By Electronic and Regular Mail

Gary Klawinski, Director
US Environmental Protection Agency
Region 2, Hudson River Field Office
187 Wolf Road, Suite 303
Albany, New York 12205

Subject: Remedial Action Completion Report, Hudson River PCBs Superfund Site, dated December 2016, submitted by the General Electric Company

Dear Mr. Klawinski:

This is in response to your request, in an email on October 3, 2017, to provide our comments on the Remedial Action Completion Report submitted to the U.S. Environmental Protection Agency (EPA) by the General Electric Company (GE), in a letter dated December 23, 2016, and GE’s request that EPA issue a Certification of Completion of the Remedial Action.

Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), GE is responsible for both the remediation of the polychlorinated biphenyl (PCB) contamination, and residual damages for the restoration of the natural resources that were injured or will continue to be injured by PCBs left in the environment. The State and Federal Hudson River Natural Resource Trustees are conducting a natural resource damage assessment (NRDA) to determine appropriate actions needed to restore injured natural resources and natural resource services of the Hudson River.

As co-Trustees with the National Oceanic and Atmospheric Administration (NOAA) and New York State (NYS), we continue to be concerned about the significant PCB contamination left in the Hudson River, the time expected for the Hudson River ecosystem to recover from that contamination, and the adverse impact of that contamination upon the wildlife, natural resources, and the public that uses these resources. Those shared concerns are most recently expressed in letters to EPA from NYS and NOAA regarding the subject report (NYS Department of Environmental Conservation letter dated November 22, 2017 to EPA Administrator Pruitt; NYS Office of the Attorney General letter dated November 22, 2017 to EPA Region 2 Administrator Lopez; and NOAA letter dated November 27, 2017 to EPA Hudson River Field Office Director Klawinski)
PCBs in the river have caused past and ongoing injury to the natural resources of the Hudson River, resulting in lost public use of those natural resources. Those injuries extend for over 200 miles, have lasted for decades, and will continue into the future. The PCB contamination adversely impacts recreational fishing and hunting through consumption advisories, and has potential adverse impacts to birds, mink and other wildlife. Restoration options, particularly in the Upper Hudson River, may be limited by the amount and concentration of PCB contamination that remains bioavailable in the river.

We share, with EPA and our co-Trustees, a goal of the successful recovery of the Hudson River—a nationally significant ecological, cultural, and economic resource—from PCB contamination. We believe additional PCB removal and robust habitat reconstruction under the CERCLA remedial program will accelerate the recovery of the river and its resources, which will reduce the restoration required and facilitate the ecological and economic recovery of the Hudson River.

Thank you for the opportunity to provide these comments.

Sincerely,

Kathryn Jahn
Hudson River Case Manager
U.S. Department of the Interior

Enclosures
November 22, 2017

Mr. Scott Pruitt  
Administrator  
US EPA  
1200 Pennsylvania Ave., NW  
Suite 3000  
Washington, DC 20460  

Dear Administrator Pruitt:  

Re: Hudson River PCBs, GE request for Certificate of Completion  

Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the National Contingency Plan (NCP), and the United States Environmental Protection Agency’s (EPA)’s own guidance, EPA must deny General Electric’s (GE)’s December 23, 2106 request for a Certification of Completion (COC) of the Remedial Action for the Hudson River PCBs Site. Overwhelming evidence and data demonstrates that the remedy is not protective of human health and the environment. Consequently, EPA cannot certify the PCB remedy for the Upper Hudson River as complete.  

Section 122(f) of CERCLA requires that remedies selected by EPA and implemented under their oversight be protective of human health and the environment prior to issuance of a COC and “Covenants not to Sue.” As explained in more detail below, EPA itself has acknowledged that this remedy is not currently protective of human health and the environment. Furthermore, recent sediment data collected by the state bolsters EPA’s determination that the remedy is not currently protective. Additionally, EPA’s proposed protectiveness determination, of “not currently protective, but will be protective” is in direct conflict with the agency’s guidance on issuance of five-year reviews of its remedies. EPA’s guidance does not allow issuance of a “will be protective” determination at a site where construction (here dredging and backfilling) has been completed. Finally, the NCP requires EPA remedies to comply with all applicable substantive requirements of state law when reconstructing habitat that was negatively affected by a remedy. EPA has failed to ensure that the habitat of New York has been adequately restored in accordance with law. The people of New York deserve better.
A decision by EPA to certify completion of the remedy will have significant consequences, including triggering the Remedial Action Consent Decree's "Covenants Not To Sue." Consequently, GE may be prematurely relieved of liability for any future work, other than monitoring and maintenance, to address the polychlorinated biphenyl (PCB) pollution of the Upper Hudson River sediments. GE would receive this release from cleanup responsibility even though their remedial actions fell short. There remains in the Upper Hudson significantly greater amounts of PCBs than EPA anticipated there would be after dredging, and habitat reconstruction has fallen well short of statutory and regulatory requirements. As described in more detail below, recent sampling by the State suggests that River Section 2 is two to three times more contaminated than EPA estimated it would be at the completion of the dredging remedy, and there are other areas of the Upper Hudson where levels of PCB left behind are well above 50 parts per million (ppm) at the surface, and likely higher levels just below the surface. If these levels of PCB were found on land they would be regulated under the Toxic Control Substance Act, and EPA would require that they be disposed of in a permitted hazardous waste landfill.

Based on these circumstances, there is significant uncertainty as to whether or not the remedy will meet the risk reduction goals set by EPA in the Record of Decision (ROD). Therefore, EPA must not approve GE's request for a COC. Granting GE's request is effectively shifting the burden to finish the cleanup onto New York State taxpayers, which is simply unacceptable. To ensure this does not happen, GE must not be released from liability until the remedy is found to be protective of human health and the environment. This decision should be an easy one for EPA, as EPA has preliminarily determined that the remedy is currently not protective of human health and the environment.

As described in the State's commentary on the recent Five-Year Review Report for the Hudson River site, the current conditions in the river are such that the remedy is not protective of human health or the environment. Much more PCB was found in the river during both project design, and project implementation, and the State has confirmed that more PCB was left behind than was intended when the remedy was selected. Despite persistent calls throughout the remediation from the State, NOAA, and other stakeholders, EPA has never considered adjusting the remedial work to take the increases in known PCB mass into account. EPA has not provided any sound scientific basis for dismissing such consideration. EPA has an obligation to consider the science, and the new data that the State has collected, before making any determination about relieving GE of its liability for the ongoing contamination of the Hudson River.

Fish PCB concentrations in the Upper Hudson River, where GE would no longer be responsible for cleanup, will remain at concentrations that pose human health and ecological risks well above the EPA acceptable risk range and well beyond the goals set forth in the ROD. EPA has admitted this in its own "Five Year Review," stating that the ultimate goals established in the ROD will not be met for at least fifty-five more years.
More importantly, the most recently measured fish PCB concentrations remain elevated such that even if “Monitored Natural Recovery” is able to achieve the reduction rates assumed by EPA, the PCB concentrations will remain well above the targeted PCB concentrations in fish that were set by EPA in the ROD and that provided the basis for selecting the dredging remedy. Simply put, EPA must not certify the remedy as complete until EPA is certain that the remedy will achieve the ROD goals. As of today, conditions are such that the opposite is true because significantly more PCB was left behind than anticipated, and the fish PCB concentrations are currently so high that the anticipated reduction rates will not allow the rapid reduction in human health and ecological risk as required by the ROD.

