioning Engineered Caps. The target thickness approach would likely "anchor" or skew the resulting remedial design toward those "target" levels for confirmation, rather than allowing for an unbiased analysis.

Additionally, the target thickness approach is misguided here because technical reviews raised serious questions about GE's "targets". As stated above, EPA did consider GE's input. During the 2012-2013 technical discussions between EPA and GE, when GE requested that EPA perform a technical review of a proposal similar to GE's current proposal for caps with defined thicknesses. In May 2013, EPA obtained review by a number of experienced persons from academia, EPA and the U.S. Army Corps of Engineers. The technical reviews generated many questions regarding the protectiveness of the approach favored by GE.[165] Examples of concerns with GE's approach include the following:

[165] Documents include: May 31, 2013, EPA, "Initial Review of GE's Conceptual Design", summarizing reviews from U.S. Army Corps of Engineers, Paul Schroeder and Trudy Estes, ERDC; University of Texas, Dr. Danny Reible; EPA (Region 1 and OSWER/OSRTI); May 28, 2013, "Technical review of Housatonic River conceptual cap design", Trudy J. Estes, and Paul R. Schroeder, Research Civil Engineers, US Army Engineer Research and Development Center; May 29, 2013, "Review of Capping Design Proposal for GE/Housatonic River", Danny D. Reible, PhD, PE.

- there was concern that GE's proposed bioturbation layer cannot also serve as the key component of the chemical isolation layer;
- GE's proposed 6-inch cap includes a 2-inch mixing layer and a 4 inch bioturbation layer, but no specific chemical isolation layer;
- a separate isolation layer of 7-9 inches is needed to ensure cap effectiveness.
- there are areas where the conceptual design is not appropriately conservative,
- concerns over improper evaluation of habitat layer restoration;[166]
- focusing attention on the need for additional design-level data prior to making a decision, such as: erosional forces issues need to be evaluated in Woods Pond and other areas with significant fetch; site-specific data be collected prior to final cap design; and GE's use of average velocities over large-scale areas underestimates the erosional forces.[167]

Those third party concerns reinforce EPA's judgment that the design of Engineered Caps at the Rest of River should be undertaken during the remedial design process, unbiased by preconceived notions of particular target thicknesses.

EPA has long recognized the significance of cap thickness to the amount of removal of contaminated soils and sediments, and the resulting impact on disposal costs. To reiterate EPA's 2012 Status Report, EPA expects that during remedial design GE will seek to optimize cap design to reduce the amount of PCB-contaminated material that requires disposal. Anticipating that scenario, EPA's Engineered Cap Performance Standards represent a reasonable technical approach to ensure that the eventual design, construction and operation of the caps is protective of human health and the environment. It avoids potentially biasing the design and affords GE the opportunity to propose, subject to EPA approval, a cap design consistent with the Engineered Cap Performance Standards.

g. Off-Site Disposal

Requirement: The Intended Final Decision requires that GE dispose of all sediment and soil removed as part of the remedy at licensed off-site disposal facilities.

GE Position: GE argues that the requirement violates the Decree and is unlawful because it would cost more than on-site disposal and would be no more protective of human health and the environment.

EPA Position: For the Rest of River, off-site disposal is more protective of human health and the environment for several reasons, and is less costly than other alternatives considered and rejected by EPA. It is a sound decision under the Decree, was developed according to the process set forth in the Decree, and is based upon an analysis of the relevant

[166] May 31, 2013, EPA, "Initial Review of GE's Conceptual Design", summarizing reviews from U.S. Army Corps of Engineers, Paul Schroeder and Trudy Estes, ERDC; University of Texas, Dr. Danny Reible; EPA (Region 1 and OSWER/OSRTI).
[167] *Id.*

criteria and the administrative record. For example, without limitation, (1) permanent on-site disposal at one of GE's preferred locations would not meet TSCA landfill siting requirements and/or require waiver of ARARs designed to protect wetland habitat and/or an ACEC; (2) unlike on-site disposal, off-site disposal does not entail the potential siting of a new landfill in an area that may not meet all the suitability requirements for such a landfill, such as proximity to drinking water sources, hydrology, and soil permeability; (3) on-site disposal would require the creation of a new landfill in an area with no known contamination whereas off-site disposal will place contamination in a pre-existing area licensed to accept hazardous substances; (4) on-site disposal faces significant state and local opposition that threatens the implementation of the remedy; and (5) while off-site disposal is more expensive than on-site disposal, it is less expensive than other alternatives requiring the treatment of contamination. In sum, based on EPA's review of the relevant criteria and the Administrative Record, off-site disposal is best suited to meet the general standards outlined in the Permit, in consideration of the Permit's decision factors, including a balancing of those factors against one another.

i. EPA's selection of off-site disposal is supported by the nine permit criteria and the administrative record.

GE claims that EPA concedes that off-site disposal would be no more protective to human health and the environment than on-site disposal. GE SOP at 6. On the contrary, EPA does favor off-site disposal in terms of protectiveness. In addition, and even more significantly, GE treats cost and protectiveness as the sole criteria for decision-making, when they are only two of the nine Permit criteria that EPA evaluated. When viewed in that context, off-site disposal is clearly the best suited disposal option.

One of the Permit factors EPA considered in selecting the remedy is its implementability, including coordination with other agencies, regulatory and zoning restrictions, and availability of suitable facilities. Long-standing and active opposition to on-site disposal threatens the Rest of River remedy with lengthy litigation and community resistance. By proposing off-site disposal, EPA avoids these road-blocks, rendering the entire remedy more likely to be promptly implemented and in that respect more protective of human health and the environment. EPA acted in a manner consistent with the Decree in considering public and governmental objections to on-site disposal because these objections are relevant to the implementability criterion listed in the Permit. In addition, the Decree allows EPA to consider any relevant evidence in the administrative record, including the overwhelming number of public comments opposing on-site disposal. Moreover, the Decree offers multiple public participation opportunities, and these would be meaningless if EPA could not consider the views of the public in remedy selection.

Apart from implementability, EPA also considered the other relevant Permit criteria, including cost. For example, in evaluating long-term reliability and effectiveness, EPA evaluated the suitability of the proposed on-site landfill locations, considering the fact that GE did not establish that the proposed locations were suitable in light of soil permeability, hydrology, and proximity to potential drinking water sources and the Housatonic River. Similarly, EPA recognized that the Woods Pond and Forest Street locations would require the waiver of ARARs designed to protect an ACEC and/or wetlands habitat. EPA further considered the suitability of a pre-existing licensed off-site disposal location in comparison

with creating a new on-site landfill and potentially disturbing the habitat in an area with no known contamination. EPA also considered disposal alternatives that might have reduced PCB mobility, volume, or toxicity -- one of the nine criteria -- but these treatment alternatives were more expensive than off-site disposal and were rejected. Overall, EPA determined that off-site disposal is the best alternative under the relevant criteria because it will provide improved implementability, increased long-term reliability and effectiveness, compliance with ARARs, and be more protective of human health and the environment. Collectively these benefits outweigh off-site disposal's higher cost and the increased short-term impacts from the remedy.

ii. EPA's consideration of public and state opposition was well within the legal framework for the remedy selection process.

GE argues that EPA's off-site disposal requirement "conflicts with the Consent Decree's remedy selection criteria and is unlawful." In fact, EPA appropriately considered public and government opposition to on-site disposal. First, the text of the Decree and Permit authorize EPA to consider public and State views in evaluating alternatives, and second, the community and State views are a significant part of the Administrative Record that the Permit directs EPA to consider.

a.. *Consideration of Public and State Views Fits Squarely within the Permit Criteria*

EPA's consideration of public or governmental comment is supported by the Permit and Decree. The procedures outlined within those documents encompass consideration of community, local government, and state views. The Permit directs GE to consider each remedial alternative according to nine criteria that provide the standards for corrective measures.

Within the nine criteria set forth in the Permit, it is permissible to consider state and local opposition because they fall within the "implementability" criterion, Permit Section II.G.2.e. GE argues that EPA is reading state and community opposition into the "implementability" remedy selection criterion. But to implement means to "put into effect," or "to carry out."[168] The public and legal opposition to on-site disposal is squarely within the plain meaning of the term "implementability" because it will jeopardize EPA and GE's ability to carry out the entire remedy.

Those who oppose on-site disposal have several mechanisms to severely delay or block implementation of the remedy. The Decree itself recognizes the Commonwealth's right to appeal the remedy pursuant to 40 C.F.R. § 124.19 before the EAB and Section 7006(b) of RCRA before the 1st Circuit.[169] But the Commonwealth is not the only party with this right. In fact, any party that commented on the draft permit or participated in a public hearing on the draft permit may petition for review of the permit before the EAB. 40 C.F.R. § 124.19. Similarly, under Section 7006(b) of RCRA, "any interested person" may seek review of a permit modification under the Administrative Procedures Act in the relevant Circuit Court of Appeals. Even after these appeals were exhausted, the Commonwealth or local governments could pass new legislation or regulations to bar on-site disposal, which may have to be defeated through litigation before the remedy could proceed.

[168] Pocket Oxford American Dictionary and Thesaurus, Third Ed., 2010, at 403.
[169] Decree Paragraph 22.bb.

EPA's reading of the term "implementability" is further informed by several of the subsections listed in the permit under implementability. Subsection 6, "coordination with other agencies," would include the many comments from Massachusetts agencies, and local municipalities and towns opposing a local landfill. The ACEC designation and the solid and hazardous waste site restrictions fall within Subsection 3, "regulatory and zoning restrictions." Finally, public and governmental opposition bears upon Subsection 7, the availability of "suitable on-site or off-site treatment, storage, and disposal facilities and specialists," because if all on-site landfills are strongly opposed by the community, the suitability of those sites is compromised.

EPA's interpretation of the nine permit criteria takes into account its CERCLA and RCRA guidance documents. These guidance documents call for EPA to consider state and local acceptance in remedy selection. The National Contingency Plan, which is the set of regulations governing Superfund cleanups, includes "state and community acceptance" as "modifying criteria that shall be considered in remedy selection."[170] In accordance with this regulation, EPA's Superfund Community Involvement Handbook notes "The agency may alter the preferred alternative or shift from the preferred alternative to another if public comments or additional data indicate that these modifications are warranted."[171]

As in CERCLA, EPA's regulations for issuing RCRA permits (along with other types of permits) require public comment and public hearing opportunities on draft permits, allowing EPA to alter the final permit in response to public views.[172] EPA's RCRA Public Participation Manual states, "Public participation plays an integral role in the RCRA permitting process."[173] A guidance document for RCRA corrective action decision documents notes that the response to comments accompanying the final permit decision should include any changes made to the proposed remedy due to public comments.[174]

b. *GE Overstates Potential Limit on Consideration of Community and State Concerns*

As shown above, the Permit criteria explicitly support the consideration of public and State views. Beyond that, even if the Permit criteria did not do so, the Permit does not limit EPA to these criteria in selecting its remedy. When EPA is selecting the corrective measures and performance standards for the Rest of River, the Permit directs EPA to consider the submissions from GE, such as the nine criteria analysis in the Corrective Measures Study report, along with "any other relevant information in the Administrative Record for the modification of this Permit."[175]

Public and governmental comments, minutes of the Citizens Coordinating Council, and other information relating to the many public engagement sessions sponsored by EPA are within the Administrative Record for the modification of the Permit. The Administrative Record also includes EPA regulations and guidance documents, including guidance documents for selection of CERCLA remedies and RCRA corrective actions. As explained below, these

[170] 40 C.F.R. § 300.430(f)(1)(i)(C).
[171] USEPA, Superfund Community Involvement Handbook, April 2005 at 36.
[172] 40 C.F.R. §§ 124.10 through 124.14.
[173] 1996 Edition, at 2-1.
[174] US EPA, 1991, Guidance on RCRA Corrective Action Decision Documents.
[175] Permit Section II.J.

guidance documents call for consideration of community and state acceptance in remedy selection. [176]

The Decree envisions active public and state participation in the remedy selection process. This public participation would be empty if, as GE asserts, EPA cannot consider the wishes of the community in remedy selection. For instance, Decree Paragraph 22.n calls for EPA to propose the draft permit modification pursuant to EPA's RCRA regulations, "including the provisions requiring public notice and an opportunity for public comment . . ." Similarly, Paragraphs 22.j and 22.k require GE to submit a CMS Proposal and CMS Report to Massachusetts and Connecticut. Comment periods and opportunities for coordination with the states would be meaningless if public and state opinions were irrelevant to remedy selection. EPA's consideration of public or governmental comment is required by the Decree and Permit and the procedures outlined within those documents encompass consideration of community, local government and state views.

Additional support for the need for state and community concerns to be considered comes from EPA's 1996 RCRA Advanced Notice of Preliminary Rulemaking ("Notice"). [177] At that time, EPA's national RCRA corrective action program championed strong public participation at the same time as proposing use nationally of Corrective Action Permit criteria similar to those being used in the Rest of River permit. The 1996 Notice stated that "EPA is committed to providing meaningful public participation in all aspects of the RCRA program, including RCRA corrective action" and that among EPA's key goals and implementation strategies for corrective action was to "Continue to involve the public in all stages of the corrective action process."[178] In that same Notice, EPA proposed to implement RCRA corrective action remedy selection through use of ten remedy selection criteria, none of which were Community Acceptance or State Acceptance.

Admittedly, the Permit does not explicitly list public and state acceptance as individual stand-alone remedy selection criteria. Nonetheless, the Permit's detailed description of the Implementability criterion, such as its specific subsections on coordination with other agencies, regulatory and zoning restrictions, and availability of suitable on-site or off-site treatment, storage, and disposal facilities and specialists, clearly is meant to accommodate public and State views. Moreover, to interpret the nine criteria otherwise leads to a result totally inconsistent with EPA guidance, the clear direction of the Decree, and RCRA and CERCLA desire for public participation. Moreover, it cannot be considered arbitrary for EPA to follow its own RCRA and CERCLA guidance in interpreting the permit criteria, and to follow the Permit direction to factor in any relevant information in the Administrative Record, in selecting the remedy. If GE intended for EPA to depart from this longstanding EPA practice codified in EPA's RCRA and CERCLA regulations, GE should have negotiated for an explicit prohibition in the Decree or Permit, but there is no prohibition in these documents. In short, far from being "arbitrary," EPA's decision to consider public and state views on the disposal alternatives was

[176] The National Contingency Plan includes "state and community acceptance" as modifying criteria. 40 C.F.R. § 300.430(f)(1)(i)(C).
[177] The negotiations on the Decree and Appendix G, the RCRA Corrective Action Permit, began in 1998, and the Decree was lodged in U.S. District Court in 1999.
[178] 61 Fed. Reg. 19432.

authorized by the text of the Decree, CERCLA's regulations, RCRA guidance, and overall EPA policy.

iii. Opposition to a new local PCB landfill has been persistent and vigorous.

GE stands alone in its advocacy of on-site disposal. Local communities and governments strongly oppose on-site disposal of PCB-contaminated material in Berkshire County. EPA has encountered this opposition from numerous Berkshire County residents, community groups, municipalities along the Housatonic, and from Massachusetts government agencies. Many residents worry about the risks posed by a PCB landfill in Berkshire County, and public opposition only intensified after GE's disposal of PCBs at the "Hill 78" landfill near a Pittsfield elementary school. Community groups have historically taken legal action to contest EPA's choices related to the cleanup. Citizens nominated, and the Commonwealth designated, the Upper Housatonic as a protected area, which activated a state prohibition on permanent landfills. EPA has encountered similar levels of resistance in other site cleanups across the country; such intense public and governmental opposition to on-site disposal threatens to delay and/or altogether block completion of the Rest of River Remedial Action. Berkshire County residents have expressed their objections to siting a new PCB landfill in their community in hundreds of public comments, protests at public meetings, and letters to newspaper editors over the last decade. For example, residents submitted comments to EPA identifying this widespread sentiment, saying that creating a landfill in Berkshire County "is unacceptable to the people of this county,"[179] And "will not be tolerated by its populace."[180]

A common theme among commenters has been a concern about the ongoing negative environmental effect of a dump or landfill in Berkshire County, which has already endured decades of impacts from GE's contamination. The Planning Board for the town of Great Barrington wrote that it "believes that there is tremendous potential for serious and long-lasting environmental and economic damage to the Town of Great Barrington if this [PCB landfill] is forced on the Town."[181] Tim Gray, Executive Director of the Housatonic River Initiative, wrote, "Toxic hazardous waste dumps will be dangerous to residents, [affect] property values, and be terrible for our tourism industry."[182] Ann Gallo asked pointedly, "GE continues to be unaware of, or are deliberately overlooking the impact of their thoughtless, offensive choices. […] Why, yet again, do they leave behind their waste on a struggling county?"[183]

In some cases, public comments were informed by the Hill 78 controversy. As part of the non-Rest of River cleanup, the Decree allowed GE to use a pre-existing landfill located on the former GE facility to dispose of soil and sediment excavated in remediating the Site. This historic landfill, called "Hill 78," was across the street from Allendale Elementary School. Residents turned out in force to voice their concerns about placement of additional material at Hill 78. Nearly 85 residents attended a public meeting at the Allendale School[184] Community

[179] Comment from Jeffrey Leppo, M.D. to US EPA (Apr. 10, 2008), SDMS 289634.
[180] Comment from John Messerschmitt to US EPA (Apr. 9, 2008), SDMS 289634.
[181] Comment from Town of Great Barrington Planning Board to US EPA (Jan. 29, 2011), SDMS 477441.
[182] Comment from Tim Gray to US EPA (Jan. 30, 2011). SDMS 477441.
[183] Comment from Ann Gallo to US EPA (Dec. 4, 2010), SDMS 477441.
[184] Jack Dew, *PCB Dump Looms Over Allendale Elementary School*, Berkshire Eagle, Oct. 23, 2005. Dew describes the scene at this meeting: "Dozens raised their hands and several shouted questions, asking 'Would you let your children play here?' 'Would you live next to the dump?'"

groups arranged independent testing of the school's air filters.[185] All 11 Pittsfield pediatricians signed a letter to the Pittsfield mayor noting concern over airborne PCBs reaching Allendale students from Hill 78 disposal activities and stating, "We urge the community to aggressively pursue options that will further reduce or eliminate the risk to our children."[186]

The "Hill 78" controversy galvanized citizens to oppose any future PCB landfills in the region. For instance, William and Christine Coan, Pittsfield residents, "strongly urge[d]" EPA to oppose an upland disposal facility in Berkshire County: "In light of the community uproar generated by the disposal dump located behind Allendale School in Pittsfield, we would suggest that the project would be delayed for years as communities utilized all political and legal means available to keep such a dump out of Berkshire County."[187] Similarly, Peter Lafayette wrote that he has "fierce opposition to GE's proposal to create another toxic landfill in Pittsfield or Berkshire County. The recently created Hill 78 contains PCB waste and has become a battleground for residents. To suggest that another PCB landfill is to be considered for Pittsfield or Berkshire County is outrageous."[188]

Massachusetts has also declared vigorous disapproval of a new local landfill in public comments and meetings with EPA officials. From 2007 through 2014, EPA received comments from seven offices within the Commonwealth of Massachusetts, including the Departments of Fish and Game, Environmental Protection, Conservation and Recreation, and Public Health, advocating against disposal within Massachusetts. For example, the Commissioners of three Commonwealth offices wrote that "[t]he Commonwealth vigorously opposes two disposal options outlined in the revised CMS that call for disposal of removed material to be sited within Berkshire County" because:

> Installation of a disposal facility in Berkshire County would also have extremely negative impacts to the communities surrounding the facility including economic aesthetic, recreational,and potential health impacts should the facility fail. Further, construction of yet another such facility just expands the number of locations that would be affected by PCB-contamination, requiring additional long-term monitoring, operation and management beyond what is already a long-term burden on the community, and which runs counter to the concept of the anti-degradation provisions incorporated into the Massachusetts site cleanup regulations. [189]

In addition, every Berkshire city or town along the Housatonic (Pittsfield, Lee, Lenox, Stockbridge, Great Barrington, Sheffield, and Tyringham) submitted at least one comment against any additional landfills. For instance, the chair of the Lenox Board of Selectmen wrote: "We find it unacceptable that there could be a new, permanent hazardous waste landfill constructed in our community. We wish to state in very clear terms that such a facility will be vigorously opposed."[190] In 2008, Pittsfield's city council unanimously passed a resolution

[185] Jack Dew, *Allendale Parents Upset at Agencies over PCBs*, Berkshire Eagle, Jan. 22, 2006.
[186] Letter from Siobhan McNally, M.D. *et. al.* to Mayor James Ruberto (May 1, 2006).
[187] Comment from William and Christine Coan to US EPA, (Apr. 3, 2008).
[188] Comment from Peter Lafayette to US EPA, (Apr. 8, 2008).
[189] Letter from Richard Sullivan, Secretary of the Massachusetts Executive Office of Environmental Affairs, et al, to US EPA (Jan. 31, 2011).
[190] Letter from Stephen Pavlosky, Chair Lenox Board of Selectmen, to US EPA (May 15, 2008).

stating its opposition to any upland disposal facility for dredged sediments in the city of Pittsfield or Berkshire County.[191]

In addition to voicing disapproval, the Commonwealth and public have taken action to protect the unique ecosystem of the Upper Housatonic. For example, 43 community members, including several members of the Massachusetts legislature, nominated the Upper Housatonic for designation as an ACEC, in 2008.[192] Nearly 1000 area residents signed petitions supporting this nomination.[193] In response, the Secretary of the Executive Office of Energy and Environmental Affairs designated the Upper Housatonic River as an ACEC in March 2009. [194] This designation automatically activated State-wide environmental protections provided for ACECs to the 13-mile corridor of riverbed, riverbank, floodplain and riverfront land running from Pittsfield to Lee, including the prohibition of siting permanent Solid Waste facilities within or adjacent to ACECs.[195] The Commonwealth later amended its statewide Hazardous Waste Facility Location Standards to prohibit permanent hazardous waste facilities in or adjacent to any ACEC in the Commonwealth.[196]

Several community advocacy groups and the Schaghticoke Nation have sought to shape the Housatonic River remedy, and have opposed on-site disposal. A Citizens Coordinating Council has been meeting since 1998, with participation from groups including Mass Audubon, Berkshire Natural Resources Council, and the Schaghticoke Nation. A community group called the Housatonic River Initiative has sponsored "No More Dumps" conferences and meetings for more than five years. Several of the groups have used legal action to oppose EPA's work at the Site. When EPA moved to enter the Decree in 2000, Housatonic River Initiative, Housatonic Environmental Action League, and the Schaghticoke Nation, among other entities, moved to intervene to overturn the Decree, in part because they opposed the Hill 78 landfill.[197]

EPA's experience at other sites lends credence to its fear that opposition to on-site disposal at the Housatonic will bar completion or timely completion of the remedy. In Bloomington, Indiana, a 1985 consent decree called for the construction of an incinerator to treat the PCB wastes from six area Superfund sites, all contaminated by Westinghouse industrial activities.[198] The public opposed the consent decree but it was entered despite this

[191] *Politicians Vow to Fight Second PCB Dump*, Pittsfield Gazette, Apr. 10, 2008.
[192] Commonwealth of Massachusetts, Designation of the Upper Housatonic River Area of Critical Environmental Concern, March 30, 2009 ("March 2009 ACEC Designation").
[193] March 2009 ACEC Designation.
[194]March 2009 ACEC Designation.
[195] *Id.*
[196]310 CMR 30.708; also see Proposed Action on Regulations, July 19, 2013; and Regulations Filed with the Secretary of State, Dec. 20, 2013, Massachusetts Register Number 1250. In addition to the normal public hearings on changes to MADEP Regulations at MADEP regional offices, two additional public hearings were arranged for Lenox and Pittsfield. This regulation applies specifically to facilities that manage wastes containing PCBs at concentrations at or above 50 ppm. A potential waiver of these regulations is discussed *infra* at Section C.
[197] Memorandum by Housatonic River Initiative in support of Motion to Intervene, Dkt. No. 20, Feb. 29, 2000; Memorandum by Housatonic Environmental Action League and Schaghticoke Nation in support of Motion to Intervene, Dkt. No. 77, May 19, 2000. Housatonic River Initiative eventually withdrew its Motion to Intervene after it reached a settlement with the US.
[198] United States v. Westinghouse Electric Corp. et al, Civ. Action No. IP83-9-C and IP 81-488-C (S.D. Ind. 1985).

opposition in 1985. At that point, the public successfully lobbied the Indiana legislature to pass laws that delayed construction of the incinerator, in part by forbidding local disposal of the incinerator ash. In 1994 the parties to the decree began to explore alternative remedies. Consent decree amendments memorializing agreements for alternative remedies were entered in 1997, 1998, 1999, and 2008. In the end, cleanup was delayed for over a decade.

Similarly, in New Bedford, Massachusetts, a 1990 Record of Decision selected dredging, on-site incineration, and on-site disposal of incinerator ash for the PCB hotspot in New Bedford Harbor.[199] In response to strong local opposition including a letter-writing campaign and other community activism, in 1993 New Bedford passed a city ordinance banning transportation of the incinerator within city limits in an attempt to prevent the cleanup. Congressional involvement from Representative Barney Frank, Senator John Kerry, and Senator Ted Kennedy, as well as the Massachusetts Department of Environmental Protection convinced then EPA administrator Carol Browner to direct EPA Region 1 to plan a new remedy with community support.[200] The new remedy, selected in a 1999 ROD amendment, included dredging and off-site disposal of hot spot sediments without incineration.[201] In the end, cleanup of this most contaminated area of New Bedford harbor was delayed for nine years.

Having learned from these experiences, EPA takes community opposition seriously in its remedy selection process. In part due to strong public opposition, EPA has chosen off-site disposal at some of the nation's largest PCB-contaminated sediment sites, such as the Hudson River site. There, more than 2.7 million cubic yards of contaminated sediment have already been disposed off-site.[202] EPA has proposed off-site disposal for the anticipated 4.3 million cubic yards of contaminated soil and sediment at the Passaic River Diamond Alkali Site after the public and state of New Jersey expressed opposition to on-site confined aquatic disposal.[203] And at the Lower Fox River site, more than 3.6 million cubic yards of dredged sediments were disposed at off-site licensed and regulated landfills.[204] Taken together, the volume of sediments disposed off-site at these three sites alone exceed the volume of sediments disposed on-site at other sites around the country.[205]

[199] US EPA, Record of Decision Amendment, New Bedford Harbor Site, Hotspot OU, at 4-7, Apr. 27, 1999.
[200] Troy W. Hartley, How Citizens Learn and Use Scientific and Technical Information in Environmental Decision Making, 10 J. of Higher Ed. Outreach and Engagement, 153, 159-161 (2005).
[201] US EPA, Record of Decision Amendment, New Bedford Harbor Site, Hotspot OU, Apr. 27, 1999.
[202] Telephone Interview with Michael Cheplowitz, EPA Remedial Project Manager (August 2015); EPA First Five Year Review for Hudson River PCBs Superfund Site, June 1, 2012.
[203] Telephone Interviews with Alice Yeh, EPA Remedial Project Manager (August 2015 and January 2016); EPA Proposed Plan for Lower Eight Miles of the Lower Passaic River, Part of the Diamond Alkali Superfund Site, April 2014; Letter from Bob Martin, Commissioner of New Jersey Department of Environmental Protection, to Amy Legare, National Remedy Review Board Chair, Dec. 6, 2012.
[204] Telephone Interview with Jim Hahnenberg, EPA Remedial Project Manager (August 2015); Telephone Interview with Susan Pastor, EPA Community Involvement Coordinator (January 2016); Five Year Review Report for Fox River NRDA/PCB Releases Superfund Site, July 17, 2014.
[205] Based on the volume of on-site sediment disposal identified in Exhibit A to GE's Statement of Position.

iv. **EPA evaluated all the relevant remedy selection factors, not just the factors related to implementability, in proposing off-site disposal.**

It should be understood that EPA considered all the relevant remedy selection factors in proposing off-site disposal, not just the factors related to implementability. For example, EPA considered factors related to cost, protectiveness, control of sources, short-term impacts, compliance with ARARs, and the long-term reliability and effectiveness of GE's proposed upland disposal locations. These points are discussed below.

In EPA's view, GE's proposed upland disposal facilities may be less effective at containing waste than an off-site disposal facility, because the locations selected by GE do not meet TSCA's siting requirements for PCB landfills. [206] GE admits this.[207] For instance, GE acknowledges that none of the three proposed landfill sites meet TSCA's requirements for soil characteristics including permeability[208]. Even more troubling, it notes that none of the three sites meet all of TSCA's requirements for a landfill site's hydrological characteristics, all three sites are located within close proximity to the Housatonic River.[209] By contrast TSCA requires that the bottom of the landfill liner be more than 50 feet above the historical high water table, that groundwater recharge areas be avoided, and that there is no hydraulic connection between the site and a surface waterbody.[210] Similarly, the Forest Street Site would not meet the TSCA requirement that a landfill be located in a relatively flat area to minimize erosion or landslides.[211]

These TSCA criteria are meant to be protective of human health and the environment in the event of leaks or failure in the landfill technology. As explained in EPA's Statement of Basis, "there is the potential for PCB releases to the Housatonic watershed if the landfills are not properly operated, monitored and maintained." Statement of Basis at 36. Moreover, the potential extended duration of the operation of the proposed on-site landfills, given the range of sediment and soil volumes at issue here and the length of remedy implementation, likely necessitates that the proposed on-site facilities operate for an extended period of time.[212] These factors increase the risks of potential future releases to the Housatonic watershed, compounded by the poor suitability of the proposed locations given such factors as soil permeability, proximity to the Housatonic watershed, and/or drinking water sources. Accordingly, use of on-site landfills would "rel[y] heavily on proper long-term operation, maintenance, and monitoring activities." [213]

By contrast, an off-site disposal facility would pose no risk of release to the Housatonic watershed, would be fully licensed and regulated under TSCA and/or other applicable federal and state requirements. Such facilities are generally constructed in the area best suited to that use considering the hydrology and soil characteristics. Here, GE has not been able to identify any on-site locations that would meet the TSCA PCB landfill siting requirements. In addition,

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[206] 40 CFR § 761.75(b)(1).
[207] GE's Revised CMS at 9-48 to 9-49.
[208] *Id.*
[209] *Id.*
[210] 40 CFR § 761.75(b)(3).
[211] GE's Revised CMS at 9-49.
[212] Comparative Analysis at 64.
[213] Comparative Analysis at 65.

an off-site disposal landfill will already contain hazardous substances whereas none of the proposed locations identified by GE are known to be contaminated, making them a less suitable alternative.

