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August 20, 2014

VIA HAND DELIVERY

Ms. Alice Yeh, Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Re: Comments on Behalf of the Lower Passaic River Study Area Site Cooperating Parties Group on the Proposed Plan for the Lower Eight Miles of the Lower Passaic River Part of the Diamond Alkali Superfund Site

Dear Ms. Yeh:

On behalf of the Lower Passaic River Study Area Site Cooperating Parties Group (CPG), we herewith deliver the following items to be included in the administrative record for the "Proposed Plan for the Lower Eight Miles of the Lower Passaic River Part of the Diamond Alkali Superfund Site," issued by Region II of the Environmental Protection Agency on April 11, 2014:

- (1) "Comments on behalf of the Lower Passaic River Study Area Site Cooperating Parties Group on the Proposed Plan for the Lower Eight Miles of the Lower Passaic River Part of the Diamond Alkali Superfund Site;"
- (2) Appendices A through G and Attachments A through L to the comments;
- (3) A List of Documents to be Included in the Administrative Record (List of Documents); and
- (4) A DVD containing the foregoing, as well as copies of all of the documents identified in the List of Documents, except for government guidance documents and reports, and copyrighted items.

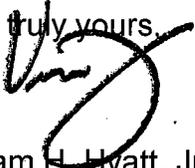
The CPG requests that these comments and documents form the basis for the selection by EPA of a response action for the lower eight miles of the Lower Passaic

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River Part of the Diamond Alkali Superfund Site; accordingly, please include them and this cover letter in the administrative record with respect to that selection. Furthermore, the CPG requests that all data collected with respect to the LPRSA be included in the administrative record.

The CPG has provided a copy of the comments and a disk containing items (1) through (3) to the recipients of copies of this letter. A copy of item (4) will be provided upon request. These comments and documents are submitted for inclusion in the administrative record and are not intended as an admission of any fact or of the liability of any CPG member.

Thank you for the opportunity to submit these comments and other materials for the administrative record.

Very truly yours,


William H. Hyatt, Jr.
Coordinating Counsel

Enclosures

cc (via overnight mail):

The Honorable Robert Menendez
The Honorable Cory Booker
The Honorable Bill Pascrell, Jr.
The Honorable Rodney Frelinghuysen
The Honorable Albio Sires
The Honorable Donald Payne, Jr.
The Honorable Chris Christie
Acting Attorney General John Hoffman
Commissioner Bob Martin
Acting Deputy Administrator Lisa Feldt
Acting Director Robin H. Richardson
Assistant Administrator Mathy Stanislaus
Deputy Assistant Administrator Barry Breen
Director James E. Woolford
Chairman Stephen J. Eills, CSTAG
Director Cyndy Mackey
Regional Administrator Judith Enck
Director Walter Mugdan
Regional Counsel Eric Schaaf

Comments on Behalf of the Lower Passaic River Study Area Site Cooperating Parties Group on the Proposed Plan for the Lower Eight Miles of the Lower Passaic River Part of the Diamond Alkali Superfund Site

I. INTRODUCTION

These comments are submitted on behalf of the Lower Passaic River Study Area Site Cooperating Parties Group (CPG) with respect to the *Superfund Proposed Plan for the Lower Eight Miles of the Lower Passaic River Part of the Diamond Alkali Superfund Site* (Proposed Plan), the accompanying Focused Feasibility Study (2014 FFS), and the nearly 1,000 pages of appendices issued on April 11, 2014 by Region 2 of the U.S. Environmental Protection Agency (EPA) (Region 2 or the Region).

The massive scale and cost of the preferred alternative remedy (Preferred Alternative) described in the Proposed Plan require a far more rigorous approach to the development and screening of remedial alternatives, the comparative analysis of those alternatives, and the determination of the overall costs and benefits of the Preferred Alternative than has been presented in the 2014 FFS and the Proposed Plan. The 2014 FFS and Proposed Plan have been prepared without consideration of extensive additional information and analyses developed through the 17-mile Lower Passaic River Study Area (LPRSA) remedial investigation and feasibility study (RI/FS) being conducted by the CPG under the direction and oversight of Region 2.

The Proposed Plan relies upon a remedial investigation (FFS RI) and the 2014 FFS to select the Preferred Alternative for the sediments in the lower eight miles (FFS Study Area) of the 17-mile LPRSA. The LPRSA is, in turn, Operable Unit 3 (OU-3) of the Diamond Alkali Superfund Site. The former Diamond Alkali facility is located at 80-120 Lister Avenue in Newark, New Jersey (the Lister Avenue Facility). Diamond Alkali's intentional discharges of 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (2,3,7,8-TCDD or TCDD) and other contaminants of concern (COCs) from the Lister Avenue Facility into the LPRSA led to the designation of this Superfund site, which bears Diamond's name and drives the need for cleanup.

The CPG is comprised of more than 60 companies who are working cooperatively with Region 2 under three settlement agreements in an effort to develop a consensus solution to remediation of the LPRSA, so that a comprehensive resolution can be achieved, avoiding what is otherwise certain to be protracted litigation. The CPG is conducting the National Oil and Hazardous Substances Pollution Contingency Plan (NCP)-compliant RI/FS of the entire LPRSA, which includes the FFS Study Area.

The CPG members never owned or operated the Lister Avenue Facility. The CPG does not include any parties who formerly owned or operated the Lister Avenue Facility, Occidental Chemical Corporation (OCC), Tierra Solutions, Inc. (Tierra), and Maxus Energy Corp. (collectively, OCC Parties), nor does it include many other parties Region 2 has deemed responsible for the remediation of the LPRSA. The OCC Parties withdrew from the CPG in 2012, when the CPG reached a settlement with Region 2 under which the CPG conducted a time-critical removal of TCDD-contaminated sediment in a mudflat at river mile (RM) 10.9 (RM 10.9 Removal Action). At that time, OCC refused to contribute a reasonable share of the costs of the RM 10.9 Removal Action even though the evidence showed that the TCDD contamination came from the Lister Avenue Facility. The remaining CPG members have continued to conduct the RI/FS (and the RM 10.9 Removal Action) under the direction and oversight of Region 2.

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II. EXECUTIVE SUMMARY

A. *The Proposed Plan is Inconsistent with CERCLA and the NCP*

The issuance of a Proposed Plan now, 7 years after the original draft FFS was released in 2007 (2007 Draft FFS) and only months before the comprehensive RI/FS of the entire 17-mile LPRSA (including the FFS Study Area) is to be completed, is inconsistent with Region 2's original concept of an "early action" and violates multiple aspects of the NCP and EPA guidance. The 2014 FFS proposes a massive dredging remedy, larger than dredging remedies at the Hudson River and New Bedford Harbor, two of the largest sediment Superfund sites in the United States, *combined*. The Preferred Alternative would be the largest cleanup in EPA history and would dredge enough sediment to fill MetLife Stadium, *twice over*. Region 2 April 11, 2014 Press Release. Even so, the Preferred Alternative would not achieve the protectiveness goals established by Region 2, yet it would likely be the most costly Superfund remedy in history. This remedy will not achieve Region 2's protectiveness goals but will cost unprecedented, enormous sums of money to implement, is not cost-effective, and directly violates the NCP. Moreover, Region 2 misrepresented the conditions of the river sediments and the effectiveness of the remedial alternatives that were evaluated. At every step in the 2014 FFS process, Region 2 has made a series of incorrect and scientifically unsupportable assumptions and interpretations that demonstrate a clear preconceived bias for a bank-to-bank remedy, the same remedy Region 2 proposed in the 2007 Draft FFS. All this despite the fact that there are now legions of data, collected over the last seven years, demonstrating that the disruption and cost of a bank-to-bank remedy are not needed to protect human health and the environment.