In 2016, the State urged EPA to develop and implement a robust monitoring plan to establish, at the appropriate spatial and temporal scale, a quantitative understanding of how much PCB remained in Upper Hudson River sediments, and how these remaining contaminated sediments would impact water and fish over time, to determine if the ROD goals for targeted reductions in fish PCB concentrations would be met. EPA thus far has not yet done so for water and fish, and has only approved a limited sampling and analysis program for PCBs in surface sediments, which has not yet been completed.

As EPA knows, in the summer of 2017, DEC completed a sampling program for surface sediments in the Upper Hudson between Fort Edward and Troy at the appropriate spatial scale to quantify the surface sediment PCB concentrations over time on a pool by pool basis — a scale closer to which fish are impacted by the remaining PCB-contaminated sediment. Although analysis of the data is still ongoing by the State, sufficient data are available to support the fact that the surface sediment PCB concentrations as they currently exist in much of the Upper Hudson are higher than anticipated by EPA at the time of remedy selection — as much as 2 to 3 times higher in River Section 2. This preliminary finding supports the State's position it is a near certainty that the remedy will not succeed in achieving the targeted reductions in fish PCB concentrations set in the ROD. Once the data set has been validated and is complete, DEC will provide the data set to EPA.

Even if EPA were to ignore the data and the legal requirements regarding the protectiveness determination, GE has failed to complete its obligations to reconstruct habitat that it destroyed during implementation of the dredging remedy. Before it can issue a certificate of completion, EPA is obligated by law to ensure that aquatic habitat affected by the remedial program is fully reconstructed to the condition it was prior to implementing the dredging program. In the attached technical document, the State describes how under CERCLA and the NCP, EPA is required to comply with applicable, relevant and appropriate requirements (ARARs) and monitor the effectiveness of the remedy to affirm that it is meeting the goals set by the ROD, and how EPA has failed to meet these requirements.
The State recommends the following course of action for EPA:

1) EPA must not certify the remedy as complete at this time, given existing evidence shows that the remedy is not currently protective of human health and the environment. Rather, EPA must withhold such certification until conditions at the site justify a determination that the remedy is protective.

2) EPA must not certify the remedy is complete unless and until habitat is reconstructed in compliance with state and federal law.

3) EPA must undertake additional studies to understand the performance of the remedy in achieving the targeted reductions in fish PCB concentrations in the Upper Hudson specified in the ROD. The State has previously identified the data which needs to be gathered to evaluate the performance of the remedy, and the spatial and temporal scale upon which the data should be gathered.

4) EPA must update the Conceptual Site Model (CSM) to take into account the information gathered at the site since the CSM was developed in the late 1990s. This information includes:
   - the PCB sediment data gathered during design which identified the much larger PCB mass in the sediments of the Upper Hudson;
   - the PCB sediment data gathered during Phase 1 of the remedy which identified further significant PCB mass in sediment missed during design due to sampling bias;
   - the surface water and surface sediment data indicating that PCB redistribution during dredging was minimal;
   - the surface sediment data gathered by the State and GE in 2016 and 2017; and
   - the surface water and fish PCB data indicating that fish PCB concentrations are relatively insensitive to PCB mass transport from upstream, i.e., that local sediments primarily controlled local fish PCB concentrations.

5) EPA must reevaluate the degree to which further removal of PCB contaminated sediment in the Upper Hudson may be required to meet the targeted reductions in fish PCB concentrations identified in the ROD. EPA selected the dredging remedy in the ROD based upon the information available in the late 1990s. With an updated CSM informed by the data gathered since the ROD was issued and the growing understanding of remedy performance obtained through the monitoring work recommended by the State, EPA should be able to determine what additional remedial work is necessary to meet the ROD goals for targeted reductions in fish PCB concentrations leading to reductions in human health and ecological risk.
6) EPA must recommit GE to the full habitat reconstruction requirements under the ROD and the substantive requirements of New York State law. In the absence of the completion of GE's reconstruction obligations, the COC cannot lawfully be issued. Remobilization of dredging activities will also require GE to refocus its efforts on reconstruction. As outlined in the ROD, a full remedial program is not complete until habitat reconstruction is sufficiently addressed. Ultimate recovery of the Hudson River depends on the completion of this required habitat reconstruction work, which must go hand in hand with the required remedial work.

The State is also very concerned about the lack of progress by EPA on moving forward with the needed Remedial Investigation for the Lower Hudson River, south of the Troy dam (Lower River). EPA should issue the needed Order to GE to perform the work. This lower 150-mile reach of river is part of the NPL site, has PCB concentrations in fish which result in human health and ecological risks well above EPA’s acceptable risk range, and the remedial work in the 40 miles of the Upper Hudson is no longer expected to result in significant reductions in fish PCB concentrations in the Lower River, particularly south of Albany. EPA must move forward with this investigation work as soon as possible.

In light of the overwhelming evidence and data that the remedy is not protective of human health and the environment, EPA legally cannot certify the PCB remedy for the Upper Hudson River as complete. EPA must instead move forward with gathering additional data and performing the evaluations necessary to determine how much further sediment removal is necessary to meet the ROD goals, ensure habitat reconstruction is performed properly, and at the same time move forward with the needed investigation work in the Lower Hudson. The State stands ready to work with and support EPA in accomplishing these tasks.

Sincerely,

[Signature]

Commissioner Seggos

Enclosure
Failures Regarding Habitat Reconstruction in the Upper Hudson River

The following state laws and regulations are applicable, relevant and appropriate requirements (ARARs) under CERCLA and NCP, which have been substantially ignored or insufficiently incorporated into the design and execution of habitat reconstruction efforts on the Hudson River:

**ECL Article 15 (Title 5), Protection of Waters, and 6 NYCRR Part 608**

Article 15 and Part 608 provide permit requirements for the types of modifications and disturbances to water resources caused by the remedial program. While permits were not required for the remedial program, the ROD requires that remedial actions comply with the substantive requirements of 6 NYCRR Part 608. Adverse effects from the remedial project that do not comply with the substantive requirements of state law include raising the river bottom surface where areas are capped, extensive rip rapping of the shoreline with no habitat amelioration, failure to replace or reconstruct many acres of wetlands consisting of submerged aquatic vegetation near the shoreline in water less than two feet deep, and filling an estimated 0.5-acre area in the vicinity of Special Area 13. EPA has not documented to DEC that the substantive requirements of permits required by these ARARs have been met or to mitigate these adverse effects. To the contrary, it is clear that the substantive requirements of these permits have not been met and as a result the habitat has been significantly impacted.

**ECL Article 24, the Freshwater Wetlands Act, and 6 NYCRR Part 663**

Article 24 and Part 663 provide permit requirements for activities that alter or fill freshwater wetlands. While permits were not required for the remedial program, the ROD requires that the remedy comply with substantive requirements of 6 NYCRR 663. These regulations require in-kind replacement or mitigation that provides substantially the same or more benefits than will be lost through the activity. Compensatory mitigation for lost wetland benefits requires that the net loss of benefits be assessed and weighed according to the state regulations. The Department is unaware of any analysis demonstrating that these permit requirements have been met in the several state regulated wetlands affected by dredging.