Compliance with ARARs is also one of the nine criteria, in fact one of the three general standards to be met in a remedy decision. EPA can waive ARARs only under certain specific circumstances, including where compliance is technically impracticable. GE claims that it is arbitrary for EPA to waive ARARs in situations involving the *temporary* storage of hazardous substances on-site but not to do so for the creation of permanent on-site landfills. However, the two situations are not analogous as discussed below.

Excavated PCB-contaminated sediments and soils will likely need to be temporarily stored on-site while awaiting transport to an off-site facility. In terms of temporary storage on-site, under some scenarios, as described more fully in Attachment C to the Intended Final Decision[214]off-site disposal may require a waiver of the Massachusetts regulations that prevent hazardous and solid waste facilities within ACECs, in order to implement the remedy and allow *temporary* storage areas where the waste would be prepared for long distance transport. As discussed in more detail below in Section III.D.7.of this Statement of Position, if those conditions occur and the regulations are applicable to temporary storage, a waiver for temporary storage is appropriate because it is technically impracticable to perform the remedy without temporary stockpiling. All alternatives for disposal and transport of the dredged sediments involve temporary storage. These waivers for temporary storage would not defeat the purpose of the waste facility siting regulations because the storage areas will not result in a permanent landfill, and EPA has established Restoration Performance Standards to ensure the temporarily-used storage areas are restored effectively.

In contrast, permanent on-site disposal at GE's Woods Pond landfill location would require waivers of these waste facility siting regulations because that location is within the ACEC and GE is seeking to place a permanent landfill there. Because the Forest Street landfill location is within a regulated wetland area a waiver may also be required of regulations or requirements designed to protect such areas including: EPA's and the Corps of Engineers' regulations under Section 404 of the Clean Water Act (40 CFR Part 230, 33 CFR Parts 320-323); the federal Executive Order for Wetlands Protection (E.O. 11990); the Massachusetts water quality certification regulations for discharges of dredged or fill material into waters of the U.S. (314 CMR 9.06); and the Massachusetts Wetlands Protection Act regulations (310 CMR 10.53(3)(q)). Likewise, the Rising Pond landfill abuts 25 acres of Priority Habitat for the state-listed Wood Turtle. As a result, further confirmation would be needed to conclude if there are any effects on priority habitat of rare species in the operational area of the landfill, and depending on the significance of such effects, compliance with, or a waiver of, the Massachusetts Endangered Species Act would be required. As another example, GE's proposed sites may not meet the potentially applicable Massachusetts hazardous waste landfill siting criteria, namely its prohibition on siting disposal facilities within 1000 feet of an existing private drinking water well. 310 CMR 30.704, 703(4) 30.010. The Woods Pond location is within 1000 feet of a drinking water well. GE did not investigate whether the other locations were within 1000 feet of drinking water wells.

[214] Intended Final Decision, Attachment C, at pages 11-12.

Since off-site disposal is a practicable alternative, technical impracticability does not provide a basis for these waivers, and there is no other valid basis for a waiver. Furthermore, Massachusetts would likely challenge all waivers related to on-site disposal under CERCLA Section 121(f)(2)(B), as authorized by Decree paragraph 22.bb.i.. During this challenge, the revised permit is stayed, causing significant delay. Decree paragraph 22.bb.ii. All-in-all, the numerous ARAR waivers required by on-site disposal, and the associated implementability challenge associated with Commonwealth appeals of those waivers, weigh against selecting on-site disposal under the nine criteria analysis based on the administrative record.

GE objects to the added cost of approximately $200 to $300 million associated with off-site disposal compared to on-site disposal, depending on the assumed location of the landfill, the transport method for off-site disposal and the rates charged by an off-site landfill at the time of disposal. However, GE fails to recognize that EPA also considered alternative options involving treatment of PCB contamination. While these alternatives included positive aspects such as controlling sources of releases and reduction of toxicity of the contamination – two of the nine Permit criteria -- these treatment alternatives are more costly than off-site disposal, and were rejected. In other words, EPA has hardly selected the most expensive or the most aggressive remedy under consideration.

GE notes that some of the short term impacts from the disposal process itself, namely transporting the waste, are likely to be somewhat higher for off-site disposal. There will be higher greenhouse gas emissions from long-distance transport, and statistics suggest that there could be an increase in injuries or fatalities from traffic accidents. However, GE fails to observe that EPA's modified permit includes a preference for rail transport, which will mitigate greenhouse gases as compared to truck transport.

In addition, community impacts of truck traffic will probably be lower for off-site disposal as compared to on-site disposal for two of the three potential on-site disposal facilities (Forest Street and Rising Pond). Only miles driven on local roads (whether on-site or off-site), as opposed to miles driven on major highways such as the Massachusetts Turnpike, should be considered to impact the local community.[215] As a result, trucks will travel fewer miles on local roads to reach a rail loading facility or the Massachusetts Turnpike, in the off-site disposal scenarios, as opposed to traveling to GE's more distant landfill locations.[216] The Forest Street location in particular, is several miles off any main road and would result in traffic through a relatively remote area, over roads that cannot support the loading. Also, as shown in the attached table, the impacts for truck traffic for the Woods Pond on-site disposal

[215] The "short-term effectiveness" Permit criterion specifically mentions "impacts to nearby communities." Permit at 22.

[216] The location of the rail loading facility has not yet been determined, but GE assumed a location immediately upstream of Woods Pond in its 2014 comments. Using this location, EPA estimates local miles traveled under each scenario. The estimated mileage includes estimates for construction of the disposal facilities and transport of waste on local roads:

	Upland Disposal Facility			Off-site by Truck	Off-site by Rail
	Woods Pond	Forest Street	Rising Pond	Travel to Massachusetts Turnpike	Rail loading Facility
EPA Estimate	955,350	4,868,700	3,147,800	1,110,200	860,950

facility and off-site disposal would be similar assuming a rail loading facility is close to the Woods Pond disposal facility.

v. The Administrative Record and the relevant remedy selection factors support EPA's decision to require off-site disposal.

EPA weighed the host of relevant factors under the Decree based on the Administrative Record after years of study and information gathering. Selecting off-site disposal would enable prompt completion of the remedy through a suitable well established landfill in an appropriate location. By contrast, allowing GE to build a new landfill adjacent to the Housatonic River would delay or bar completion of the remedy and result in a potentially unsuitable landfill location in an area with no known contamination. During any delay associated with on-site disposal, the public health and environment would be unprotected. PCBs would continue to migrate downstream, including into Connecticut, and to wash up on floodplains during storm events. Fish in the Housatonic would continue to bioaccumulate PCBs from food web exposure pathways and direct uptake pathways that will continue until the remediation of the river, and unacceptable risks would remain in the floodplain. Off-site disposal protects the public health and environment better than on-site disposal because it allows for the remedy (and corresponding risk reduction) to be implemented with a minimum of delay, and in an established suitable landfill location.

Even if GE is correct that the federal government, through Court orders and other coercive means, could eventually impose the landfills on the community against their will, after establishing that such locations are otherwise suitable and protective, this would only occur after a long, drawn out process, substantially delaying the cleanup. Further, GE is requesting that EPA waive environmental regulations or requirements to create a new landfill near the Housatonic River and/or potential drinking water sources in areas of unsuitable geology and permeable soil to save GE money, without considering the multiple benefits of promptly implementing the remedy through existing off-site established locations. GE fails to adequately account for the uncertainties and risks associated with long term operation and maintenance of a new landfill within the Housatonic River and watershed.

GE provided a table of 24 sites where it asserts that PCB-contaminated sediments and soil were disposed on-site or at local landfills, included as Exhibit A to its Statement of Position. More complete and accurate information for each of the sites listed in GE's table is provided in Table 2 to this Statement of Position. While it is true that EPA has successfully implemented on-site disposal of dredged sediments at several sites around the country, GE's table is misleading because it lumps local landfills together with true on-site disposal. For instance, GE cites 250,000 cubic yards of non-TSCA sediment locally disposed at the Ottawa River Site. These non-TSCA sediments were actually disposed at an off-site landfill owned and operated by the City of Toledo, while the TSCA-regulated sediments from that site were disposed out of state at a hazardous waste landfill. This "local disposal" at a fully-regulated municipal landfill is not comparable to on-site disposal, where regulations may be waived.

GE also stretches the term "on-site disposal" beyond its logical limits. For instance, GE calls the disposal of roughly 100,000 cubic yards of less-contaminated sediment at the River Raisin Site "on-site disposal," but this sediment was actually disposed at an off-site pre-existing confined disposal facility two miles away operated by the US Army Corps of Engineers for disposal of contaminated sediments unearthed during navigational dredging.

This disposal in a pre-existing federally-managed facility outside site borders cannot be considered "on-site disposal," and is not comparable to GE's proposal to build a new upland disposal facility outside the area of contamination, adjacent to the Housatonic River site, where GE has argued that EPA should waive relevant and applicable regulatory requirements.

For nearly half of the Sites listed in GE's table, only a portion of the wastes was disposed on-site while the remainder was shipped off-site to a licensed and regulated landfill.[217] For instance, at Lower Fox River more than 95% of the contaminated sediment and soils were disposed off-site at TSCA and municipal landfills, but GE mentions only the small amount disposed at an off-site landfill owned by a PRP. Similarly, at the Fields Brook Site, the vast majority of contaminated sediment and soil was disposed off-site: roughly 700,000 cubic yards out of a total of roughly 750,000. But GE mentions only the first Operable Unit, where 14,000 cubic yards of contaminated sediment and soils were treated on-site or disposed on-site.

GE cites the on-site disposal of contaminated soil and sediment in the prior non-Rest of River Decree removal actions as its principal example of on-site disposal. The Decree allowed GE to dispose of dredged contaminated soil and sediment in two consolidation areas: the first on top of an existing landfill, the "Hill 78" discussed above, and the second adjacent to the existing landfill, in an area called "Building 71." GE fails to mention that Hill 78 was a pre-existing landfill, not an area with no known contamination such as GE's new proposed landfill sites. Moreover, the Decree limited the footprint for Hill 78 and Building 71 and required off-site disposal of remaining wastes. As a result, GE could only dispose approximately 245,000 cubic yards of soil, sediment and building debris at these facilities, far less than the volume anticipated for Rest of River. GE and EPA have to date transported approximately 100,000 cubic yards of material from non-Rest of River areas off-site for disposal. Any additional material generated by GE in completing the non-Rest of River cleanups will also be transported off-site for disposal.

Moreover, public opposition to this on-site disposal was resolved during Consent Decree negotiations. As a component of the Decree that authorized the GE Pittsfield facility landfills, GE provided the City of Pittsfield with an economic redevelopment package (referred to as the Definitive Economic Development Agreement, or DEDA) valued at $45,000,000.[218] This in part, led to the City of Pittsfield supporting the Consent Decree, and its on-site landfilling, at the time of entry, thus facilitating implementation. There is no such "host benefit" package proposed for the municipalities in Berkshire County that would bear GE's proposed on-site landfill. Furthermore, as discussed above, the public's experience with the Hill 78 and Building 71 landfills has now informed and provoked heightened opposition compared to that present during the lodging of the Decree.

GE also claims in its SOP that "EPA concluded [in the earlier Housatonic cleanup] that the use of on-site disposal facilities for PCB-containing material was appropriate and consistent with the use of such on-site containment as the 'presumptive remedy' for similar situations and types of waste," citing the United States' response to comments on the proposed

[217] See Table 2 to this Statement of Position, Sites included in Exhibit A of GE's Statement of Position that had Off-site Disposal of PCB-Contaminated Sediments/Soils.

[218] Definitive Economic Development Agreement, Exhibit 6 to Memorandum in Support of Motion to Enter Consent Decree,

Decree.[219] GE mischaracterizes EPA's comments. In fact, EPA noted that containment is the presumptive remedy for *pre-existing landfill* sites, citing guidance that called for containment at municipal landfill sites and military landfills.[220] This guidance is inapplicable to the landfill proposed for the Rest of River, which would not be a pre-existing landfill and would be located in an area with no prior known contamination. EPA has not been able to locate any EPA statement that on-site disposal is the presumptive remedy for large dredged sediment sites. As discussed above, EPA frequently chooses off-site disposal for the sites most similar to the Rest of River, and even used off-site disposal as a component at 11 of the 24 sites identified by GE as examples of on-site disposal.

In sum, EPA was well within its discretion to choose off-site disposal from the range of alternatives given the severe challenges and likely delay associated with implementing a remedy that includes on-site disposal in a potentially unsuitable location, and the resulting inability of the remedy to protect human health and the environment. In considering all the relevant remedy selection factors, the benefits of having an implementable, permanent, compliant remedy acceptable to the community at an established off-site landfill outweigh the higher cost and short-term impacts associated with off-site disposal. EPA evaluated the alternative approaches, and is proposing selection of the alternative best suited to meet the Permit's General Standards, in consideration of the decision factors, including a balancing of those factors against each other. Ultimately, in proposing to select off-site disposal in an established suitable landfill, EPA has chosen the remedy that is likely to be promptly implemented and protective of human health and the environment, rather than mired in litigation and controversy for years. In doing so, EPA follows the Decree, including the Permit criteria, but it also fulfills its duty to protect the public, and upholds the purpose of CERCLA and RCRA.

B. EPA Selected a Remedy that Provides a Level of Certainty Supported by the Consent Decree, RCRA, and CERCLA.

In this dispute, GE demands a level of detail and certainty that is inconsistent with the Decree and impossible to achieve. Nonetheless GE makes these demands in an effort to reduce its costs, even though the United States has already limited GE's exposure to future expenses by capping certain categories of response costs for which GE would otherwise be liable. GE's

[219] GE SOP, p. 6.

[220] EPA's specific comment in the Response to Comment is as follows: "Under the NCP, the Agency's expectation is to use engineering controls, such as containment, for wastes, such as PCB-contaminated soil, that pose a relatively low long-term threat. Moreover, under Agency Directive No. 9355.0-49FS, Presumptive Remedy for CERCLA Municipal Landfill Sites, September 1993 and Agency Directive No. 9355.0-67FS, Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills, December 1996, the presumptive remedy for CERCLA (i.e. Superfund) municipal landfills and military landfills, respectively, is containment." United States' Response to Comments on Proposed Consent Decree, July 20, 2000, at 68-69. In the second paragraph that GE cites, EPA writes "In fact, EPA has more recently prescribed contaminant as the presumptive remedy for Superfund municipal landfills, Agency Directive No. 9355.0-49FS, Presumptive Remedy for CERCLA Municipal Landfill Sites, September 1993 and Agency Directive No. 9355.0-67FS, Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills, December 1996." *Id.*

demand for even greater limitations on future expense unfairly and improperly shifts the risks of uncertainty away from GE, the responsible party, and onto the general public.

GE claims that virtually all its future obligations should be known at the time of selection of the remedy. This demand is not supported by the Decree or the uncertainties related to any future work. While the Administrative Record demonstrates the significant effort by EPA over many years to solicit and consider extensive input from all stakeholders, including GE, to ensure an appropriate remedy for Rest of River, the Decree contains several provisions that specifically recognize that EPA's chosen corrective measures may nevertheless fail to achieve and maintain Performance Standards. Indeed, the Decree is explicit that there is no guarantee or "warranty or representation of any kind" that the chosen corrective measures will achieve and maintain the Performance Standards. CD ¶ 40.[221] Further, if, during implementation of the corrective measures, the work is not achieving and maintaining the Performance Standards, EPA may require GE to incorporate "such modification" to the work that is necessary to achieve and maintain Performance Standards, or to carry out and maintain the effectiveness of the response action. CD ¶ 39.a.[222] Decree Paragraphs 39 and 40 reflect the fundamental principle that no innocent party should bear the risk that selected cleanup measures fail to protect human health and the environment. This principle is codified in CERCLA's statutory provisions on covenants not to sue, and the limitations and reservations—known as the "reopeners"—for those covenants, 42 U.S.C. § 9622(f), set forth in the reopener provisions of the Decree, CD ¶¶ 162, 163, and mirrored in EPA's model settlement document. Likewise, there is nothing in the case law that suggests that GE is entitled to the certainty it demands.[223]

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[221] Paragraph 40 provides:

> Nothing in this Consent Decree, the SOW, the Rest of the River SOW, … constitutes a warranty or representation of any kind by Plaintiffs that compliance with the work requirements set forth in the SOW, the Rest of the River SOW, … which requirements are not part of or included within the Performance Standards, will achieve the Performance Standards.

[222] Paragraph 39.a. applies to the Rest of the River SOW and provides:

> For each Removal or Remedial Action required under this Consent Decree, if EPA determines that modification to the work specified in the … the Rest of the River SOW, … is necessary to achieve and maintain the Performance Standards or to carry out and maintain the effectiveness of a particular Removal or Remedial Action, EPA may require that such modification be incorporated in the … the Rest of the River SOW; provided, however, that a modification may only be required pursuant to this Paragraph to the extent that it is consistent with the scope of the response action for which the modification is required and does not modify the Performance Standards (except as provided in Paragraph 217 (Modification) of this Consent Decree).

In any conflict between Paragraph 39.a. of the Decree and the Permit, the provisions of the Decree control. CD, definition of Consent Decree.

[223] Cases interpreting CERCLA and RCRA support the conclusion that some uncertainty at the time of remedy selection is acceptable. For example, in *United States v. Hooker Chemicals & Plastics Corp.,* 540 F. Supp. 1067 (W.D.N.Y. 1982), the court upheld the settlement of a RCRA corrective action complaint even though the final remedy had not been selected. The Consent Decree provided that the defendant would conduct sampling, analysis, and then implement the remedy to be chosen based upon this additional information. The court found the approach "wise" in that the "parties have chosen to proceed cautiously." *Id.* 1073.

Similarly, in *United States v. Akzo Coating,* 719 F. Supp. 571, (E.D. Mich. 1989), the court upheld a CERCLA settlement over objections that the proposed pilot testing was ill-defined and unreliable. *Id.* at 585. The court concluded that

To the extent that GE objects that certain response action obligations are not sufficiently specific, those details will be developed in the next phases of the remedy implementation process through the Rest of River Statement of Work ("SOW") and Work Plans—phases that occur after remedy selection, and in which GE will be heavily involved. CD ¶ 22.x. In fact, per the Decree, GE negotiated the ability to submit the first draft of the SOW, which is typically done by EPA. CERCLA guidance recognizes that the amount of information that is developed in selecting a remedy need only be set at "a level of detail *appropriate to the site situation*."(emphasis added).[224] Even the major components of the remedy, including the treatment technologies and/or engineering controls that will be used, as well as any institutional controls, may be presented in "bullet form."[225] Bullet form is all that is required because, according to EPA guidance:

> the ROD is only intended to provide the framework for the transition into the next phase of the remedial process, namely Remedial Design. Remedial Design is the engineering phase during which additional technical information and data identified are incorporated into technical drawings and specifications developed for the subsequent implementation of the remedial action. The specifications in the Remedial Design are based upon the detailed description of the Selected Remedy and the cleanup criteria provided in the ROD.[226]

Here, the major components of the selected remedy are described in considerably more detail than "bullet form." The Decree contemplates that additional details required for the design and implementation of the remedy will be provided during the SOW and Work Plans phases for the Rest of River—and are not required at the remedy selection stage—otherwise there would be no need for Work Plans or the SOW. GE is wrong to claim that, at the remedy selection phase, it is entitled to detail well beyond "bullet form."

Finally, GE is wrong to suggest that it is entitled to more certainty than is provided in the Intended Final Decision. Although GE may wish that it had struck a different bargain, both

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> **It is legally acceptable to leave aspects of a remedial action plan open for further determination**…. Moreover, there are sound justifications for leaving aspects of a remedy open for future determination. The science of remedying and evaluating toxic waste, like all sciences, is constantly evolving. To require the defendants and the EPA to select a remedy if soil flushing proves to be ineffective, without the aid of knowing how the soil conditions have changed, is unreasonable and would preclude the implementation of new methods of clean up that are not yet discovered.

Id. at 585 (emphasis added). The decision was affirmed. 949 F.2d 1409, 1434 (6th Cir. 1991).

[224] National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. § 300.430(f)(5)(i) (emphasis added). "The Agency will then evaluate potential remedies against the five decision factors listed in proposed section 264.525(b), as appropriate to the specific circumstances of the facility…. In practice, the relative weights assigned to these five factors will vary from facility to facility according [sic] the site characteristics…." 55 Fed.Reg. No. 145, 36824-5 (July 27, 1990).

[225] EPA, *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents* (July 1999), 6-41.

[226] Id. At 6-42. Here, the Intended Final Decision is the RCRA equivalent of a CERCLA ROD, and the Decree requires the remedy to be implemented as a CERCLA remedial action. CD ¶¶ 22.p, 22.z.

sides must accept and fulfill their obligations. EPA has already compromised over $100 million in response costs as a result of the Decree's limitation on EPA's right to recover certain categories of capped response costs. EPA negotiated these capped cost categories at GE's request to limit GE's uncertainty and exposure to costs. Any further EPA compromise regarding GE's obligations to clean up of the River is neither required by the Decree nor is it in the public interest.

1. PCB Downstream Transport and Biota Performance Standards

Requirement: The Downstream Transport Performance Standard specifies annual average values for PCB movement, or flux, over Woods Pond Dam and Rising Pond Dam (Section III.B.1.a). The Short-Term Biota Performance Standard sets an average PCB concentration of 1.5 mg/kg in fish fillets to be achieved within 15 years of completion of remedial activities in the applicable reach of the River. (Section III.B.1.b). (For simplicity, the Short-Term Biota Standard is referred to herein as the "Biota Performance Standard" as distinguished from the Long-Term Biota Standard).[227] If the PCB Downstream Transport Performance Standard is exceeded at either dam in three or more years within any five-year period after the completion of Rest of River construction-related activities and/or if the Biota Performance Standard is exceeded in two consecutive monitoring periods after that 15-year period, GE must identify the potential cause(s) of the exceedance and propose additional actions necessary to achieve and maintain the relevant Standard, and EPA will determine any such additional actions in accordance with the Decree.

GE Position: GE generally objects to these Performance Standards on the following grounds: (1) the PCB Downstream Transport Standard is allegedly not related to any perceived risk to human health or the environment; (2) the computer model predicting the effectiveness of the remedy is an insufficiently reliable basis upon which to establish the Standards; and (3) each Standard allegedly exceeds EPA's Consent Decree and statutory authority.[228]

EPA Position: As discussed below in more detail (1) the PCB Downstream Transport Standard is based upon PCB source control, and reducing the risk of ongoing PCB contamination; (2) the computer model has been subject to multiple phases of peer review and evaluation and is supported by the Administrative Record; and (3) each Standard is well within Consent Decree and statutory authority.

a. The Standards are supported by PCB source or risk control objectives.

[227] In its 2014 Comments, GE requested clarification that a failure to achieve and maintain Long-Term Biota Performance Standards requires only monitoring and maintenance of institutional controls. GE Comments at 63. Accordingly, the Intended Final Decision clarifies the obligations regarding Long-Term Biota Performance Standards. Section II.B.1.b.(1)(b). Further, EPA considered GE's 2014 Comments and concludes the Long-Term Biota Performance Standard for fish fillet in Connecticut remain, based on CT DEEP's consumption calculations assuming 365 fish meals per year and a 1×10^{-6} cancer risk. Section II.B.1.b. (1)(b). footnote 3.

[228] GE also claims that these Performance Standards are not "proper Performance Standards." GE SOP at 24 n.28. GE offers no explanation as to why these Performance Standards fail to satisfy the Consent Decree definition of a Performance Standard, which includes "cleanup standards, design standards and other measures and requirements set forth in …the final modification of the Reissued RCRA Permit to select the Rest of River Remedial Action …"CD ¶ 4. These standards clearly set forth clear requirements to promote the remedy's reduction in risks and control of the source of PCB contamination. That being the case, GE's claim may be disregarded.

GE claims the PCB Downstream Transport Standard is arbitrary because it is allegedly not related to risk reduction to protect human health and the environment. Yet, one of the General Standards for the remedy is to reduce the bioavailability of PCBs through "control of sources of releases," Permit II.G.1.b, p. 20. Here the Performance Standard measures the effectiveness of the remedy in achieving this objective by measuring the levels of PCBs transported downstream. PCBs traveling downstream are an uncontrolled source. They are bioavailable to human and ecological receptors and cause recontamination of the floodplains.[229] Therefore the Performance Standard is related to risk reduction because it measures the effectiveness of the remedy in achieving source control objectives. Contrary to GE's argument, this Standard includes a clear human health or environmental risk-based justification.

b. EPA exercised sound judgment in relying on the model work to develop the Performance Standards.

GE next claims that EPA's method for developing the PCB Downstream Transport and Biota Performance Standard was faulty because the model was designed to measure the comparative effectiveness of remedies rather than to establish an absolute measure for Performance Standards. GE SOP at 26. EPA's technical and scientific analysis of the facts, considerations of the model, and other information in the record, however leads to the opposite conclusion – and such EPA conclusions are entitled to deference as discussed below.

First, GE argues that EPA was required to establish the measure of the effectiveness of the remedy "based on an analysis of risk," and by making a showing "that the specified values [in the measure] are tied to reductions in risk or are otherwise justified under the remedy selection criteria." GE SOP at 25. Yet nothing in the statutes or Consent Decree prescribes the particular quantitative method by which EPA is to set Performance Standards measuring the effectiveness of the remedy, nor do the statutes or Consent Decree include the hypothetical demands for EPA's selection of such Performance Standards.[230] To the contrary, the Decree requires EPA to develop the model, subject to multiple stages of peer review, as a first step in evaluating alternatives for cleaning up the River. CD ¶¶ 22.g. h. and i.[231] The Decree also requires EPA to set Performance Standards, and does not preclude EPA, in its expert judgment, from relying on the peer-reviewed model – including comments from GE -- to establish Performance Standards. This is all the more true, where EPA has already considered and addressed any valid concerns regarding the model as shown below.

[229] Without question a Performance Standard may be developed to measure the effectiveness of the remedy. Permit definition of Performance Standards.

[230] GE cites to RCRA § 3004(v) and CERCLA §§ 101(24), 121(d)(1) to imply that Performance Standards may only be set after undertaking certain kinds of risk analysis as measured by certain criteria dictated by GE. GE SOP at 25. Yet nothing in these statutory provisions require the use of a particular form of risk analysis or decision making in setting Performance Standards. Further, the Consent Decree grants EPA the authority to set Performance Standards necessary to protect human health and the environment, without the theoretical and hypothetical constraints or limitations GE now demands. CD and Permit definitions of Performance Standards.

[231] Pursuant to the Decree, EPA Region 1 retained a consultant, HDR (formerly Hydroqual), to develop the required computer model to analyze the anticipated impact of remedy alternatives on PCB downstream fate and transport, bioaccumulation, and other factors. The model was subject to multiple independent peer reviews, resulting in changes to the model framework.

Specifically, a more stringent Performance Standard for general downstream transport was initially proposed by EPA in its August 2012 response to the National Remedy Review Board comments: namely achieving and maintaining a maximum of 2.0 kg/year PCB flux rate (mass per time) over Woods and Rising Pond Dams. This initial more stringent proposal was based upon the model work, but was ultimately adjusted after EPA and its consultant, HDR evaluated comments received by GE during the 2012/2013 Technical Discussions. In particular, during the Technical Discussions, EPA, CT DEEP, and GE worked together to craft the structure of the Performance Standard presented in the draft permit and now included in the Intended Final Decision. As a result, the approach set forth in the Intended Final Decision now accounts for variation in average annual flows and applies an uncertainty factor to predicted results.[232] Had EPA relied on the absolute values of the model predictions, the Downstream Transport Standard would be more stringent.

Similarly, the Biota Performance Standard would be more difficult to achieve, if EPA had relied on absolute values allegedly derived from the model as claimed by GE. To the contrary, the Biota Performance Standard does not become effective until 15 years after the completion of remediation activities in each entire reach. If EPA were to consider the model to be predictive of absolute concentrations as GE claims, then the Biota Performance Standard would be effective far earlier than the 15 year period. For example, in Reach 5A, the model predicts that the remedy will achieve the Biota Performance Standard approximately 8 years after completion of the remediation in Reach 5A. Yet the Performance Standard is only triggered 15 years after completion, when the modeled concentration is approximately 0.6 mg/kg, or 60 percent lower than the Performance Standard of 1.5 mg/kg. Similarly, for Woods Pond, the projected fish tissue concentration is approximately 1.0 mg/kg 15 years after remediation, approximately one-third lower that the Standard. Therefore, by applying the Biota Performance Standard in a given reach 15 years after remediation is completed, EPA accounts for uncertainties in remedy performance, including those associated with model predictions of performance.[233]

EPA's reliance on this modeling work to develop Performance Standards is supported by the Administrative Record, EPA guidance, and case law.[234] EPA is best positioned to consider and evaluate scientific information in developing a remedy that is in the public interest, including reliance upon information and analysis developed through computer modeling work – especially when EPA has already considered, addressed and/or rejected GE's

[232] Namely, "to account for uncertainty in setting a compliance value given the variability in the flux verses flow values, a regression was fit to the flux vs. flow values and prediction intervals were calculated." Memorandum from Ed Garland, HDR to Scott Campbell, Performance Standard Flow-Based Annual Average PCB Flux Methodology, April 25, 2014.

[233] Because it is anticipated that the Biota Standard will be achieved in the short-term, EPA established the complimentary Long-Term Biota Standard to measure the remedy's long-term success at achieving additional risk reduction and measuring progress towards long-term risk reduction goals in Massachusetts and Connecticut. Section II.B.1.b. (1)(b). footnote 3.

[234] *E.g., Sierra Club v. US Forest Service*, 878 F. Supp 1295, 1310 (D.S.D. 1993) ("as long as an agency reveals the data and assumptions upon which a computer model is based, allows and considers public comment on the use or results of the model, and ensures that the ultimate decision rests with the agency, not the computer model, then the agency use of a computer model to assist in decision-making is not arbitrary and capricious."); U.S. EPA OSRTI OSWER Directive 9200.1-96FS, *Understanding the Use of Models in Predicting the Effectiveness of Proposed Remedial Actions at Superfund Sediment Sites (2009).*

concerns regarding use of the model. It is within EPA's expertise to establish Performance Standards measuring the effectiveness of the remedy based upon information in the Administrative Record, including computer modeling.

c. The Performance Standards do not exceed EPA's Consent Decree or statutory authority.