B. *The History of CPG Settlements with Region 2*

Pursuant to a 2004 settlement agreement with Region 2, as amended, the CPG provided Region 2 with over \$13,000,000 in funding for its RI/FS of the entire 17-mile LPRSA. In 2007, Region 2 advised the CPG that it lacked the resources to complete the RI/FS and asked the CPG to complete the study. On May 8, 2007, the CPG and Region 2 entered into a Settlement Agreement and Administrative Order on Consent (the RI/FS AOC) under which the CPG agreed to complete the RI/FS of the entire 17-mile LPRSA, including the lower eight miles of the LPRSA which are the subject of the Proposed Plan. In the RI/FS AOC, Region 2 agreed to allow the CPG to act for the Region and under its oversight, to complete the study. Since 2007, the CPG has spent more than \$100,000,000 on the RI/FS, which complies with the NCP and is scheduled to be completed in a matter of months. The RI/FS is a mandatory step in the remedy selection process required by the Comprehensive Environmental Response, Compensation and Liability Act, 42 USC 9601 *et seq.* (CERCLA), and the NCP. By contrast, the FFS is nowhere to be found either in CERCLA or the NCP.

The CPG has developed and is continuing to develop extensive data and analysis of the LPRSA, including the FFS Study Area, in the course of completing the RI/FS necessary to select an appropriate remedy. All of this has occurred under the oversight, and at the direction, of Region 2. However, instead of following established legal and regulatory processes to reach a proper decision about how to address contamination in the Passaic River, Region 2 has circumvented the RI/FS process, and has effectively: (1) delayed completion of the RI/FS that it had previously required; (2) increased the costs for itself, for CPG members, and for the public; and (3) increased the likelihood of expensive and time-consuming litigation between and among the Region, CPG members, and other third parties, including the current and former owners and

operators of the Lister Avenue Facility which discharged the TCDD and other contaminants and started this entire series of events.

In 2012, the sampling performed as part of the RI/FS process, identified a mudflat with elevated concentrations of TCDD and other contaminants in the vicinity of RM 10.9. In response, the CPG entered into another settlement with Region 2 to conduct the RM 10.9 Removal Action, which was a time-critical action to remove and cap sediment contaminated with TCDD at RM 10.9.

C. The 2014 FFS is Inconsistent with the NCP

In spite of requiring the CPG to conduct extensive and expensive sampling in the LPRSA, Region 2 has failed and refused to give consideration to all available data and information learned from the RI/FS and the RM 10.9 Removal Action. Both the RI/FS and RM 10.9 datasets include comprehensive and detailed information that furthers the understanding of contaminant patterns in the river and illustrates the efficacy of a targeted, adaptive management approach to sediment remediation and risk reduction. These data undermine the assumptions and conclusions in the 2014 FFS, but were ignored by Region 2 when undertaking its modeling and setting preliminary remediation goals (PRGs).

The 2014 FFS intended to support the Proposed Plan was initiated in response to public pressure to "do something" on the LPRSA. The FFS began prior to 2007 as a study to find an "early action" that could be completed quickly to satisfy public pressure to remove TCDD contamination from the sediments in the LPRSA. Over time, the "early action" FFS morphed into a study to find a final remedy for the sediments in the lower eight miles of the river. Once that change was made, two duplicative studies of the same sediment were being conducted simultaneously, a violation of the NCP. Region 2 has offered no explanation to justify a duplicative study of the same sediments that were already being evaluated in the RI/FS. That duplication has wasted tens of millions of dollars because it is now clear that the Preferred Alternative selected in the Proposed Plan cannot be implemented in the months before the RI/FS is completed. Moreover, the 2014 FFS remedy clearly does not comply with the NCP definition of an "early action." The 2014 FFS is neither technically sound nor scientifically reliable and ignores the realities of the river dynamics.

The NCP requires an analysis of alternative remedial approaches before a preferred alternative can be selected. The NCP states that the analysis and evaluation shall reflect the scope and complexity of the specific site. Given the unprecedented size, scope, scale, and estimated cost of the Preferred Alternative, the Proposed Plan should have contained a complete, thorough and detailed analysis of all available information for this specific site. Instead, as will appear in these comments, Region 2, among other things:

- Ignored data – results from hundreds of sediment cores and thousands of samples – it required the CPG to gather and analyze as part of the RI/FS, especially data collected since 2012;
- Ignored background:
 - Selected unattainable PRGs that can never be achieved because the PRGs are unrealistic given that they are significantly lower than the concentrations of materials in the upper 9 miles of the river and, for COCs other than TCDD, also lower than background concentrations found above Dundee Dam;

- Essentially ignored the impacts of background concentrations on attaining cleanup goals and the urban nature of the LPRSA; as a result, following a massive sediment removal, recontamination to background levels will occur and the remedy will have little to no long-term benefit for any COC, other than possibly TCDD;
- Ignored lessons learned regarding critical implementation issues encountered during the RM 10.9 Removal Action involving bridge openings, channel width and depth, tidal cycles, and other restrictions on the movement of barges;
- Deferred until remedial design key feasibility, implementation, and short term effectiveness issues the NCP requires EPA to balance during the decision-making process and certainly before selecting a preferred alternative;
- Avoided site-specific data in favor of generic, default values or non-LPRSA data, for example by:
 - Refusing to be involved in or consider the consumption data from a year-long in-person, peer-reviewed survey of anglers on the Lower Passaic River (the creel angler survey (CAS)) and instead relying on shorter, older studies that were performed in different areas or not designed to determine consumption rates, including a mail survey of New York anglers on lakes and ponds more than two decades old. Region 2 further ignored the same author's follow-up study that found results less helpful to the Proposed Plan;
 - Relying on extreme over-conservatism in the 2014 FFS HHRA. The CPG is conducting a site specific human health risk assessment, which demonstrates that the risks in the 2014 FFS HHRA are exaggerated and not borne out by a more site-specific analysis which shows risks to be only slightly above USEPA's target risk levels (See Attachment B);
 - Refusing to use available empirical data and instead relying on modeled initial conditions for recovery projections;
 - Refusing to use available empirical data and instead relying on modeled tissue concentrations for background above Dundee Dam;
 - Relying on data collected prior to the LPRSA RI/FS and non-LPRSA data in its bioaccumulation calculations to predict future risk, directly contradicting its December 2010 agreement that non-LPRSA data would not be used to develop risk estimates for the LPRSA; and
 - Not relying on surface water data collected to develop partitioning co-efficients for contaminant fate and transport (CFT) modeling that the Region and its contractors deemed critical and essential to the LPRSA RI/FS, instead relying on older regional values developed from the Contaminant Assessment and Reduction Program (CARP) model.
- Relied upon a conceptual site model (CSM) that:
 - Did not integrate extensive sediment, surface water and biota data collected by the CPG as part of the RI/FS under Region 2 oversight; and
 - Incorrectly concluded that there is no ongoing recovery in the River, that background concentrations do not influence the FFS Study Area, and that high concentrations are random and without structure (i.e., "well mixed box"), yet at the same time, the

Region's sediment transport (ST) model and CFT model are inconsistently based on the concept that there is structure in the data.