ECL Articles 15 and 24 and their implementing regulations must be followed to ensure the protection of Hudson River aquatic resources. Substantial loss of regulated wetland area and the benefits these areas provide has resulted from the project even though practical means are available to substantially mitigate these losses. EPA has largely ignored or disregarded the Department’s input with respect to meeting standards for these ARARs. Such disregard is counter to the scheme of cooperative federalism enshrined in CERCLA and endangers the success of the remedial program at the site.
Compliance Failures

The following areas have been identified as particular areas of concern where ARARs have not been met:

West Griffin Island Area

Most of the West Griffin Island Area is mapped by New York State as a wetland under ECL Article 24 and was dredged under the remedial program. Before dredging, this area supported a nearly continuous, dense cover of emergent and floating wetland vegetation. Approximately 22 acres of state regulated wetlands were dredged in this area. EPA’s approved design for this area was not in accordance with ECL Article 24 and 6 NYCRR Part 663 substantive requirements. Dredging and backfilling departed from the approved design in a manner further inconsistent with state law, and the habitat reconstruction plan was not in accordance with state law. The result is a failed wetland that does not provide the wetland benefits lost due to dredging.

Special Area 13

Approximately one quarter mile of shoreline along Special Area 13 was capped during construction so that roughly one-half acre of river bottom was converted to sterile rock rip rap above the water’s surface, thus amounting to filling in an Article 15 6 NYCRR Part 608 navigable water with consequent loss of habitat. No mitigation has been done.

CU-95 Support Area

The reconstruction plan for the CU-95 support area improperly delineated New York State regulated wetlands, had numerous technical shortcomings, and did not comply with the substantive requirements of 6 NYCRR Part 663. In particular, rather than restoring the site to its pre-existing natural condition, the plan called for a driveway to remain, which is an incompatible activity under the regulations.

Coveville Cove

Portions of NYS regulated wetland SY-6 were dredged near the mouth of the Coveville Cove. As with the West Griffin Island area, post-dredging depths are not suitable for the reconstruction of wetland vegetation and the wetland benefits lost due to dredging. Moreover, EPA has not provided a mitigation plan that demonstrates reconstruction of NYS regulated wetlands.

Similar deficiencies exist across multiple additional habitat reconstruction sites on the Hudson River. The Department has provided EPA with a detailed report of conditions at each wetland reconstruction area. The report notes shortcomings at many locations, including the failure to establish appropriate elevations for the desired wetlands vegetation, and provided recommendations for improvement. While most of these areas
are small, they cumulatively add up to a substantial degradation of the wetlands resource protected by ECL Article 15 and 6 NYCRR Part 608.

**Submerged Aquatic Vegetation Reconstruction**

EPA has excluded from required reconstruction of submerged aquatic vegetation those areas that were less than two feet deep or more than eight feet deep before dredging throughout the Upper Hudson. This apparent (EPA has not responded to the Department’s request for documentation allowing this practice) decision has grave consequences for New York State’s aquatic resources as a substantial portion of the pre-existing habitat will be lost. Failure to reconstruct this submerged aquatic vegetation does not meet Article 15 6 NYCRR Part 608 permit standards because it is “unreasonable, uncontrolled or unnecessary damage to the natural resources of the State.”

**Reconstruction Concerns**

The Department has provided additional documentation to EPA of habitat reconstruction deficiencies and has requested ameliorative responses in the past. In the vast majority of cases, however, EPA has failed to take action that would put the Hudson River on a trajectory to success. The following broad categories of concern are applicable throughout the Upper Hudson River dredging area:

**Submerged Aquatic Vegetation Monitoring**

The Department has repeatedly expressed concerns to EPA about the appropriateness of the sampling scheme and locations for submerged aquatic vegetation. In spite of multiple requests, EPA has not provided details of the statistical design so that the Department might evaluate its adequacy.

**Habitat Area Delineation**

The Department has requested that EPA determine the actual area of successfully reconstructed submerged aquatic vegetation and riverine fringing wetlands. Knowing the amount of habitat actually reconstructed is critical in determining the extent to which habitats existing before dredging have been replaced. EPA has not responded to these requests.

**Success Criteria for Habitat Reconstruction**

The Department has a long record of pointing out where EPA’s criteria for successful habitat reconstruction are inadequate in scope and rigor. In light of EPA’s failure to respond productively to these concerns, the State expects to do its own evaluation of success.
Conclusion

The EPA must fulfill its obligations under federal and state law to ensure the reconstruction of habitat destroyed through remedial actions on the Hudson River. EPA must identify needed reconstruction and commit to performing it. A certificate of completion for the remedy cannot be issued unless and until all required habitat reconstruction is successful. The Department is prepared and available to work with EPA on these activities.
November 22, 2017

By Electronic and U.S. Mail

Peter Lopez, Administrator
United States Environmental Protection Agency, Region 2
290 Broadway
New York, NY 10007-1866

Walter Mugdan, Director
Emergency and Remedial Response Division
United States Environmental Protection Agency, Region 2
290 Broadway
New York, New York 10007-1866

Gary Klawinski, Remedial Project Manager
United States Environmental Protection Agency, Region 2
Hudson River Field Office
187 Wolf Road, Suite 303
Albany, New York 12205

Re:  Hudson River Superfund Site: General Electric’s Application for a Certificate of Completion of the Remedial Action

Gentlemen:

Thank you for providing the New York State Office of the Attorney General with the opportunity to comment on the General Electric Company’s application for a Certificate of Completion of the remedial action for the Hudson River Superfund Site contained in its December 2016 “Remedial Action Completion Report.”

We understand that EPA may issue a Certificate of Completion to General Electric for the Upper Hudson River based upon a determination that GE has completed the remedial tasks agreed to in the 2006 Consent Decree. For the legal and factual reasons discussed below, EPA’s issuance of the Certificate of Completion would be unlawful at the present time because completion of the remedial tasks under the Consent Decree is not the functional or legal
equivalent of completion of a remedial action in accordance with CERCLA’s requirements, as Section 122(f)(3) requires. 42 U.S.C. § 9622(f)(3).

Certifying completion of a CERCLA remedial action may only be lawfully issued under the statutorily prescribed terms of CERCLA itself. Before EPA certifies a remedial action to be complete, thereby giving rise to a covenant not to sue, Section 122(f)(3) requires that EPA certify that the remedial action has been completed “in accordance with the requirements of CERCLA.” 42 U.S.C. § 9622(f)(3). Section 121(d)(1) requires, among other things, that the remedial action “shall attain a degree of cleanup … at a minimum which assures protection of human health and the environment.” 42 U.S.C. § 9621(d)(1). Thus, in issuing a Certificate of Completion under Section 122(f)(3), and in giving effect to a covenant not to sue, EPA must certify that the remedial action has attained the requisite degree of cleanup and therefore has been completed in accordance with CERCLA’s requirements.

Here, EPA has not determined - and validly cannot determine based on the administrative record - that the remedial action for the Upper Hudson River has attained a degree of cleanup that assures protection of human health and has been completed in accordance with CERCLA’s requirements. Significant amounts of PCB-contaminated sediment remain in the Upper Hudson River, causing PCB concentrations in fish to remain at levels injurious to human health if consumed. Indeed, those levels in fish are currently several times above the remedial action objectives set forth in EPA’s 2002 Record of Decision. As is expected and as EPA acknowledges, the public continues to eat contaminated fish despite State-issued advisories cautioning against consumption. This has resulted in continuing exposure and unacceptable health risks to New Yorkers. Furthermore, by EPA’s own admission, the remedial action is not now protective of human health and the agency currently does not have the data to determine if and when it may be protective in the future. Because EPA has not found that the remedial action has attained a degree of cleanup that assures protection of human health, a Certificate of Completion of the remedial action may not lawfully be granted nor a covenant not to sue given effect.