GE claims that the PCB Downstream Transport and Biota Performance Standards exceed EPA's Consent Decree and statutory authority because they (1) impose potential additional unspecified response action obligations; (2) constitute an allegedly impermissible contingent remedy; and (3) allegedly violate the covenants of the Decree. None of these criticisms have merit as discussed below.

It is undisputed that EPA has authority to issue Performance Standards, as it is intended that the Permit include Performance Standards. CD ¶¶ 23, 24; Permit II.J. And it is undisputed that there are consequences under the Decree for failure to achieve and maintain and achieve Performance Standards. For example, in such cases, the Decree specifically provides for modification of the Rest of River SOW to include modified work to achieve and maintain Performance Standards, CD ¶ 39.a, or to seek additional response action if certain covenant reservation, or "reopener" conditions are met. CD ¶¶ 162, 163. Thus, even though the Permit calls for EPA to set forth "the *appropriate* corrective measures necessary to meet the Performance Standards," Permit II.J. (emphasis added), the controlling Consent Decree recognizes that it will not always be possible or *appropriate* to identify all corrective measures necessary to meet and maintain the Performance Standards at the time of the Intended Final Decision. CD ¶39.a. Indeed, the Decree specifically recognizes that there is no "warranty or representation of any kind" that compliance with the selected corrective measures will achieve Performance Standards. CD ¶ 40.

GE argues that certain provisions of the Decree and Permit imply that together they were "intended to provide GE with certainty and finality at the time of the Rest of River remedy selection." GE Comments at 61. In fact, no provision of the Decree or Permit explicitly or implicitly provides the certainty and finality now demanded by GE. Indeed, the Decree directly contradicts GE's strained interpretation by explicitly providing for additional response actions to achieve and maintain Performance Standards:

> if EPA determines that modification to the work specified in the … the Rest of the River SOW, … is necessary to achieve and maintain the Performance Standards or to carry out and maintain the effectiveness of a particular Removal or Remedial Action, ***EPA may require that such modification [of the work] be incorporated in the … the Rest of the River SOW***.

CD ¶39.a (emphasis added).[235]

[235] If there is any conflict between the Decree and Permit, the Decree controls. The definition of the term "Consent Decree" provides that "in the event of conflict between this document and any appendix, this document shall control." CD definition of "Consent Decree."

In claiming that these Performance Standards violate the Decree's covenants, GE ignores the provisions of Paragraph 39.a. GE SOP 26. GE only points to the Decree's provisions regarding reopener conditions or five year review, CD ¶¶ 43.c, 44, 46, 161-3, while ignoring the authority to require additional response actions to achieve and maintain Performance Standards set forth in Paragraph 39.a of the Decree. As a result, GE is wrong to claim that a provision in the Intended Final Decision "that allows EPA to require GE to conduct additional response actions (not specified in the remedy decision) in the future without satisfying the reopener conditions would violate the Decree." GE SOP at 26. That is exactly what Paragraph 39.a. allows.[236] In short, these Performance Standards, like any other Performance Standard, are not a violation of the Decree's covenants.

GE also claims that no additional new or modified work can be required for the Rest of River because any such work would not have been subject to the "nine criteria analysis required"[237] for other corrective measures at the time of the permit modification. GE SOP 26, Comments at 61. If this flawed interpretation of the Decree were correct, it would render Decree Paragraph 39.a and the Operation and Maintenance (O&M) provisions[238] superfluous – neither modified work pursuant to Paragraph 39.a nor O&M work could ever be required because such work can never be subject to the allegedly relevant analysis -- it is unknowable at the time of remedy selection what modified work or O&M will be necessary to achieve and maintain Performance Standards.[239] It is well settled that contractual terms should not be interpreted to render any provisions superfluous, and GE's argument is incorrect.[240] In addition, as discussed above at Section III.B, not all components of the remedy require the level of analysis demanded by GE. In short, neither the Decree nor the Permit requires that all work required for the Rest of River Remedial Action be subject to a fixed analysis at the time the permit is issued.

Finally, GE argues that any additional work required by an exceedance of a Performance Standard would constitute an allegedly impermissible "contingency remedy" that has not been fairly evaluated under the relevant criteria in breach of the Decree or law. GE

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[236] GE also claims that these Performance Standards conflict with the Certification of Completion provisions of the Decree. CD ¶ 88; Comments at 62. However, these Performance Standards function like any other Performance Standard. If at the time of completion of Remedial Action for the Rest of River, the Performance Standards have been attained and there is no violation of the Performance Standard, GE is entitled to a Certification of Completion. The ongoing obligation of maintaining any Performance Standard is established through O&M following Certification of Completion.

[237] Note that while the "nine criteria" are significant to remedy selectionthe Decree and Permit provide that EPA may select the remedy based upon the CMS (which includes an evaluation of the alternatives under the nine criteria) and the information in the Administrative Record. CD ¶ 22.p; Permit II. J..

[238] The Decree defines O&M to include "all activities required to maintain the effectiveness of the Remedial Action for the Rest of the River as required under an Operation and Maintenance Plan developed for the Rest of the River Remedial Action." CD ¶ 4. For example the O&M program requires "other response actions necessary to achieve and maintain compliance with Performance Standards." Intended Final Decision II.C.

[239] Moreover, the question whether the "nine criteria analysis" applies during Paragraph 39.a. modification of work need not be resolved today. This question should be resolved during dispute resolution under the Decree, if and when EPA ever determines that modification of the work is necessary under Decree Paragraph 39.a., and if and when GE disputes that determination.

[240] *U.S. v. Melvin*, 730 F. 3d 29, 37 (1st Cir. 2013)(contracts should be interpreted to give force to all provisions); *Crowe v. Bolduc*, 365 F. 3d 86, 97 (1st Cir. 2004)(" . . . an inquiring court should, whenever possible, avoid an interpretation that renders a particular word, clause, or phrase meaningless or relegates it to the category of mere surplusage.").

SOP at 27. In arguing that the "contingent remedy" here is impermissible, GE relies upon an EPA guidance document relating to the selection of contingent remedies in CERCLA RODs, describing some of the situations in which it is permissible or acceptable to include contingent remedies in a ROD. [241] Indeed, the Decree itself contains several permissible conditional response action obligations. For example, the Decree authorizes Performance Standards for a Conditional Solution, including as may be identified for the Rest of River: for example, when a property owner declines a land use restriction offer from GE, then GE may need to undertake additional cleanup if the land use changes. CD ¶ 34. Similarly, in certain circumstances when the selected remedy fails to achieve and maintain Performance Standards, the Decree also obligates GE to undertake additional response actions to achieve and maintain those Performance Standards. CD ¶39.a. Those additional response actions contribute to the effectiveness of the cleanup, but necessarily cannot be defined at the time of the remedy decision. Likewise, in certain emergency situations, GE must "take all appropriate action to prevent, abate, or minimize" the release or threat of release. CD ¶91. Thus, the Decree contemplates that not all work, contingent or otherwise, required for the Rest of River, such as O&M, can or need be subject to a fixed analysis at the time of the Final Intended Decision. Thus, the requirement here to undertake additional work in response to failure to maintain and achieve Performance Standards is no different than failure to meet and achieve any other Performance Standard, and does not constitute an impermissible contingent remedy.

In conclusion, GE simply does not like the fact that it may someday be required to undertake additional or modified work to achieve or maintain these Performance Standards according to the provisions of the Decree. None of these requirements are unusual or outside the bounds of EPA's contractual or statutory authority. EPA must choose a remedy that is in the public interest and that protects human health and the environment, even if there is some uncertainty in the process.

2. Requirements Regarding Legally Permissible Future Projects or Work in Sediment and Banks

Requirement: In the event that a third party plans to conduct any Legally Permissible Future Project or Work[242] that requires handling or disturbance of sediments or riverbank soils with PCB concentrations greater than 1 mg/kg in certain stretches of the River, GE must conduct response actions, including material handling and off-site disposal, engineering controls, etc., to maintain Performance Standards, and/or the effectiveness of the remedy, and to be protective of such project or work.

GE Position: GE objects to the Performance Standards and corrective measure requirements regarding Legally Permissible Future Projects or Work on the grounds that these provisions allegedly exceed EPA's Consent Decree and statutory authority for three reasons: (1) the provisions allegedly constitute an open-ended impermissible contingent remedy that has allegedly been inadequately evaluated under the relevant criteria; (2) the provisions are allegedly an impermissible end-run around the statutory and Decree re-opener provisions; and

[241] EPA, *EPA 540-R-98-031, A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents* (1999) at 8-3.

[242] This term is defined to include "construction and repair of structures; utility work; flood management activities; road and infrastructure projects; dam removal, maintenance, repair, upgrades, and enhancement activities; and activities such as the installation of canoe/boat launches and docks." Intended Final Decision, Definitions, at page 4..

(3) the provisions allegedly unlawfully deprive GE of defenses to hypothetical 3rd party actions.

EPA Position: The Performance Standard and corrective measures regarding Legally Permissible Future Project or Work are well within Consent Decree and statutory authority. Given the amount of PCB contamination remaining following remediation, these provisions are essential to maintaining the effectiveness of the cleanup as conditions or uses change. Each of GE's arguments is rebutted below.

(1) **The provisions are not an impermissible open-ended contingent remedy selected without adequate evaluation under the relevant criteria**.

The record refutes each of the issues embedded in GE's claim that these provisions constitute an open-ended impermissible contingent remedy selected without adequate analysis. By this objection, GE seeks an unreasonable level of certainty that is inconsistent with other provisions of the Decree, and with the realities of dealing with PCB contamination. The requirement for GE to undertake work necessary to be protective of a Legally Permissible Future Project or Work is analogous to the previously approved Performance Standards for Conditional Solutions for the Rest of River and the right to identify similar Conditional Solutions for the Rest of River. CD ¶ 34, and ¶ 34(d)(iii). As set forth in Decree Paragraph 34, Performance Standards for Conditional Solutions require GE to use best efforts to obtain institutional controls in the form of Environmental Restriction and Easements ("EREs") for certain properties. If GE is unsuccessful in obtaining EREs, GE must then undertake a clean up to be protective of the current use, including, in certain circumstances, undertaking further response actions to be protective of future projects or work. CD ¶ 34(d)(iii). [243] The Decree authorizes EPA to select similar Performance Standards for Conditional Solutions for the Rest of River. *Id.*

Not only are the Performance Standards for Legally Permissible Future Projects or Work not impermissibly "open-ended," these requirements serve as a limit on the scope of required corrective action. GE is required only to undertake response actions to achieve and maintain the Performance Standard for Legally Permissible Future Projects and Work. These requirements are also in keeping with the additional work required to achieve and maintain any Performance Standard as set forth in Decree Paragraph 39.a and are consistent with the requirement to undertake Operation and Maintenance, including "other response actions necessary to achieve and maintain compliance with Performance Standards." Intended Final Decision II. C. GE is unreasonably demanding more certainty in the process of addressing the

[243] These Performance Standards include the requirement to undertake additional response actions in the event of implementation of projects, or certain changes in the legally permissible future uses related to certain properties, including "for any activities that would involve any off-property disposition of soils or excavation of soils, response actions to ensure the proper excavation, management and disposition of such soils and the protection of workers and other individuals during such excavation activities, in accordance with applicable laws and regulations." CD ¶ 34.d (ii)(C). And these Performance Standards include all the Performance Standards for a Conditional Solution "*that may be identified as Performance Standards for a Conditional Solution in the Rest of River SOW*" including response actions related to implementation of future projects or changes in use. CD ¶ 34 (emphasis added). Accordingly, the Decree authorizes EPA to identify Performance Standards for Conditional Solutions in the revised Permit for the Rest of River, and the Performance Standards identified in the Intended Final Decision regarding conditional solutions for legally permissible future work or projects are within the authority of the Decree. *Id.*

hundreds of acres of contaminated River and floodplain. This is especially true when GE is not being required to remove all the PCB contamination, or even impose EREs for riverbed and banks – GE is simply tasked with managing its residual contamination during Legally Permissible Future Projects or Work in a way that is protective of human health and the environment and meets Performance Standards, thus reducing costs to GE.

GE also objects that EPA has allegedly not adequately analyzed alternative corrective measures under the nine criteria for Performance Standards and other requirements related to Legally Permissible Future Projects or Work. This is not true. EPA guidance documents on selecting either RCRA or CERCLA remedies only require "appropriate" analysis of the remedy under the relevant criteria, and recognize that the ultimate weight given to the factors, and how they will be balanced, depends on the risks posed by the facility "and the professional judgment of the decision-makers."[244]

Nothing in the Decree requires EPA to undertake a more rigorous analysis of any particular factor than is required by regulation or guidance. As is the case with many of GE's objections, EPA—not GE—is in the best position to judge the appropriate level of analysis for selecting a remedy for the Rest of River that is in the public interest and protective of human health and the environment.

Here EPA considered the relevant information in the record including information regarding EREs, Conditional Solutions, Intuitional Controls, and PCB contamination in the Rest of River. For example, GE's analysis included a cost estimate for "Institutional Controls and EREs."[245] EPA considered these alternatives and the alternative of requiring a full cleanup of all third party property, or requiring ERE's on all property with residual contamination. In the end, EPA proposed an alternative that is less expensive than requiring complete removal of all PCBs, or even imposing EREs on the properties at issue here. Given the potential health risks posed by the PCB contamination that will remain after remediation, EPA rightly determined that the remedy should contain certain restrictions to such exposure. EPA concluded that it had sufficient information upon which to make a proposal according to the relevant criteria and information in the Administrative Record, and it is unreasonable for GE to argue that it is in a better position than EPA to determine whether further analysis is necessary.

GE's objection that these provisions constitute an impermissible "contingent remedy" is also wrong for the same reasons discussed above at Section III.B.1.. In addition, the conditional framework for Legally Permissible Future Project or Work is authorized by, or is analogous to, the Performance Standards for Conditional Solutions endorsed under similar circumstances in GE's Revised CMS,[246] and the Decree. CD ¶¶34-38.

Although GE argues that the conditional solutions for Legally Permissible Future Project or Work selected in the Intended Final Decision are not specifically endorsed by the Conditional Solution provisions of the Decree, CD ¶ 34, these provisions are nonetheless

[244] 55 Fed.Reg. No. 145, 36824-5 (July 27, 1990)(" The exact emphasis placed on these decision factors, and how they will be balanced by EPA in selecting the most appropriate remedy for a facility, will necessarily depend on the types of risks posed by the facility, and the professional judgment of the decision-makers.").
[245] The cost estimate was submitted by GE under a claim of confidential business information, as part of the supporting material for the Revised CMS. EPA is handling the information in accordance with CBI claims.
[246] *See* GE's Revised CMS 4-29 to 4-30, endorsing the use of Conditional Solutions at certain floodplain properties where EREs are not obtainable.

within the broader authority of the Decree authorizing EPA to select a remedy to be protective of human health and the environment. To address residual levels of PCB contamination within portions of the floodplain, conditional solutions, such as the Performance Standards for Legally Permissible Future Projects or Work, are an acceptable alternative to requiring complete and costly cleanup of all contamination on all properties, or even the imposition of EREs on all such property. Source and risk control objectives are being met through protective measures to respond to residual contamination. For example, in lieu of total cleanup, to address residual contamination, the MCP establishes an analogous "Temporary Solution," that requires inspection protocols for residual contamination and precludes certain changes in use. 40 MCP 40.1000. These MCP Temporary Solutions have been implemented by GE in certain portions of Pittsfield.[247] In short, the Performance Standards for Legally Permissible Future Project or Work are not an impermissible open-ended contingent remedy selected without adequate analysis.

(2) – (3) **The provisions are lawful and consistent with the reopener provisions.**

GE also claims that the Performance Standards and related requirements regarding a Legally Permissible Future Project or Work violate the reopener provisions of the Decree, because certain "additional" future work may be required to be protective of the Legally Permissible Future Project or Work. However, the work is not "additional" within the meaning of the reopener provisions, because the Intended Final Decision provides that GE shall undertake such work. Just as none of the Performance Standards and related requirements in the Decree and SOW for Conditional Solutions, CD ¶ 34, trigger the reopener provisions, neither do the Performance Standards regarding a Legally Permissible Future Project and Work for the Rest of the River. In either case, the work at issue is necessary to achieve and maintain the Performance Standards as set forth in the Decree, SOW, and/or Intended Final Decision. GE's obligations are simply part of the remedy and not "additional" work. These future work provisions are a rational response to PCB contamination in the River short of requiring massive investigation on all potentially contaminated property, EREs, and/or complete clean-up.

Third, GE contends the requirements are "unlawful" because they deprive GE of certain defenses in a hypothetical third party suit against GE for the same relief. If GE's argument were correct, EPA could never settle disputes involving contamination of third party property, yet such settlements are a common EPA practice, including in this case. Here, GE agreed to cleanup certain third party properties, and waived certain defenses that GE might have had against third parties suing GE for the same relief. For example, the Conditional Solution provisions of the Decree provide that GE will undertake cleanup work on certain third party property including if such third party undertakes a Legally Permissible Future Project or Work. CD ¶ 34(d).[248] GE now claims such requirements are "unlawful." *Id.*[249] But in resolving the

[247] See, for example, GE's seventh annual inspection report of certain Temporary Solution properties at the Dalton Avenue Site, Pittsfield, Mass.

[248] To quote GE, these requirements "make GE entirely responsible to perform, at its sole cost, the response actions associated with whatever project or work the property owner or project proponent selects, regardless of its scope of costs and without the need for the owner or proponent to consider the necessity of the costs, their consistency with the NCP or the Massachusetts Contingency Plan (MCP), and whether there are more reasonable and cost-effective alternatives that would involve less PCB handling or impacts." GE SOP at 29.

[249] In making this argument GE relies upon the inapposite case, *Kelley v. EPA*, F.3d . *Kelley* involved comment on EPA rule-making not interpretation of a public interest Consent Decree.

United States' claims, GE agreed to these terms. CD ¶34. GE also agreed that EPA could identify such terms for the Rest of River, as the alternative could require EREs or complete cleanup on all these properties at far greater expense. *Id.* This is not unlawful, but inherent in the settlement of the United States' claims requiring cleanup of GE's contamination on third party property.

In sum, EPA considered the alternative of selecting a remedy for the Rest of the River to require GE to immediately clean up all the PCBs on all third party property, or even impose EREs on riverbank and riverbed. Instead EPA chose a more limited response, which simply required GE to properly manage and handle PCB material if there is a Legally Permissible Future Project or Work on certain third party property with PCB contamination above 1 mg/kg. Shifting the responsibility and costs of managing and disposing of GE's PCBs to innocent landowners or to the United States would not be in the public interest, and would be contrary to the bargain struck by the Parties years ago.

3. Requirements Regarding Future Floodplain Activities and Uses

Requirement: For properties within designated Exposure Areas (EAs) that do not meet the residential Performance Standard (2 mg/kg at surface and at depth), GE must: (i) record Grants of Environmental Restrictions and Easements (EREs) on GE properties and Notice EREs on Commonwealth properties; (ii) offer compensation for EREs on all other properties; and (iii) for properties where the owner declines an ERE, implement Conditional Solutions under which GE must undertake any response actions for any Legally Permissible Future Project or Work at the property (including material handling and off-site disposal, engineering controls, etc.) and any response actions for any change in use to a Legally Permissible Future Use to meet certain specified Performance Standards for future floodplain uses For any other floodplain properties in Massachusetts and Connecticut in Reaches 5 through 16 where sampling data indicate that PCB concentrations exceed 1 mg/kg in the floodplain portion, GE must conduct response actions for any Legally Permissible Future Project or Work (including material handling and off-site disposal, engineering controls, etc.) and response actions for any change in use to a Legally Permissible Future Use to meet the specified Performance Standards for future floodplain uses .

GE Position: GE objects to the Performance Standards and corrective measure requirements regarding future floodplain activities and uses on the grounds that the Standards and requirements are overbroad and conflict with EPA guidance. In particular, GE alleges that EPA guidance requires a change in use to be reasonably anticipated before requiring GE to record or seek EREs or implement Conditional Solutions. GE also objects to the requirements related to any Legally Permissible Future Project or Work that requires proper management and disposal of PCBs above 1 mg/kg but below 2 mg/kg on the grounds that this requirement is allegedly inconsistent with imposing a general residential clean-up standard of 2 mg/kg.

EPA Position: The Standards and requirements are consistent with the law, the NCP, the Decree, EPA guidance, and sound remedy selection decision-making. In the face of residual potential PCB contamination within certain areas of the floodplains, EPA could have chosen to require GE to sample and clean up all such property to residential standards, which would have been the most protective, and most costly, remedy. Instead, EPA has proposed a cleanup to be protective of current uses while only requiring GE to manage potential residual PCB contamination through a combination of more limited obligations, including: notification to land owners of residual contamination; responsibility for addressing PCB contaminated

material in certain exposure areas through EREs and Conditional Solutions; responsibility for addressing PCB contaminated material in portions of Reaches 5-16 through sampling and, *if necessary based upon sampling results*, additional response actions to be protective of legally permissible future uses and activities. The following addresses GE's comments regarding (a) EREs/Conditional Solutions, and (b) Legally Permissible Future Project or Work and/or Changes in Use.

a. EREs/Conditional Solutions

GE claims the obligation to seek EREs (or alternatively Conditional Solutions) on properties with no reasonably anticipated change in use is arbitrary and capricious and inconsistent with EPA guidance. Contrary to GE's claims, however, the EPA guidance cited by GE explicitly recognize that institutional controls are required to be protective of even *unanticipated* changes in future use.[250] explains that, if residual contamination remains on site, "institutional controls will generally have to be included in the alternative to prevent an *unanticipated* change in land use that could result in unacceptable exposures to residual contamination, or, at a minimum, alert future users to the residual risks and monitor for any changes in use." *Id*. at 9 (emphasis added).[251] This is all the more true because institutional controls serve multiple purposes including prevention of changes of use (even if unanticipated), notice of contamination, and/or safe handling instructions for contaminated soil during future excavations onsite. For instance, even on properties where there may be no reasonably anticipated change in use, notice and safe soil handling instructions are appropriate to be protective of utility work, or in the case of Audubon property, trail maintenance or development. Indeed, GE agreed to such institutional control provisions in the model ERE

[250] *Land Use in the CERCLA Remedy Selection Process*, OSWER Directive 9355.7-04.

[251] Most recently, EPA guidance established that "if any cleanup alternative being evaluated leaves residual contamination in place, ICs should be considered to ensure that unacceptable risk from residual contamination does not occur." Institutional Control s: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites, December, 2012. Indeed, unless all contamination is removed, Institutional Controls are a "typical" component of a remedy. *Remedy Selection guide* (EPA, 1995) at 13 ("Institutional controls typically will be used in conjunction with engineering controls when the remedy results in long-term waste management onsite."). And to the extent the guidance documents discuss institutional controls in the context of consideration of reasonably anticipated land use, such consideration of reasonably anticipated land use does not limit the scope of appropriate institutional controls. *Considering Reasonably Anticipated Future Land Uses and Reducing Barriers to Reuse at EPA-Lead Superfund Remedial Sites* (EPA, 2010) at 11 ("Regions should take into account reasonably anticipated future land uses when selecting ICs and drafting the specific IC requirements and evaluating which instruments may be best to achieve the IC objectives."). If hazardous substances remain on site, institutional control objectives should be established to be protective of human health and the environment regardless of whether a change in use is reasonably anticipated, or not.

attached to the Decree.[252] CD Appendix O. These kinds of protections are just as appropriate for third party owned property or state-owned property in the Rest of River.[253]

If EREs cannot be obtained following best efforts, implementation of Conditional Solutions is appropriate for all the foregoing reasons, regardless of whether the change in use is reasonably anticipated.[254] Whether a change in use is reasonably anticipated or not, is no reason to shift responsibility away from GE for addressing its residual contamination to third parties or the United States. Further, GE is not being asked to address all its residual contamination on all property at this time, only if the property owner declines an ERE after best efforts, and upon the occurrence of a Legally Permissible Change in Use or Future Project or Work to protect human health and the environment.

b. Legally Permissible Future Project or Work and/or Changes in Use

GE argues that requiring any additional response action for properties with PCB levels below the residential cleanup standard of 2 mg/kg is allegedly inconsistent with the Decree. GE SOP at 32. Contrary to GE's implication, however, EPA has not set an unqualified universal standard of 2 mg/kg as protective throughout the entire Rest of River, including floodplains, with limited or no sampling history. The residential standard rests upon the requirements for adequate sampling and characterization of the property followed by response action to achieve the standard.

The properties at issue in the Rest of River cited by GE (Permit Section II.B.6.c. -- portions of the floodplains in Reaches 5-16), however, have not been sampled or have limited sampling and are not subject to any initial cleanup or response action measures as part of the

[252] GE assumes that if land is cleaned up to a standard that is generally protective of that current use, such as commercial, or industrial, then no further action is required at the property to address any residual contamination even if there is future excavation of contaminated material. This is wrong. For example, even if a property may be generally safe for commercial use, the level of PCBs remaining would still pose an unacceptable risk if the property use changed to a scenario with more potential PCB exposure, such as to a recreational or residential use, or if the property owner decided to excavate or otherwise handle any of the remaining PCB contamination. Accordingly, the levels of remaining PCBs make it essential that excavation and handling of PCB contaminated material requires additional response actions to remain protective of human health and the environment.

[253] GE claims there is no need to provide such protections on state-owned property where there is no reasonably anticipated change in use. GE SOP 32. But the Notice ERE provides notice of residual contamination and/or instruction for handling residual contamination. These requirements remain relevant for any potential change in use (even if unlikely) and whether the property is owned by a third party or the Commonwealth.

[254] GE also argues that Conditional Solutions are not Institutional Controls because Institutional Controls cannot include affirmative obligations. GE SOP at 32, n. 36. However, GE previously agreed that the model ERE, an Institutional Control that is attached as an Appendix to the Decree, imposes affirmative obligations regarding contaminated soil management and handling. CD, Appendix O. Similarly, EPA Institutional Control Guidance, December 2012 provides that EREs may "require the performance of specific activities." *Id.* at 4. Nevertheless, this issue need not be resolved here. The only relevant question is whether EPA properly selected conditional solutions as components of the Intended Final Decision. As noted above, this selection was a well-chosen alternative to requiring GE to cleanup all its contamination on all property. Instead, GE need only implement certain response actions in the event of certain Legally Permissible Changes in Use or Project or Work on contaminated property.

remedy.[255] In other words the extent of contamination is unknown or uncertain. In such areas, EPA has determined that additional sampling must be undertaken in certain circumstances to determine if additional response actions is such area are necessary to be protective of human health and the environment. Moreover, GE is not required to conduct any sampling in such areas unless: (1) there is a Legally Permissible Change in Use or Future Project or Work, and (2) there is sampling data showing PCB levels are above 1 mg/kg. Only if the sampling establishes levels above 1 mg/kg, must GE undertake response actions to be protective of any Legally Permissible Future Project or Work, for example, ensuring the proper excavation, management, and off-site disposal of such sediment or soil.[256] Similarly, only if additional sampling establishes levels above 2 mg/kg (or above the applicable Performance Standards in Tables 3 and 4) must GE undertake response actions to be protective of any change in a Legally Permissible Future Use. Accordingly, EPA determined that the risk of unknown PCB levels, including potentially high PCB levels, requires that certain properties with any Legally Permissible Future Project or Work or change in Use be subject to additional sampling and, if necessary, additional response action. The Intended Final Decision is not inconsistent with the Decree in treatment of property with no or limited history of PCB sampling or other response action measures, because there are no such areas outside of Rest of River under the Decree. The alternative would require GE to extensively sample all the Rest of River properties at issue to confirm that such properties are safe for all future uses and activities. Such an alternative would have been far more expensive than the Intended Final Decision.

The remainder of the objections to the requirements here are the same as GE's objections to the requirements for Performance Standards and Corrective Measures regarding Legally Permissible Future Projects or Work. For the same reasons as stated above, these requirements here are an appropriate remedy for addressing GE's contamination.

4. Inspection, Monitoring, Maintenance at Non-GE-Owned Dams

*Requirement***:** In the Intended Final Decision, EPA includes requirements to ensure that future PCB releases from dams are minimized, including that GE "shall minimize PCB releases related to dams and Impoundments by inspecting, monitoring and maintaining such dams and Impoundments, and operating the Woods Pond and Rising Pond Dams," and that such activities shall include: maintaining the integrity of the dam to contain contaminated sediments, and conducting materials handling and off-site disposal, and engineering controls.[257]

*GE Position***:** GE asserts that EPA's requirements would impose obligations on GE that are the responsibility of dam owners under federal and state law. Specifically, GE argues: (1) that this requirement would interfere with existing federal and state dam regulatory programs, by creating conflicts between GE and the dam owner on repairs and upgrades; (2) that EPA does not have authority to impose obligations or liabilities on GE that go beyond what is

[255] To the extent that the Intended Final Decision is not clear on this point, it can be modified to clarify that the obligation to address a Legally Permissible Change in Use or Future Project or Work at properties with PCBs contamination less than 2 mg/kg in these reaches will no longer apply if such properties are remediated to residential standards. Similarly, EPA can clarify in Sections 6.b.1.b that for properties in EAs that are remediated to residential standards, then GE does not need to seek EREs or implement a CS

[256] After all, disposing of PCBs above 1 mg/kg in Massachusetts is subject to regulation. 310 CMR 40.0000.

[257] Intended Final Decision, at II.B.2.j.(1)(a), and II.B.2.j.(2)(b). The description in this Statement of Position of the Intended Final Decision requirements is general; for specific details, see the Intended Final Decision.

necessary to protect human health and the environment from GE's PCB releases, such as potential liability as the "operator" of the dams; and (3) that EPA's proposal is in conflict with the Decree requirement that EPA evaluate this requirement under the remedy selection criteria in the Permit.

EPA Position: As an initial point, there is no absolute requirement for GE to perform inspection, monitoring and maintenance requirements on dams they do not own. GE can elect, as part of the Performance Standards for the Reach 7 Impoundments, to remove the PCBs impounded behind the dams, thus eliminating the inspection, monitoring and maintenance requirements.[258] However, depending on the approaches that GE recommends in its remedy design proposals, if risks remain under GE's approach, then the inspection, monitoring and maintenance requirements in the Intended Final Decision represent a rational approach to ensuring protectiveness.