- Employed an inadequate screening level ecological risk assessment (SLERA), when the NCP requires a much more elaborate baseline ecological risk assessment (BERA), which evaluates actual site conditions, to be conducted;
- Based ecological risk calculations on inaccurate and unrealistic assumptions, including:
 - Created a fake, generic fish that does not exist and is not representative of the life histories of the fish population that does inhabit the River;
 - Estimated that a large portion of a heron's diet consisted of bottom dwelling common carp eight to ten times its weight;
 - Reduced literature values by applying undisclosed "extrapolation factors";
 - Selected a 2,3,7,8-TCDD toxicity threshold for benthic organisms based on a conference presentation that was not peer-reviewed; and
 - Accounted for mink when the species has not been observed in the FFS Study Area.
- Ignored site-specific data detailing the actual conditions of the benthic community and the biologically active zone (BAZ) in the LPRSA (site-specific empirical data show a BAZ 0 to 2 cm below the sediment-water interface) when conducting its analysis and instead substituted default values that do not reflect reality (default generic BAZ of 0 to 15 cm);
- Failed to provide the information necessary to reproduce bioaccumulation calculations and failed to respond to Freedom of Information Act (FOIA) requests seeking this information;
- Ignored the fact that the risks CERCLA and the NCP are intended to eliminate or control are not driven by the mass of the contamination but by exposure of receptors that may be harmed to the few contaminants that actually affect risk;
- Failed to apply key scientific concepts in constructing its models, such as that some degree of contaminants adhere to sand, directly impacting the potential for recontamination;
- Employed a numeric model that falls far short of professional standards (e.g., so poorly calibrated that predicted surface water concentrations of several COCs are 10 times greater than empirical results) and produces absurd post-remedy projections (e.g., less than 10 parts per trillion of TCDD in surface sediment post-remediation), even though TCDD concentrations upstream of the FFS Study Area and in Newark Bay are many multiples higher, and in some portions of its model predicts nonsensically that enough sediment accumulates to fill in the River to reach elevations above the water surface;
- Ignored the results of its own model when they do not support a bank-to-bank dredge (for example, Region 2's model shows that the flux of COCs to Newark Bay is only slightly reduced following a bank-to-bank remedy in the FFS Study Area);
- Conducted a parallel study of the same sediments, under the guise of selecting an "early action" but which took so long that it can no longer credibly be viewed as "early." This duplicative work has wasted tens of millions of dollars.
- Failed to appropriately analyze the feasibility of completing the Preferred Alternative by not properly evaluating the feasibility of opening and closing multiple bridges which carry

vehicular and rail traffic; failed to determine whether such bridges can even, in fact, be mechanically opened and closed thousands of times during the project;

- Included extensive navigational dredging in the Proposed Plan, which is not a CERCLA response action because it does not address risk to human health and the environment
- Included approximately \$850,000,000 of cost for navigational dredging which is not a CERCLA response action but is instead the responsibility of the US Army Corps of Engineers (USACE) and is not economically justified; this dredging represents by volume 48% of the dredging called for by the Region's Preferred Alternative;
- Led the public to believe that planning, permitting and construction of the Preferred Alternative could be completed in 5 years (a physical impossibility), and failed to consider or inform the community of the enormous logistical nightmares they would face during implementation, including many thousands of bridge openings with resulting traffic congestion and rail transportation delays;
- Failed to evaluate the disruption to the local and regional economy as a result of huge daily delays in vehicular and rail traffic, an economic impact that could be in the hundreds of millions of dollars over a period of 10 to 20 years (a realistic estimate of the time period for implementing the Preferred Alternative);
- Ignored existing data and information concerning the current unavailability of possible sites for sediment processing facilities;
- Failed to consider the significant environmental impacts associated with the movement of thousands of rail cars with sediment to disposal facilities located many hundreds of miles away;
- Held the CPG to higher standards of performance than it required of its own contractors;
- Ignored the fact that the Proposed Plan would need a waiver from applicable or relevant and appropriate requirements (ARARs) for surface water quality;
- Failed to fully evaluate and inform the public regarding the use of a confined aquatic disposal (CAD) facility versus an upland processing facility and off-site disposal, and allowed the State of New Jersey to effectively wield a veto over the use of a CAD; – a commonly used and technically acceptable method of sediment disposal used by EPA and the USACE throughout the country;
- Failed to inform the community of the fact that pathogen contamination in the LPRSA, which presents greater acute health risks in the LPRSA than the presence of COCs in the sediment, is not addressed at all in the 2014 FFS; pathogens will prevent the LPRSA from being fishable or swimmable, even after implementing the Preferred Alternative;
- Disregarded and failed to address multiple key technical comments made by the EPA's Contaminated Sediments Technical Advisory Group (CSTAG) and the peer reviewers on its CSM when it issued the Proposed Plan, including the express direction that the Region develop a bank to bank dredging alternative which excludes navigational dredging. Moreover, its own peer reviewers in 2008 warned of the potential for recontamination from sediment above RM 8 and also recommended the development of a targeted remedy – both of which the Region failed to adequately heed;
- When pressed by the EPA's National Remedy Review Board (NRRB) in 2012, Region 2 included a targeted remedial alternative in the 2014 FFS -- Alternative 4, Focused Capping with Dredging for Flooding (Focused Capping Alternative), but designed it using

one set of criteria (chemical flux) and then evaluated the effectiveness of the remedy using an entirely different set of criteria (predicted surface concentration). The Focused Capping Alternative fails to target all areas with high concentrations of contamination. As a result, the Region failed to develop a technically sound targeted alternative, which it then evaluated as not being protective of human health and the environment; the Focused Capping Alternative appears to have been designed to fail.

These and other clear errors of judgment on the part of Region 2 detailed in these comments were arbitrary and capricious, abuses of discretion, and violations of law.

The 2014 FFS, which duplicates and essentially replaces the RI/FS for the lower eight miles of the LPRSA, is not described anywhere in the NCP, is inconsistent with the NCP, and should not have been used to propose a preferred alternative. The 2014 FFS fails to provide sufficient technical justification for the conclusions drawn in the Proposed Plan. The alternatives described in the 2014 FFS are nothing more than concepts that have not been fully evaluated through the feasibility study process, as required by the NCP. Instead, such evaluation has been improperly deferred to the remedial design by Region 2; as a result, critical feasibility and implementation issues are not being considered in the decision-making process. For example, the 2014 FFS fails to consider factors that will significantly affect implementation and short-term effectiveness, such as the presence of 15 bridges in the FFS Study Area, most of which would have to be opened and closed thousands of times in order to implement the Preferred Alternative and dozens of utility crossings in the lower eight miles that will have to be precisely located and avoided. These considerations adversely impacted the schedule of the RM 10.9 Removal Action and are certain to have a similarly adverse impact on the Proposed Plan Preferred Alternative. Indeed, the impact can be expected to be far greater because, relative to the RM 10.9 Removal Action, the Preferred Alternative would require the dredging of 250 times more sediment.

Furthermore, the cornerstone of the evaluation of the feasibility of the Proposed Plan Preferred Alternative is a 2005 environmental dredging pilot study report (2005 Pilot Study) (LBG 2012) that cannot be used for the purpose for which Region 2 has used it, which is to estimate the duration of construction and the cost of the remedy. Region 2's presumed environmental dredging production rate is based on broad, undocumented assumptions, and has never been achieved in an environmental dredging project, much less at a site of this complexity. The Region's presumed dredging production rate is especially arbitrary given the densely populated, urban environment of the LPRSA. Instead of using dredging rates from the 2005 Pilot Study or the RM 10.9 Removal Action, Region 2 assumed an efficiency that they were unable to achieve in the 2005 Pilot Study. However, Region 2 has not included any documentation, detailed analysis, or explanation to support the higher dredge rates that it assumes will occur on this project. A more realistic dredging rate, combined with consideration of serious implementation issues, compels the conclusion that Region 2's duration and cost estimates are seriously flawed beyond any tolerance allowed by the NCP. Region 2's estimates are essentially useless.