Additionally, CERCLA Section 122(c)(1) states that when EPA enters into a settlement agreement to implement a CERCLA remedial action, liability “shall be limited as provided in the agreement pursuant to a covenant not to sue in accordance with subsection (f).” 42 U.S.C. § 9622(c)(1) (emphasis added). Thus, the only covenant not to sue that EPA has the authority to lawfully issue is one that is in accordance with Section 122(f) after compliance with CERCLA’s requirements, including the requirement in Section 121(d) to attain a degree of cleanup that is protective of human health and the environment. EPA has no residual or other authority to give effect to a covenant not to sue based solely upon completion of the remedial tasks identified in a settlement agreement, such as the Consent Decree here. EPA’s issuance of the Certificate of Completion and covenant not to sue that are outside of CERCLA’s parameters is ultra vires and contrary to law.

For the reasons stated above, additional investigation and further remedial action are required before EPA validly can determine that the remedial action is completed in accordance
with CERCLA’s requirement and attains a degree of cleanup that assures protection of human health and the environment. A Certificate of Completion and covenant not to sue can be lawfully issued to GE only after CERCLA’s requirements have been met.

Very truly yours,

Office of New York Attorney General
Eric T. Schneiderman
Environmental Protection Bureau

By:
Maureen F. Leary
James C. Woods
Brittany M. Haner
Assistant Attorneys General
John D. Davis
Environmental Scientist

cc:  Thomas Berkman, NYSDEC
     Andrew Guglielmi, NYSDEC
     Eric Schaff, USEPA Region 2
     Douglas Fischer, USEPA Region 2
     Peter Kautsky, USDOJ
     Eric Merrifield, General Electric Company
By Electronic and Regular Mail

Gary Klawinski, Director
US Environmental Protection Agency
Region 2, Hudson River Field Office
187 Wolf Road, Suite 303
Albany, NY 12205

Subject: Comments on the Remedial Action Completion Report, Hudson River PCBs Superfund Site, Revised December 2016

Dear Mr. Klawinski:

Summary: The National Oceanic and Atmospheric Administration (NOAA), as one of three Hudson River Natural Resource Trustees, recommends that before the Remedial Action Completion Report (RACR) is approved and finalized that EPA demonstrate that the remedial action is protective of human health and the environment, the habitat has been fully reconstructed and that additional documentation has been incorporated into the document. These actions will help to maximize recovery of NOAA trust resources and provide transparent and detailed documentation of remedial actions which will be useful for our damage assessment. Under federal Superfund law, the General Electric Company (GE) is responsible for both the remediation -- cleanup -- of the polychlorinated biphenyl (PCB) contamination, and the restoration of the natural resources injured by PCBs. The State and Federal Hudson River Natural Resource Trustees are conducting a natural resource damage assessment (NRDA) and will seek to recover damages to restore the natural resources of the Hudson River on behalf of the public.

Concerns re the timely achievement of the Remedial Action Objectives (RAOs): According to EPA guidance (EPA 2017), “Source remediation actions normally remain in the RA phase until their RAOs are achieved”…. Where “source material is defined as material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to groundwater, to surface water, to air, or acts as a source for direct exposure. Examples include soil vapor extraction, in situ thermal treatment, and dredging of contaminated sediments.”

Recent analyses indicate that fish in the Lower Hudson River won’t achieve EPA’s protective RAO goals until decades later than predicted in the 2002 Record of Decision (ROD). This is because data collected after the 2002 ROD demonstrate that pre-remedial sediment concentrations in the Upper
River were 2-3 times higher and decay rates were greatly overestimated relative to values generated by models used to support remedy selection. These result in 3-5 times higher estimates of post-remedy PCB sediment concentrations and Lower River fish that will remain unacceptably contaminated for decades longer. Upper river fish will also take much longer to achieve protective goals of the ROD.

Concerns re potential underestimates of PCB concentrations: More recent paired PCB congeners (Method 1668) and PCB Aroclor (Method 8082) analyses on sediment samples (Anchor QEA 2017) demonstrated that the Aroclor method underestimated Total and Tri+ PCBs1 by about 2.4 times based on the geometric mean and about 2.7 times based on the arithmetic mean. This underestimation of Total and Tri+ PCBs in sediment based on recent EPA Method 1668 split-sample analysis is not addressed in the RACR. Underestimation of PCBs can result in incorrect estimates of PCB surface concentrations and mass per unit area, which could potentially lead to unremediated areas actually meeting the trigger for cleanup set forth in the 2002 ROD. Further evaluation is recommended, prior to finalizing the RACR, to assess whether the Sediment Sampling and Analysis Program (SSAP) analyses under-reported PCBs and if so what steps should be taken to address this potential low bias.

NOAA requests that EPA delay approval of the RACR to allow GE to fix the deficiencies of the report and for EPA to conduct a thorough review of new information. This new information includes more than 1600 sediment samples (top 2 inch) collected by the New York Department of Environmental Conservation (NYSDEC 2017) as well as fish samples, analyzed by Method 1668 to assess the nature and extent of contamination left behind in the Upper Hudson River following six years of dredging. These steps are necessary to ensure that the Hudson River remedy protects human health and the environment consistent with EPA’s Comprehensive Five Year Review Guidance (EPA 2001).

Concerns re lack of full documentation in the RACR: NOAA’s comments on the RACR also reflect our overarching concern that the document does not fully report and document technical components of the remedial action that will be lost if they are not included in the final document (see examples in detailed comments below).

Approving the RACR has potential implications for the Hudson River Natural Resource Damages Assessment (NRDA). GE’s PCBs have caused injury to the Hudson River. Injuries to the public’s natural resources extend for over 200 miles (from the Hudson Falls plant site to the Battery in New York City and beyond), have occurred for decades, and will continue for decades after the cleanup is completed if the remaining PCBs are not removed from the river. The Trustees seek to recover damages to restore the natural resources of the Hudson River injured by PCBs. Feasibility, cost, and efficacy are among the considerations of the Trustees in evaluating and selecting restoration alternatives. Approving the RACR could impede the Trustees' injury assessment because of inadequate and incomplete documentation and it could limit restoration options because of the amount and concentration of PCB contamination that remains bioavailable in the river.

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1 Tri+ PCBs or trichlorinated biphenyl PCBs represent the sum of the trichloro- through decachlorobiphenyl homologue groups.
Specific Comments

Section 1

Page 1-4, Top, “Further, GE considers the inspections held on November 10 and 30, 2016 (with the follow-up on December 16, 2016) as satisfying the RA Completion Pre-Final Inspection requirement of Paragraph 57.a. No additional inspections have been required.”: The 2005 Remedial Action Consent Decree states in Section XIV Para 57a:

“Within 15 days after Settling Defendant makes the preliminary determination that the Remedial Action is complete, Settling Defendant shall schedule with EPA and the State an RA Completion Pre-Final Inspection. The RA Completion Pre-Final Inspection shall consist of a walk-through inspection of all on-land properties at which sediment processing/transfer operations, habitat restoration, and other remedial activities were conducted, and an on-river inspection of the dredge areas. The purpose of the inspection is to help determine whether the Remedial Action has been completed in accordance with this Consent Decree.”

According to the text above, inspections were to cover land-based and dredge areas and as such should have included inspections of habitat reconstruction. But the focus of the inspections appears to support properties only. There is no documentation that remediated areas were inspected by NYSDEC, NYS Canal Corp or EPA and how many of these agencies agreed that backfilling, capping, and habitat reconstruction were complete, and that follow-up actions were not required. NYSDEC’s letter of November 22, 2017 identifies deficiencies in habitat reconstruction and confirms that the state does not agree that habitat reconstruction is complete.