Further, to address GE's specific arguments, first, there is no interference or conflict with existing requirements on dam owners. GE's responsibilities under the Intended Final Decision are in connection with minimizing releases of the PCBs that are located behind the dams.[259] The requirements of the Intended Final Decision are not meant to relieve the dam owner of its statutory obligations. If GE believes that the dam owner is currently performing inspections of the dam in a frequency and a manner that will ensure minimization of releases of PCBs located behind the dam, and GE receives approval from EPA that the activities by the dam owner are protective to minimize releases of PCBs located behind the dams, GE does not have to perform duplicative inspection, maintenance and monitoring activities at that dam. [260] Beyond that, based on EPA's review of GE's Statement of Position, EPA would be willing to clarify in the Final Permit decision that if GE uses best efforts to fulfill these obligations but cannot fulfill them without a conflict occurring, GE may submit to EPA for review and approval a plan that includes, without limitation, any proposed actions GE will take to remediate the PCB contamination behind the dams, any further actions to be taken to obtain agreement from the dam owner, and whether the Engineered Caps will maintain effectiveness without GE having fulfilled its obligations regarding dam inspection, monitoring and maintenance.

If however, the activities performed by the dam owner are not sufficient to minimize releases of PCBs behind the dams, GE has the responsibility in the proposed remedy to ensure that the release of PCBs is minimized. In fact, GE's own experience at Rest of River is

[258] Intended Final Decision, at II.B.2.f.(1)(d).

[259] In Reaches 5-9, there are six dams which currently have impoundments that contain GE's PCBs at unacceptable levels: Woods Pond Dam in Reach 6, the Columbia Mill Dam, Eagle Mill Dam, Willow Mill Dam and Glendale Dam in Reach 7, and Rising Pond Dam in Reach 8. GE currently owns the Woods Pond Dam and Rising Pond Dam, and only two other dams are currently in active use (Willow Mill and Glendale). Presently in Reach 7, the Eagle Mill dam is already partially breached and the owner of the Columbia Mill Dam vacated the dam/mill complex and is no longer operates the dam.

[260] *See* Intended Final Decision, II.B.2.j.(2)(b): Permittee may seek EPA approval for another party to implement some or all of the Permittee's inspection, monitoring and maintenance activities.

inconsistent with its arguments. GE took ownership of Rising Pond Dam in 2008.[261] However, even as far back as 1989, GE had performed an inspection of Rising Pond Dam.[262]

Moreover, as to GE's second argument, these requirements are clearly necessary to protect human health and the environment, and EPA is not exposing GE to further liability as an operator. First, EPA's concern toward minimizing releases of PCBs from dams is not theoretical, but based in recent history on this same stretch of the Housatonic. In 1992, releases of contaminated sediment occurred when water behind the Rising Pond Dam was released to facilitate repairs to the dam. According to the Connecticut Department of Environmental Protection's Bureau of Water Management, no apparent measures were employed to contain PCB contaminated sediment in Rising Pond during this work.[263] Following the dam repair, benthic and fish tissue samples collected and analyzed for PCBs downstream of Rising Pond showed an increase in PCB concentrations.[264] Additionally, per Connecticut DEP, GE informed CT DEP that March 1993 data collected at a downstream location during high flow events in April, May and June 1992 exhibited atypically high PCB levels.[265]

Ensuring the effectiveness of the dams at minimizing PCB releases is also important to the protectiveness of the Engineered Cap called for in the proposed remedy. Were there to be a significant dam opening or failure, the Engineered Cap would also fail to be effective in isolating the PCBs. It is not logical to construct Engineered Caps behind a dam and then not ensure that the dams are properly inspected, monitored and maintained.

If EPA had chosen to require GE to remediate all PCBs behind the dams, then the emphasis on protecting Engineered Caps, would not be as important. Moreover, GE has the flexibility in the Intended Final Decision to propose to excavate more sediment as a way of eliminating the need for an Engineered Cap behind a dam. If GE does not choose that approach, GE must take other actions like a Cap to keep remedy protective.

As to "operator" liability, initially, EPA points out that the Intended Final Decision allows GE to reach agreements with each dam owner on responsibilities, and that GE may seek EPA approval for another party to implement some or all of GE's activities. Furthermore, GE has already agreed that it will not contend that PCB contamination in the Rest of River did not migrate from the GE facility.[266] Furthermore, in past actions by EPA under CERCLA for River cleanup, EPA determined that GE is a liable party for PCB contamination in the River under CERCLA.[267] GE does not subject itself to additional liability by performing the

[261] Berkshire Eagle, "GE buys former Fox River dam", Sunday July 13, 2008.
[262] April 12, 1989, memorandum from Harza Engineering Company to GE, re: Rising Pond Dam, Assessment of Planned Breaching of Dam; June 12, 2006.
[263] Connecticut Bureau of Water Management Interdepartmental Message from Charles Fredette (Supervising Sanitary Engineer) to Michael Harder (Director) Regarding Summary of 1992 CT DEP Housatonic PCB Monitoring Re: Rising Dam, Great Barrington, MA. May 18, 1993. ("Fredette Memorandum").

[264] Connecticut Post, "Higher level of PCBs in Housatonic feared", May 23, 1993.
[265] Fredette Memorandum.
[266] Decree Appendix G, Reissued RCRA Permit, at Section I.P (Interpretation of Migration from GE Facility).
[267] E.g., June 3, 1998, EPA, Second Unilateral Administrative Order for Removal Action, CERCLA Docket No. I-98-1040, Paragraph 9.

necessary actions needed to minimize PCB releases from behind the dams. In fact, by performing the actions, GE is minimizing its liability for future releases.

Regarding GE's argument that EPA should have evaluated these requirements separately under the remedy selection criteria, the record is clear that EPA has fulfilled its responsibility to perform a thorough evaluation of multiple alternative remedies pursuant to the nine Permit criteria. At the same time, EPA is not required to perform that same level of evaluation on each element within an alternative. For example, to address the risks posed by PCBs behind the Reach 7 Impoundments, EPA evaluated a number of remedial options, including an alternative to remove all PCBs at levels posing unacceptable risks. Instead of requiring such a full-scale removal, EPA has proposed to reduce the risks with an alternative that excavates some PCBs and reduces exposure to the remaining PCBs through use of an Engineered Cap behind the Impoundments. However, as with other remedy components that seek to isolate or reduce exposure to PCBs, the approach must also include long-term monitoring/maintenance elements to ensure the proposed approach remains protective. Each of these elements within a proposed alternative is not required to undergo the same level of evaluation. In that respect, these obligations are more similar to the requirements for inspection, monitoring and maintenance in Section II.B.4, as well as the Operation and Maintenance requirements at Section II.C of the Intended Final Permit.

In summary, as demonstrated above, GE's arguments are without merit. However, in the interest of resolving this dispute based on GE's Statement of Position, EPA is willing to modify this provision as follows: (1) clarify in the Final Permit decision that if GE uses best efforts to fulfill these obligations but cannot fulfill them without a conflict occurring, GE may submit to EPA for review and approval a plan that includes, without limitation, any proposed actions GE will take to remediate the PCB contamination behind the dams, any further actions to be taken to obtain agreement from the dam owner, and whether the Engineered Caps will maintain effectiveness without GE having fulfilled its obligations regarding dam inspection, monitoring and maintenance; (2) place these requirements in the Final Permit decision within the Reach 7 provisions of Section II.B.2.f, the Inspection, Monitoring and Maintenance provisions at Section II.B.4, and/or the Operation and Maintenance provisions at Section II.C; and (3) revise the responsibilities in the Final Permit decision to be that GE will ensure performance of inspection, monitoring and maintenance instead of performing inspection, monitoring and maintenance.

5. GE Responsibilities Regarding Catastrophic Failure or Material Breach of a Dam

*Requirement***:** If there is a catastrophic failure or breach of a dam causing a materially greater than normal release of PCBs, GE must propose a response to maintain the Performance Standards or to maintain the effectiveness of the remedy Upon EPA approval of such plan, GE is to implement the plan.[268]

*GE Argument***:** GE objects as follows: (1) for non-GE dams, repair or removal of a dam is the responsibility of the dam owner, not GE; (2) the requirements for GE to conduct response actions have not been evaluated under remedy selection criteria and thus conflict with the Decree, and that such actions "constitute a contingent remedy under EPA guidance"; and

[268] Intended Final Decision, II.B.2.j.(2)(b)

(3) these future contingent requirements conflict with the CD covenants, which allow EPA to require such additional response actions only if EPA determines that there is new information or conditions indicating that the remedy is no longer protective.

*EPA Position***:** As stated above, PCBs from GE's facility have contaminated the River sediments, bank soils, floodplain, and biota for many miles, including in impoundments behind the dams in Rest of River, including into Connecticut. The Intended Final Decision allows for PCB contamination to remain behind the Rest of River dams at a significant cost savings to GE. That residual PCB contamination could still pose an unacceptable risk if a breach or failure of a dam occurs. That being the case, in conjunction with preventative requirements,[269] if a dam fails or has a material breach, GE must propose and implement a protective response.

First, regulatory requirements on dam owners do not prohibit GE from taking action to address GE's PCBs migrating downstream from a failed or breached dam. Given the large concentrations of residual PCBs behind the dams, it is very reasonable to expect that if a dam that was holding back GE's PCBs becomes compromised, GE should be held responsible for ensuring that the Performance Standards, and the effectiveness of the cleanup, are maintained. As for GE's specific objection about not being required to repair or remove a dam, EPA is not mandating in this proposed remedy the specific actions that would be most appropriate; what is most appropriate depends on the circumstances. Instead, EPA is requiring GE to submit a plan, and upon approval by EPA, to implement that plan. If at that point GE disagrees with EPA's response to its submittal, GE may avail itself of the Decree's Dispute Resolution provisions. Also, if GE does not want the uncertainty of long-term maintenance, EPA included in the Performance Standards for the Reach 7 Impoundments the option for GE to remove sufficient PCBs sequestered behind the dams to avoid that responsibility.[270]

Second, as to specifying and evaluating the response activities in the Permit, GE is seeking unreasonable and infeasible specificity. The specific actions required after a release of GE's PCBs have not been identified, and will necessarily depend on the circumstances of the PCB contamination, the plan submitted by GE, and the EPA response. EPA guidance for RCRA or CERCLA remedies only require "appropriate" analysis of the remedy under the relevant criteria, which EPA has performed very thoroughly for Rest of River. It cannot be considered "appropriate" to force EPA and GE to identify *now* the specific activities that may or may not take needed in response to a *future* dam failure. Moreover, it is consistent with the Decree and Permit for the response to an unplanned event during remedial action or O&M to be unknown at the time of Permit issuance. As discussed in Section III.B.1 above, the Decree includes several response action obligations that are not appropriate to define at Permit issuance, but which are important for maintaining Performance Standards and the effectiveness of the remedy. In many respects, this requirement for the dams is similar to the obligation to maintain an Engineered Cap or the obligation to maintain the cap of a landfill.[271]

[269] EPA Statement of Position, Section III.B.4..
[270] Intended Final Decision, II.B.2.f(1)(d).
[271] Under the Decree, GE is responsible for long-term maintenance of the caps for the On-Plant Consolidation Areas established at the former GE Plant Area. Decree ¶ 15.

That being said, EPA has bounded the potential responses by GE by making clear in the Intended Final Decision that GE's responsibilities for dam failure are limited to responses to maintain Performance Standards or remedy effectiveness.

Further, the fact that it is virtually impossible to foresee the specifics of each and any such occurrence years prior to the event does not constitute a "contingency remedy". As is discussed above in Section III.C.1,c. regarding the Downstream Transport and Biota Performance Standards, such a remedy applies where EPA selects an alternative remedy in a ROD in case the preferred ROD remedy fails. Here EPA cannot predict a specific "contingency remedy" to use because EPA cannot predict the circumstances or the specific response activities, if any, following a future failure or breach.

Third, EPA disagrees with GE's claim that EPA's response authority is limited to a demonstration that there is new information or conditions indicating a lack of protectiveness.[272] EPA's ability to require such work is not so limited. First, distinct Decree authority for such work is not necessary. The Intended Final Decision provides for achieving and maintaining the Performance Standards and the remedy's effectiveness. The required responses of GE to a material release of GE's PCBs from a dam are precisely measures to maintain Performance Standards and remedy effectiveness. That being the case, they are not separate, additional response actions that require additional Consent Decree authority can be required by EPA under the response action.

Finally, even if EPA needed to invoke the Decree separate from carrying out the response action, the Decree provides a less limited threshold. Paragraph 39 of the Decree provides that if EPA determines that modification to the work specified in the Rest of River Statement of Work ("Rest of River SOW"), and/or in work plans developed pursuant to the Rest of River SOW and/or the Decree is necessary to achieve and maintain the Performance Standards or to carry out and maintain the effectiveness of the response action, EPA may require that such modification be included in the Rest of River SOW and/or such other work plans; provided however, that a modification may only be required under Paragraph 39 to the extent that it is consistent with the scope of the response action for which the modification is required and does not modify the Performance Standards of the response action (except as provided in the Decree provision on mutually-agreed modifications). If EPA did not have the direct ability to require the work pursuant to the Intended Final Permit, Paragraph 39 allows for such work to proceed with fewer limitations than GE seeks.

C. EPA Correctly Interprets the Consent Decree and GE Cannot Shirk its Liabilities.

GE argues that EPA incorrectly interpreted the Decree and Permit by requiring GE to restore natural resources damaged during implementation of the cleanup or to comply with ARARs that require restoration. These arguments are directly refuted by the terms of the Decree: the covenant not to sue GE for natural resource damages is not effective until after GE has implemented all the work required by EPA's Intended Final Decision, including compliance with ARARs. Clearly, the United States would not agree to a settlement that

[272] GE cites to Decree Paragraphs 162-163, which are the Pre- and Post-Certification Reservations of Rights, or "Reopeners" to GE's liability covenants. Such reopeners are one method to require additional response actions, but are not necessary in this situation where EPA may require the actions in a more straightforward way.

included the selection of a remedy for a complex hundred mile river system without requiring any natural resources that were damaged by the clean up to be restored. Such a hypothetical agreement would cost GE less but runs counter to public policy, EPA practice, and the terms of the Decree.

1. Restoration Requirements for Areas Disturbed by Remediation Activities.

a. Restoration and Compensatory Mitigation

Requirement: GE must develop and implement a plan for restoration of affected habitats disturbed by remediation activities to the extent feasible and consistent with remediation requirements.

GE Position: GE argues that any obligation to restore natural resources damaged by implementation of the remedial action and/or to comply with ARARs allegedly violates the Decree covenants and/or otherwise exceeds EPA's Consent Decree and statutory authority.

EPA Position: Both types of restoration activity required by the Intended Final Decision are within EPA's Consent Decree and statutory authority, including (1) requiring GE to restore resources disturbed by remediation activities; and (2) requiring GE to comply with ARARs that provide for restoration work. Each of these points is discussed below.

GE advances a novel argument to suggest that EPA does not have the authority under CERCLA or RCRA to require the restoration of impacted habitats disturbed by remediation activities. GE SOP at 33-34. Such authority is vested in EPA pursuant to: Section 106 of CERCLA, providing the power to "issue such orders as may be necessary to protect public health and welfare and the environment," 42 USC § 9606; Section 3004(u) of RCRA granting broad authority to issue "corrective action for all releases of hazardous waste," 42 USC § 6924(u); and Section 3005(c)(3) of RCRA providing that each permit under this section "shall contain such terms and conditions as the Administrator (or the State) determines necessary to protect human health and the environment." 42 U.S.C. § 6925(c)(3). Nothing in the Decree limits this authority, and GE's past implementation of the Decree recognizes EPA's authority to require GE to restore natural resources disturbed by response action to pre-remediation condition. For example, when GE compared the alternatives for remediating the Rest of River in its Revised CMS, GE considered potential restoration activities to restore disturbed areas[273] and estimated the costs of restoring areas disturbed by the response actions to pre-remediation condition, including the cost of restoring forested wetland, shrub and shallow emergent habitat, backwater, deep emergent marsh, and other habitat.[274] GE and EPA considered restoration as a component of the evaluated remedial alternatives, separate and apart from settlement of natural resource damage ("NRD") claims. Similarly, in other areas of the GE Pittsfield/Housatonic River Site outside the Rest of River, such as Unkamet Brook, Silver Lake, and portions of the floodplains, where GE has undertaken removal action work, GE is restoring, or has restored, portions of the Brook, Lake and floodplains to at least pre-remediation condition pursuant to the applicable Work Plans.[275] For example, pursuant to the Work Plan for Phase 4 Floodplain

[273] Revised CMS, Chapter 5, Approach to and Considerations in Evaluating Adverse Impacts from Remedial Alternatives, Means to Avoid or Minimize those Impacts, and Potential Restoration.
[274] Revised CMS, Appendix Q, Submitted as Confidential Business Information.
[275] *See* Work Plans for Unkamet Brook, Silver Lake, and Phase 3 and Phase 4 properties adjacent to the 1 ½ Mile Reach.

Properties, GE conducted inventories of pre-existing conditions, including trees, shrubs, and other features to ensure that restoration of conditions to pre-remediation conditions would be achieved. Accordingly, this work to restore the Brook, Silver Lake, and portions of the floodplain to pre-remediation condition is independent of GE's obligations to also create additional habitat improvements in other separate areas of the Brook and Lake to resolve its natural resource damages liability to the natural resource trustees.[276]

Under CERCLA, cleanups must also comply with all ARARs. 42 U.S.C. § 9621(d).[277] Here, the Clean Water Act and the Massachusetts Endangered Species Act constitute ARARs and, under certain circumstances, these ARARs require the restoration of natural resources disturbed by remediation. GE argues, however, that EPA does not have authority to require restoration of disturbed areas even as part of CERCLA's mandate to comply with ARARs, because ARARs may allegedly only apply to hazardous substances that remain "onsite." GE SOP at 34. No court has ever adopted GE's interpretation and it is refuted by the Decree: the Decree establishes ARARs that are not limited to hazardous substances remaining "onsite." Decree, Appendix E, Attachment B. Likewise, EPA's guidance makes clear that federal and state statutes and regulations that are directed at protecting locations (e.g. resource areas, including habitats) can also be ARARs. For example EPA guidance on such location-specific ARARs states that substantive compliance with the federal Endangered Species Act ("ESA") means:

> that the lead agency must identify whether a threatened or endangered species, or its critical habitat, will be affected by a proposed response action. If so, the agency must avoid the action or take appropriate mitigation measures so that the action does not affect the species or its critical habitat.[278]

Indeed, the ESA is an ARAR that GE does not dispute, including the obligation to "take mitigation measures so that action does not affect species/habitat." Intended Final Decision, Attachment C at 7.

Thus, contrary to GE's claims, it is well settled that the natural resources disturbed by remediation must be restored and mitigated as part of the remedial process in accordance with the substantive requirements of ARARs, such as the ESA, the Massachusetts Endangered Species Act, the Massachusetts Wetlands Protection Act, and the Clean Water Act. Indeed, in other areas of the Site outside the Rest of River, the Clean Water Act and the Massachusetts Wetlands Protection Act constitute ARARs for the Removal Actions Outside the Rest of River and respectively require that River banks will be restored, habitat will be improved, and "disturbed vegetation will be restored." Decree, Appendix E,*Id*. Table 3 at 2, 4, 5. Similarly, GE does not dispute that the National Historic Preservation Act and the Mass. Historical Commission Act serve as ARARs, including for the Rest of River. *Id.* at 7; Intended Final Decision, Attachment C at 6, 13.

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[276] *See* Work Plans for Unkamet Brook, Silver Lake, and Phase 3 and Phase 4 properties adjacent to the 1 ½ Mile Reach.

[277] The statute requires the remedy to be conducted in accordance with all ARARs unless specific waiver requirements are met. CERCLA §121(d).

[278] EPA's CERCLA Compliance with Other Laws Manual: Part II, Clean Air Act and Other Environmental Statutes and State Requirements (August, 1989), p. 4-12

In addition, GE claims that any restoration to return disturbed areas to pre-remediation condition or to comply with ARARs would conflict with the Decree's covenants regarding natural resource damages ("NRD"). The future liability covenants related to NRD for the Rest of River, however, are not triggered until the Rest of River Remedial Action is complete. CD ¶¶ 112.a., 161. Indeed Paragraph 161(d) is explicit on the timing of the covenant:

> With respect to future liability, the covenant not to sue shall be effective for each Removal or Remedial Action to be performed by [GE] … upon EPA's Certification of Completion for that individual Removal or Remedial Action....

CD ¶ 161(d). Indeed, the statute prohibits the Natural Resource Trustees from providing a covenant for NRD until the responsible party "agrees to undertake appropriate actions necessary to protect and restore the natural resources damaged by" releases of hazardous substances. 42 U.S.C. § 9622(j)(2).[279] As discussed earlier, other provisions of the Decree, in turn, require that GE's implementation of response actions comply with ARARs, which include those requiring that natural resources disturbed by the remedy be restored or mitigated: Specifically, GE is required to comply with any ARAR set forth in the documents selecting the Rest of River Remedial Action and/or in the Rest of River SOW, unless waived by EPA pursuant to CERCLA and the NCP. CD ¶ 8. Here, GE agreed to implement the remedy for the Rest of River, and the NRD covenant for the Rest of River applies once this Remedial Action is complete. CD ¶¶ 112.a., 161(d).

GE relies on Decree Paragraph 114.b, a payment provision to the Natural Resources Trustees, to argue that it precludes EPA from requiring compliance with ARARs or restoration of areas disturbed by remediation activities. But this provision merely provides that GE pay the Trustees: "$600,000 as mitigation for wetlands impacts associated with PCB contamination and with response actions at the Site." CD ¶ 114.b. GE ignores the other relevant Decree provisions that state that GE's *satisfaction of the natural resource damage claims* is subject to GE's "[p]erformance of the response actions required under the Decree." CD 112(a). In short, until GE performs the Rest of River response actions in accordance with the requirements of the Decree, which include compliance with ARARs, GE has not satisfied the Governments' claims for natural resource damages. Accordingly, the payment provision in Paragraph 114.b is not a covenant not to sue from the United States. As noted above, that covenant is set out in Paragraphs 112(a) and 161, and is not triggered until completion of all Work required in the Rest of River SOW.[280]

GE also includes a few summary arguments regarding the level of detail and likelihood of success of restoration. SOP at 33, incorporating Comments. To the extent GE objects that the specifics of restoration are not sufficiently developed, those details will be set forth in the

[279] GE suggests that because the *Natural Resource Trustees* have authority to recover for NRD, GE SOP at 34, that the United States, through EPA, may not require restoration of resources damaged by response action work or compliance with ARARs requiring restoration of natural resources. This interpretation is inconsistent with the covenants and with the statute. 42 U.S.C. §9622(j)(2). Satisfaction of the *Trustees'* claim is triggered by completion of all work required by the Decree, including the work set forth in EPA's Intended Final Decision.

[280] GE is wrong to claim that "restoration and acquisition of equivalent resources are part of NRD, not remedial action." GE SOP at 34. The Trustees and EPA have overlapping interests and jurisdiction and worked together here to draft a settlement in the public interest. As noted above the covenant not to sue for NRD does not apply until all the work is completed in the Rest of River, including restoration of resources disturbed by remediation and/or in compliance with ARARs.

Rest of River SOW or the Work Plans for the Rest of River SOW as is contemplated by the Decree. CD ¶¶ 22.x. To the extent GE further questions the likelihood of success of restoration efforts, information in the record does not support GE's position, and as noted above at Section III.B of this Statement of Position additional detail or certainty is not required at the remedy selection phase of remedy implementation. Finally, the restoration requirements in the Intended Final Decision reflect the expertise and input of EPA and the States in this area.

2. Massachusetts Endangered Species Act

Requirements: PCB contamination from GE's facility has been deposited widely throughout the Rest of River, including in areas designated by the Division of Fisheries and Wildlife ("DFW") in the Massachusetts Department of Fish and Game ("DFG") as habitat for endangered, threatened and species of special concern (collectively, "State-listed species") pursuant to the Massachusetts Endangered Species Act ("MESA") and the MESA regulations.[281] In evaluating remedial approaches for Rest of River, EPA has worked extensively with DFW's Natural Heritage and Endangered Species Program ("NHESP") over many years to identify potential approaches that balance remediation of the risks posed by GE's PCBs with the protection of State-listed species, and the Intended Final Decision reflects agreements reached between EPA and NHESP in this regard. [282, 283] The integration of MESA concerns into the Intended Final Decision is not limited to a particular provision, but is part of many different components for addressing the River, riverbanks, and floodplains.[284]

GE Position: GE argues three things: (1) that the net benefit requirement is inapplicable to species for which the "take" would impact a significant portion of the local population and that the requirement cannot be applied to those species; (2) that the requirement is not an ARAR as defined by CERCLA because of, GE claims, the amount of discretion in the decision maker; and (3) that the requirement is an attempt to recover natural resource damages in violation of the Decree's covenants not to sue for natural resource damages (NRD).

EPA Position: First of all, the dispute is speculative and need not be decided at this time. During the design of the remedy, if EPA determines that a "take" that would impact a significant portion of the local population occurs, EPA will identify that to GE, and GE would have the right, as with any design/implementation dispute, to pursue Dispute Resolution under the Decree, including review by U.S. District Court. CD Section XXIV. Beyond that, EPA will clarify the position below.

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[281] M.G.L. c. 131A and 321 CMR 10.00.

[282] See EPA's May 2012 Status Report; and NHESP's July 31, 2012 letter to EPA, Attachment B to the Intended Final Decision.

[283] The Intended Final Decision is similar to the June 2014 Proposed Cleanup Plan EPA issued for public comment. The Commonwealth, in its October 27, 2014 letter expressing support for the Proposed Cleanup Plan, stated, [T]he Commonwealth wishes to express our appreciation of EPA's willingness to consider and address many of the Commonwealth's concerns and priorities for the remediation of this unique ecosystem that … includes one of the richest and most diverse array of state-listed species protected under [MESA] and the MESA regulations at 321 CMR 10.00".

[284] Attachment B to the Intended Final Decision provides a description of the Core Habitat Area concepts used to assist EPA and the Commonwealth in identifying the remedy most suited to the circumstances of Rest of River.

With respect to the Net Benefit provision, EPA's Intended Final Decision includes a table of the applicable or relevant and appropriate environmental requirements for the Rest of River remedy (the "ARAR Table"). [285] The ARAR Table has the following Synopsis for this provision of MESA:

> A proposed activity in mapped Priority Habitat for a state-listed rare, threatened, endangered species or species of special concern, or other area where such a species has occurred may not result in a "take" of such species, unless it has been authorized for conservation and management purposes that provide a long-term net benefit to the conservation of the affected state-listed species. A conservation and management permit may be issued provided an adequate assessment of alternatives to both temporary and permanent impacts to State-listed species has taken place, an insignificant portion of the local population would be impacted by the project or activity, and an approved conservation and management plan is carried out that provides a long-term Net Benefit to the conservation of the State-listed species.[286]

Similarly, the ARAR Table includes the following as the Actions to be Taken to Achieve this requirement*:*

> To the extent that unavoidable impacts result in a take of state-listed species, EPA would follow the regulatory requirements with respect to implementing a conservation and management plan providing for a long-term net benefit to the affected state-listed species.[287]

GE argues that if there is a "take" of a species which results in a "significant" portion of the local population being impacted by the project or activity, the requirement to submit a Conservation and Management Plan providing for a Net Benefit to the species would not apply, because the "take" is prohibited outright.

DFW has affirmed for EPA that under the MESA regulations, if a determination of a take is made, the project or activity must either be modified to eliminate the take or the proponent must obtain a conservation and management permit ("CMP") pursuant to 321 CMR 10.23. More specifically, in addition to showing that the impacts from the remedial action have been avoided, minimized and mitigated, the MESA regulations at 321 CMR 10.23(2)(a)-(c) set forth three separate, distinct and substantive performance standards that must be met in order to obtain a CMP authorizing a take under MESA:

a) there has been an adequate assessment of alternatives to both temporary and permanent impacts;

b) only an insignificant portion of the local population of the affected state-listed species will be impacted, and

[285] See Attachment C to the Intended Final Decision, at 14.
[286] Intended Final Decision, Attachment C, at 14.
[287] Ibid.

c) an approved conservation and management plan provides for the long-term Net Benefit for the conservation of the state-listed species. The term "Net Benefit" is defined in the MESA regulations at 321 CMR 10.01 to mean (1) an action(s) that contribute significantly to the long-term conservation of a state-listed species, and (2) that conservation contribution exceeds the harm caused by the proposed project or activity.

As noted above, DFW has affirmed for EPA that the insignificant impact on local population and the Net Benefit performance standards in 321 CMR 10.23(2)(b) and (c) are separate and distinct substantive requirements applicable to the permitting of a take. More specifically, in order to authorize a take, 321 CMR 10.23(2)(b) requires that there be an "insignificant impact" to the *local* population of the affected state-listed species. In comparison, 321 CMR 10.23(2)(c) requires that a Net Benefit be provided to the affected state-listed species *as a whole* (i.e., beyond the geographic location of the local population of that species).

If a take will have a significant impact on the local population of the affected species, in order to move forward, such an activity would need to be redesigned or coupled with a form of mitigation that would result in an insignificant impact on the local population. In that regard, there are certain forms of mitigation designed to enhance the local population, thereby lessening the overall impact of a project. For this reason, DFW typically requires an applicant to evaluate whether a Net Benefit can be provided, even in cases where there is a preliminary assessment that the activity will impact a significant portion of the local population. This approach is appropriate because after-the-fact habitat management and habitat restoration could off-set remediation impacts in certain cases, which should be considered in evaluating the level of impact on the local population resulting from a particular remedial alternative in site-specific locations.

During design and implementation of the proposed remedy, if, despite that evaluation and potential mitigation, a significant impact on the local population remains, EPA, in consultation with DFW, will evaluate whether it is appropriate to waive the requirement of an insignificant impact on local population pursuant to CERCLA Section 121(d)(4), such as if it is technically impracticable to comply with that requirement. GE remains obligated under the MESA regulations to comply with the separate, distinct and substantive Net Benefit performance standard in 321 CMR 10.23(2)(b) to compensate for the resulting take through the implementation of a conservation and management plan.

GE also argues that MESA provides too much discretion to the decision maker on determining whether to permit a "take", and that amount of discretion does not satisfy CERCLA 121(d)'s requirement for that an ARAR be "standard, requirement, criteria or limitation".