D. The 2014 FFS and Proposed Plan are Arbitrary and Capricious

The 2014 FFS and the Proposed Plan are based on clear errors of judgment in the underlying work done to support the agency's decisions, the methodologies used, and the conclusions reached by Region 2. One of the most significant of these errors in judgment is Region 2's selection of PRGs for the FFS Study Area. In setting the PRGs, Region 2 disregarded EPA guidance and established practice by selecting unattainable PRGs for some COCs that are substantially below background levels (~10 times lower). The higher background levels will

guarantee that the PRGs will not be met, thus assuring that the remedy will fail. Region 2 failed to provide a full and complete evaluation of the impact of background conditions and further failed to justify its departure from the 2007 Draft FFS where PRGs were set at background concentrations. Thus, Region 2 arbitrarily and capriciously changed its decision from the 2007 Draft FFS, which admitted that remedial objectives will not be achieved in the LPRSA until PRGs are met above Dundee Dam.¹ The Passaic River above Dundee Dam is outside of the LPRSA, and beyond the scope of the Preferred Alternative.

The clear errors in judgment made by Region 2 in setting PRGs render the Proposed Plan untenable and fail the US Supreme Court's test for reliable science in the *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993) decision.

Combined with the multitude of other errors, omissions, and violations of law, the Region's proposed selection of the Preferred Alternative is arbitrary and capricious. Furthermore, due to the errors in scientific methodologies and the unreliability they create, the Proposed Plan and the underlying analysis in the 2014 FFS would not satisfy the US Supreme Court's *Daubert* standards for the admissibility into evidence of expert testimony, the spirit of which has been applied by the federal courts to prevent unreliable scientific evidence from being relied upon to make administrative decisions. Many of these deficiencies are summarized in Section II.C. above and detailed discussion is included in these overall comments. Specifically, for example, the use of flawed numeric models and the failure to use all available data to validate and calibrate these models result in nonsensical and absurd predictions about the future effectiveness of the Preferred Alternative. Accordingly, Region 2 should withdraw the 2014 FFS and Proposed Plan, and select a remedy for the LPRSA in reliance on the RI/FS, as required by CERCLA and the NCP, and in accordance with the terms of the RI/FS AOC. To do otherwise is not only a breach of the foregoing processes, but a breach of the RI/FS AOC.

E. EPA's National Policy on Sediment Site Remediation

Major contaminated sediment sites, such as the LPRSA, present especially complex challenges to EPA, involving more uncertainty than other kinds of Superfund sites. More than a decade ago, EPA recognized these challenges by publishing CERCLA guidance that articulated 11 *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites* (USEPA 2002b) (henceforth referred to as Principles). Then, in 2005, EPA issued detailed guidance for project managers making remedial decisions for contaminated sediment sites entitled, *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* (USEPA 2005) (henceforth referred to as Sediment Guidance). Among other things, the Principles and Sediment Guidance advocate the use of "adaptive management," which counsels that environmental cleanups of contaminated sediment sites should be conducted in phases so that uncertainties inherent in complex sediment sites can be better informed and resolved as the cleanup proceeds and as additional data and experience are generated by the process. In other words, adaptive management encourages regulators to learn from activities and improve performance as the cleanup proceeds. While Region 2 claims it will use an adaptive management approach in the remedy implementation, such an approach is fundamentally flawed. Adaptive management is intended to guide *decision-making*. Selecting a massive dredging remedy first is inconsistent with adaptive management and precludes the requisite flexibility and adjustment during remedy selection. Region 2 has ignored this EPA guiding principle in deciding on its Proposed Plan.

¹ "[A]ny remedial effort within the Lower Passaic River can only be expected to meet risk-based PRGs once the load from above the dam also meets the PRGs." 2007 Draft FFS, pages 2-16 to 2-17.

F. *The Sustainable Remedy*

Consistent with the Principles and Sediment Guidance, the CPG is developing an alternative as part of the remedial alternatives evaluation in the RI/FS. This alternative, called the Sustainable Remedy, will provide a comprehensive remedy for the entire 17 miles of the LPRSA, including the lower eight miles of the LPRSA which are the subject of the Proposed Plan. The Sustainable Remedy will reduce sediment-related risks faster and more cost-effectively, cause less resuspension and less disruption to the community, address many of the implementation issues presented by the Preferred Alternative, and be consistent with the NCP and current EPA guidance. The Sustainable Remedy will achieve a level of protectiveness that is comparable to the Preferred Alternative in a much shorter time frame with less disruption to the community. It does this by targeting specific areas where the presence of risk-driving COCs in sediments are inhibiting the natural recovery processes in the river, and to which the food web is or might be exposed. Further, the Sustainable Remedy specifically avoids the disruption of other areas in the river that are not contributing to risk, and precludes resuspension from these areas. Because it is an interim remedy, the Sustainable Remedy will employ adaptive management to decision-making wherein Region 2 can learn and adapt as information develops. If goals are not achieved following implementation of the Sustainable Remedy, additional work can be done to achieve those goals. That is the essence of the adaptive management advocated by EPA.

G. *Conclusion*

The 2014 FFS and Proposed Plan must be withdrawn because they do not meet the requirements of the NCP, are based on arbitrary and capricious assumptions and conclusions, and are technically and legally insufficient. They do not comply with EPA guidance or Region 2's own directions with respect to the RI/FS, and are so technically deficient as to fail the applicable *Daubert* standards. Therefore, the Proposed Plan is premature and not sufficiently supported, and should never have been issued in its present form. It should be withdrawn pending completion of the RI/FS.

III. BACKGROUND

Dioxin, specifically 2,3,7,8-TCDD, is the principal contaminant of concern that has driven investigation and response activities for the entirety of the Diamond Alkali Superfund Site, including the LPRSA. The historical release of TCDD at the Lister Avenue Facility and Region 2's investigation of and response to those releases have played a critical role in shaping the current state of the river, the administrative process, and the remedy now required for the river. Accordingly, a brief overview of that history is necessary.

A. *The Release of Dioxins from the Lister Avenue Facility*

A detailed history of the Lister Avenue Facility is attached to these comments as Attachment A. In brief, from 1951 to 1969 various predecessor companies of OCC, including Diamond Alkali and Diamond Shamrock (Diamond) produced trichlorophenol (TCP) and 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) at the Lister Avenue Facility. In its production of TCP, Diamond created 2,3,7,8-tetrachlorodibenzo-*p*-dioxin as a product impurity. TCDD formation was inherent in the production of 2,4,5-T. Diamond annually produced millions of pounds of TCP and 2,4,5-T. All of the TCP and 2,4,5-T produced by Diamond contained TCDD. Samples of Diamond's 2,4,5-T streams in 1965 detected TCDD ranging from 80 ppm to 140 ppm, and as much as 26 ppm in its 2,4,5-T product. As further detailed in Attachment A, at the same time it

was producing TCDD, Diamond intentionally and continuously discharged its highly toxic chemical waste to the River – a waste disposal policy that essentially amounted to “dumping everything” into the Passaic River. TCDD is the only COC that is substantially elevated above regional concentrations (the mean concentration of TCDD is approximately 85 times higher in the Lower Passaic River than above the Dundee Dam), and TCDD is the only COC that is not significantly influenced by sources located both upstream and downstream of the LPRSA. As a result sediment removal will have little to no long-term benefit for any COC other than TCDD.

Prior to 1983, EPA undertook a comprehensive, nationwide survey of facilities that it believed had the potential to have created TCDD contamination, including the Lister Avenue Facility. In 1983, the New Jersey Department of Environmental Protection (NJDEP) collected samples at the Lister Avenue Facility, every one of which detected TCDD in concentrations in excess of 60 parts per billion (ppb) (when an acceptable concentration is thought to be less than 1 ppb). When TCDD contamination was found at such high levels on the Lister Avenue Facility, the Governor of New Jersey declared a state of emergency and delegated broad authority to the Commissioner of NJDEP "to take such emergency measures as he may determine to be necessary in order to fully and adequately protect the health, safety and welfare of the citizens of [New Jersey] from any actual or potential threat or danger which may exist as a result of the possible contamination of the [Lister Avenue Facility]."