Page 1-5 to Page 1-6: “The ROD established criteria to govern the removal of sediments. Those criteria were based on the mass per unit area (MPA) of PCBs with three or more chlorine atoms (Tri+ PCBs). They targeted removal of sediments with an MPA of 3 grams per square meter (g/m2) or greater in River Section 1 and 10 g/m2 or greater in River Section 2, and removal of selected sediments with high PCB concentrations and erosion potential in certain Hot Spots identified by NYSDEC (Hot Spots 36, 27, and the southern portion of 39) in River Section 3. In addition, EPA’s July 2004 decision in a dispute resolution proceeding relating to GE’s initial Phase 1 Dredge Area Delineation Report established additional removal criteria based on the concentrations of Tri+ PCBs in surface sediments (EPA 2004a).” This wording suggests that the ROD did not specify delineating sediments other than on mass, which is incorrect. NOAA recommends that the document be revised to more accurately reflect the record. The ROD (pp 54-55) states:

“For the active technologies (capping and removal), areas of sediment targeted for remediation were selected based on the potential for those areas to contribute PCBs to the water column and fish through the food chain. The delineation of the target areas considered a number of factors, primarily the inventory of PCBs in the sediment, but also surface sediment concentrations, sediment texture, bathymetry and depth at which the PCB contamination is found.”
Further, the July 22, 2004 Dispute Resolution, Attachment 2 (p. 2) states, “The Administrative Record contains numerous statements in key EPA documents identifying the Agency’s use of PCB concentrations in surface sediment as a separate basis for sediment removal that has its own numerical criteria.” The attachment also provides numerous examples.

Page 1-6: First Full Para: Cite directly from the ROD pp ii – iv and reiterated on pp 94-96 rather than paraphrasing components of the remedy.

Page 1-6, Last Para to Page 1-9: Cite directly from EPA Engineering Performance Standards (EPS) for Phase 1 and Phase 2 related to residual, resuspension, productivity, and quality of life standards rather than paraphrasing the Standards. Similarly the substantive water quality certification requirements should be quoted.

Page 1-10, Section 1.4: NOAA recommends that this section specify the number of samples or records collected by media per sampling program, e.g., SSAP, SEDC, BMP. This can be presented in tabular form.

Page 1-11, Second Bullet, Biological Assessment (BA): NOAA (2012) announced the designation of five distinct population segments (DPS) of Atlantic sturgeon as federally protected under the Endangered Species Act on February 6, 2012 with the final rule going into effect on April 6, 2012. Atlantic sturgeon in the Hudson River fall within the New York Bight DPS segment and were listed as a federally endangered species. The biological assessment referenced in the RACR pre-dates that determination but components of the remediation occurred post-determination. The Section 7 biological consultation for Atlantic sturgeon should also be discussed and all BA’s should be included in an appendix to the RACR.

Page 1-13 to Page 1-14, Table 1-1: Phase 1 remedial design and remedial action submittals should be added to Table 1-1 or the information should be provided in a separate table. Please provide the specific titles for each of the addenda to the Phase 2 Final Design Reports (FDR) and Remedial Action Work Plans (RAWP) under the list of annual submittals and include the full citation in the Section 10 References.

Page 1-13, Table 1-1, 2011 and 2012 Submittals; and Page 10-2, Section 10: Please check release dates of the FDRs. Based on our records it appears that the Phase 2 FDR for 2011 should be cited as Revised April 2011 and the Phase 2 FDR for 2012 as Revised May 2012. Also please list all the addenda to design reports and any memoranda reflecting modifications to the design that are not otherwise presented, in Table 1-1 and insert those citations in the Reference Section 10.

Page 1-14: The description of the Remedial Action Monitoring (RAM) Quality Assurance Project Plans (QAPP) appears incomplete as updates, such as to the Standard Operating Procedures (SOPs) were not listed. Please revise and compile all RAM QAPP documents in a table similar to Table 1-1 and include all final documents and revisions/addenda/memoranda in an appendix to the report.

Page 2.1, Section 2.1.1, ‘For Tri+ MPA, the criteria targeted removal of sediments in any area that had an MPA at or above 3 g/m2 in River Section 1 or 10 g/m2 in River Section 2, as well as
sediments with high PCB concentrations and erosion potential in certain Hot Spots in River Section 3.” EPA makes clear in Final Decision Regarding General Electric Company’s Disputes that for hot spot remediation the following criteria were established: “1. Remediate sediment with a MPA greater than 10 g/m2; 2. Remediate “surface” sediment concentrations greater than 30 mg/kg…” (FS at p. 3-43, emphasis added).” The RACR should be clear about how the “hot spots” were defined for the purposes of remedy implementation.

Page 2.1, Section 2.1.1, “…this process was designed to delineate areas of sufficient size exceeding the criteria (and considering the ancillary information) to warrant removal from an engineering perspective, not to identify or designate for removal every discrete location exceeding the criteria.” The RACR should specify the decision from EPA’s July 2014 Final Dispute Decision. EPA stated that “GE shall apply the 50,000 square foot criterion consistent with the ROD, as the company was directed to do in EPA’s March 25, 2004 comments. The 50,000 square foot criterion shall be applied in limited instances where there would otherwise need to be a mobilization of equipment to reach an isolated area. An area that qualifies for exclusion on the basis of the 50,000 square foot criterion shall be identified only after a local interpolation via IDW$^2$ or some other spatial interpolator (or kriging) has been applied. Contaminated areas within reasonable proximity of one another do not constitute isolated areas. The ROD does not identify any minimum surface area for delineation of dredge areas that are not isolated. GE’s dredge area delineation reports shall identify and provide technical justification for each area that it proposes to be excluded on the basis of the 50,000 square foot criterion.”

Page 2-2, Para 2, “There are 60 CUs in River Section 2…”: The sentence should read “There are 60 CUs in River Section 1.”

Page 2-3, First Full Para: In accordance with the Phase 2 CDE, in locations where the edge of the dredge area did not extend to the shoreline, the lateral limits of the dredge area were defined using stable slope extending beyond the sediments targeted for removal. In locations where dredging extended to the shoreline and there were no sediment cores along the shoreline, the design called for a sediment removal cut of two feet (vertical) at the shoreline and then extending along a stable slope until it intersected the dredge prism. For these purposes, a stable slope was defined as a slope with a maximum steepness of 3 (horizontal) to 1 (vertical), or based on the existing slope if it was steeper and stable.” As-built CAD, pdf and shape file CU polygons should include the lateral extent of the stable slope and differential between the dredge prism and the stable slope. The actual constructed slope should be specified. The most current CU shape files were released during the remedial design and may not represent the final constructed condition that includes the lateral extent of the stable slope. The design CU shape files also do not include CU-01A.

Page 2-3, Last Para: “Engineering adjustments included internal slope adjustments to ensure stability after the sediment was removed; and offsets for in-water structures, including bridges, rip-rap, and dams.” Shape files documenting offsets should be part of the RACR.

Page 2-4, Section 2.1.2: More details on tree trim and tree removal in each river pool (Phase 1 and Phase 2) should be included in the RACR. This includes tables, maps as-builts and shape files of trees trimmed and removed during the remedial action and the Tree Removal Plan developed by a

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$^2$ IDW or inverse distance weighting
Certified Arborist during the remedial action as required by the Final Design contract specifications. To the best of our knowledge, this information is not included in any Annual Progress Report and was not included in the Phase 1 Completion Report for shoreline trimmed/cut prior to 2009 dredging.

Page 2-7, CU 60: GE should provide shape files depicting the staging areas, access road with finger piers, and the transload station.

Page 2-7, CU 95-2 and 95-3: GE should provide shape files depicting the staging area, CU 95-2 access road with finger piers, and transload station.