EPA disagrees. The DFW Director's authority to permit a take of a State-listed species is subject to and limited by several specific standards established in the MESA regulations. First, as outlined above, the DFW's Director's authority to authorize a take is subject to the performance standards at 321 CMR 10.23(2), unless in a situation such as GE's implementation of the Rest of River remedy, such MESA performance standard(s) is waived by EPA. Furthermore, the MESA regulations at 321 CMR 10.23(7) ("General Mitigation Standards Applicable to Individual and General Conservation and Management Permits Issued by the Director") specifically address the general mitigation standards to be applied by the

DFW Director in issuing CMPs[288]. This regulation directs the Director to apply the areal habitat mitigation ratios specified therein that correspond to the affected category of state-listed species: 3:1 for endangered species; 2:1 for threatened species; and 1.5:1 for species of special concern.

While the regulation reserves the right to deviate from the applicable mitigation ratio or allow an alternative mitigation approach, discretion to do so is subject to the process and criteria specified therein. Specifically, the decision-maker is required to determine in writing that the alternative mitigation ratio or mitigation approach is either sufficient or required to meet the Net Benefit standard. In making such determination, the decision-maker must also consider, at a minimum, the 5 factors identified in the regulation, which involve specific conservation management considerations such as the threats to and population density of the affected state-listed species, the size and configuration of both the habitat impact and quality of the habitat proposed to be protected.

With respect to GE's argument on the MESA-required activities being precluded by the Natural Resource Damage covenants in the Decree, EPA disagrees with GE's characterization and has responded to GE's arguments in Section III.C.1 of this Statement of Position.

D. EPA Correctly Designated ARARs and ARAR Waivers

1. Water Quality Criteria:[289]

Requirements: The relevant National Recommended Water Quality Criteria establish PCB limits for the Housatonic River. EPA identified the requirements for the Intended Final Decision.

GE Position: GE argues that EPA should not attempt to meet the human health criterion based on human consumption of water and organisms of 0.0000064 micrograms per liter (ug/L) in Connecticut because of difficulties in measuring the 0.000064 ug/L standard, and

[288] 321 CMR 10.23(7) includes the following habitat mitigation ratios that are to be generally applied: The Director, in determining the appropriate nature and scope of mitigation necessary for an applicant for an individual or general conservation and management permit to achieve the long-term Net Benefit performance standard in 321 CMR 10.23(1), will generally apply the following areal habitat mitigation ratios, based on the category of State-listed Species:
1. Endangered Species: 1:3 (i.e., protection of three times the amount of areal habitat of the affected Endangered Species that is impacted by the Project or Activity);
2. Threatened Species: 1:2 (i.e., protection of two times the amount of areal habitat of the affected Threatened Species that is impacted by the Project or Activity).
3. Special Concern Species: 1:1.5 (i.e., protection of one and one half times the amount of areal habitat of the affected Species of Special Concern that is impacted by the Project or Activity).

[289] For each of the ARARs discussed in this Statement of Position, more specific information, including a synopsis of the requirements, the status of the requirement, and the action(s) to be taken to attain the ARAR, can be found at Attachment C of the Intended Final Decision, Summary of Applicable or Relevant and Appropriate Requirements.

that given uncertainties in extrapolating model results to CT, there is no reliable method to predict the attainment of this criterion in CT. [290]

EPA Position: EPA disagrees. Current modeling shows that the remedy will achieve attainment of the 0.000064 ug/L level in 3 of the 4 Connecticut impoundments.[291] In its Revised CMS submittal, GE evaluated alternative SED 9, which, of the alternatives evaluated in the Revised CMS, is the alternative most similar to the proposed remedy (one difference is that the proposed remedy has less excavation of sediment in Reach 5B, which could cause its estimates to be slightly higher than those for SED 9.) In GE's Revised CMS evaluation of SED 9, GE stated that for the Connecticut impoundments, the water column concentrations estimated by the model exceed the criterion in one of four impoundments. Given those estimates, the remedy is intended to meet this standard.

As GE has stated, the Connecticut modeling provides a means of generally estimating the impact of different sediment alternatives on the major four Connecticut impoundments.[292] However, EPA does recognize that there is inherent uncertainty in this modeling based on the nature of the analysis. Accordingly, EPA will consider a waiver of the ARAR in the future should it become apparent that these criteria are technically impracticable to meet.[293] However, until there is further information indicating that the chances for attainment in CT impoundments is not as likely as currently modeled, EPA believes it is reasonable to continue to seek attainment of this standard.

2. Clean Water Act Section 404 Regulations:

Requirements: The regulations are to address dredging and filling of waterbodies. As EPA states in the Intended Final Decision's ARAR Table,[294] the remedy is designed to reduce human health and environmental risks posed by PCBs and includes actions to excavate riverbed sediments, bank soils and floodplain soils, with backfilling and capping.

To comply with the CWA 404 ARAR, the remedy will include excavation technology and multiple engineering controls to minimize resuspension of any PCB-contaminated water,

[290] GE in its Statement of Position makes a blanket reference to the arguments made in its 2014 comments on this issue on EPA's 2014 remedy proposal. To the extent that a response to those 2014 comments is required for this Statement of Position, it is as follows. First, GE claims that continued input of PCBs from atmospheric sources decreases the likelihood of ever attaining 0.000064 ug/L. In response, EPA's stands by its modeling efforts as being appropriate for this decision-making. The modeling efforts, prescribed by the Consent Decree, included for Massachusetts sections of the River independent scientific peer reviews on three different components of the modeling process, and the ability for GE to provide comments to the peer review panel at each of the three junctures (which GE availed itself of). For Connecticut, GE used the outputs from the peer reviewed Massachusetts model as inputs for its modeling effort in Connecticut. The model is sufficient for the purposes of Rest of River decision-making. Second, GE argues that EPA erred in stating that all remedial actions in the waterway will be conducted so as not to contribute to an exceedance of the water quality criteria. EPA disagrees. Overall, the remedy components are designed to reduce the PCB levels in the riverbed, bank soils and floodplain soils, not to contribute to exceedances. As noted above, modeling results indicate that the PCB concentrations in water will be reduced significantly due to the Intended Final Decision. Implementation of the proposed remedy will significantly improve the likelihood of achieving the water quality criteria.

[291] GE Revised CMS, Section 6.9.4, at 6-300 (2010).

[292] GE Revised CMS, Section 3.2.5, at 3-45 (2010).

[293] 2014 Statement of Basis, at 40.

[294] Intended Final Decision, Attachment C, at 4.

including any from wetlands. The remedy will proceed from upstream to downstream, with capping to follow in parts of the river.

Any remedy activities that will alter wetlands, including excavation of contaminated wetland soils and sediments, backfilling and capping, will be conducted in accordance with these standards.

GE Position: GE argues three points: (1) That there are practicable alternatives that would be protective and have less adverse impacts than the proposed remedy; (2) That the proposed remedy would cause or contribute to exceedance of a water quality criterion; and (3) That the regulations include the "compensatory mitigation" regulations, and that attempt to recover compensatory mitigation would violate the covenants not to sue that GE received for natural resource damages under the Decree. CD ¶ 161.

EPA Position: EPA disagrees with GE's assertions. EPA has evaluated each of the alternatives from GE's Revised CMS, and has reviewed the public comments on the June 2014 proposed remedy. EPA has determined that there are no practicable alternatives with lesser effects on the aquatic ecosystem than the proposed remedy. The EPA regulations provide that "an alternative is practicable is it is available and capable of being done after taking into consideration costs, existing technology, an logistics in light of overall project purposes."[295] Additionally, the Preamble to the Clean Water Act Section 404(b)(1) Guidelines states "… [w]e consider implicit that, to be practicable, an alternative must be capable of achieving the best purpose of the proposed activity." [296] The proposed remedy, which EPA has determined to be best suited under the circumstances, is designed to reduce the unacceptable risks posed by GE's PCB contamination, while at the same time to avoid, minimize and mitigate risks to habitat. No other practicable alternative has less adverse impact on the aquatic ecosystem. EPA's proposed remedy includes extensive efforts to reduce the impacts of the remediation. See the description in the discussion of the Massachusetts Water Quality Certification regulations and the Massachusetts Wetlands Protection Act, at Sections III.D.4.and III.D.5 of this Statement of Position, for more details.

Second, the remedy will not cause or contribute to violation of any applicable water quality standard, violate an applicable toxic effluent standard, jeopardize existence of endangered or threatened species, or contribute to significant degradation of waters of the United States. In fact, the remedy is designed to reduce the health risks, reduce the levels of contamination in the riverbed sediments, bank soils and floodplain soils, and to isolate and stabilize the remaining PCB contamination. The remedy also includes substantial safeguards to protect endangered and threatened species.[297]

Third, with respect to GE's argument about compensatory mitigation activities being precluded by the NRD covenants in the Decree, there is currently no specific dispute for resolution at this time because no compensatory mitigation measures have been required.[298] Moreover, based on its comments on the 2014 remedy proposal, GE appears to acknowledge

[295] 40 C.F.R. § 230.10.
[296] 45 Fed. Reg. 85,339 (Dec. 24, 1980).
[297] See Section II.B.1.c of the Intended Final Decision.
[298] EPA's ability to require restoration activities for areas disturbed by remediation activities and/or to achieve ARARs is also discussed above in Section III.C.1 of this Statement of Position.

that requirements directed to "attempting to address the impacts of the release by returning affected areas to their pre-remediation condition" [299] would not be covered by GE's NRD covenant. The future liability covenants related to NRD for the Rest of River, however, are not triggered until the Rest of River Remedial Action is complete. CD ¶¶ 112.a., 161. Indeed Paragraph 161(d) is explicit on the timing of the covenant:

> With respect to future liability, the covenant not to sue shall be effective for each Removal or Remedial Action to be performed by [GE] … upon EPA's Certification of Completion for that individual Removal or Remedial Action....

CD ¶ 161(d) (emphasis added). Indeed, the statute prohibits the trustees from providing a covenant for NRD until the responsible party "agrees to undertake appropriate actions necessary to protect and restore the natural resources damaged by" releases of hazardous substances. 42 U.S.C. §9622(j)(2). Here, GE agreed to implement the remedy for the Rest of River, and the NRD future liability covenant for the Rest of River applies once this Remedial Action is complete. CD ¶¶ 112.a., 161(d)

Finally, if during implementation of the proposed remedy, EPA makes a specific determination as to the necessary measures to accomplish compensatory mitigation, and GE interprets such action as being covered by the Decree NRD covenant, GE may at that time avail itself of the dispute resolution provisions under the Decree. CD § XXIV.

3. Executive Orders on Wetlands and Floodplains:

Requirements: Wetlands and floodplains of the Housatonic River are among the areas where GE's PCBs have come to be deposited, and those PCBs are posing unacceptable risks to human health and the environment. To address those risks, the Intended Final Decision includes activities such as excavation and capping of GE's PCBs in wetlands and in floodplains. To accomplish those activities and other remedy components, support activities are proposed to take place in the floodplain, such as use of temporary access roads and temporary areas for staging excavated material prior to disposal. The proposed remedy also requires GE to complete restoration of areas disturbed by the cleanup implementation, per the Restoration Performance Standards discussed above at Section III.C.1. Throughout the remedy implementation, EPA will comply with the Executive Orders for Protection of Wetlands[300], and for Floodplain Management[301].

GE Position: GE argues as follows: (1) that activities in the floodplain will result in occupancy or modification of the floodplain, and (2), that the proposed remedy would not meet the requirements of the Floodplain or Wetlands Executive Orders because, GE asserts, there are practicable alternatives with less impact on the floodplain and wetlands.

EPA Position: First, with respect to occupancy or modification of the floodplain, EPA's proposal mandates a number of different requirements to ensure there is no long-term occupancy or modification of the floodplain. The Restoration Performance Standards state clearly that, for all areas disturbed by remediation activities under this Permit, GE shall:

[299] October 27, 2014, GE letter to EPA, "GE's comments on EPA's Draft RCRA Permit Modification and Statement of Basis for Proposed Remedial Action for the Housatonic River – Rest of River", at 66.
[300] Executive Order 11990.
[301] Executive Order 11988.

> (a) Implement a comprehensive program of restoration measures that addresses the impacts of the Corrective Measures on all affected ecological resources, species and habitats, including, but not limited to, … floodplain, wetland habitat …, and
>
> (b) Return such areas to pre-remediation conditions (e.g., the functions, values, characteristics, vegetation, habitat, species use, and other attributes), to the extent feasible and consistent with the remediation requirements.[302]

Plainly, the proposed remedy is designed to not have long-term impacts on the floodplain. However, to the extent that the limited activities to remove PCB contamination from the floodplain, and the support activities for other proposed remediation activities are considered occupancy and modification of the floodplain, EPA has determined that there is no practicable alternative to it.

EPA disagrees with GE's second argument. Based on EPA's extensive evaluation of alternatives to remediate GE's PCBs, there is no practicable alternative with less adverse impacts on either the floodplains or wetlands. As described elsewhere in this Statement of Position, the proposed remedy is a balanced, reasonable approach to address the unacceptable risks posed by GE's PCBs while also emphasizing protection of sensitive habitat.

With respect to the floodplain, GE's PCB contamination is causing unacceptable risks throughout the Rest of River floodplain, as well as in the riverbed, riverbanks, Backwaters, and related Rest of River areas. That being the case, activity in the floodplain is necessary to address the floodplain risks and to support the activities to clean up GE's PCBs in other Rest of River areas. These remediation activities in the floodplain will be temporary, and they will be restored after remediation. In addition, the proposed remedy is designed to minimize impacts on flood storage capacity from cleanup activities. For example the Engineered Caps used in several remedy components will be designed and placed so that they will not decrease flood storage capacity. In addition, the remedy will comply with regulatory standards on floodplain management.[303]

Regarding wetlands, significant levels of contamination exist in wetlands within the Rest of River. EPA has determined that its proposed remedy is the least environmentally damaging practicable alternative. [304] EPA will minimize potential harm and avoid adverse impacts on wetland resources, to the extent practical, by using best management practices to minimize harmful impacts on the wetlands, wildlife and habitat. The Restoration Performance Standards cited above include wetland habitat among those areas for which GE must implement a comprehensive program of restoration measures, and return such areas to pre-remediation conditions to the extent feasible and consistent with the remediation requirements.[305]

4. Massachusetts Water Quality Certification Regulations:

Requirements: These regulations govern the discharge of dredged or fill material, dredging, and dredged material disposal in waters of the United States within the

[302] Intended Final Decision, at II.B.1.c(1).
[303] Statement of Basis, at 40.
[304] Statement of Basis, at 40.
[305] Intended Final Decision, at II.B.1.c.

Commonwealth. They are applicable to the proposed remedy, and EPA has stated that all activities will be conducted in accordance with these regulations.[306]

GE Position: GE argues that EPA cannot show that there is no practicable alternative with less adverse impact on the aquatic ecosystem, that the proposed remedy would necessarily have an adverse effect on the estimated habitats of rare wildlife species, and that application of the 1:1 restoration/replication requirements to acquisition or construction of new wetlands as compensatory mitigation would be unauthorized.

EPA Position: First, EPA evaluated many alternatives to address the criteria in the Permit, and determined that the proposed remedy is the alternative best suited to satisfy the Permit criteria. The proposed remedy is designed to reduce the unacceptable risks posed by GE's PCB contamination, while at the same time to avoid, minimize and mitigate risks to habitat. There is no other practicable alternative that reduces unacceptable PCB risks while protecting habitat with less adverse impact on the aquatic ecosystem.

Although GE is correct in that 314 CMR 9.06(2) generally prohibits any project involving the discharge of dredged or fill material that will have any adverse effect on specified habitat sites of Rare Species, GE's argument ignores other pertinent aspects of the regulations that allow the remedy to go forward. Even with that general prohibition, projects that involve the discharge of dredged or fill material in protected resource areas are otherwise permissible under 314 CMR 9.06(2) if appropriate and practicable steps are taken, such as a minimum of 1:1 restoration or replication, to avoid and minimize potential adverse impacts. Furthermore, the prohibition in 314 CMR 9.06(2) may be overcome by meeting the criteria at 314 CMR 9.08 applicable to variances, including taking all reasonable measures to avoid, minimize, and mitigate adverse effects on the environment and demonstrating the action is justified by an overriding public interest.

The Commonwealth has affirmed that there exists an overriding public interest in waiving the prohibition in 314 CMR 9.06(2) because the proposed remedy is designed to reduce the unacceptable risks posed by GE's PCB contamination while at the same time avoiding, minimizing, and mitigating the risks posed to the habitat of Rare Species. In addition, to meet the criterion for a variance of the prohibition in 314 CMR 9.06(2) on projects that will have any adverse effect on specified habitat sites of Rare Species, the proposed remedy provides for taking all reasonable measures to avoid, minimize, and mitigate adverse effects on the environment. Massachusetts Department of Environmental Protection ("MassDEP") generally seeks to coordinate implementing its regulations regarding the protection of habitat of Rare Species with the Division of Fisheries and Wildlife's Natural Heritage and Endangered Species Program in the Massachusetts Department of Fish and Game ("Natural Heritage Program"). This criterion is met through the development and implementation of a Conservation and Management Plan to provide for a long-term Net Benefit to such habitat sites in accordance with the Massachusetts Endangered Species Act regulations.[307] Finally, MassDEP has determined that the proposed remedy is otherwise permissible under 314 CMR 9.06(2) because appropriate and practicable steps will be taken,

[306] Attachment C to the Intended Final Decision, at 8.

[307] *See* EPA's Statement of Position at Section III.C.2 on the application of the MESA Conservation Plan/Net Benefit Requirement in the context of GE's implementation of the Rest of River remedy.

including a minimum of 1:1 restoration or replication, to avoid and minimize potential adverse impacts on protected resource areas.

As EPA addresses in Section III.D.2 of this Statement of Position, EPA disagrees with GE's characterization of the requirements for potential compensatory mitigation projects.

5. Massachusetts Wetlands Protection Act Regulations:

Requirements: These regulations govern activities in wetlands. EPA has stated that all remedy activities will be conducted in accordance with these standards.[308] As EPA describes in Attachment C to the Intended Final Decision, the proposed remedy satisfies the criteria for a "limited project", per 310 CMR 10.53(3), where there are no practicable alternatives to the response action that would be less damaging to resource areas, and where impacts to resource areas are minimized.

GE Position: GE asserts that (1) there are practicable, protective and less damaging alternatives, and (2) that (a) Section 10.59 of the regulations prohibits projects that would have short-or long-term adverse effects on the habitat of a local population of a state-listed species, without mention of a MESA Conservation and Management Plan, and (b) that EPA's remedy would have such impacts.

EPA Position: EPA has evaluated thoroughly many different alternative approaches to addressing the risks posed by GE's PCB contamination in the wetlands of Rest of River. In its review, there was no practicable remedy that addresses the unacceptable risks to human health and the environment that included less adverse impacts on wetlands. EPA has considered alternatives to avoid adverse impacts, and has required specific steps to minimize harm to the floodplain and to ensure that no practicable alternative has less adverse impact on the wetlands. EPA's proposed remedy includes specific Performance Standards on Restoration of Areas Disturbed by Remediation Activities, which require GE to:

> 1. Implement a comprehensive program of restoration measures that addresses the impacts of the Corrective Measures on all affected ecological resources, species and habitats, including but not limited to, riverbanks, riverbed, floodplain, wetland habitat, and the occurrence of threatened, endangered or state-listed species and their habitats; [309], and
>
> 2. Return such areas to pre-remediation conditions (e.g., the functions, values, characteristics, vegetation, habitat, species use, and other attributes), to the extent feasible and consistent with the remediation requirements.[310]

GE is correct that Rest of River response actions are "limited projects" within the meaning of 310 CMR 10.53. 310 CMR 10.53(3) states that "no [limited] project may be permitted which will have any adverse effect on specified habitat sites of Rare Species, as identified by procedures established under 310 CMR 10.59[]." Since 2006, MassDEP has continued to maintain a written policy entitled "DWW Policy 06, Procedures for Coordinated review Under the Endangered Species and Wetlands Protection Regulations for State-Listed

[308] Attachment C to the Intended Final Decision, at 10.
[309] Intended Final Decision, at Section II.B. 1.c.
[310] Intended Final Decision, at Section II.B.1.c..

Wildlife in Wetlands" (the "Policy") that is applied in determining whether a project will have any adverse effect on such sites. As MassDEP explains in the Policy:

> Pursuant to 321 CMR 10.00, the Natural Heritage Program reviews any project proposed for state-listed species habitat. When a project is proposed in estimated habitat in wetland resource areas, it is also subject to MassDEP's wetlands regulations. In fulfilling its responsibilities under 321 CMR 10.00, the Natural Heritage Program considers whether a take will occur under 321 CMR 10.18 and whether it can be permitted under 321 CMR 10.23. A set of conditions that avoid a take under 321 CMR 10.18, will be presumed to not have an adverse effect on the habitat of state-listed wildlife species pursuant to 310 CMR 10.37 and 10.59. It makes sense for the Natural Heritage Program to make these determinations at the same time as it fulfills its obligations under MassDEP's wetlands regulations.
>
> As provided in 310 CMR 10.37 and 10.59, when a project is proposed in estimated habitat, the issuing authority relies on the Natural Heritage Program's opinion as to whether a proposed project has any short or long-term effect on the habitat of the local population of any state-listed wildlife species. Accordingly, when the Natural Heritage Program makes a determination pursuant to 321 CMR 10.23, that a project may proceed pursuant to a conservation and management permit, this determination shall be presumed to satisfy the standard for no short or long-term adverse effect pursuant to the wetlands regulations (310 CMR 10.37 and 10.59.)

MassDEP has affirmed for EPA that consistent with the above MassDEP's written policy as applied in the context of GE's implementation of the Rest of River remedy pursuant to CERCLA[311], an EPA determination, made in consultation with the Natural Heritage Program, that a response action with an adverse effect on a specified habitat site of Rare Species will be mitigated through a Conservation and Management Plan providing a Net Benefit to the affected State-listed species as a whole will satisfy MassDEP's substantive standards under 310 CMR 10.53(3) and 10.59.

6. Massachusetts and Connecticut Dam Safety Regulations:

Requirements: The Rest of River includes six dams in Massachusetts, and six dams in Connecticut. Many of those dams are in areas where PCB contamination has been found, in some instances at highly elevated levels. The EPA Intended Final Decision includes several project components dealing with PCBs in relation to the dams, such as addressing PCB-contaminated sediment in impoundments behind dams,[312] ensuring inspection, monitoring and maintenance,[313] and responding to a PCB release due to a dam breach or failure.[314] In EPA's listing of ARARs,[315] EPA listed the two states' dam safety regulations as "potentially applicable".

[311] For relevant background, see EPA's Statement of Position on the MESA Conservation Plan/Net Benefit Requirement at Section III.D.2.
[312] Intended Final Decision, Section II.B.2.e, f, g.
[313] Intended Final Decision, Section II.B.2.j.
[314] Intended Final Decision, Section II.B.2.l.
[315] Intended Final Decision, Attachment C, ARAR Table, at 11, 14

GE Argument: GE does not dispute that the Massachusetts Dam Safety Standards constitute ARARs for the dams currently owned by GE, Woods Pond Dam and Rising Pond Dam. For other dams, GE asserts that the Federal Energy Regulatory Commission (FERC) preempts state jurisdiction on some dams, and that for others, the regulations clearly establish responsibilities of non-party dam owners, not GE.

EPA Position: As noted above, EPA listed these as "potentially applicable" requirements. EPA recognizes that if responsibilities for a particular dam are subject to preemption by FERC, the state dam safety ARAR would not be applicable. Other than Woods Pond and Rising Pond Dams, if in the future, GE becomes owner or operator of any Rest of River dam for which FERC does not preempt dam safety regulations, the ARAR would be applicable for such dam(s). Finally, as described above in Section III.B.4-5 of this Statement of Position, these ARAR requirements are in addition to the other responsibilities related to dams in the Intended Final Decision, which, unless specifically provided, are not dependent on the dam safety regulations being applicable.

7. Massachusetts Location Standards for Hazardous Waste Management Facilities

Requirements: These requirements provide locational requirements for hazardous waste management facilities, including restrictions on hazardous waste facilities in an ACEC.

The Intended Final Decision includes excavation of PCB-contaminated soil and sediment and the off-site disposal of such excavated soil and sediment. The Intended Final Decision does not require disposal at a hazardous waste disposal site in the ACEC. However, prior to transportation of the excavated soil and sediment to its off-site disposal location, the Intended Final Decision provides for temporary management of excavated soil and sediment at locations near the River, some of which would be within the ACEC. The temporary management may include temporary stockpiling or accumulation of materials, and may include locations related to railroad transport of excavated materials. Also, the remedy includes restoration of the temporarily used areas -- for each area disturbed during remedy implementation, including those within the ACEC, the remedy includes provisions for restoration of what is disturbed by the temporary management of the excavated material.

These regulations prohibit permanent disposal locations within an ACEC. As specified in Attachment C to the Intended Final Decision, to the extent that the provisions of 310 CMR 30 apply to temporary management of excavated materials prior to disposal off-site, and if the temporary management occurs within or in close proximity to the ACEC, and the materials being temporarily managed are subject to these regulations, EPA, in consultation with the Commonwealth, considers as waived, pursuant to CERCLA 121(d)(4)(c), the requirements of 310 CMR 30 that prohibit such temporary management locations during remedy implementation.

GE Position: GE argues that if EPA waives the ARAR relating to temporary management of materials, EPA should also select on-site disposal and extend that ARAR waiver analysis to permanent, not temporary, disposal of hazardous waste within the ACEC.

EPA Position: EPA disagrees. Placement of a permanent disposal facility is clearly within the scope of the regulations. Moreover, the temporary and permanent effects on the resources of the ACEC are very different. With temporary management of waste, followed by

restoration of disturbed areas, there will be only short-term impacts on the resources of the ACEC. Such short-term impacts are dramatically different than the impacts on the resources of the ACEC associated with construction of a hazardous waste disposal facility, which will impact the resources of the ACEC in perpetuity. In addition, removal of GE's PCBs to reduce the unacceptable health risks cannot be implemented without temporary impacts to the resources of the ACEC, whereas the remedy can be implemented without allowing permanent impacts to the resources of the ACEC that would result from construction of a hazardous waste disposal facility. Permanent on-site disposal within the ACEC at GE's preferred Woods Pond landfill location, would require waivers of these waste facility siting regulations. Since off-site disposal is a viable alternative, technical impracticability does not provide a basis for this waiver, and there is no other basis for a waiver.

8. Massachusetts Site Suitability Criteria for Solid Waste Facilities:

Requirements: These requirements provide criteria for placement in Massachusetts of solid waste facilities, including restrictions for placement of a solid waste facility in an ACEC.

The Intended Final Decision includes excavation of PCB-contaminated soil and sediment and the off-site disposal of such excavated soil and sediment. The Intended Final Decision does not require disposal at a solid waste disposal site in the ACEC. However, prior to transportation of the excavated soil and sediment to its off-site disposal location, the Intended Final Decision provides for temporary management of excavated soil and sediment at locations near the River, some of which would be within the ACEC. The temporary management may include temporary stockpiling or accumulation of materials, and may include locations related to railroad transport of excavated materials. Also, the remedy includes restoration of the temporarily used areas -- for each area disturbed during remedy implementation, including those within the ACEC, the remedy includes provisions for restoration of what is disturbed by the temporary management of the excavated material.

These regulations prohibit permanent disposal locations within an ACEC. As further described in Attachment C to the Intended Final Decision, to the extent that the provisions of 310 CMR 16 apply to temporary management of materials after excavation and prior to off-site disposal, and if the temporary management occurs within or in close proximity to the ACEC, and the materials being temporarily managed are subject to these regulations, EPA, in consultation with the Commonwealth, considers as waived, pursuant to CERCLA 121(d)(4)(c), the requirements of 310 CMR 16.40 that prohibit such temporary management locations during remedy implementation.

GE Position: GE makes three arguments: (1) that these requirements should be waived because the State has not applied the requirements to on-site waste management/disposal facilities at other sites in Massachusetts, or at the GE-Housatonic Site; (2) that EPA should waive the requirements for permanent disposal under the same analysis as EPA proposes to waive the ARAR for temporary stockpiling of solid waste; and (3) that if the regulations do apply, the prohibition on siting a solid waste handling facility in a Riverfront Area (within 200 feet of a flowing waterbody) would need to be waived as technically impracticable from an engineering perspective.

EPA Position: As to the application of requirements by the State, CERCLA Section 121(d) requires each remedial action to achieve the ARARs, unless a specific reason for a waiver of the ARAR exists. One basis for a waiver is if a State has not consistently applied (or

demonstrated the intention to consistently apply) the regulations in similar circumstances at other remedial actions within the State.

The Commonwealth timely identified 310 CMR 16 as an ARAR for this remedial action. Moreover, contrary to GE's implication, the Commonwealth has in fact cited 310 CMR 16 as an ARAR at prior remedial action sites.[316]

With respect to the other response actions at the GE-Housatonic Site, none of the response actions were performed as CERCLA remedial actions and therefore the ARAR provisions did not apply. Moreover, for the GE-Pittsfield/Housatonic River Site Removal Action cited by GE in its 2014 Comments, the Building 71 On-Plant Consolidation Area, listing the Site Suitability Criteria as an ARAR was not necessary. Specifically, the Building 71 Consolidation Area: was designed to handle hazardous waste, not solid waste: was not within or adjacent to an ACEC; was in an area with existing groundwater contamination and at or adjacent to areas with soil contamination: and included capping to meet RCRA and TSCA requirements.

For other Massachusetts sites, there are several reasons why the 310 CMR 16 regulations were not listed as ARARs. Specifically:

- For New Bedford Harbor, the disposal areas: were not located within or adjacent to an ACEC; consisted of Confined Disposal Facility or Confined Aquatic Disposal, not an upland landfill; were constructed in areas already contaminated; and were designed to meet RCRA and TSCA requirements.
- At Sullivan's Ledge: the disposal area was not located within or adjacent to an ACEC; the remedy did not expand the footprint of the existing disposal area or create a new disposal facility; the remedy required the consolidation of all excavated material into an existing disposal area; and the remedy required a cap designed to meet RCRA and TSCA requirements.
- At Silresim Chemical Corporation, the remedy called for all excavated material to be disposed of under a RCRA-equivalent cap; the disposal area was not located within or adjacent to an ACEC; the remedy did not expand the footprint of the existing disposal area or create a new disposal facility; and the remedy required the consolidation of all excavated material into an existing on-site disposal area.
- At the Norwood PCBs Site, the remedy called for all excavated material to be disposed of on-site in a manner that met TSCA requirements; the disposal areas were not located within or adjacent to an ACEC; the remedy did not expand the footprint of the existing disposal area or create a new disposal facility; and required capping that met TSCA requirements.

Decisions not to list 310 CMR 16 as an ARAR at these sites were because application of those regulations was not necessary.