In 1984, Diamond sued Aetna and its other insurers in the Superior Court of New Jersey. Diamond sought insurance coverage, among other things, for "claims [that] have been asserted and actions filed by residents, property owners, employees and others in the vicinity of the [Lister Avenue Facility] and relief that has been sought by the environmental authorities based on alleged bodily injury and property damage assertedly resulting from [TCDD] allegedly created in the manufacture of herbicides at the [Lister Avenue Facility]." After a 20-day bench trial in September and October, 1988, the trial court ruled in favor of the insurers and against Diamond on the TCDD claims. Diamond appealed and the Appellate Division of the Superior Court affirmed the trial court judgment. Both the Law Division and the Appellate Division found that Diamond had knowingly and intentionally discharged TCDD into the LPRSA. See Attachment A for a more detailed analysis of and copies of the Law Division and Appellate Division opinions.

In 2005, the NJDEP sued OCC and other connected parties, including Maxus and Tierra, seeking to hold them liable for the intentional discharges from the Lister Avenue Facility and the costs the State of New Jersey has incurred in responding to contamination in the river. In 2011 and 2012, a New Jersey court found OCC, Maxus, and Tierra jointly and severally liable under the NJ Spill Compensation and Control Act for the State of New Jersey's past and future cleanup and removal costs associated with the discharges at and from the Lister Avenue Facility. The OCC Parties are not members of the CPG. As a practical matter, any effort to implement a cleanup of any scale in the lower eight miles of the Passaic River that does not involve substantial participation and funding by the OCC Parties is bound to fail and result in years of litigation.

From 1951 to 1969, various predecessor companies of OCC knowingly and intentionally discharged 2378-TCDD from the Lister Avenue Facility into the LPRSA. 2378-TCDD is the only COC in the LPRSA that is substantially elevated above regional concentrations. The mean concentration of 2378-TCDD is approximately 85 times higher in the Lower Passaic River than above the Dundee Dam.

B. The Regulatory History of the Diamond-Alkali Superfund Site

In 1984, EPA placed the Lister Avenue Facility on the National Priorities List (NPL). The Lister Avenue Facility was designated as OU-1 of the Diamond Alkali Superfund Site. After several emergency response actions to remove TCDD contamination from properties adjacent to the Lister Avenue Facility, Region 2 issued a Record of Decision (ROD) selecting an interim containment remedy for the Lister Avenue Facility. A containment vault was constructed and a groundwater extraction and treatment system was installed to prevent further releases of TCDD to the LPRSA. OCC and the then-current owner of the Lister Avenue Facility, on behalf of OCC, completed construction of that interim remedy in 2001. Maintenance of the remedy is being conducted on behalf of OCC, under Region 2 oversight.

In 1994, OCC entered into another AOC with Region 2 under which OCC agreed to investigate contamination in the sediments of the lower 6-mile stretch of the LPRSA, from RM 1 to RM 7. That 6-mile stretch of the LPRSA was designated as OU-2 of the Diamond Alkali Superfund site. The investigation revealed that sediment contaminated with TCDD moved in and out of the 6-mile stretch of river, suggesting to Region 2 that a more comprehensive study of the river was required. In 2002, Region 2 expanded the investigation to include the entire LPRSA, from RM 0, at the mouth of the river, to RM 17, at Dundee Dam. The LPRSA was designated as OU-3 of the Diamond Alkali Superfund Site. In 2004, Region 2 and OCC entered into a separate AOC under which OCC agreed to conduct an RI/FS of Newark Bay, which became known as OU-4 of the Diamond Alkali Superfund Site.

Prior to 2007, Region 2 began to conduct the RI/FS for the LPRSA, which it then estimated would cost \$10,000,000. In June 2004, at the request of Region 2, the CPG and the Region entered into a cost recovery settlement under which the CPG provided Region 2 with over \$13,000,000 to fund the RI/FS. However, in 2007 Region 2 informed the CPG that its costs were so significantly underestimated, and its resources so inadequate, that it could not complete the study. Region 2 asked the CPG to agree to a consent order and take over and complete the remaining RI/FS tasks. Accordingly, on May 8, 2007, Region 2 and the CPG entered into a separate AOC, under which the CPG agreed to take over and complete the RI/FS of the entire 17 miles of the LPRSA, from the mouth of the river to the Dundee Dam (RI/FS AOC). By agreement memorialized in the RI/FS AOC, Region 2 agreed not to take over the preparation of the RI nor of the FS unless certain events occurred. Those events have not occurred, and the CPG continues to conduct the RI/FS. Those promises by Region 2 were the essence of the bargain under which the CPG agreed to perform and complete the RI/FS. The CPG agreed to conduct a complete RI/FS in compliance with the NCP so that any remediation of the LPRSA would be accomplished in a cost-effective manner (RI/FS AOC ¶44).

At the same time Region 2 was negotiating the RI/FS AOC with the CPG, and despite its claimed lack of funding and resources, the Region was also preparing the 2007 Draft FFS for an "early action" in the lower eight miles of the LPRSA. In the RI/FS AOC, Region 2 acknowledged that it was "evaluating interim remedial measures or interim or final early action alternatives" and that "implementation of any such action may result in the need to resequence certain RI/FS field investigation activities" (emphasis added). Region 2 and the CPG specifically agreed that revised plans or schedules may be needed to reflect the "resequencing of RI/FS activities if impacted by the implementation of any interim action." However, Region 2 agreed that the work to be performed under the RI/FS AOC "shall provide all appropriate and necessary information to assess [LPRSA] conditions and evaluate alternatives to the extent necessary to select a remedy that will be consistent with CERCLA ..." (emphasis added). Thus, while the CPG understood that interim or early actions were being considered by Region 2, the CPG neither

agreed nor understood that the 2014 FFS would be Region 2's sole basis for selecting a final remedy for nearly half of the LPRSA or that the Region was duplicating the remedial investigation for the lower eight miles of the LPRSA that it had just agreed with the CPG to undertake.

In June 2007, only 1 month after signing the RI/FS AOC, Region 2 released the 2007 Draft FFS for review, proposing alternatives for a final remedy for the lower eight miles of the LPRSA, even though the CPG was then undertaking to complete the RI/FS to select a final remedy for the entire 17-mile LPRSA, including the lower eight miles of the LPRSA. The 2014 FFS effectively supplants more than \$100,000,000 of spending by the CPG to provide all necessary information for remedial selection in the LPRSA. Contrary to the RI/FS AOC, the 2014 FFS and Proposed Plan nullify the key goal and purpose of the CPG's performance of the RI/FS -- to collect the data needed to select a remedy for the entire 17-mile LPRSA. The proposal of alternatives in the 2007 Draft FFS for a final remedy for the sediments in a portion of the LPRSA was in direct conflict with the RI/FS and was a breach by Region 2 of the RI/FS AOC.

The 2007 Draft FFS was also highly criticized by a number of commenters, including EPA's own Contaminated Sediment Technical Advisory Group. CSTAG is comprised of Regional and EPA Headquarters staff who monitor the progress of, and provide advice regarding, a small number of large, complex, or controversial contaminated sediment Superfund sites, including the LPRSA. Region 2's 2014 FFS and Proposed Plan still has not addressed all of the issues and concerns previously raised by CSTAG.