Page 2-9, Table 2-2: The RACR would benefit by summarizing the Phase 1 dredge areas along with the Phase 2 dredge areas to provide context so the reader has a comprehensive picture of the remedial action without having to resort to reviewing multiple documents at the same time.

Page 2-9, Table 2-2: For Year 5, list CU-01A under the CU Completed column rather than as a table note and include the volume per cubic yard (cy) of sediment removed in CU-01A in the appropriate Sediment Removal cell.

Page 2-10, Top Para: The RACR should also tabulate the volume (cy) of sediment removed per CU, the size of the CU (acres) and the average and maximum depth of sediment removal for Phase 1 and Phase 2 as this information is not available elsewhere as the data in Appendix A of the Annual Progress Reports pools data across CUs since it is parsed by volume removed per week or 4 week period not the total dredged per CU. This table should include CU-01A as a discrete entry.

Page 2-10, Top Para: Append “of Appendix A” after references to “Table 1”, “Table 2” and “Table 3”.

Page 2-10, Table 2-3: The Target Removal Volume (cy) and the Actual Removal Volume (cy) presented in the table for Phase 2 should include the sediment dredged from CU-01A. The table should be revised to include CU-01A if it doesn’t already do so. By including CU-01A directly into Year 5 of Table 2-2 (as requested above), what is and isn’t included in Table 2-3 would become more transparent. This table should have a subsection for Phase 1 and a grand total for the entire dredging project to provide context and to be comprehensive.

Page 2-11, Table 2-4: Total and Tri+ PCB mass removed should also be reported by CU for each of Phase 1 and Phase 2. The Phase 2 Year 5 mass removed should include CU-01A, if it doesn’t already do so.

Page 2-11, Top Para: “The Annual Progress Reports also provide, in Appendix D, tables showing the mass of Total and Tri+ PCBs removed from the River in the subject year and prior years.” The tables in Appendix D do not make clear whether the PCBs removed from CU-01A are included in the mass removed (kg) tabulation. This can be clarified in the footnote. Furthermore the footnote can update the mass removed to include CU-01A if not provided in Appendix D.

Page 2-12, First Full Para with Bullets: The RACR should differentiate between the types of backfill used during Phase 1 and those used during Phase 2. This should include a listing of backfill
Types 1-5 and why changes to backfill placed during construction were made. There should also be a brief discussion of backfill tolerances so that the reader understands that a 1-foot backfill design may result in backfill thickness more or less than 12 inches thick.

Page 2-12, Table 2-5: For context and comprehensiveness, please insert a row for Phase 1 Reach 8 or add CU1-CU8 to the Reach 8 row but footnote to distinguish between backfilling under Phase 1 and Phase 2. Also add a “River Pool” column to the left of “Reach” and insert “Designated” before “Shoreline Elevation”. Also insert a separate table, summarizing the type of backfill, volume and design and constructed thickness of backfill per CU for Phase 1 and Phase 2.

Page 2-12, Bullets and Footnote 10, and Page 2-13: Please provide as-built shape files depicting areas where cap and backfill were placed (phase, year, CU, acres, cap/backfill type, design and construction thickness), any modifications from design, and include polygons for areas where dredged but no cap/backfill placed due to water depth constraints, where nearshore backfill was placed to return an area to original bathymetry, and where a habitat layer was placed over backfill or cap. These as-built shape files should include both the extent and grade of the stable slope of the backfill or cap area that extends beyond the CU dredge prism.

Page 2-13, First Full Para with Bullets: The RACR should differentiate between the types of caps constructed during Phase 1 and Phase 2. This should include a listing of all cap types and why changes to cap design were made over time. There should also be a brief discussion of cap tolerances so that the reader understands that a constructed cap may be thicker or thinner than the cap design thicknesses on a total and individual layer basis.

Page 2-13, Para 2: Any agreements reached between GE and EPA regarding placement of backfill and cap material should be summarized in a table in Section 2.3 of the RACR including changes between design and as built.

Page 2-13, Para 3, “The total area during Phase 2 that received backfill and/or cap material amounted to 493 acres with 111 of those acres receiving cap materials.”: This paragraph suggests that 111/493 acres or 22.5% of Phase 2 was capped, but 493 acres were dredged in total for the entire project. Please check that the acres dredged in Phase 1 vs Phase 2 are current and update the RACR.

Page 2-14, Table 2-6: The reader would benefit from Table 2-6 having a row for Phase 1 (2009). Also please prepare a similar table that compiles the same information supplemented with cap type, design and measured cap thickness, volume cap placed, and area capped (i.e., nodes capped, non-counted capped areas) stratified by CU for Phase 1 and Phase 2. The RACR would be a good place for this synthesized data to reside and it is not readily available elsewhere.

Page 2-14, Table 2-6, Note and First Full Para: Please define what constitutes “non-counted capping areas”.

Page 2-11 to 2-14, Section 2.3: Please include schematics of all backfill, cap types, and shoreline stabilization methods constructed during the remedial action.
Page 2-11 to 2-14, Section 2.3: Please include the result of all chemical and physical analyses itemized below from each fill source. Raw and summarized data should be provided as part of the RACR submittal. We do not believe that this information is provided in any of the remedial action documents that preceded the release of the draft RACR. Per Phase 1 and Phase 2 contract specifications, prior to delivery of aggregate to the Project Site, at least one set of chemistry analyses was required for each material type and borrow source. In addition to pre-construction tests, pre-placement samples from each fill source were tested for the presence of polychlorinated biphenyls (PCBs), pesticides, target compound list (TCL) volatile organic compound (VOCs), TCL semi-volatile organic compounds (SVOCs), herbicides, target analyte list (TAL) metals, cyanide, and Total Organic Carbon (TOC) for each 20,000 tons of materials delivered to the Project Site, or at the request of the Construction Manager. In addition, for Backfill Type 2 with TOC, Backfill Type 3 and Backfill Type 5 pre-placement samples for TOC was tested for each 5,000 tons of materials delivered to the Project Site in addition to pre-construction tests. Further correlation analyses were performed between pre-placement TOC content and post-placement TOC content and river conditions.

One gradation test was also conducted for each 5,000 tons of each gradation material delivered to the Project Site for placement, or at the direction of the Construction Manager where material characteristics were visibly different. One Diesel Range Organic and Gasoline Range Organic (DRO/GRO) was similarly conducted for every 5,000 tons of each material delivered to the Project Site, or at the request of the Construction Manager.

For top soil, physical and chemical analyses (grain-size, pH, organic matter, phosphorus, potassium, calcium, and magnesium, TCL VOCs, TCL SVOCs Pesticide/PCBs, herbicides, TAL Metals, cyanide and TOC) was performed on one sample per 1,000 cy, or subset.

Page 2-14, Bottom to Page 2-15, Top: Please provide shape files documenting the as-built method, duration (short vs long term), location, year, areal extent (acres) and whether shoreline stabilization was implemented up to or above the designated shoreline elevation.

Section 3

Page 3-1, Para 4: Section 3.1 should tabulate the mass and volume of debris removed per CU. Woody debris and other vegetation should be differentiated from other debris.

Page 3-2, Para 2, “Following processing, the debris, coarse material and filter cake…”: Does debris include grubbed vegetation, e.g., SAV and wetland vegetation removed prior or during dredging, grubbing including tree trim and removed trees?

Page 3-2, Para 2,”The estimated volume of material processed I Phase 1 was given in Appendix A…For Phase 2, the estimated volumes of materials processed (in tons)…”; and Page 3-3 Table 3-1: Please provide the estimated volume of material processed by matrix, especially the woody debris and other debris, by year including Phase 1 and Phase 2 for comprehensiveness.