GE claims that if the ARAR is legitimate for this action, the ARAR waiver proposed by EPA should be extended not just to temporary management of materials prior to disposal off-

[316] *See*, e.g., Norwood PCBs Site, 1996; Fort Devens Operable Unit 2 Decision, 1999.

site, but to the permanent disposal within the ACEC of solid waste generated in the cleanup. EPA disagrees. Placement of a permanent disposal facility is clearly within the scope of the regulations. Moreover, the temporary and permanent effects on the resources of the ACEC are very different. With temporary management of waste, followed by restoration of disturbed areas, there will be only short-term impacts on the resources of the ACEC. Such short-term impacts are dramatically different than the impacts on the resources of the ACEC associated with construction of a hazardous waste disposal facility, which will impact the resources of the ACEC in perpetuity. In addition, removal of GE's PCBs to reduce the unacceptable health risks cannot be implemented without temporary impacts to the resources of the ACEC, whereas the remedy can be implemented without allowing permanent impacts to the resources of the ACEC that would result from construction of a hazardous waste disposal facility. Permanent on-site disposal within the ACEC at GE's preferred Woods Pond landfill location would require waivers of these waste facility siting regulations. Since off-site disposal is a viable alternative, technical impracticability does not provide a basis for this waiver, and there is no other basis for a waiver.

Finally, as to GE's argument about a waiver of the Riverfront Area requirements, the provision would be potentially applicable like other provisions in 310 CMR 16. To the extent that (1) the provisions of 16.40 apply to the temporary management of materials during implementation of the remedy after excavation and prior to off-site disposal; (2) the materials temporarily managed on-site during implementation of the remedy constitute solid waste under the regulation; and (3) the locations for management of materials include Riverfront Area(s) pursuant to the regulations, EPA, in consultation with the Commonwealth, considers as waived, pursuant to CERCLA 121(d)(4)(C), the requirements of 16.40 that prohibit or restrict such temporary management locations during implementation of the remedy.

9. MESA:

In its reference to the MESA ARAR in the Statement of Position (pages 40-41),, GE has raised the same arguments as it makes regarding MESA at pages 34-35 of its brief. That being the case, EPA's position regarding the MESA ARAR dispute is the same as EPA's position at Section III.C.2 above.

IV. CONCLUSION

As the foregoing demonstrates clearly, the arguments in GE's Statement of Position should be rejected, and EPA's Intended Final Decision affirmed. For over a decade, EPA has followed faithfully the remedy decision-making process provided in the Consent Decree and Permit, including scientific information gathering and technical analysis, multiple reviews by independent peer-review panels, and an extraordinary number of process opportunities for both GE and the public. EPA relied upon its technical expertise and objectivity, along with input from GE and the public, in analyzing alternatives in light of the relevant criteria in the Permit and information in the Administrative Record. Based on that analysis, EPA proposed a balanced, reasonable remedial approach, rejecting more costly and intrusive alternatives, as well as alternatives with less health protection and less cost.

EPA has carefully considered GE's arguments, and has identified herein particular modifications or clarifications that EPA is willing to make in the final Permit to address GE's concerns. For example, see the clarification as to the obligation to address a Legally

Permissible Change in Use or Future Project or Work at properties with PCBs contamination less than 2 mg/kg in Section III.B.2 above, the Section III.B.4 statement of three potential modifications to Inspection, Maintenance and Monitoring of non-GE-owned dams, the Section III.C.2 clarification regarding the MESA regulations, and Section III.D.8's clarification regarding the Riverfront Area requirements in 310 CMR 16.

However, the great majority of GE's arguments, are premised on a skewed evaluation that focuses almost exclusively on minimizing GE's costs and shifting environmental risks and additional costs to the public. That distorted approach should be rejected. The record is clear that the Intended Final Decision is the remedy best suited to meet the Permit's general standards in consideration of the decision factors, including a balancing of those factors against one another.

For the reasons stated above, EPA's Intended Final Decision should be upheld consistent with this Statement of Position.

TABLE 1

ABBREVIATIONS

ACEC	Areas of Critical Environmental Concern
ARARs	Applicable or Relevant and Appropriate Requirements
CAA	Clean Air Act
CCC	Citizens Coordinating Council
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CMS	Corrective Measures Study
CMP	Conservation and Management Permit
CMR	Code of Massachusetts Regulations
CPUE	Catch Per Unit Effort
CSTAG	Contaminated Sediments Technical Advisory Group
CT DEEP	Connecticut Department of Energy and Environmental Protection
CTE	Central Tendency Exposure
CY	Cubic Yards
DEDA	Definitive Economic Development Agreement
EA	Exposure Area
EAB	Environmental Appeals Board
EO	Executive Order
EPA	Environmental Protection Agency
ERA	Ecological Risk Assessment
ERE	Environmental Restriction and Easements
FERC	Federal Energy Regulatory Commission
GE	General Electric
HEAST	Health Effects Assessment Summary Table
HHRA	Human Health Risk Assessment
IMPG	Interim Media Protection Goal
IRIS	Integrated Risk Information System
LOAEL	Lowest Observed Adverse Effect Level
MA DEP/MassDEP	Massachusetts Department of Environmental Protection
Mass FWB	Massachusetts Fisheries and Wildlife Board
Mass NHESP	Massachusetts Natural Heritage and Endangered Species Act
MATC	Maximum Acceptable Threshold Concentration
MCP	Massachusetts Contingency Plan
MESA	Massachusetts Endangered Species Act
MNR	Monitored Natural Recovery
NCP	National Contingency Plan
NRD	Natural Resource Damages
NRRB	National Remedy Review Board
O&M	Operation and Maintenance

PCB	Polychlorinated biphenyls
PSA	Primary Study Area
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RME	Reasonable Maximum Exposure
ROD	Record of Decision
ROR	Rest of River
SOP	Statement of Position
SOW	Statement of Work
SWAC	Surface Weighted Average Concentration
TLC	Thin Layer Capping
TSCA	Toxic Substance Control Act.

Table 2.

Sites Included in Exhibit A of GE's Statement of Position that had Off-site Disposal of PCB-contaminated Sediment/Soils

Site	**Information Cited in GE's Exhibit A (On-site Disposal Volume/Type of Disposal)**	**Actual Total Volume Sediment/Soils Disposed <u>On</u>-site**	**Actual Total Volume Sediment/Soils Disposed <u>Off</u>-site**	**Source/Basis**
GE Housatonic, including Upper ½ Mile and 1 ½ mile reaches R1 / MA	245,000 yds^3 / Placement in two on-site consolidation areas at GE Plant – a new one for TSCA and RCRA regulated material and an existing one for other material.	245,000 yds^3 disposed on-site.	Approximately 125,000 to 135,000 yds^3 to be disposed off-site (excluding Rest of River).	CD (2000) Interview with Dean Tagliaferro, EPA RPM, January 2016
New Bedford R1 / MA	up to 550,000 yds^3 / Disposed in on-site CAD in Lower Harbor.	19,000 yds^3 disposed in on-site Pilot Study CDF. 300,000 yds^3 projected to be disposed in CAD cell in Lower Harbor.	As of 12/4/15, 384,421 yds^3 disposed off-site. 229,579 yds^3 projected additional to be disposed off-site.	OU 2: 1990 ROD 1992 ESD 1995 ESD 1999 Amended ROD OU 1: 1998 ROD 2001 ESD 2002 ESD 2010 ESD 2011 ESD 2015 ESD Interview with Elaine Stanley, EPA RPM 1/12/16-1/20/16
Norwood PCBs R1 / MA	20,000 yds^3 / Consolidation of soils and sediments into portion of site to be covered with TSCA-compliant multi-layer cap.	20,000 yds^3 consolidated and capped on-site.	Approximately 500 yds^3 disposed off-site (1983 removal action).	ROD Amended (1996) Interview with Dan Keefe, EPA RPM, 1/19/16
Grand Calumet River R5 / IN	~800,000 yds^3 / On-site disposal of sediments in a RCRA CAMU.	Approximately 800,000 yds^3 disposed on-site in RCRA CAMU as part of U.S. Steel site remediation.	150,000-200,000 yds^3 disposed off-site.	AOC under RCRA (1998) CD under CWA (1998) Interview with Dianna Mally, EPA Project Mgr 1/21/16

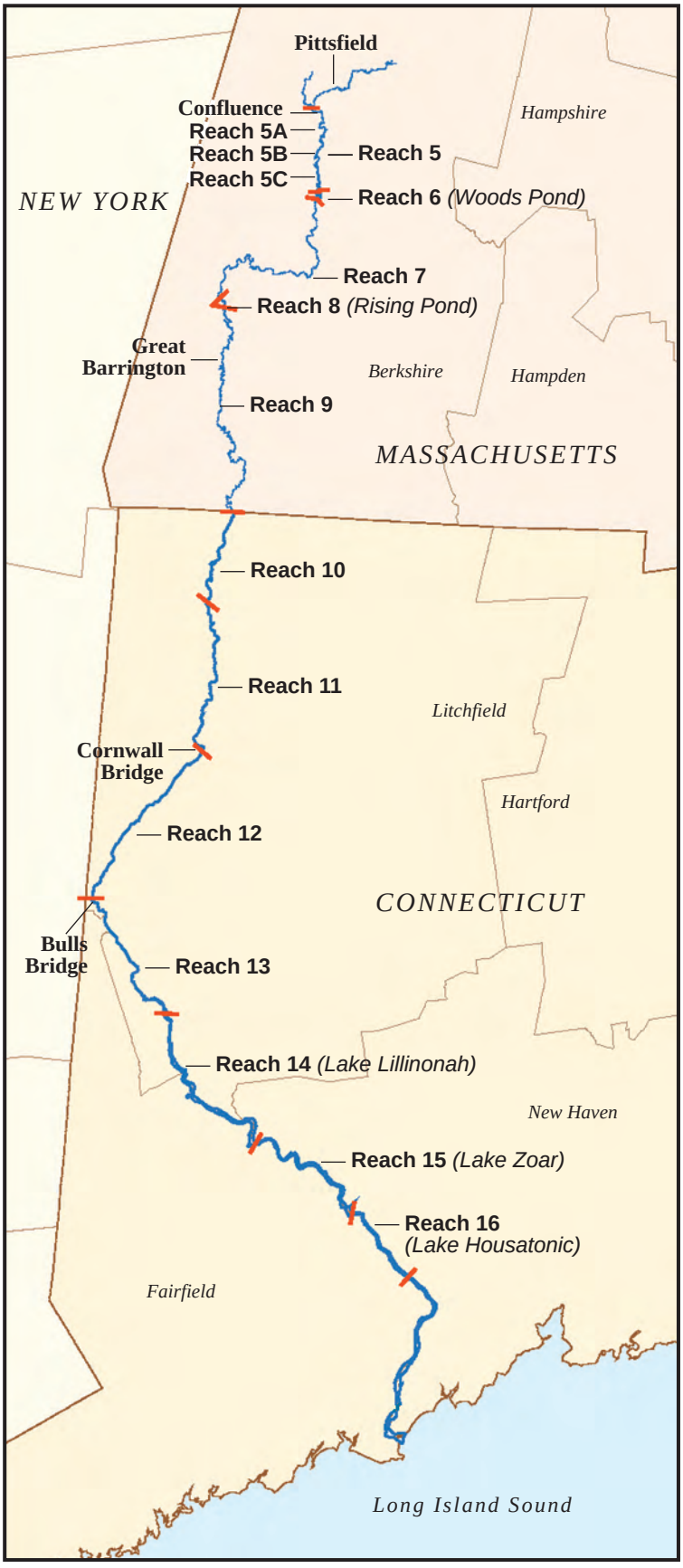
Site	Information Cited in GE's Exhibit A (On-site Disposal Volume/Type of Disposal)	Actual Total Volume Sediment/Soils Disposed On-site	Actual Total Volume Sediment/Soils Disposed Off-site	Source/Basis
Lower Fox River R5 / WI	81,000 yds^3 /disposal at local industrial landfill owned by PRP located approximately 6 miles away.		3,694,000 yds^3 as of 8/1/15 disposed off-site. Volume includes 81,000 yds^3 from 2000 removal action disposed off-site in Greenbay, WI landfill owned by PRP Fort James Corp. The additional dredged volumes were disposed at facilities in Whitelaw, WI (TSCA), Chilton, WI (non-TSCA), and at two facilities in Michigan.	AOC (2000) see also final report on project (2000) NPL Fact Sheet (2015) Interview with Jim Hahnanberg, EPA RPM in August 2015 and with Susan Pastor, EPA Community Involvement Coordinator, January 2016
Ashtabula River R5 / OH	500,000 yds^3 /On-site disposal on PRP's property.		509,000 yds^3 sediment pumped through a 2.5 mile pipeline to a sediment confinement facility on the Fields Brook site in Ashtabula, OH (owned by a PRP).	Fact Sheet (May 2008) Interview with Owen Thompson, EPA Project Manager for Fields Brook site, 1/27/16
Ottawa River R5 / OH	250,000 yds^3 / disposal of sediments (except from limited hotspots) in nearby landfill.		239,877 yds^3 disposed off-site (includes 220,000 yds^3 non-TSCA regulated disposed at Hoffman Road Landfill, Toledo, OH; 19,877 yds^3 TSCA-regulated disposed out-of-state).	Ottawa River Legacy Act Cleanup (2010) Interview with Scott Cieniawski, EPA Project Mgr., August 2015
River Raisin R5 / MI	109,000 yds^3 / On-site disposal of less contaminated sediment (106,000 cy) at CDF 2 miles north of river mouth. Off-site disposal of the most contaminated sediment (3,000 cy).		72,250 yds^3 (includes 70,000 yds^3 non-TSCA regulated disposed at USACE Sterling State Park CDF approx. 2 miles north of River Raisin mouth; 2,250 yds^3 TSCA regulated disposed at Wayne Disposal, Belleville, MI).	River Raisin Legacy Project (2012) Interview with Scott Cieniawski, EPA Project Mgr., August 2015
Outboard Marine Corporation Site / Waukegan Harbor R5 / IL	OU 2: 124,000 yds^3 / On-site disposal at Outboard Marine Corporation Plant 2 property at newly constructed sediment consolidation facility.	126,000 yds^3 from Waukegan Harbor consolidated in on-site containment cells including approximately 12,000 yds^3 that were thermally treated prior to placement in cells, resulting in 30,000 gallons of removed PCBs, being disposed off-site.	Approximately 46,000 yds^3 from Outboard Marine Corp. Plant 2 property disposed off-site under 2006 removal action and 2007 ROD.	ROD (2009) ROD (2007) Fourth Five-Year Review (2012) ESD (2012) Interview with Timothy Drexler, EPA RPM, January 2016
Allied Paper / Portage Creek (including Bryant Mill Pond) / Kalamazoo River R5 / MI	OU3: 4,000 yds^3 / Consolidation of soil/sediment into existing on-site landfill to be capped. Bryant Mill Pond: ~150,000 yds^3 / Disposal in on-site former dewatering lagoons on PRP property.	154,000 yds^3 disposed on-site in Allied Landfill.	166,127 yds^3 disposed off-site from various removal actions. 30,800 yds^3 projected to be disposed off-site under 2015 ROD for Kalamazoo River.	Bryant Pond Time Critical Removal Action (1999) RODs (1998, 2015) Interview with Jim Saric, EPA RPM, January 2016

Site	Information Cited in GE's Exhibit A (On-site Disposal Volume/Type of Disposal)	Actual Total Volume Sediment/Soils Disposed On-site	Actual Total Volume Sediment/Soils Disposed Off-site	Source/Basis
Fields Brook R5 / OH	14,000 yds^3 / Off-site thermal treatment of most contaminated sediment (3,000 cy). Disposal of other excavated sediments (11,000 cy) at on-site TSCA-equivalent landfill.	Approximately 41,514 yds^3 disposed on-site.	Over 729,079 yds^3 disposed off-site.	ROD (1986) ESDs (1997, 1999, 2001) Third Five-Year Review (2014) Interview with Owen Thompson, EPA Project Manager, 1/27/16
Twelve Mile Creek R4 / SC [Sangamo Weston / Twelve Mile Creek/Lake Hartwell)	Volume not specified / On-site disposal of sediments dredged from behind dams at upland SMU proximate to site.		450,000 yds^3 non-TSCA regulated disposed in off-site landfill constructed on parcel purchased by PRP located adjacent to the site.	ESD (2009) Interview with Craig Zeller, EPA RPM, 1/25/2016
Reynolds Metal / St. Lawrence River R2 / NY	77,600 yds^3 /On-site disposal of sediments with PCBs < 50 ppm at industrial landfill on PRP property with RCRA cap. Off-site disposal of sediments with PCBs > 50 ppm.	69,000 yds^3 non-TSCA regulated disposed on-site.	16,655 yds^3 TSCA- regulated disposed off-site.	Decision Document Amend (1998) Interview with Pam Tames, EPA RPM 1/20/16
Commencement Bay: Thea Foss/Wheeler-Osgood Waterways R10 / WA[1]	620,000 yds^3 / Disposal of contaminated sediments in on-site near-shore fill area (St. Paul near-shore fill area).	422,535 yds^3 disposed in a CDF at the head of the St. Paul Waterway.	Approximately 5,000 yds^3 from Thea Foss disposed in permitted off-site, upland facility located in Pierce County, WA.	ESD (2004) Five-Year Review (2004) Remedial Action Construction Report (2006) Third Five-Year Review (2009) Fourth Five-Year Review (2014) Interview with William Ryan, EPA RPM, February 2016

[1] The Commencement Bay Superfund site has several operable units. Only those for which PCBs were a major constituent of dredged sediment were included in this table. The CDFs which received sediment from the operable units discussed above also received sediment from other operable units/projects.

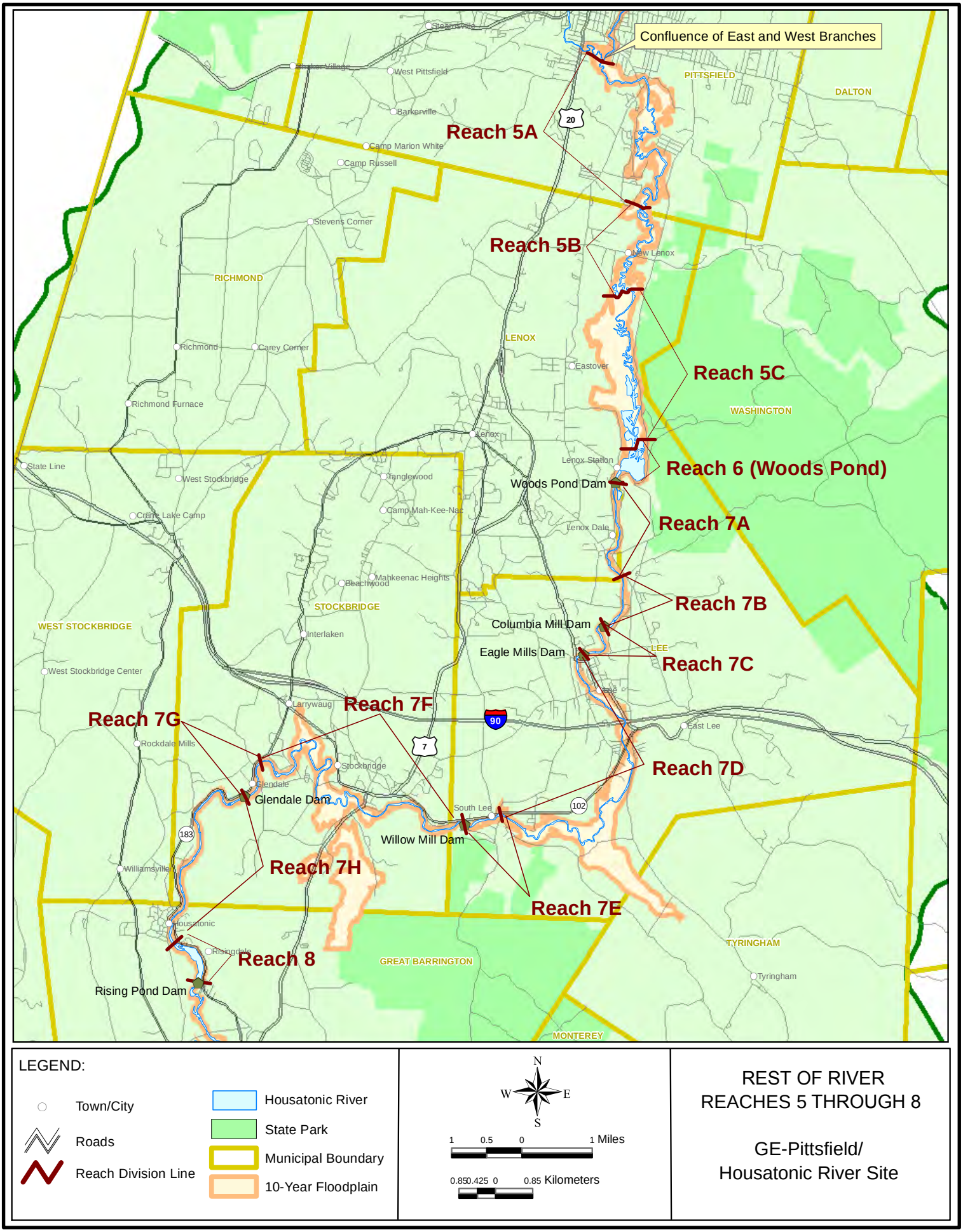
Site	Information Cited in GE's Exhibit A (On-site Disposal Volume/Type of Disposal)	Actual Total Volume Sediment/Soils Disposed On-site	Actual Total Volume Sediment/Soils Disposed Off-site	Source/Basis
Commencement Bay / Hylebos Waterway R10 / WA	940,000 yds^3 / Disposal of contaminated sediments at local near-shore man-made slip (Blair Slip 1) converted to CDF and at upland regional landfill.	493,000 yds^3 disposed in the Blair Slip 1 Nearshore Confined Disposal Facility (NCDF) created by the Port of Tacoma, a PRP, as a dual purpose use: a shipping terminal has been constructed on top.	135,000 yds^3 less contaminated sediment disposed in Dredged Material Management Program (DMMP) which is located in open water in Commencement Bay, but manages material dredged to maintain navigational waterways and berth depths in the state of Washington. 405,000 yds^3 dredged from the head of the Hylebos disposed at Roosevelt Regional Subtitle D Landfill in central Washington (located over 200 miles from Commencement Bay).	Third Five-Year Review (2009) Fourth Five-Year Review (2014) Interview with Jonathan Williams, EPA RPM, 2/5/2016
Commencement Bay/ Olympic View Resource Area R10 / WA			2002 Non-Time Critical Removal Action: Approximately 11,000 yds^3 of contaminated sediment and debris were removed from the nearshore area and disposed of in an off-site upland landfill.	Third Five-Year Review (2009) Fourth Five-Year Review (2014)

FIGURE 1



REST OF RIVER (REACHES 5 THROUGH 16)

FIGURE 2



LEGEND:

- Town/City
- Roads
- Reach Division Line
- Housatonic River
- State Park
- Municipal Boundary
- 10-Year Floodplain

N W E S

1 0.5 0 1 Miles

0.85 0.425 0 0.85 Kilometers

REST OF RIVER
REACHES 5 THROUGH 8

GE-Pittsfield/
Housatonic River Site

Attachment A

Timeline for Opportunities for GE and the Public to Comment during Rest of River Process

For nearly two decades, EPA has made extraordinary efforts to solicit and respond to the views of GE, other stakeholders, and the rest of the public throughout the Rest of River process.

-In 1998, a year prior to EPA lodging the Decree, EPA established a Citizens Coordinating Council ("CCC") made up of over 30 environmental, business and community leaders from Berkshire County and Connecticut. The CCC provides a participatory forum for the governments, and sometimes GE, to discuss with the public the status of cleanup, and other activities at the Site, and to obtain feedback from the CCC, and to answer questions. For many years, during periods of most active remediation, the CCC met monthly. Currently, the CCC meets four times a year.

-EPA subjected its human health and ecological risk assessments, and three of its modeling documents, to independent peer review. As part of these independent peer reviews, all stakeholders were invited to present their views to the peer reviewers. Following hearing the positions of the peer reviewers, EPA adjusted its work products if necessary.

-From 2000-2005, EPA conducted human health and ecological risk assessments of the Rest of River, and submitted those risk assessments to peer review by panels of independent risk assessment experts. GE and other members of the public were provided the opportunity to present their views to the scientific peer review panels. GE also performed its own studies as part of the risk assessment processes. CD ¶ 22.b-e.

-From 2001-2006, EPA conducted modeling of the fate, transport and bioaccumulation of PCBs in the Rest of River down through Reach 8, and submitted three different modeling documents to peer review by panels of independent modeling experts. In each of the three independent modeling peer reviews, GE and other members of the public were provided the opportunity to present their views to the scientific peer review panels. CD ¶ 22.g-i.

-In 2003, GE submitted, and EPA approved, a RCRA Facility Investigation Report that included data on the scope and concentrations of PCB contamination in Rest of River;

-In 2005-2006, GE developed and submitted, and EPA approved, Interim Media Protection Goals for the Rest of River. CD ¶ 22.f.

-In 2007, GE submits its Corrective Measures Study Proposal (or Work Plan for the CMS)

-In 2008, GE developed and submitted a Corrective Measures Study ("CMS"), and in 2010 a Revised CMS, each of which included an analysis of alternative approaches to addressing the unacceptable risks posed by the PCBs in the Rest of River.

- In April and May 2011, after reviewing GE's Revised CMS and the public comments received on the Revised CMS, and before EPA made a proposal to its National Remedy Review Board and Contaminated Sediments Technical Advisory Group, EPA held an extraordinary set of public sessions known collectively as a "Charrette." EPA designed and carried out the Charrette to fully inform and involve the overall public, including GE, about EPA's Rest of River remedy decisionmaking. Over the course of three evening sessions in April 2011, EPA and its experts presented information about the Rest of River, PCBs, and sediment remediation to nearly 200 citizens. EPA offered a second full-day Charrette in May 2011, at which citizens weighed remedial alternatives using the Permit's evaluation factors.

-In June-July 2011, EPA Region 1 (the "Region") submitted EPA's proposed remedy to EPA's internal advisory National Remedy Review Board ("NRRB"), and Contaminated Sediments Technical Advisory Group ("CSTAG"). GE and the public presented their views to the NRRB/CSTAG.

-From September 2011 to May 2012, EPA, Massachusetts and Connecticut jointly engaged in remedy discussions, and in May 2012 issued to GE and the public a Status Report of Potential Remediation Approaches for the Rest of River. EPA followed up with multiple public meetings in both Connecticut and Massachusetts to hear public comments on the governments' Status Report.

-From August 2012 – December 2013, at GE's request EPA and GE engaged in technical discussions regarding the proposed remedy.

-In June 2014, pursuant to the procedures in the RCRA Corrective Action Permit, EPA, in consultation with Massachusetts and Connecticut, issued for public comment a Draft Modification to the RCRA Permit, and Statement of Basis ("Draft Permit Modification"). The public comment period, which included a formal public hearing, continued until October 27, 2014. EPA received over 2,100 pages of comments from more than 140 commenters.

In addition to the formal public comment steps called for by RCRA or CERCLA, EPA informally solicited public comments at many steps in the process, including on GE's Interim Media Protection Goals submittals, and GE's CMS proposal, CMS and Revised CMS.

As demonstrated above, in recognition of the broad impact that this remedy will have on the communities lining the Housatonic River, EPA has afforded GE and the public with a virtually unprecedented number of process opportunities. These interactions with the public and GE have assisted EPA in selecting the alternative best suited to satisfy the Permit's remedy selection criteria.

Attachment B

Response to GE's Comments on Toxicity Values Used to Evaluate Human Health Risks

EPA's process for evaluating human epidemiological and animal evidence to determine the carcinogenicity and cancer potencies of chemicals, including PCBs, is set forth in Agency guidelines (USEPA, 1976, 1984, 1986c, 1994, 1996a). The guidelines were developed within the Agency, published in the Federal Register for external comment, and peer reviewed by a panel of expert scientists in the fields of carcinogenesis, toxicity, exposure, and related scientific disciplines from universities, environmental groups, industry, labor, and other governmental agencies. EPA responded to comments on the draft guidelines and made changes based on a review of the comments submitted by these groups and individuals. The guidelines were also submitted for review to EPA's Science Advisory Board, an external scientific review panel. Agency guidelines for assessing carcinogens are consistent with the scientific approaches that are used by national and international agencies (e.g., the National Toxicology Program [NTP, 1984] and the International Agency for Research on Cancer (IARC, 1987) for evaluating the carcinogenicity of chemicals.

EPA's process for evaluating human epidemiological and animal evidence to determine the noncancer toxicity of chemicals, including PCBs, is set forth in the Agency's guidelines (USEPA, 1986a-b, 1991, 1992, 1993a, 1996b, 1998) and the background document on non-cancer toxicity provided on IRIS (USEPA, 1993b). The guidelines cover a variety of health endpoints, including Developmental Toxicity (USEPA, 1986b, 1991); Reproductive Toxicity (USEPA, 1996b); Neurotoxicity (USEPA, 1998); Female Reproductive Risk (USEPA, 1986a); and Male Reproductive Risk (USEPA, 1986a). The guidelines were developed within the Agency, published in the Federal Register for external comment, and peer reviewed by a panel of expert scientists from universities, environmental groups, industry, labor, and other governmental agencies working in various fields associated with non-cancer toxicity, including developmental toxicity, neurological toxicity, endocrine effects, etc. EPA responded to comments on the draft guidelines and made changes based on a review of the comments submitted by these groups or individuals. The guidelines were also submitted for review to EPA's Science Advisory Board, an external scientific review panel.

References

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USEPA. 1996b. Guidelines for Reproductive Toxicity Risk Assessment. Federal Register 61 (212) 56274-56322. 31 October 1996.

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Attachment C

Responses to GE's Comments on EPA's Ecological Risk Assessment and Development of IMPGs for Amphibians, Insectivorous and Piscivorous Birds, and Mink

GE's Statement of Position had discrete arguments regarding the Ecological Risk Assessment ("ERA") and Interim Media Protection Goals ("IMPG") development for amphibians, insectivorous and piscivorous birds, and mink. EPA's specific technical responses are below on each topic. Overall, EPA's work on the ERA and IMPGs was a thorough, reasoned approach using generally accepted practices, as well as establishing an independent, peer-reviewed process, while at the same time soliciting GE and public input.