In June 2008, Region 2, OCC and Tierra (on behalf of OCC) entered into an AOC for a non-time-critical removal action to remove 200,000 cubic yards (cy) of contaminated sediments from RM 3.0 to RM 3.8, adjacent to the Lister Avenue Facility. Not surprisingly, in light of the history of the Lister Avenue Facility, Region 2 determined that these sediments have the highest levels of TCDD measured in the river. Dredging, dewatering, and transport off-site of the first 40,000 cy of sediment were completed in 2012. In the June 2008 AOC, Region 2 agreed to condition the obligation of OCC to remove the remaining 160,000 cy of contaminated sediment upon the availability of a confined disposal facility (CDF) which may never come into existence. Thus, Region 2 in effect, gave OCC a free pass on the removal of the majority of the most heavily contaminated sediment in the Lower Passaic River, even though that sediment is clearly OCC's responsibility and even though that sediment continues to move up and down the river. In fact, no CDF has become available, OCC has taken no action toward removal of the 160,000 cy of TCDD-contaminated sediments, and Region 2 has taken no action to make the project happen.

In June 2012, EPA and the CPG entered into an AOC for a time-critical removal of highly contaminated sediments found at the surface of a mudflat at RM 10.9 ("RM 10.9 Removal Action"). OCC is not a party to that AOC and refused to contribute a reasonable share of the costs of the RM 10.9 Removal Action, even though the evidence showed that the primary contamination found at RM 10.9 – 2,3,7,8-TCDD – was traceable to the Lister Avenue Facility. As a result, OCC withdrew from the CPG. Neither OCC nor any party on behalf of OCC is participating in the 17-mile RI/FS or the RM 10.9 Removal Action. On June 18, 2012, Region 2 issued a unilateral administrative order to OCC under Section 106 of CERCLA, ordering OCC to participate and cooperate with the CPG in conducting the RM 10.9 Removal Action. Again, OCC defied Region 2 and did not comply with that order and remains in violation of its terms, but Region 2 appears to have taken no enforcement action to compel OCC to comply.

In April 2014, Region 2 released its Proposed Plan, including such supporting appendices as an updated version of the 2007 Draft FFS. However, a comparison of the two documents

demonstrates that the 2014 version is essentially the same as the earlier 2007 Draft FFS, except for the fundamental change in the approach to background, which is contradicted by LPRSA data and EPA precedent, and has not been justified by Region 2. (See Attachment J). Contrary to the 2007 Draft FFS's recognition of the impossibility of setting remedial goals lower than background, the 2014 version ignores background conditions and establishes unattainable PRGs below background concentrations. (See Appendix C, Section C; Appendix D.2. Sections A and B). Subject to this exception, seven years later, the 2014 version still contains the same fundamental flaws and ignores data collected by the CPG as part of the 17-mile RI/FS.

IV. THE PROPOSED PLAN IS LEGALLY INDEFENSIBLE AND MUST BE WITHDRAWN

In this section of the comments, the multiple and various instances where the Proposed Plan is legally indefensible are discussed with an emphasis on an explanation of the legal principles and regulatory guidance that apply. Examples of the technical deficiencies are discussed and explained in this section. (Section V provides a comprehensive and detailed discussion of the serious technical flaws and deficiencies.) The comments included in this section capture multiple instances that both individually and collectively demonstrate significant departure from the controlling applicable legal principles addressed in this section and from widely accepted scientific and technical approaches to these issues.

A. The Proposed Plan Alternatives are Irreconcilably Inconsistent with the RI/FS

CERCLA requires that the process of remedy selection be conducted in a manner consistent with the NCP. As part of that process, the NCP requires that an RI/FS be conducted. The purpose of the RI is to characterize the nature and extent of contamination at the site; the purpose of the FS is to identify alternative remedial actions, to screen them, to analyze them against nine remedy selection criteria and to propose a Preferred Alternative. The CPG entered into the RI/FS AOC with Region 2 in May 2007 under which the CPG agreed to conduct the NCP-compliant RI/FS of the full 17-mile LPRSA.

At the time the CPG entered into the RI/FS AOC, the CPG understood that interim or early actions were being considered by Region 2. However, the CPG did not agree, and Region 2 did not suggest, that the 2014 FFS would supplant the CPG's commitment to provide all necessary information for remedial selection in the LPRSA. Indeed, the RI/FS AOC provides that the work conducted under the agreement "shall provide all appropriate and necessary information to assess [LPRSA] conditions and evaluate alternatives to the extent necessary to select a remedy that will be consistent with CERCLA..." (emphasis added) (RI/FS AOC at ¶13). Further, "the final RI/FS report as approved by EPA, and the Administrative Record, shall provide the basis for the proposed plan(s) that will be issued by EPA under CERCLA..." (*id.* at ¶38).

Notwithstanding the unambiguous language of the RI/FS AOC, Region 2 admits that the Proposed Plan proposes a final remedy for the sediments in the lower eight miles of the LPRSA. Thus, from the time Region 2 entered into the RI/FS AOC with the CPG, it was conducting two parallel studies simultaneously to select a remedy for the same sediments in the same lower eight miles of the LPRSA. Such duplication breaches the RI/FS AOC and is inconsistent with the NCP, as discussed herein. If Region 2 compelled the CPG to perform an RI/FS, just to direct that the RI/FS conform to the 2014 FFS, such conduct would be arbitrary and capricious, an abuse of Region 2's discretion, and unlawful. The Proposed Plan, if adopted, deprives the

CPG of its benefit in entering into the RI/FS AOC, which was to achieve the selection of a cost-effective remedy compliant with the NCP. In essence, if the 2014 FFS goes forward it will have nullified the necessity for the RI/FS and vitiated the agreement that the CPG sought to be achieved.

Further, the issuance of the Proposed Plan now, more than seven years after the Region issued the 2007 Draft FFS, is even more arbitrary and capricious given that the RI/FS, which will provide a comprehensive and scientifically supported view of the entire LPRSA, is scheduled to be completed in a matter of months. The CPG has conducted all activities pursuant to work plans reviewed and approved by Region 2, and has modified project deliverables and work products as per Region 2 direction. The CPG has made extensive progress under the RI/FS AOC. It has completed numerous data collection efforts; analyzed thousands of sediment, water, and biota samples; and is developing hydrodynamic, sediment transport, contaminant fate and transport, and bioaccumulation models. These data, as well as the results of the evaluation of these data, have been formally and informally provided to Region 2, yet Region 2 has failed to give adequate consideration to them in the Proposed Plan (see, e.g., Appendix C, Section 1.A. and Section 1.C.1; Appendix D.1. Section 1A and Table 1, and Section 1.B). Moreover, the Region has continued to direct the CPG to conduct sampling of the LPRSA to complete the RI/FS. The most recent sampling events were completed in 2013 and included numerous samples from the lower eight miles. The fact that Region 2 has continued to direct the collection of data for a portion of the FFS Study Area after it had already determined the remedy for the FFS Study Area is arbitrary and capricious. The added fact that the Region then effectively ignored the data is a clear error of judgment. See Section V for multiple additional examples where Region 2 has caused time-consuming, costly efforts as a part of the RI/FS, which it is now ignoring by issuing the Proposed Plan.

The Region's rush to issue an unfinished and unsupported Proposed Plan, shortly before the completion of the Region 2-sanctioned and NCP-compliant RI/FS, is an unprecedented effort to select a remedy that is not supported by the data or the NCP process, but rather one that is politically driven. The CPG will not voluntarily fund or perform a remedy which is not feasible and which is inconsistent with the NCP.

B. The Proposed Plan Alternatives are Inconsistent with the NCP

The Region has circumvented the detailed remedy selection process required by the NCP. The Region selected a politically driven remedy in 2007, and succumbed to political pressure to push it forward for seven years, all while attempting to move faster than the NCP allows. Its decision to select a massive dredging remedy in the midst of an NCP-compliant RI/FS is inconsistent with the NCP's early action, interim action, remedial investigation and remedy selection provisions. It is now more than seven years after the FFS began and the 17-mile RI/FS is scheduled to be completed within a few months. As a result, the 2014 FFS will in no way expedite the process.