Page 3-3, Section 3.2: Please provide the number and size of rail cars that transported all debris and specifically woody debris off-site if mass or volume is not otherwise available.
Section 4

Page 4-1, Section 4, Para 2, “no replacement/reconstruction of shoreline habitats was necessary; and (c) the replacement/reconstruction of SAV and RFW habitats in Phase 1 dredge areas was performed in 2010 and 2011, consisting of the construction of SAV habitat in certain areas in CUs 3 through 8 and RFW habitat in certain areas in CUs 2, 7, and 8.”: Phase 1 habitat reconstruction appears deficient based on GE monitoring results, NYSDEC’s November 22, 2017 letter and trustee site visits.

Page 4-2, Top Para, “the installation of any shoreline replacement/reconstruction measures in Phase 2 areas, including reconstruction or repairs of disturbed areas above the shoreline elevations, was described in Section 2.4 (Shoreline Stabilization); and the OM&M of such measures is beyond the scope of this RA Completion Report.”: Section 2 should provide figures, tables, shape files and other details about disturbance to areas up or above the specified designated shoreline extent for each of the river pools. For example, live stakes were installed in CU-51 following clearing of the shoreline area prior to remediation of the fingerlike projection subarea.

Page 4-2, Section 4.1, “the placement of backfill and/or cap material, as described in Section 2.3, constituted the construction of such habitats; and the verification that the required type and thickness of backfill and cap material were successfully placed in accordance with the applicable Phase 2 design, as recorded in the Backfill/Engineered Cap Completion Approval Form (Form 2) package for each CU, met the requirement for replacement/reconstruction of UCB habitats.”: Successful placement of backfill and/or cap material per the design may still not provide suitable habitat for regrowth of aquatic vegetation beds (SAV) or riverine fringing wetlands (RFW) or be optimum for invertebrates, fish and wildlife of the Hudson River.

Page 4-2, Section 4.1 and Section 4.2: One or both of these sections should discuss placement of a habitat layer on top of backfill or cap as part of habitat reconstruction and shape files should be provided showing when, thickness, acres, and material placed in the river as habitat layer.

Page 4-2, Section 4.2.: “The Phase 2 CDE established the approach for identifying Phase 2 dredge areas where additional habitat backfill (as described in Section 2.3) would be placed to support the designation of those areas as SAV areas. That approach focused on pre-dredging SAV areas that were delineated in water depths between 2 feet and 8 feet (based on the shoreline elevations established using a design flow of 5,000 cubic feet per second [cfs] at the USGS gage in Fort Edward) and that would be in water depths greater than 8 feet after dredging and backfill placement.”: The habitat reconstruction of SAV did not reconstruct all of the SAV impacted by the remedy because: (1) dredging, backfill and capping destroyed existing SAVs and other potential SAV habitat at pre-dredge water depths between 0-2 ft and >8 ft; (2) only a portion of the impacted SAV areas would be replanted within the targeted depth zone because a significant area would be reconstructed passively through natural recolonization; (3) the total area planted or naturally recolonized was at a less than 1:1 ratio; and (4) SAV habitat reconstruction did not account for loss of functionality or time to recover of reconstructed beds.

Page 4-3, Para 3, “During Phase 2, SAV habitat was constructed by planting in 48 CUs and SAV natural recolonization areas were designated in 78 CUs.”: The total acres per CU designed vs.
constructed vs. existing stratified by each of the two construction methods (passive recolonization vs planting) should be tabulated including the West Griffin Island Area. The entire Sept 2016 habitat ledger can be updated and included in the RACR. SAV habitat reconstruction should not be deemed complete since some of the natural recolonization areas have not recolonized and some of the planted areas area also devoid of SAV. The cause of planted SAV not surviving should be investigated. Neel (2017) reports that 32 leaf samples from water celery, *Vallisneria Americana*, collected from the nursery that supplied plants for the Upper Hudson River SAV habitat reconstruction plantings were of a single genotype in contrast to the more than 400 genotypes found elsewhere in the Hudson. According to Neel, low numbers of genotypes result in lower growth and survival in seagrasses (Williams 2001, Hughes *et al.* 2009), reduced resistance to disturbance (Hughes and Stachowiz 2004) and lower growth (Engelhardt *et al.* 2014).

Page 4-4, Section 4.3, “*RFW habitats were then constructed by planting and seeding with native RFW species in accordance with the applicable design specifications, as well as the requirements set forth in the pertinent RAWP sections on habitat construction for the subject year, with any modifications agreed upon by GE and EPA.*”: The habitat reconstruction of RFW did not reconstruct all of the RFW impacted by the remedy because: (1) dredging, backfill and capping destroyed existing RFW and other potential RFW habitat; (2) a subset of the impacted RFW reconstructed through installation of plant plugs and seeding was not generally successful; (3) the total area planted and/or seeded was at a 1:1 ratio; and (4) RFW habitat reconstruction did not account for loss of functionality or time to recover of reconstructed wetlands.

Page 4-4, Section 4.3, Para 3, “*During Phase 2, RFW habitat was constructed in 41 CUs. Those constructed RFW areas are also identified by CU in Table 4-1, which shows all Phase 2 CUs in which RFW habitat was constructed and the year in which that construction was completed...*” The total acres per CU designed vs. constructed vs. existing stratified by each of the three construction methods (seeding Zone A vs seeding and planting Zone A; planting + seeding wild rice Zone B) should be tabulated including the West Griffin Island Area. The entire Sept 2016 habitat ledger can be updated and included in the RACR. RFW habitat reconstruction should not be deemed complete since some of the seeded areas and some of the planted areas are devoid of or limited in emergent vegetation or have different vegetative communities or communities with different structure.

Page 4-4, Section 4.3, Footnote 15: The footnote should make clear that this approach was a modification from Phase 1 as part of adaptive management due to the poor success associated with Zone A seeding where no plant plugs were installed in Zone A.

Page 4-5, Table 4-1: Insert Phase 1 SAV and RFW construction by CU to provide context and completeness.

**Section 5**

Page 5-1 to Page 5-2, Section 5.1: This section should briefly describe any changes to routine controls and best management practices between Phase 1 and Phase 2.

Page 5-5, Section 5.2.3, Para 1: The RACR should make clear that only 1 of the 5 river reaches or pools in River Section 3 was sampled for PCBs in fish during annual baseline and remedial monitoring. PCB tissue residues were not documented for Upper and Lower Mechanicville, Waterford and Troy Pools.
Page 5-5, Section 5.2.3, Para 2 and Footnote 20: The RACR warrants a more detailed and accurate discussion of non-compliance with consent decree mandated NYS Standard Fillet (rib-in) processing vs. fish processed as non-NYS standard (rib-out) fillet. This discussion should not be primarily embedded in a footnote to the report. The RACR should make clear that results of the 2014 black bass study provide no information on what the impact of non-adherence to processing protocol had on other filleted fish including white and yellow perch, white and channel catfish, brown and yellow bullhead, and striped bass.

NOAA previously commented on the 2014 black bass study (e.g., Federal Trustee letter of 9/23/15 regarding the Phase 2 Sediment Processing Facility Demobilization and Restoration Plan, NOAA presentation to Five Year Review Team 9/15/16, Federal Trustee letter of 7/21/16) providing our interpretation of the 2014 study results. That interpretation differs from that presented in the RACR. GE, in footnote 20, relies on a letter from the 2015 EPA 2 Regional Administrator, rather than a peer reviewed data analysis and interpreted technical report.