Amphibians

GE, in its SOP and in Section III.C.2 of its October 2014 comments, criticizes EPA's risk assessment and derivation of the lower-bound IMPG for amphibians. EPA agrees with GE that the derivation of the lower bound IMPG for amphibians (3.3 mg/kg PCB) was based on EPA's field study of wood frogs (calculated using the methodology recommended by the Peer Review Panel) summarized in the ERA,[1] however EPA disagrees with GE's characterization of the amphibian risk assessment and the IMPG.

It is accepted practice in a typical assessment of ecological risk[2] to conduct studies using surrogate or representative species (e.g., wood frogs and leopard frogs) to estimate risks to the larger taxonomic group (e.g. amphibians), as it is impossible to study all effects to all taxa within a group as a practical matter. As discussed in Appendix E of the ERA, this procedure was followed for the amphibian portion of the ERA, in which the results of field studies of wood frogs and leopard frogs were combined with other lines of evidence to reach the conclusion that there is significant risk to local populations of amphibians in the Housatonic River.[3] The majority of the Peer Review Panel agreed with EPA's conclusion.[4]

EPA also disagrees with GE's statement in the SOP that EPA's demonstration of risk to this taxonomic group was overstated and based solely on a site-specific wood frog field study. In fact, risk to amphibians was demonstrated using three lines of evidence (field studies, laboratory studies, and review of the effects of PCBs on amphibians documented in the scientific literature) as documented in the ERA, not solely the site-specific field study for wood frogs. EPA also modeled the effect of the metamorph sex ratio and malformations on local population dynamics for wood frogs. The modeling supported the weight of evidence of risk to amphibians from PCBs, specifically, that PCBs have an impact on wood frog population growth and abundance and hasten population decline, reduce population numbers, and increase the likelihood of local extinction.[5]

EPA does recognize that populations of frogs and other amphibians have reproductive strategies that can withstand losses of individuals during development. EPA's wood frog study was designed to assess the potential impact of PCBs on different amphibian life stages, including

[1] Final Ecological Risk Assessment, Appendix E, at E-145
[2] EPA 2002 Framework for Ecological Risk Assessment EPA/630/R-92/001
[3] Final Ecological Risk Assessment, Appendix E
[4] Responsiveness Summary to Peer Review of the ERA, at 184.
[5] Final Ecological Risk Assessment, at 4-66.

reproduction, growth, and maturation, based on known or expected toxicological effects of PCBs on amphibians documented in the scientific literature. However, many of those effects (or combinations of effects) from PCB exposure are biologically relevant at the local population level. The lower-bound IMPG for amphibians was based on two sensitive and biologically relevant endpoints (metamorph malformation and sex ratio), which act in concert to limit the viability of local wood frog populations.[6] The sediment lower-bound IMPG of 3.3 mg/kg PCB was established, which corresponds to a 20% incidence of malformation (which would lead to either death or sterility in the adult, among other issues), rather than the more conservative 20% incidence rate for metamorph sex ratio observed at the lower PCB concentration of 0.61 mg/kg.[7] It should be noted that the objective of the IMPG,[8] while derived from data on one species, is to provide adequate protection for all amphibian species, including those that may be more sensitive to PCBs than the wood frog (e.g. leopard frogs, salamanders).

Therefore, based on the weight of evidence available for the amphibian risk endpoint, EPA disagrees with GE's assertion that wood frogs can tolerate a 20% or greater effect level, and maintains that EPA is correct in using this IMPG in the Performance Standard for Vernal Pools.

Insectivorous Birds/Piscivorous Birds

GE states in its SOP and in Section III.C.2 of GE's October 2014 comments that EPA overstates the risks to insectivorous and piscivorous birds and that EPA derived IMPGs based on inappropriate methods in the ERA. Regarding the ecological risk assessments for insectivorous birds and piscivorous birds, GE again mischaracterizes the risk assessment process that was followed for the Rest of River. First, EPA did not "require" that any specific effect level be used for any of the endpoints examined in the final ERA[9], nor did EPA "require" that any IMPG be based on a particular modeled food intake rate. EPA's only requirement was that the risk assessment follow sound scientific procedure and established EPA guidance. Effects and exposure levels used for any of the endpoints were selected by the risk assessors and subsequently peer-reviewed by an independent panel of risk assessment experts. In their review of the July 2003 ERA, Peer Review Panel members commented favorably on the decision criteria used to select effects metrics for wildlife, which included the two bird endpoints.[10]

Laboratory studies were not available to characterize effects of PCBs to the surrogate species used in the avian risk assessments, and the field studies had significant limitations which prohibited their use for deriving an IMPG. Therefore, a threshold range was derived using toxicity data from the scientific literature, in accordance with the decision criteria established in the ERA. A threshold range provides a range of doses that would be protective of the most sensitive bird species (the lower end of the range) as well as the most tolerant bird species (the upper end of the range). The threshold range for insectivorous and piscivorous birds selected for the assessment conducted in the ERA was 0.12 to 7.0 mg/kg body weigh/day based on

[6] The term used in the ERA was the MATC; the IMPG was developed based on the MATC.
[7] The metamorph sex ratio 20% incidence rate was 0.61 mg/kg. EPA selected the IMPG of 3.27 mg/kg based primarily on metamorph malformations. A Peer Review Panel member noted that Ouellet (2000) suggests that malformation rates greater than 5% are biologically relevant. The stochastic population modeling conducted by EPA and presented in the ERA supports the conclusion that these effects are biologically relevant.
[8] This IMPG of 3.3 mg/kg was used in the Performance Standard for Vernal pools in EPA's Intended Final Decision
[9] Final Ecological Risk Assessment
[10] Responsiveness Summary to the Peer Review Comments on the ERA

reproductive studies conducted on white leghorn chickens[11] and American kestrels,[12] respectively. The Peer Review Panel members were supportive of the approach and the data used to derive the threshold range for these endpoints.[13]

With regard to piscivorous birds, EPA acknowledges the fact that the dataset from which the modeled food intake rate used to calculate the piscivorous bird IMPG was derived did not include the osprey. As noted in the final ERA (Volume 6, page H-25), there were insufficient data to generate an allometric equation for Falconiformes, of which osprey are members, so the equation for Charadriiformes was used. However, this latter group includes many piscivorous birds, and was therefore deemed by EPA to be acceptable, lacking an alternative. Again, the ERA Peer Review Panel did not express concerns with this accepted approach to establishing effect levels for groups with limited experimental data.

Lastly, on page 40 of GE's October 2014 comments, GE states that, despite EPA's assertion that the remedy will reduce ecological risks, the proposed remedy does not include remediation directly related attaining IMPGs for the insectivorous and piscivorous bird receptors. The analysis of how the proposed remedy (as well as the other alternatives) attains the ecological IMPGs is documented in EPA's Comparative Analysis. Even though EPA did not include specific Performance Standards requiring attainment of IMPGs for these receptors, the remedy will reduce risks[14] by significantly reducing exposure of these receptors to PCBs in sediment, surface water and biota.

Mink

GE states in its SOP in Section III.C.2 of GE's October 2014 comments that EPA overstates the risks to mink and that EPA derived IMPGs based on inappropriate methods. GE, as it has in the past, attempts to cast doubt upon the validity of the study of PCB toxicity to mink that was conducted as part of the ERA. These same points were raised over a decade ago in GE's comments on the ERA and were thoroughly refuted.[15, 16]

As was the case with amphibians, a Maximum Acceptable Threshold Concentration (MATC) was derived from effects on one species of the taxonomic group (i.e. mink) that must be protective for all species in the group, including those that may be more sensitive (i.e. river otter). The MATC of 0.984 mg/kg PCB corresponds to a concentration that would be expected to cause 20% reduced survival (LC20) of mink kits from 0 to 6 weeks of age, an effect judged by EPA to be biologically relevant. This PCB concentration is higher than the Lowest Observed Adverse Effect Level (LOAEL) of 0.72 mg/kg determined from studies conducted regarding PCB contamination in Saginaw Bay, and nearly four times higher than the LC20 (0.248 mg/kg)

[11] Lillie, R.J., H.C. Cecil, J. Bitman, and G.F. Fries. 1974. Differences in response of caged white leghorn layers to various polychlorinated biphenyls (PCBs) in the diet. Poultry Science 53:726-732.
[12] Fernie, K.J., J.E. Smits, G.R. Bortolotti, and D.M. Bird. 2001. Reproductive success of American kestrels exposed to dietary polychlorinated biphenyls. Environmental Toxicology and Chemistry 20:776-781.
[13] Responsiveness Summary to the Peer Review Comments on the ERA, multiple locations
[14] Comparative Analysis, at 39-41.
[15] Responsiveness Summary to the Peer Review Comments on the ERA, at 69-70, (Response O-RS-25), by Weston/EPA
[16] Responsiveness Summary to Public Comments on New Information on the ERA, at 52 to 60, (Responses GE-23 to GE-27)

derived from those studies.[17] The consensus among the Peer Review Panel members regarding the overall scientific validity of the design, conduct, and interpretation of the mink feeding study.[18]

With regard to the lack of necropsies performed on kits that died prior to six weeks of age, this question was also clearly explained in Response GE-27 and O-RS-25 in the ERA Responsiveness Summary. In summary, it is standard operating procedure in conducting these studies at Michigan State University to not necropsy young mink kits because of the cannibalistic behavior of maternal mink and other kits toward dead offspring, leaving no carcass to necropsy; other studies reported in the scientific literature also did not necropsy young mink kits. This lack of data in no way invalidates the results of this study, as clearly indicated by the Peer Reviewers' remarks. As discussed in the ERA, the conclusion that these kits died as a result of PCB exposure is supported by data on kit weight, which is known to be depressed by PCB exposure, and the negative relationship between PCB concentration and kit survival. If other contaminants were responsible for the observed kit deaths, the results would be expected to be random with respect to PCB concentration.

Lastly, on page 40 of GE's October 2014 comments, GE states that, despite EPA's assertion that the remedy will reduce ecological risks, the proposed remedy does not include remediation directly related attaining IMPGs for mink. The analysis of how the proposed remedy (as well as the other alternatives) attains the ecological IMPGs is documented in EPA's Comparative Analysis. Even though EPA did not include Performance Standards for attainment of IMPGs for piscivorous mammals, the remedy will reduce risks[19] by significantly reducing exposure of these receptors to PCBs in sediment, surface water and biota.

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[17] Bursian, S. J., Sharma, C., Aulerich, R. J., Yamini, B., Mitchell, R. R., Orazio, C. E., Moore, D. R. J., Svirsky, S. and Tillitt, D. E. (2006), Dietary Exposure Of Mink (Mustela Vison) To Fish From The Housatonic River, Berkshire County, Massachusetts, USA: Effects On Reproduction, Kit Growth, And Survival. Environmental Toxicology And Chemistry, 25: 1533–1540. doi:10.1897/05-406R.1

[18] Responsiveness Summary to the Peer Review Comments on the ERA, at 290 - 292.

[19] Comparative Analysis, at 41-42.

Attachment D

Responses to GE's Arguments on Potential Harm from EPA's Proposed Remedy

GE, in its Statement of Position ("SOP") (pages 14 and 15) and on pages 34-37 of Section III.C.1 and Attachments C, D and E of its October 2014 comments, claims that EPA's Proposed Remedy would cause severe and enduring harm to the Rest of River's unique ecosystem. GE's concerns, and EPA's responses are as follows:

GE Argument: Remedy would impact the entire channel in Reaches 5A and 5C, harming ecosystem and species

As GE correctly notes in its comments at 34 para. 4, the proposed remedy would remediate the entire river bed in Reaches 5A and 5C and would impact limited river banks in Reach 5A, or 35% of the approximately 10 linear miles of bank in that most upstream subreach. After sediment removal (sufficient to construct the appropriate Engineered Cap), the river bed will be returned to its former grade by placing the Engineered Cap to contain any residual PCB contamination.[1] EPA recognizes that removal of the sediment in these reaches of the Housatonic River will create a significant short-term disruption to the ecosystem (e.g.to benthic invertebrates, fish populations, substrate composition, and colonization by invasive species), however, sediment removal is necessary to mitigate the significant threat to human health and environment caused by GE's PCBs.

In recognition of these short-term impacts, EPA included measures in the proposed remedy to mitigate them to the extent possible. First, the remediation will be conducted using a phased approach, thus an entire reach will not be affected at any single time. Phasing the remediation (and restoration) will provide many species with areas adjacent to the construction for refugia. The Restoration Performance Standards and corrective measures also include provisions for the management of impacts to state-listed species as necessary.[2]

Second, the proposed remedy requires that the Engineered Cap include in its design a habitat layer approximating the natural sediment characteristics.[3] Therefore, there should be minimal long-term effect on substrate composition. Furthermore, as shown following the remediation of the Upper 2-Mile Reaches, there will be significant redeposition of sediment from upstream sources and reworking of surficial sediment, which will further assist in returning the natural characteristic of the riverbed.

Third, the extent and timing of recovery of benthic invertebrates and fish populations in these reaches following remediation would be considerably more rapid than GE claims. There is an excellent example of the recovery that can be expected which was documented in the studies conducted upstream in the East Branch of the Housatonic River following the extensive remediation in the ½-Mile and 1½-Mile Removal Reaches (these actions included remediation of

[1] The actual remediation amounts will be determined during remedial design pursuant to the process described in the Intended Final Decision. Intended Final Decision at 24.
[2] Intended Final Decision at 21-22
[3] Intended Final Decision at 38

the river bed, all banks, and much of the floodplain immediately adjacent to the river). In 2007, approximately one year following completion of remediation of these two miles of river, EPA conducted a quantitative survey of benthic invertebrate populations and a semi-quantitative survey of fish populations at three transects in the 1½-Mile Removal Reach.[4] The results of the investigation showed that benthic invertebrate populations had recolonized the sediment bed as measured by species richness, density, and diversity, and that the benthic community had higher diversity, increased abundance, and increased presence of pollution-intolerant taxa than before the remediation occurred. The fish species composition and numbers also were observed to meet expected conditions. In addition, tissue PCB concentrations in the invertebrates, which form the base of the aquatic food chain, were reduced by over 99% as compared with pre-remediation levels. Using similar field and laboratory methods, GE conducted surveys at the same three locations in 2012 and obtained substantially the same results, with even further reductions in tissue PCB concentrations observed.[5] There is no reason to believe that recovery in Reaches 5A and 5C, following sediment remediation, will be any less rapid or complete, particularly considering that recovery will be enhanced by placement of a habitat layer as part of the Engineered Cap.

Fourth, in these surveys, there was no indication of colonization by invasive aquatic species documented by EPA or GE by either plant or animal species. Similarly, there is no indication from these surveys that the removal of contaminated sediment and subsequent placement of an engineered cap have caused any meaningful change in groundwater flow and/or the presence of a hyporheic zone in the riverbed.

Fifth, in the case of the banks in Reach 5A that will be remediated, extensive ecological restoration using the well-established principles of bioengineering and natural channel design are expected to lead to a recovery similar to that observed in the 1 ½-Mile Removal Reach.

With regard to the position of the Commonwealth quoted by GE, EPA notes, as GE is well aware, that these remarks were part of the Commonwealth's 2011 response to GE's Revised CMS, not to the 2014 proposed remedy or the 2015 Intended Final Decision. The current position of the Commonwealth is stated in its October 27, 2014 comment letter, as follows: "we support . . . the more specific approach to remediating the Reach 5 river banks set forth in the Proposed Cleanup Plan, which is . . . responsive to the Commonwealth's concern about ensuring that the fundamental, dynamic character of the river remains intact following the necessary remediation of eroding banks."[6]

GE Argument: Loss of banks, trees, routes, and rise of invasive species

In its October 2014 comments, GE expresses concerns at 34 para. 2 regarding the proposed remediation and subsequent stabilization of river banks in Reach 5A. The Intended Final Decision provides for removal of contaminated soil from eroding riverbanks in Reach 5A, and other contaminated soil from riverbanks in Reach 5B.[7] EPA recognizes the value of

[4] Post-Remediation Aquatic Community Assessment, 1 ½-Mile Removal Reach, December 2007, Prepared by Weston Solutions for USEPA.
[5] 2012 Aquatic Macroinvertebrate Sampling Report, 1½-Mile Reach of Housatonic River. GE. October 24, 2012
[6] Commonwealth of Massachusetts' Comments on EPA's Proposed Cleanup Plan for Rest of River (June 2014)
[7] Intended Final Decision, II.B.2.a.(1)(b)-(f); II.B.2.b.(1)(c).

undisturbed river banks and their role in providing habitat for some species of mammals, birds, and other taxonomic groups as well as in providing stability against erosional forces. However, EPA also recognizes, and has demonstrated via Housatonic River Modeling Study,[8] that many areas of river bank in Reach 5A are highly contaminated with PCBs originating from the GE facility in Pittsfield, MA and that eroding PCB-contaminated banks contribute significantly to PCB contamination that is transported downstream. Therefore, the proposed remedy requires contaminated, erodible banks in 5A and hot spots in banks in 5B be excavated and restored. The four issues that GE raises in this comment are: reduction of habitat, removal/elimination of mature trees along the banks, reduction of access routes for various animal species; and an increase in the potential for colonization by invasive species. Each of these points are addressed below.

After remediation activities are completed, restoration practices will be implemented that address the impacts of the remediation on river banks and that restore, to the extent practicable, the functions, values, characteristics, species use, and other ecological attributes existing prior to remediation. The proposed remedy requires that GE employ a design approach for the restoration of river banks, using natural channel design principles in Reach 5A, that will emphasize bioengineering methods.[9,10] The bioengineering methods (e.g. woody debris toe protection) will provide a variety of habitat.[11] Recognizing that the bank remediation/restoration will affect only a limited amount of the nearly 20 miles of river bank in Reach 5, EPA considers the short-term effects of bank remediation/restoration to be acceptable considering the long-term benefits of PCB removal and associated reduction in risk and downstream transport.

Similarly, EPA recognizes that some mature trees will need to be removed to remediate the banks. The proposed remedy stipulates ecological restoration activities that will promote and accelerate the regeneration of mature forest along the impacted banks, rather than result in a permanent change to a more open condition along the River. As noted above, the amount of bank disturbance is limited, thereby minimizing the removal of mature trees. As shown by GE's bank vegetation monitoring following remediation of the ½-Mile Removal Reach, the timely establishment of canopy trees on restored river banks can be accomplished; in 2008, which was the 7th year of monitoring, all planted areas had canopy tree numbers that exceeded the Target Performance Standard.[12] Monitoring results in 2010 further confirmed success in establishing canopy trees.[13] Based on the proven re-vegetation success that has occurred upstream, and at other large restoration projects,[14] EPA expects similar success when requiring an active restoration program for the Rest of River.

Because the extent of bank remediation will be limited to only a portion of Reach 5A, the disruption of wildlife use, including slides and burrows of mammals and access routes for reptiles, amphibians, and smaller mammals between the River and the floodplain, will also be

[8] Final Model Documentation Report: Modeling Study of PCB Contamination in the Housatonic River. November 2006.
[9] Intended Final Decision
[10] Statement of Basis
[11] Comparative Analysis
[12] 2008 Annual Monitoring Report, Upper 1/2 Mile Reach of the Housatonic River. January 1 2009.
[13] 2010 Annual Monitoring Report, Upper 1/2 Mile Reach of the Housatonic River. January 28 2011.
[14] Comparative Analysis, Attachment 12, Attachment 13

limited. In addition, local observations from the 1½-Mile Removal Action, which involved much more extensive bank stabilization than will be necessary in the Rest of the River, show an existence of a robust beaver population a few years following bank stabilization. The beaver population rebounded so successfully in this area that additional plantings, herbivore control measures, and continued maintenance of protective tree cages[15,16] were necessary to help ensure successful re-vegetation. Based on the large extent of undisturbed banks and the monitoring observations at the upstream remediation project, EPA expects any reduction in slides and burrows and access routes for reptiles, amphibians, and smaller mammals to be temporary.

With regard to GE's final point, EPA recognizes that colonization by invasive species during and following the Proposed Remedial Action, as with any project, is a serious concern, particularly in disturbed or newly planted areas, as well as downstream impoundments and, to a lesser extent, in the backwaters. As a result, and as specified in §II.B.H.18.b of the Intended Final Decision, an Invasive Species Control Plan is a required part of the Operation and Maintenance Plan, which will be part of the Rest of River

Statement of Work and incorporated into an adaptive management approach. EPA recognizes that control of invasive species can be difficult, particularly the control of invasive forms of submerged aquatic vegetation, but "difficult" should not be interpreted to mean that properly implemented control measures will not be successful. EPA recognizes there is a risk that some invasive species already in the Housatonic River system may increase, at least temporarily, as a result of the remediation.

The probable success of a properly designed and implemented Invasive Species Control Plan in mitigating the potential threat of post-remediation colonization is demonstrated by the monitoring results for the upstream 1½-Mile Reach. As a result of the control plan implemented by GE, invasive plant species exhibited less than 5% aerial cover following remediation activities, which successfully met the established Maintenance Standards throughout the post-removal monitoring periods. This monitoring shows that the Invasive Species Control Program continues to be successful.[17]

GE Argument: Natural Channel Design Failures

At 35 para. 3 of its comments, GE cites a recently published technical paper[18] that they claim raises questions about the effectiveness of ecological restoration, and particularly of Natural Channel Design (NCD). According to GE, in the paper, the authors identify the shortcomings with the Natural Channel Design approach – notably, its failure to address chemical and biological processes – and show that river restoration is fraught with problems and has had disappointing outcomes to date. According to GE, the authors conclude that ". . . a major emphasis remains on the use of dramatic structural interventions, such as completely reshaping a channel, despite growing scientific evidence that such approaches do not enhance ecological recovery . . . ."

[15] 2012 Annual Monitoring Report, 1 1/2 - Mile Reach of the Housatonic River. January 30 2013.
[16] 2014 Annual Monitoring Report, 1 1/2 - Mile Reach of the Housatonic River. January 29 2015.
[17] 2014 Annual Monitoring Report, 1 ½ - Mile Reach of the Housatonic River. GE. January 29, 2015.
[18] Palmer, M.A., K.L. Hondula, & B.J. Koch. 2014. Ecological Restoration of Streams and Rivers: Shifting Strategies and Shifting Goals, Annu. Rev. Ecol. Evol. Syst. 45: 247-69.

However, when taken in its entirety, this paper does not lead to the conclusion that the proposed remediation and restoration of the Rest of River cannot be successful in implementing the principles of NCD. Rather, there are numerous observations made by the authors that are germane to the remediation and restoration of the Rest of River and are fully supportive of the measures that EPA has specified in its Intended Final Decision.

First, Palmer et al. note, relative to ecological processes, that "an over-reliance on channel design may obfuscate efforts to identify the factor that most limits recovery of a stream; quite often this factor is water quality, and thus *ecological recovery will not occur until the source of pollutants is removed*." [*emphasis added*] Palmer et al. also note that "As with restoration of any ecosystem, the most successful and sustainable approaches should *target the source of degradation* and focus on the appropriate scale." [*emphasis added*] The authors also conclude that "efforts at watershed and riparian scales that target restoration of hydrological processes and prevention of pollutants from entering the stream appear to offer the most promise." The authors observe "In any case, once stressors, such as nonnatives, uncontrolled runoff, or pollutant inputs, are removed, restoration theory suggests that a stream should recover on its own (Falk et al. 2006). This form of restoration is the ultimate type of functional restoration because the stressors exert their impact by influencing the processes, both ecological and physical, that define healthy rivers (Gilvear et al. 2013)." These points show that the paper's conclusions support the focus in the Intended Final Decision on removal of PCB contamination from the river, banks, and floodplain followed by the active restoration of remediated banks and adjacent floodplain.

The conclusions that Palmer et al. make regarding complete channel reshaping are not applicable to the specific challenges for the Housatonic River and the Intended Final Decision. First, the channel restoration projects reviewed by Palmer et al. did not specifically include contamination removal as the primary objective. Second, Palmer et al.'s comments apply less to the channel work in the Intended Final Decision because, unlike many of the projects referenced in the paper, the post-remediation restoration goal is not to *enhance* biological diversity or *improve* existing habitat, values and functions, but to replicate existing functions and values post-remediation. Therefore, the focus of the Proposed Remedial Action is fundamentally different from the goals set for the majority of stream restoration projects reviewed by Palmer et al.

Perhaps most important to reiterate in response to GE's comment, the Intended Final Decision is not an NCD project; instead, it is a contamination removal project. The cornerstone of the Proposed Remedial Action is to address contamination in river sediment and floodplain soil along the length of the degraded river corridor. The intent of the NCD and bank stabilization techniques proposed by EPA is to reduce the potential for erosion of contaminated banks and the subaqueous caps, thereby preventing additional pollutants from entering the stream system, where risks from exposure to PCBs are high. EPA fully understands that a critical aspect of the project involves applying NCD principles not in a vacuum, but as one tool to be used in concert with an active remediation and restoration program.

GE Argument: Loss of mature forested habitat

In GE's comments at 35 para. 4 regarding the loss of mature forested floodplain habitat as a result of remediation in the ROR, GE fails to recognize that the Housatonic River and its floodplain have been heavily impacted by human activity over the past 300 years, including clearing and deforestation of nearly the entire watershed, but have recovered from these impacts.[19] Considered as a whole, the floodplain forests in the ROR area consist primarily of younger trees.[20] In addition, the 45 acres of floodplain (not all of which is forested) that EPA estimates will need to be remediated[21] represents only 4.2%[22] of the entire PSA.

EPA acknowledges that the PCB remediation activities will directly affect aspects of forest ecology raised by GE such as the production of coarse woody debris and leaf litter, flood flow alteration, and soil characteristics in the short-term and on a localized scale.[23] However, the remediation and its unavoidable short-term impacts will remove PCB contamination from the floodplain soil, and remedy's Restoration requirements will result in a mature forest becoming reestablished following restoration, benefiting the river and floodplain ecosystems. The impact to the forest and its ecosystem functions will be temporary, and the ecosystem, as it has in the past, will recover as succession transforms the young vegetation that initiates the restoration process into a mature restored forest.

EPA's belief in the success of this recovery is, and will continue to be, supported by the documented success of restoration activities at numerous sites, including in the 1½-Mile Phase 4 Floodplains properties, where GE planted over 650 trees and shrubs. With proper maintenance and replanting when necessary, GE achieved a 100% survival rate. As an example, for the 79 cottonwoods planted in May 2010 in the 1 ½ Mile, the average height of the trees by the summer of 2012 (two years later) was at least 24.2 feet, with 58 of the trees having a recorded height of greater than 25 feet.[24] Similarly, post-remediation monitoring of the adjacent riverbanks in both the ½-Mile Reach and 1½-Mile Reaches of the Housatonic River indicates that the trees and shrubs planted as part of the riverbank restoration efforts have been meeting or exceeding the performance standards for survivorship and areal cover.[25,26,27] EPA expects that the future restoration of affected areas in the ROR will produce similar results.

There are restoration techniques available to mitigate the specific types of effects noted by GE in its comment. For example, during floodplain restoration coarse woody debris can be introduced through the reuse of tree trunks that were removed during remediation, and similarly, woody materials can be introduced during bank restoration. Trees that will be planted within the

[19] Ecological Risk Assessment, Volume 3, Appendix A.1: Ecological Characterization of the Housatonic River. USEPA. November 2004. Section 2.1.
[20] Ecological Characterization of the Housatonic River
[21] Statement of Basis. As discussed in the Comparative Analysis, the exact areas (therefore habitat types) are to be determined based on habitats and occurrences of state-listed species as defined by the Core Areas.
[22] Statement of Basis and Comparative Analysis
[23] Comparative Analysis
[24] Floodplain Non-Residential Properties Adjacent to 1½ Mile Reach of Housatonic River (GECD720); Summary of August 2012 Inspection Activities for the Group 4C Floodplain Properties, GE. 11 September 2012.
[25] 2007 Summer Vegetation Monitoring Report
[26] 2012 Annual Monitoring Report 1½ - Mile Reach of the Housatonic River
[27] 2009 Annual Monitoring Report Upper ½ - Mile Reach of the Housatonic River.

remediated areas during restoration activities will begin to produce leaf litter in their first years, so the loss after clearing is a matter of degree and is temporary, as these planted trees grow and produce increasing amounts of leaf litter. Floodplain microtopography can be restored in the final grading following remediation by implementing proper survey techniques and controls as well as through the reuse of tree trunks, to restore floodplain roughness and thus water retention/flood flow.

Selecting backfill material (including manufactured soil)[28] that best mimics the characteristics of the soil currently present is a restoration technique that will also serve to offset the soil disruption that is an unavoidable effect of the remediation. GE comments that backfilled soils will not fully duplicate the characteristics of the existing floodplain soils in either their physical behavior with respect to groundwater hydrology and infiltration of surface water, nor in their ability to provide refugia and overwintering habitat for floodplain-dwelling species. EPA recognizes that it will likely not be possible for backfill to duplicate exactly all of the physical/chemical qualities of existing floodplain soils, but believes that GE's claims that backfilled soil will be environmentally unacceptable are greatly overstated. The use of soil that is reasonably similar to natural soils is implicit in the Restoration Performance Standard requiring excavated areas to be backfilled to original grade, and engineering specifications for backfill soil will be subject to EPA review and approval. Other engineering controls will also be necessary to prevent the compaction of backfill soil during and after placement. Ecological restoration in these areas will enhance the ability of backfilled areas to serve substantially the same functions as they did prior to remediation. Finally, EPA notes that less than 5% of the floodplain in the PSA is expected to be excavated; therefore, even if the backfilled soils ultimately present any of the problems that GE cites in its comment despite EPA's oversight, such problems will be limited to a number of small, non-contiguous areas of floodplain and/or subject to additional actions by GE to alleviate the concern(s). EPA believes that any short-term environmental effects are justified by the reduction of unacceptable human health and ecological risks by the excavation of contaminated floodplain soil.

Because only a small percentage of the floodplain will be disturbed and even that will be dispersed through time and space, the refugia of mature forest habitat will remain and mobile species will be able to move among mature forest patches during the remediation and restoration activities. As restored areas mature, migration and/or dispersal and re-introduction of mature forest species can be expected. The riparian corridor will remain because work in such a limited area of the floodplain will only temporarily create small openings that will have minimal impact on corridor integrity and contiguity. In addition, phasing of the remediation will prevent this small amount of clearing from occurring at the same time, further reducing its impact.