Region 2's rationale for circumventing the CERCLA process was that the lower 8.3 miles of the river were believed to contain the majority of the fine-grained sediment and, therefore, the bulk of the contaminated sediment. This conclusion overlooks the fact that the risks CERCLA and the NCP are intended to eliminate or control are not driven by the *mass* of the contamination but by the *exposure* of a few risk-driving contaminants to receptors that may be harmed. Deeply buried contamination (the bulk of the mass to which Region 2 refers) will not be exposed to such receptors and should not be considered when evaluating the risks CERCLA and the NCP are intended to address. Further, the failure of the 2014 FFS to properly address ongoing sources

(i.e., above RM 8) will prevent the Preferred Alternative from meeting protectiveness standards. Thus, the 2014 FFS proceeded on a false premise. (See Section VI, FN 25, for a different approach taken by Region 10 at the Lower Duwamish Waterway Superfund Site).

Furthermore, Region 2 has failed to consider significant implementation issues; instead, it has inappropriately deferred these issues until the design phase. Such an approach is clearly at odds with the NCP, which requires that the ability to implement the remedial alternative and the uncertainties associated therewith be considered *before* the remedy is selected. Therefore, Region 2 is in clear violation of its own regulations. See Section V.B. for an extended discussion of instances where Region 2 deferred implementation issues contravening the NCP.

1. The alternatives in the Proposed Plan do not meet the criteria for an early action under the NCP, making it unnecessary and duplicative of the RI/FS

The NCP provides that “[s]ites should generally be remediated in operable units when early actions are necessary or appropriate to achieve significant risk reduction quickly, when phased analysis and response is necessary or appropriate given the size or complexity of the site, or to expedite the completion of total site cleanup” (40 CFR § 300.430(a)(ii)(A)). It further provides that “[o]perable units, including interim action operable units, should not be inconsistent with nor preclude implementation of the expected final remedy” (40 CFR § 300.430(a)(ii)(B)).

First, the lower eight miles that are the subject of the Proposed Plan were not previously designated as a separate OU and are not identified as a separable OU in Region 2’s fact sheets or in EPA’s Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) database. In the Proposed Plan, Region 2 claims that it has now designated the lower eight miles of the Diamond Alkali Superfund Site as a separate OU for the conduct of one of the alternatives in the Proposed Plan. Such an after-the-fact designation is arbitrary and capricious and inconsistent with the NCP. The Region has stated that the lower eight miles were selected for the 2014 FFS because they contained most of the mass of TCDD contamination found in the LPRSA. However, the risk CERCLA is intended to control results not from the *mass* of contaminants, but from the *exposure* of risk-driving contaminants to receptors through pathways which connect the receptors to the contaminants. In this case, Region 2 determined that the relevant pathway is the bioaccumulation of contaminants in fish that are consumed by humans. The mass of contaminants is irrelevant to this pathway.

Reliance on the mass of contaminants to separate the lower eight miles of the LPRSA from the rest of the site for the purpose of conducting the Proposed Plan was arbitrary and capricious because there is no rational connection between the mass of contaminants and the risk that is intended to be controlled.

Second, Region 2’s Proposed Plan is not an “early” action and will not achieve significant risk reduction “quickly.” In the 2007 Draft FFS, Region 2 stated the action was “intended to take place in the near term, while the comprehensive 17-mile study [was] ongoing.” EPA Lower Passaic River Restoration Project, Draft Source Control Early Action Feasibility Study, June 2007, at 1-1. In a letter dated September 20, 2007 to the CPG, Region 2 Administrator Alan Steinberg indicated it was his “intent to select a remedy in Autumn 2008.”² In addition, based

² Further, in a letter from Administrator Steinberg to Bradley Campbell, NJDEP Commissioner, Administrator Steinberg expressed concern regarding NJDEP’s proposed Directive related to a six-mile stretch of the River, as the comprehensive 17-mile study had been launched, stating: “[by] focusing on a limited geographic area, the NJDEP’s

upon the Region's own modeling results, the 2014 FFS will not achieve significant risk reduction for at least 15 years and disturbing buried material that would not otherwise be disturbed will actually increase risk in the short-term. (See Appendix B, Section V.) Therefore, Region 2's Proposed Plan will not achieve risk reduction quickly.

The FFS no longer qualifies as an early action, 30 years after designation of the Diamond Alkali Superfund site, 7 years after the release of the 2007 Draft FFS and only months prior to completion of the NCP-compliant RI/FS for the entire 17 miles.

Third, dredging and capping the entire lower eight miles of the river will not "expedite the total site cleanup." At the outset, total site cleanup will not be expedited because the upper 9 miles will remain unaddressed and act as continuing sources to recontaminate the FFS Study Area. See Appendix B, Sections III.B. and III.C. Also, the 2014 FFS will focus on removing sediment in the lower 8.3 miles of the Passaic, regardless of how contaminated it may be rather than addressing the hot spots throughout the river where elevated levels of certain contaminants are primarily driving risk. (See Section V.B.2. and Appendix B, Sections II and III.D. for detailed discussion on technically deficient consideration of recontamination and the failure to appropriately consider hot spots.) Furthermore, as described in Section V.C.1., based upon lessons learned from the RM 10.9 Removal Action, there are significant access, infrastructure, and utility easement issues that will require substantial time, energy, and effort to address. (See also Attachment H.) These issues have not been fully considered by Region 2; as a result, the dredging and duration estimates in the 2014 FFS are unrealistically short and unachievable, see Section V.C.2., making it even more unreasonable to consider the FFS Proposed Plan an early action that will "expedite total site cleanup."

Instead of expediting cleanup, the FFS will prevent expeditious cleanup as Region 2 will have no parties willing to perform the work. The FFS is inconsistent with the NCP and should not supplant the RI/FS. The FFS will inevitably lead to wasteful and time-consuming litigation that can easily be avoided by following the NCP and completing the RI/FS.

Finally, there is simply no way for Region 2 to conclude that the alternatives in the Proposed Plan will be consistent with the rest of the final remedial action for the LPRSA, because the RI/FS process for the 17-mile LPRSA is not yet complete. The only way Region 2 could assert that the Proposed Plan is consistent with the remedy for the rest of the LPRSA is if it has already prejudged the RI/FS remedy for the full River even though it has not yet seen the RI/FS. Such an action would be arbitrary, capricious, and inconsistent with the NCP.

It is clear that implementation of the Proposed Plan will effectively eliminate any targeted or adaptive management approaches to remediation of the sediments before the Region has the necessary information to make such a determination. In contrast, the Sustainable Remedy described in Section VI and Appendix F can be started sooner than the Proposed Plan and can

approach does not take into account the likelihood of recontamination from these sources."). The same criticisms Region 2 asserted against the NJDEP Directive are valid against the Proposed Plan.

achieve risk reduction much more quickly. Consistent with the Sediment Guidance (see Section IV.C.2. for an in-depth discussion of the Sediment Guidance), the Sustainable Remedy is exactly the sort of “phased analysis” that is “appropriate given the size [and] complexity of th[is] site.” (See 40 CFR § 300.430(a)(ii)(A).)

2. Duplicative Processes are Disallowed by the NCP

The preamble to the NCP mandates the need to avoid duplication of effort. In response to commenter concerns about multiple and overlapping RI/FSs at operable units, the preamble provides that “duplication of efforts on RI/FSs should be avoided” and “[n]o duplication of investigatory or analytical efforts should occur when selecting an operable unit for a site” (emphasis added) (55 FR 8666). As discussed above, Region 2 has acted arbitrarily in calling the lower eight miles of the LPRSA a separable OU in the 2014 FFS when there was previously no publicly available information establishing the area subject to the Proposed Plan as a separate OU. Instead, the lower eight miles are part of the 17-mile LPRSA, which is OU 3 of the Diamond Alkali Superfund Site. OU 3 is the subject of the RI/FS being performed by the CPG, in compliance with the NCP and under Region 2 oversight.