NOAA’s evaluation of the data supports the conclusion of a consistent low bias where NYSDEC Standard Fillet samples report higher PCBs than non NYSDEC standard fillets: 40% of NYS Standard Fillet samples were ≥20% higher and 20% were ≥40% higher than non-NYS standard fillet samples on a lipid normalized basis. Total PCBs measured in these NYS Standard Fillets were ~75% higher than the non-NYS standard processed fillets on a wet weight basis. EPA in their May 2017 Proposed Second Five Year Report observed more than a 2 times difference on a wet weight basis and <20% difference on a lipid-normalized basis, although EPA’s conclusion that the non-standard fillet lipid-normalized data are useable for establishing trends is not consistent with the results.

NOAA continues to offer the following recommendations:

- EPA prepare and release a peer-reviewed data analysis and interpretation technical report of the 2014 black bass NYSDEC standard fillet vs rib-out study that they had GE conduct. The Trustees can then cite this in our NRDA documents and GE can cite this in the RACR.

- EPA require GE to conduct an additional comparative study to provide data on the differences in wet weight and lipid-normalized PCBs between NYS Standard Fillet vs non-standard fillets in up to seven additional fish species that EPA monitors at this site.

This additional data collection would:

- Provide data to reduce uncertainty in fish PCBs during pre-dredging baseline (2007-2008) and dredging years (2009 and 2011-2015); and

- Improve evaluation of modeling of time to achieve fish triggers set forth in the ROD (0.05, 0.2, 0.4 ppm PCBs) to support remedial effectiveness and Trustee injury determinations.

Page 5-5, Footnote 19: This footnote should explain why collection of black bass was discontinued at Albany/Troy and Catskill. It was due to a decline in their population downstream of the Federal Dam at Troy.
Page 5-6, Footnote 21: The delay in processing the 2015 was because the SOP for processing fish was being updated to incorporate the requirement to fillet following NYSDEC Standard Fillet protocols.

Page 5-8, Table 5-1: To provide context and improve comprehensiveness of the overall remedial action, please add a row for Phase 1 (2009) far-field stations monitored daily or weekly.

Page 5-9, First Para: Include a brief description of the similarities and/or differences in the Resuspension Standard between Phase 1 and 2.

Page 5-9: Total and Tri+ PCB mass removed and remaining as residual or inventory after backfill and/or cap should be provided per CU in the RACR as a new table.

Page 5-10, Table 5-2: To place Phase 2 in the context of Phase 1 and the full remedy, please include a row for Phase 1(2009) total and Tri+ PCB loads and percent release past Waterford.

Page 5-10, Table 5-2, Note 1: The preparation of the table is attributed to Anchor QEA, LLC but other tables do not contain a similar attribution.

Page 5-10, Table 5-2, Note 3: The minor modifications of the method mentioned in the Phase 2 EPA for calculating mass should be described.

Page 5-11, First Full Para: Exceedances should be tabulated and submitted as part of the RACR.

Page 5-12: For context and completeness, also bullet the special studies conducted during Phase 1. A summary paragraph should be provided for each bulleted special study conducted under the remedial action so the reader doesn’t have to access and review each of the separate reports.

Page 5-12, Footnote 30: Documentation should be provided supporting EPA’s concurrence that the NAPL characterization study could not and would not be completed.

Page 5-13, Black Bass Fillet Ribcage Study: EPA committed to completing a thorough analysis of the data and present the results in a formal memo or report. This is still outstanding and should be completed so that it can be referenced in the RACR.

Section 6

Page 6-3, Table 6-1: Please update table to reflect state site # for the six entries listed as “pending”.

Section 7

Page 7-3, Section 7.1.2, Para 2 to Para 4; Page 7-4, Section 7.13 Para 2 and Section 7.1.4, Para 2 and 3, and Page 7-5, First Full Para: “The post-decontamination sampling results met the criteria for unrestricted use…”, “The post-decontamination sampling results for the stormwater drainage piping and structures met the criteria for unrestricted use “: The criteria should be specified in this section of the RACR.
Page 7-7, Section 7.2, “The support areas that were used for handling PCB-containing materials, as well as the other key support areas that were used for significant project activities, were demobilized and restored through removal of equipment and temporary foundations and facilities, decontamination of equipment as necessary, grading and stabilization of the sites, and other appropriate restoration (including wetlands restoration where applicable)…” Table 7-1 should include all restoration actions including grading, stabilization and other appropriate restoration including wetlands. Shape files of the impacted areas and the scope and type of restoration should also be provided in the RACR.

Section 8

Page 8-1, Section 8.1, “All CU completion/acceptance packages, as described in Section 5.2 of the SOW, have been submitted to and approved by EPA.”: The CU completion/acceptance packages are incomplete because as-built documentation and/or as-built shape files are missing for various components of the remediation. For example, as-builts or construction impacts have not been provided for tree trim/tree removal, access dredging, road access areas with and without finger piers, rock dike construction, material loading and staging areas and processing facility and subsequent support site restoration, etc. Shape files have not been and should be provided final CU boundaries, access dredging areas, tree trim/removals, backfill/cap/habitat layer including the area extent beyond the dredge boundary for stable slope, shoreline stabilization measures and repairs, etc.

Page 8-2, Last Sentence: “Further, GE considers that the inspections held on November 10 and 30, 2016 (with the follow-up on December 16, 2016) satisfied the RA Completion Pre-Final Inspection requirement of Paragraph 57.a, given that no additional inspections have been required.”: According to the consent decree, inspections were to cover land-based and dredge areas and as such should have included inspections of habitat reconstruction. There is no documentation that habitat areas were inspected by NYSDEC, NYS Canal Corp or EPA and that they concurred that follow-up actions were not required habitat reconstruction. (See Comment to Page 1-4, Top Para, above).

Section 10

All the documents cited in the References section should be included on the external drive provided as part of the RACR submittal.

Figures

Figure 1-1: Please add Reach 8 Phase 1 CUs to the imagery and to the acreage table. Separate Phase 1 and Phase 2 acres can be supplied along with the total acres remediated in the Thompson Island Pool (Reach 8).

Figure 1-3 and Figure 1-4: Report the total number of acres remediated in Reach 4 (Upper Mechanicville Pool).

Figure 2-1 to Figure 2-31: The symbology for the navigation channel in the legend and map are not the same because the dark blue fill in the legend is missing from the figures.
Figure 5-1a to Figure F-1e and Figure 5-2a to Figure F-2e: Non-detect results should be depicted using different symbols to distinguish between detected and non-detected PCB results.

In conclusion, NOAA appreciates the opportunity to provide technical comments on the draft Remedial Action Completion Report (RACR). NOAA shares the goal of full recovery of the Hudson River from PCB contamination and cleanup construction impacts in as short a time as is practicable to minimize ongoing injury to natural resources and the services those resources provide to people and the economy. Our technical comments are intended to improve the comprehensiveness of the RACR. NOAA recommends that before the RACR is approved and finalized that EPA demonstrate that the remedial action is protective of human health and the environment, that the habitat has been fully reconstructed, and that additional technical information be incorporated into the document. Foremost in our consideration is a timely, positive outcome for the river, including the migratory and resident biota that inhabit the river, the public that enjoys and cherishes the river, and the economic benefits that are derived from the river. Please do not hesitate to contact us with any questions or comments or if you would like to discuss these recommendations further.

Sincerely,

Lisa Rosman
References


NOAA 2016. Recommendations on the Use of Available Data to Evaluate Remedy Effectiveness, Presentation to Hudson River Five Year Review Team.

Neel, M. 2017. Rise and Fall and Rise of Submerged Aquatic Vegetation in the Tidal Freshwater Hudson River, co-presentation to Hudson River Foundation, November 7, 2017,