GE Argument: Vernal pool impacts

Regarding GE's comments at 36 and also at SOP Footnote 15, EPA is aware of the challenges that may be posed in the remediation of vernal pools and ecological restoration, but disagrees with the comment that this will result in irreversible changes and have a very low chance of success. EPA believes that the long-term environmental benefits of stabilizing and/or

[28] Manufactured soil can also be referred to as engineered soil or amended soil.

addressing the harmful PCB contamination in the vernal pools will outweigh short-term changes and temporal loss of functions that may happen as a result of remediation activities.

First, based on comments by GE and others on the 2014 proposed remedy, the Intended Final Decision includes modified Vernal Pool requirements to avoid excavation to the extent possible by specifying the use of an activated carbon (or similar) amendment of vernal pool soils. Activated carbon amendments act to reduce the bioavailability of organic contaminants by increasing the organic carbon content of the contaminated medium which binds the PCBs, and have shown promise in a number of applications. [29] Activated carbon (AC) and similar amendments are increasingly being used as a component of the remedy at contaminated sediment sites. [30] EPA believes there is a reasonable expectation that AC treatment will be successful in avoiding excavation in at least some of the contaminated vernal pools designated for remediation. Only if this is determined to unsuccessful does the proposed remedy require excavation and restoration of the Vernal Pools. Furthermore, should the activated carbon approach not work, no excavation is required in Core Area 1 and GE is required to minimize the impacts from excavation in Core Areas 2 and 3 on a case-by-case basis.[31]

Second, in the event that AC amendment is not successful in achieving the required reduction of bioavailability, and excavation and restoration of the Vernal Pools outside of Core Area 1 is required, EPA believes this can be successfully accomplished. EPA acknowledges that, if performed haphazardly, the cleanup and subsequent restoration efforts have the potential to cause changes in sediment types and soil composition, pool size and depth, pool hydroperiod, vegetation characteristics, shading and foliage cover, litter and coarse woody debris, and other important parameters of these ephemeral pool features. However, these and other potential impacts can be eliminated or reduced by a well-designed restoration program such as the one outlined in EPA's Intended Final Decision.

EPA has reviewed the literature and the state of the science related to the history and efficacy of vernal pool restoration and creation in the context of the Housatonic River cleanup. It is clear that vernal pool restoration in particular (as opposed to vernal pool creation) can be accomplished successfully with a careful approach and attention to detail. In the evaluation of 15 vernal pool creation projects in New England, Lichko and Calhoun (2003, as cited in Stantec Consulting 2010) note that failures of pool creation projects to replace key vernal pool functions were due primarily to lack of clear goals, poor planning, poor execution, and lack of clear criteria for measuring success. Other studies are in accord with these conclusions, and indicate that an important factor in the success of vernal pool creation is evaluating and replicating physical and biological conditions of reference pools and/or those pools to be restored, particularly in regard to hydroperiod and pool morphology.

[29] Comparative Analysis, Attachment 3.
[30] Patmont Cr, Ghosh U, Larosa P, et al. In Situ Sediment Treatment Using Activated Carbon: A Demonstrated Sediment Cleanup Technology. *Integrated Environmental Assessment and Management*. 2015; 11(2):195-207.
[31] Intended Final Decision at II.B.3.b.

For example, the vernal pool remediation efforts by GE in the 1.5-Mile Reach in 2006 at vernal pool 8-VP-1[32] provide a good indication of the potential for successful vernal pool restoration under similar circumstances. After restoration, as documented by both GE and EPA in post-remediation inspection reports, in a short time vernal pool 8-VP-1 was providing breeding habitat for vernal pool amphibian species, providing ecological functions similar to the pre-remediation pool, and was shown to be meeting the Massachusetts criteria for a certified vernal pool.[33] EPA expects similar results when existing vernal pools are remediated and restored in the Rest-of-River cleanup activities using the program outlined in the Intended Final Decision.

In selecting the preferred remediation alternative, EPA coordinated with the Commonwealth of Massachusetts and the State of Connecticut regarding cleanup approaches, and evaluated remediation alternatives against the Permit's general standards and decision factors[34]. The proposed alternative involves a requirement for avoidance and minimization of impacts to species and habitats regulated under the Massachusetts Endangered Species Act, and will employ an adaptive management approach. The phased approach to remediation construction over an estimated 13 years will also help to mitigate short term impacts on vernal pool habitats.[35]

GE Argument: Impacts on zones surrounding vernal pools

EPA acknowledges, as GE infers at 36 para. 2, that the habitat surrounding a vernal pool is as important as the pool itself in supporting populations of vernal pool species and that, to varying degrees, remediation and subsequent restoration efforts will have the potential to cause short-term changes in a number of floodplain characteristics in these buffer areas. However, EPA believes that these short-term effects will be mitigated by an active restoration program and are off-set by the reduction in exposure to harmful PCBs to the amphibian populations.

GE Argument: Spillover impacts into areas adjacent to disturbed areas

EPA acknowledges and shares the concerns noted by GE at 36 para. 3 regarding potential spillover effects (potential increases in erosion and sedimentation (even with controls), the spread of invasive plant and animal species to such areas, changes in microclimate, and the effects of noise from construction and traffic on sensitive bird and mammal species during the breeding and rearing seasons) that might occur during the construction phases of the remediation. EPA's Intended Final Decision[36] addresses these issues and provides the framework for minimizing and mitigating them. Each of the specific effects delineated in this comment is

[32] Floodplain Residential and Non-Residential Properties Adjacent to 1.5-Mile Reach of Housatonic River (GECD710 and GECD720); Summary of April/May 2009 Inspection Activities for the Group 4C Floodplain Properties. May 21, 2009.
[33] Floodplain Residential and Non-Residential Properties Adjacent to 1.5-Mile Reach of Housatonic River - Summary of April/May 2009 Inspection Activities for the Group 4C Floodplain Properties. GE, May 2009. Floodplain Residential and Non-Residential Properties Adjacent to 1½ Mile Reach of Housatonic River - Summary of April/May 2010 Inspection Activities for Group 4C Floodplain Properties, GE, June 2010. 2012 4C Floodplain Vernal Pool Monitoring Summary, May 2012; 2014 4C Floodplain Vernal Pool Survey.
[34] Statement of Basis
[35] Draft Modification to the Reissued RCRA Permit for Public Comment – June 2014.
[36] Intended Final Decision.

addressed briefly below. However, applicable to all of these issues is the fact that, as demonstrated by the body of data and other information developed at Rest of River over the last 15 years, wildlife is currently impacted by the existing PCB contamination. EPA believes that the long-term environmental benefits of removing and/or isolating the PCB contamination in the River and surrounding areas will outweigh short-term effects and temporal loss of functions that will occur as a result of the remediation and subsequent restoration activities.[37]

Erosion and Sedimentation – Erosion and sediment controls are a necessary component of any construction activity and are guided by best management practices (BMPs). The Performance Standards and Corrective Measures outlined in EPA's Intended Final Decision require that GE develop Remedial Design/Remedial Action Work Plans. EPA anticipates that these plans will: 1) provide appropriate erosion/sediment control measures (in the Final Remedial Design/Remedial Action Work Plans), 2) insure that reconstruction of river banks will minimize erosion, considering the principles of natural channel design, in areas where PCB-contaminated sediments are removed, 3) maximize the use of bioengineering methods when reconstructing riverbanks, and 4) the selection of appropriate cover/cap material for the Erosion Protection Layer of Engineered Caps.

To minimize the negative effects of construction on the community, BMPs such as phased construction, dust suppression techniques, perimeter air monitoring, and other engineering controls will be required during remedial construction[38]. There are several techniques that can control erosion by working in conjunction with the geomorphic processes and conditions of the construction site, including minimizing the time between removal of the pre-construction cover and establishment of the post-construction cover.[39]

Invasive Species – EPA acknowledges that there is the potential that areas disturbed during remediation and restoration activities could be colonized by invasive plant species. This impact will be mitigated via active control of invasive species as specified by the requirement for an Invasive Species Control Plan in the Intended Final Decision. Invasive plants will be identified and targeted for control during the post-construction monitoring and maintenance phase of remediation. The requirement for GE to develop and implement a control plan and then monitor the success of that plan during the post-construction operation and maintenance phase, will ensure that invasive species will be kept under control during and after completion of the Proposed Remedial Action. Invasive species control and documented success in the Upper ½-Mile and 1 ½ Mile Reaches was also discussed above in the subsection titled *Loss of banks, trees, routes, and rise of invasive species*.

Microclimate – Effects of remediation and restoration activities on the existing microclimate may include temporary loss of shading, increases in surface water and soil temperatures, increased wind velocities, and increased evapotranspiration, among others. As noted in the NRRB Site Information Package,[40] remediation and restoration of the river and floodplain at this scale cannot be accomplished to any meaningful level without short-term

[37] Comparative Analysis
[38] Statement of Basis.
[39] Harbor, J. 1999. Engineering geomorphology at the cutting edge of land disturbance: erosion and sediment control on construction sites. Elsevier Science B.V., Geomorphology, 1999.
[40] National Remedy Review Board Site Information Package for the Housatonic River, Rest of River,

impacts to the present state of the river and floodplain. However, EPA believes that phasing the project and performing construction in relatively small areas of the project at any given time will reduce the scale of these impacts, and implementation of a comprehensive ecological restoration program will initiate an accelerated recovery of the ecosystem that will not only alleviate impacts caused by the remediation, but also, over the longer term, create processes that will sustain diverse river and floodplain communities.

Noise – EPA acknowledges the concern that construction-related noise during remediation activities may affect wildlife breeding and rearing of young in some species, but believes such effects will be localized and can be mitigated. Through consultation with the state and federal wildlife agencies, EPA will ensure that the remedial construction plans to be developed by GE, to the extent possible, avoid, minimize, and mitigate these effects. Time and scheduling constraints on construction activities will limit the amount of disturbance at any one time and restrict construction disturbance to seasonal schedules that allow use of the riparian corridor by native species. Furthermore, only a portion of the river system will be affected at one time, so the effects in any one area will be limited to a relatively short period of time.

GE Argument: Fragmentation of the PSA ecosystem

EPA disagrees with GE comments at 36-37 that the Primary Study Area (PSA) ecosystem will not recover following the implementation of restoration practices. The complex ecosystems that currently exist within the project area are present despite anthropogenic activities that have been influencing land cover in the area since the 1700s. These historical activities significantly affected the ecological conditions and processes around the river, including vegetation types and succession, river meandering, downstream transport of sediment via accelerated bank erosion, and deposition in the floodplain.[41] In addition to historical straightening and damming of the channel, the river and surrounding forests were impacted by the clearing of riparian areas for agriculture and development. Urban development and historical agricultural activities in the upper PSA resulted in loss of vegetation in the floodplain and riparian areas.[42] Following these past disturbances, the ecosystem was left to adjust and recover naturally, which has resulted in the current conditions in the PSA. An active restoration program will speed up the natural process of ecosystem recovery. EPA's ecological restoration strategy is to mitigate the temporary impacts related to the remediation activities, not to restore the ecosystem back to some historic, unaltered, pristine state. After remediation and restoration, it is understood that Rest of River will not mirror what is observed on-site today – an environment that has been compromised in many ways by high concentrations of PCBs – nor what was there 100 years ago before PCBs were released into the river. Instead, the goal of the ecological restoration is to restore the functions and ecosystem services that currently exist.

To maintain, to the extent practicable, undisturbed forest corridors in the PSA and minimize adverse impacts to disturbance-sensitive species, EPA will require GE to develop remediation plans that include a phased approach to construction and subsequent restoration. Phasing the work will disperse the effects of the construction activities over time (the remedial action period is estimated to be 13 years) and space (a distance of 10.5 miles),[43] and provide

[41] Comparative Analysis.
[42] Active cropland is now relatively uncommon. Ecological Characterization of the Housatonic River.
[43] Statement of Basis.

optimal coordination of restoration with remedial activities. This will limit ongoing disturbance to any one area and allow native species to continue using river corridor habitats in post-restoration areas and areas yet to be disturbed. In the Intended Final Decision,[44] GE is required to address these concerns in the restoration plans, which will be reviewed and approved by EPA (after consultation with the States). The Intended Final Decision also provides for the use of adaptive management to improve and adjust construction as well as restoration methods during later phases.

EPA has reviewed the state of the science of ecological restoration and provided examples focused on river restorations involving larger river channels and/or remediation in the Comparative Analysis.[45] These examples show that, following restoration of impacted sites throughout the world, it is possible to restore both the ecological function of areas and appearance after they are disrupted in projects on a large scale. The examples also serve to highlight the common practices that helped to establish the restoration success. Thus, EPA has concluded that implementing remediation and restoration as required in the Intended Final Decision will result in the return of the functions, values, characteristics, vegetation, habitat, species use, and other attributes, to the extent feasible and consistent with the remediation requirements.

GE Argument: Impacts on state-listed species

EPA does not agree with GE comments at 37 and in Attachment E that the proposed remedy would have "severe adverse impacts" or "substantial impacts" on state-listed species. On the contrary, the benefits of removing or significantly decreasing the exposure of such species, and others, to high levels of PCB contamination, outweighs the short-term impacts. EPA's opinion is shared by the Commonwealth of Massachusetts, whose responsibility it is to administer the Massachusetts Endangered Species Act. As discussed in the Commonwealth's comments on EPA's Proposed Cleanup Plan for Rest of River[46], the Commonwealth has been providing comments to EPA on the remediation of the Rest of River since 2008 and has been involved in discussions with EPA and the State of Connecticut since 2011. As a result of this collaboration, and after a thorough review of the components of the remedy that potentially could result in a "take" of state-listed species, the Commonwealth expressed its support for EPA's proposed remedy, noting that the plan would be protective of human health and that the plan is "directed at preserving the dynamic character of the river ecosystem and avoiding, minimizing and mitigating remedy impacts to the affected wildlife and their habitats, with a particular focus on protecting state-listed species (p. 2)[44].

Moreover, the Commonwealth specifically addressed the consistency of the proposed remedy with the MESA requirements; its support for the proposed remedy makes it is clear that GE's exaggerated claims of impacts to state-listed species are without merit.

In addition to the Commonwealth, the Massachusetts Audubon Society, one of the more prominent landowners along the Rest of River, also provided extensive comments on EPA's

[44] Intended Final Decision.
[45] Comparative Analysis, Attachment 12 - River & Floodplain Restoration
[46] Commonwealth of Massachusetts' Comments (2014).

proposed remedy.[47] Nowhere in its comments does Mass Audubon express concerns regarding the impact of the proposed remedy on the American bittern, nor on state-listed species generally. The Audubon "State of the Birds" report[48] [49] cited by GE in its comment does include a species-specific review of the status of American bittern. However, one of the primary reasons listed in the Audubon report for the declining local populations of this species is habitat degradation, with "chemical contamination" cited as one of the major causes of habitat degradation. EPA agrees with this assessment. In fact, the American bittern was specifically evaluated in the Ecological Risk Assessment conducted for the GE/Housatonic River Site, and it was concluded that "American bitterns feeding and reproducing in the Housatonic River PSA are at a high risk of toxicity from exposure to PCBs in these reaches."[50] It is both technically and rationally illogical to conclude that a cleanup plan specifically targeted at the removal of the very chemical that poses a threat to American bitterns should not be conducted because it might temporarily affect the contaminated habitat occupied by those same bitterns.

Attachment C to GE Comments – Brooks, Calhoun, Hunter, ecological impacts of remedy

The topics in Attachment C were also addressed in GE's text on pages 34-37. To the extent that additional issues were raised in Appendix C, EPA's response is incorporated in the applicable sections above.

Attachment D to GE Comments – 30 articles about restoration

In its Attachment D referenced in its Statement of Position, GE claims that EPA's position that restoration would effectively and reliably re-establish the pre-remediation conditions and functions of the affected habitats is not supported, and references 30 sources it claims were not considered by EPA.

There are some general principles of ecological restoration on which GE and EPA agree:

- Ecological restoration is a fairly young discipline;
- Ecological restoration can improve the structure and function of degraded ecosystems and can, under the right circumstances, re-establish an approximation of the previous ecosystem, but takes some time to develop; and,
- Restoring the ecological integrity of degraded waterways is tough, complicated work.

Notwithstanding these basic points of agreement regarding ecological restoration, remediation with subsequent restoration is necessary within the Rest of River due to PCB contamination that poses unacceptable risks to human health and the environment, as clearly

[47] Mass Audubon (Henry Tepper, President), Re: Proposed Remedial Action for the Housatonic River: Statement of Basis for EPA's Proposed Action for the Housatonic River "Rest of River" & General Electric Company, Pittsfield, Massachusetts Draft Modification to the Reissued RCRA Permit for Public Comment - June 2014. Letter to Dean Tagliaferro (USEPA), October 27, 2014.
[48] Mass Audubon. 2013. State of the Birds: Massachusetts Breeding Birds: A Closer Look. Mass Audubon Society.
[49] The Commonwealth of Massachusetts Natural Heritage & Endangered Species Program collaborated with Mass Audubon in the preparation of the State of the Birds report.
[50] Final Ecological Risk Assessment, at K-66.

demonstrated in EPA's Human Health Risk Assessment and Ecological Risk Assessment. Nowhere in Attachment D to GE's comments is this serious problem acknowledged (indeed, the term "PCBs" is not found anywhere in Attachment D), and in fact the authors refer only to the remediation itself as the source of the environmental degradation that requires restoration, as though the Proposed Remedial Action was being performed in a vacuum. The remediation and restoration would be unnecessary if PCBs from GE's Pittsfield facility were not currently contaminating many miles of the Housatonic River and many acres of the adjacent floodplain. Addressing the contamination in these areas will result in unavoidable temporary impacts, but will provide significant benefits for the river and its floodplain in the long term. As is shown by the title of the restoration requirements in the Intended Final Decision (Restoration of Areas Disturbed by Remediation Activities), the rationale for EPA's ecological restoration strategy is that it is being undertaken to mitigate temporary impacts related to the remediation activities, not, as claimed in Attachment D, to restore the ecosystem back to some historical state. After remediation and restoration, it is understood that the Rest of River will not mirror what is observed today, an environment compromised in many ways by high concentrations of PCBs, nor what was there 100 years ago before PCBs were released into the river. Instead, the goal of the ecological restoration is to restore, following remediation, the functions and ecosystem services that exist today but without the significant impairment from PCB contamination.

In Section II.B.1.c.of its Intended Final Decision, EPA describes the Restoration Performance Standard and associated Corrective Measures. This program was designed to include the elements that have been identified in the literature as being the major contributors to the success of restoration projects, and to avoid the causes of failure that were common for the projects that were not deemed a success (many of which GE notes in its Attachment D). The Corrective Measure lays the foundation for a successful restoration process, outlining procedures for conducting the baseline assessment; developing the restoration performance objectives and evaluation criteria; developing a restoration corrective measures coordination plan to be performed during the implementation of the corrective measures; and lastly, designing and implementing the restoration plan, and monitoring. This process will require GE to collect additional information which will form the basis of an adaptive management strategy to inform the process iteratively as the remediation proceeds downstream, and into post-construction activities.

GE's statement "… any meaningful ecological recovery of certain elements of the Rest of River ecosystem will take, at best, decades beyond the timeframe of the remediation, implies that floodplain remediation and restoration could require an extremely long and unreasonable period of time. However, EPA notes in Section II-4 of the Ecological Characterization of the Housatonic River that "Much of the upper two-thirds of the project site appear to have been cleared for agriculture at one time" and in Section II-2 that "Farm abandonment and reforestation, in the form of both natural and planted trees, began to shape the landscape of Berkshire County in the early part of the 20th century." It was also noted by the Berkshire Regional Planning Commission that "As discussed at the Rest of River Municipal Committee work session of February 27, 2014, in which EPA and DFW staff were present, it was estimated

that the floodplain forests are probably in the order of 60 years old."[51] These statements indicate that much of the forested area (described by GE in Attachment D as an "ecologically vibrant reach of river") is 100 years old or less.

It is not surprising that there is a seemingly mature floodplain forest in this situation, in that a dominant forest canopy species in Rest of River floodplain – the silver maple (*Acer saccharinum* L.) is one of the fastest growing deciduous trees of the eastern and mid-western forests. It can grow 3-7 feet per year achieving a mature height of 90 feet, and is a source of fast shade, large woody debris, and litter in streams. Silver maple shares many of its sites with red maple (*Acer rubrum* L.), a medium sized tree that grows 2-5 feet per year reaching a mature height of 68 feet that is also dominant in the forested floodplain of the Rest of River. With prolific seed and such rapid growth rates, the rapid reforestation exhibited over the last century following deforestation without an active restoration program is explained. However, GE seems to be unaware of the life history characteristics of the dominant tree species in the Rest of River, stating that "one might subtract only 10 years from the 100-200 years it takes to grow a very large silver maple by planting a sapling rather than waiting for seed-based recruitment." While it may be true as a generalization that restoration of some mature forest communities can be difficult and slow to achieve, the dominance of these species in the natural communities and conditions of Rest of River is central to EPA's position that restoration of forested floodplain in these areas is feasible in a reasonable time frame.

Based on this information, it is evident that historically a substantial portion of Rest of River was in agriculture or logged, and the dominant tree forest structure removed, before the Housatonic River ecosystem established its current floral and faunal communities and ecological functions (as a "novel" ecosystem) over the past 60-100 years. This recovery process occurred naturally, not aided by active restoration activities and without careful monitoring and adaptive management. With an active restoration program in place to promote and track the restoration response after remediation, the historical ecosystem response to human intervention supports EPA's position that substantial recovery will not require centuries following remediation, but rather a much shorter period of time.

EPA's Attachment 12 (River & Floodplain Restoration) to its Comparative Analysis provides some relevant examples of successful ecological restoration projects across various settings and scales. These example projects show demonstrated successes following restoration of impacted sites throughout the world, illustrating that it is possible to restore both the ecological function of areas and appearance after they are disrupted, and highlight the common practices that helped to establish the restoration success. Examples of projects were selected where the project was of particular relevance to the Housatonic River in that they were large rivers and streams with a floodplain connection and/or with sediment/soil remediation (much of the current literature base includes much smaller river systems than the Housatonic and/or very different primary restoration goals, such as maintaining a specific stable channel form).

GE claims that "None of the case studies cited as examples of successful restoration is appropriate for comparing the potential outcomes of the proposed remediation and restoration

[51] Letter from Nathaniel W. Karns (BRPC) to Dean Tagliaferro (USEPA), October 20, 2014, Re: Comments on the Draft Modification to the Reissued RCRA Permit for Public Comment - June 2014 and the Statement of Basis for EPA's Proposed Remedial Action for the Housatonic River "Rest of River" (June 2012).

efforts in the Rest of River…." However, GE goes on to base its argument on the premise that the Rest of River area is "ecologically vibrant," and that the examples that EPA provides "were focused on rivers that were physically, chemically, and biologically degraded." As it is EPA's view that the Housatonic River and its floodplain are chemically and biologically degraded by the PCB contamination present, and the area has been physically degraded through historical alteration of the river channel and floodplain, in fact these examples serve as EPA intended.

The technical publications referenced in EPA's Attachment 12 were noted by GE as being slim and dated. GE's critique overlooks the relevance of the body of work presented in Attachment 12 and the fact that the references, which describe the history of ecosystem restoration and/or highlight successful river and floodplain restoration practices, were not intended to represent an exhaustive literature review of the subject of ecological restoration. GE's criticism of the document as though it were an attempt to do so thus constitutes a straw-man argument. Rather, the references are a selection of relevant studies that document the development of the science of restoration or provide examples of restoration with varying degrees of success, but which have common techniques proven successful that can be emulated across varying conditions.

GE's comment also emphasizes that some citations were not published in a "peer-reviewed journal," implicitly suggesting they may not have merit in the discussion of restoration science. It should be recognized that not all valid sources of information are peer-reviewed. Resources such as books or studies by academics or government agencies may be evaluated on their technical merit, though their publication process may not include the peer review process used by academic journals. For example, the Housatonic River Historical Changes in River Morphology reference[52] is not itself from a peer-reviewed journal article, but is a review of a series of peer-reviewed books and publications. For restoration projects, there is a large body of scientifically rigorous work that is not formally peer-reviewed; much of it is generated by active practitioners and has occurred relatively recently. But it is nonetheless valid and used by other scientists and managers to inform decisions. For example, only a small fraction of the tens of thousands of pages of work conducted by both EPA and GE on the GE/Housatonic River Site has been published in peer-reviewed journals, yet the research is accepted by both parties and others, as the common information upon which decisions regarding the future of the river should be based.

Much of the criticism about the references listed in EPA's Attachment 12 is aimed at a common thread – that river restoration is difficult. EPA's Attachment 12, the Statement of Basis, and other materials presented by EPA indicate EPA's agreement with this conclusion, and go on to state that it is important to obtain more site-specific investigation to set appropriate restoration targets, develop an adaptive management approach, and implement a careful plan that pays close attention to detail, is conducted by restoration experts, and reflects lessons learned from past restoration projects.

Some of the references are criticized by GE as not being relevant. For example, Leopold and Maddock, 1953 was described as being a "technical review of limited relevance to the Rest

[52] National Remedy Review Board Site Information Package, Appendix A – Historical Changes in Housatonic River Morphology

of River beyond foundation science." This criticism seems to contradict the earlier statements by the authors of Attachment D about the unknowns related to river ecology and river restoration, and implies that the knowledge of the "foundation science" is neither helpful nor necessary. Leopold and Maddock's important work sets the stage for the current understanding of river systems.

A Compilation of Research Papers Cited by GE

As with nearly any scientific discipline, there is a large body of literature available on ecological restoration and as with other disciplines, the authors of the literature often present diverging viewpoints. As GE notes in Attachment D, its search of the literature generated 9,874 references on river, stream, or floodplain restoration as of July 17, 2014. GE's Attachment D provides a selective list of 30 technical papers from this body of work; the majority of which are relatively new.

EPA's review of the papers selected by GE concludes that, while some of the papers provide information that is worth considering in the implementation of the Restoration Corrective Measures required in the Intended Final Decision, in general, none of the conclusions in these papers suggest that the restoration Performance Standards established in the Intended Final Decision will not be achievable.

In one example, Palmer et al. (2014) cited by GE make note that, in relation to ecological processes, "an over-reliance on channel design may obfuscate efforts to identify the factor that most limits recovery of a stream; quite often this factor is water quality, and thus ecological recovery will not occur until the source of pollutants is removed" (P. 251). Palmer et al. observe that "as with restoration of any ecosystem, the most successful and sustainable approaches should target the source of degradation and focus on the appropriate scale." The authors also conclude that "efforts at watershed and riparian scales that target restoration of hydrological processes and prevention of pollutants from entering the stream appear to offer the most promise." Accordingly, the paper's conclusions actually support the focus of the Intended Final Decision on stream bed, bank, and floodplain PCB removal followed by restoration. The focus of several of the research papers cited by GE appears not to be on remediating and restoring rivers that have been contaminated and present unacceptable risks to human health and the environment.[53] Rather, the focus appears more to be on the evolving nature of the river restoration science and debate on how best to restore ecosystems in general. EPA's Intended

[53] For example, GE cites the following paper, which is described as *a case study that proposes a set of technical monitoring and assessment measures in an effort to assess success and discern failures in river restoration*. Buchanan, B.P., M.T. Walter, G.N. Nagle, and R.L. Schneider. 2012. *Monitoring and assessment of a river restoration project in central New York.* River Research Applications 28:216-33. According to the authors of this paper the main impetus for this project was to protect properties along a reach of the Six Mile Creek where bank erosion had become severe. In another example, GE cites the following paper which describes reasons for failure of one stream rehabilitation project. Smith, S.M., and K.L. Prestegaard. 2005. Hydraulic performance of a morphology-based stream channel design. Water Resources Research 41(1l): W l 1413:1-17. This project was a stream rehabilitation project on a gravel bed tributary to the Patapsco River in Maryland. As the authors describe "The Deep Run reconfiguration was proposed to reduce sediment loading to a riparian wetland located immediately downstream of the project reach. The wetland project was created by gravel extraction in the Deep Run valley, which lowered the floodplain elevation."

Final Decision addresses those issues, with its multiple measures to avoid, minimize and mitigate impacts, Restoration Performance Standards, monitoring and adaptive management.

Attachment E

Cross-References to GE's Statement of Position

GE's Arguments from 1/19/2016 Statement of Position		Location of GE's Argument	Location of EPA Response
I.	EPA's Out-of-State Disposal Requirement Conflict with the Consent Decree's Remedy Selection Criteria and is Unlawful	6	III(A)(2)(g)
II.	EPA's Intended Remedy is Not Necessary to Protect Health and Would Cause Overall Environmental Harm and Therefore Violates the Consent Decree	11	III(A)
	A. EPA's Remedy Goes Beyond What is Necessary to Protect Human Health	12	III(A)(2)
	B. EPA's Remedy Would Cause Overall Harm to the Environment	14	III(A)(2)(a)
III.	The Remedies for the Impoundments and Backwaters Are Inconsistent with the Consent Decree's Remedy Section [sic] Criteria and Are Arbitrary and Capricious	16	III(A)
	A. EPA's Deep Dredging Remedy for Woods Pond	16	III(A)(2)(b)
	B. Remedy for Reach 7 Impoundments	19	III(A)(2)(c)
	C. Rising Pond Remedy	20	III(A)(2)(d)
	D. Remedy for Backwaters	22	III(A)(2)(e)
IV.	EPA's Engineered Cap Performance Standards and Requirements Arbitrarily Fail to Consider Cap Information Presented by GE	23	III(A)(2)(f)
V.	The PCB Downstream Transport and Biota Performance Standards Exceed EPA's Authority, Are Arbitrary, and Conflict with the Consent Decree	24	III(B)(1)
VI.	The Required Additional Response Actions for Third-Party Dams and Other River Projects Are Unauthorized, Contrary to the Consent Decree, and Otherwise Unlawful	27	III(B)(4)
	A. Requirement to Inspect and Maintain Non-GE-Owned Dams in Massachusetts	27	III(B)(4)
	B. Requirements to Conduct Response Actions for Future River Projects	28	III(B)(2)
	C. Requirements to Conduct Response Actions for Future Dam Failure or Breach	30	III(B)(5)
VII.	Many of the Requirements Relating to Future Activities and Uses at Floodplain Properties Conflict with the Consent Decree, Exceed EPA's Authority, and/or Are Otherwise Unjustified	30	III(B)(3)
VIII.	EPA's Requirements for Habitat Restoration/Mitigation and a MESA Conservation Plan Exceed EPA's Authority and Conflict with the Consent Decree	33	III(C)
	A. Habitat Restoration/Mitigation Requirements	33	III(C)(1)
	B. MESA Conservation/Net Benefit Plan Requirement	34	III(C)(2)