In performing a separate study for the lower eight miles of the River, Region 2 is conducting a substantially overlapping study and is duplicating investigatory work being done through the 17-mile RI/FS within the same operable unit. This duplication is a direct violation of the NCP.

3. The Remedial Investigation Process Used by Region 2 Contravenes the NCP

The NCP requires that a remedial investigation be performed prior to the selection of a final remedy “to collect data necessary to adequately characterize the site for the purpose of developing and evaluating effective remedial alternatives” (40 CFR § 300.430(d)(1); see also 40 CFR § 300.430(e)(1): “[d]evelopment of alternatives shall be fully integrated with the site characterization activities of the remedial investigation”). Although the FFS RI is labeled a remedial investigation, Region 2 has circumvented the remedial investigation requirement under the NCP and explicitly contemplated under the RI/FS AOC.

Specifically, the Region relies on inadequate data and fails to develop alternatives based on a comprehensive site characterization to make its “final” remedy selection decision. See Section V.A.1. for a detailed discussion of the datasets that Region 2 has ignored. While the Region purports to “use” some of the 17-mile RI/FS data, in reality, the Region did not populate its models with the data and does not fully incorporate them into its analyses. For example, Region 2 does not use RI/FS data to set contemporary surficial sediment contaminant concentrations in the river. Rather, Region 2 uses older and less dense datasets to initialize its model and then uses the model’s predicted changes to set the current conditions. (See Section V.A.1. for an extensive discussion on the data Region 2 ignored and Region 2’s violation of an agreement with the CPG³ not to use older data for key decisions.) This approach is illogical and

³ See Data Usability and Data Evaluation Plan for the LPRSA Risk Assessments, April 18, 2014 (“During the December 14 and December 16, 2010, meetings between USEPA and CPG representatives, it was agreed that EPCs in the risk assessments will be calculated using only current data that meet the DQOs specified in this document”). See Section V.A.1 for a more detailed discussion of this issue.

violates the NCP given that Region 2 has actual measurements of current conditions, which it directed the CPG to collect. Region 2 compares its calculated results with the actual data and deems them “close enough” to support Region 2’s predetermined remedy, even though its model results are inconsistent with the actual data. Such improvident “use” of data is inconsistent with CSTAG’s recommendations described below and has resulted in a materially flawed system understanding. Region 2’s failure to consider all of the RI/FS data has caused the Region to reach inaccurate conclusions about current conditions, natural recovery processes, and the effectiveness of remediation. See Appendix B, Section V.

The quality of the Region’s FFS RI is so poor that Region 2 would never accept the work had a private party performed a similar study. Such a double standard is arbitrary and capricious, an abuse of discretion, and unlawful.

4. The Feasibility Study Process Used by Region 2 Was Deficient and Does not Comply with the NCP

The primary objective of the FS is to ensure that appropriate remedial alternatives are developed and evaluated such that relevant information can be presented to a decision-maker and an appropriate remedy selected (40 CFR § 300.430(e)(1)). Merriam-Webster defines “feasibility” as “...the capability of being done, accomplished, or carried out; likelihood; suitability.” However, instead of evaluating the capability or likelihood of accomplishing the various alternatives in the Proposed Plan, Region 2 has improperly deferred critical feasibility issues to the design phase. For example, the 2014 FFS provides that “[d]epending upon the facility location that is eventually selected, dewatering, water treatment, and transfer facilities with good rail access and suitable wharf facilities are expected to be available or could be developed” (2014 FFS at p.4-43) and, with respect to disposal “[d]uring the design phase, additional due diligence evaluations would be needed for actual disposal purposes” (2014 FFS Appendix G at p.4-1). **The analyses undertaken by Region 2 on key feasibility study issues associated with rail access and transport were so lacking that the standard of practice for a feasibility study was not met.** (See Attachment F) Region 2’s deferral of an appropriate feasibility analysis until after its decision (which assumes, without support, that the selected remedy is feasible) is clearly a violation of the NCP.

In essence, Region 2 is proposing a remedy, after which it will determine whether the alternative proposed is “feasible.” That is the opposite of the step-by-step decision-making process prescribed by the NCP. Put simply, it is backwards!

The Proposed Plan and supporting 2014 FFS fail to satisfy the NCP criteria for a feasibility study for numerous reasons:

- The development and evaluation of remedial alternatives is flawed and incomplete given the scope and complexity of the site.
- The 2014 FFS retained alternatives that should have been screened out given the Region’s conclusion that the State of New Jersey’s opposition is likely to make a CAD administratively infeasible and the unavailability of upland processing facilities (see Sections IV.B.5. and V.C.2., Appendix A, Section B.6.e., Attachment F).

- The 2014 FFS does not address significant, and perhaps insurmountable, implementation issues associated with bridges, navigational constraints, and utility crossings (see Section V.C.2., Appendix A, Section B.5.b., Attachment E).
- The 2014 FFS uses a dredging rate that has never been achieved in an environmental dredging project and is not supported by the 2005 Pilot Study (see Section V.C.2., Appendix A, Section B.6.a.).
- The Proposed Plan defers critical issues to the design stage, misleads the public as to the true extent of the project duration and impacts, and therefore violates the public participation requirements of the NCP (see Sections IV.B.4. and V.C.2.; Appendix A, Section C). Moreover, by improperly deferring key elements of the feasibility analysis until after the decision on a remedy is made, Region 2 cannot realistically estimate the duration or anticipated costs of the Proposed Plan.
- The alternatives in the Proposed Plan are not cost-effective and use a discount rate that is unrealistic and out-of-date (Section IV.B.4; Appendix A, Section B.7.; Attachment C).

A detailed analysis of the 2014 FFS's failure to adequately develop and evaluate alternatives against the NCP criteria can be found in Section V.C.2. and Appendix A.

The development and evaluation of remedial alternatives is flawed and incomplete. The NCP provides that “[t]he development and evaluation of alternatives shall reflect the scope and complexity of the remedial action under consideration and the site problems being addressed. Development of alternatives shall be fully integrated with the site characterization activities of the remedial investigation...” (emphasis added) (40 CFR § 300.430(e)(1)). The 2014 FFS alternatives are not fully integrated with the comprehensive site characterization of the RI/FS. Region 2’s development and evaluation of alternatives: (1) fails to include at least one critical alternative that would evaluate a bank-to-bank alternative without navigation, (2) overstates the effectiveness and implementability of the Preferred Alternative, and (3) understates the benefits of a targeted approach. The scale of the alternatives in the Proposed Plan mandates a far more rigorous analysis of the NCP criteria than is presented in the 2014 FFS. See detailed discussion in Section V.B.

The 2014 FFS retained alternatives that should have been screened out. None of the bank-to-bank dredging remedial alternatives identified in the Proposed Plan should have survived the NCP’s development and screening analysis for remedial alternatives (see 40 CFR § 300.430(e)(7)). As set forth in Section V.C. and Attachment F, the alternatives are “technically... infeasible” and “would require equipment... [and] facilities that are not available within a reasonable period of time.” (*id.* at § 300.430(e)(7)(ii)). Because Region 2 appears to have concluded that a CAD is administratively infeasible, an upland processing facility must be used to dewater and transport sediment. However, there are key areas where the Region has failed to analyze the availability of needed equipment and facilities (see Attachment F, Appendix A, Section B.6.d.). Potential sites identified for processing facilities back in 2007 were not re-evaluated by Region 2 (*id.*). In reality, there are conflicting uses at many of the sites that would inhibit their use as processing facilities with rail access (see Attachment F). Furthermore, some processing facilities have long-term leases in place that clearly preclude them from being available “within a reasonable period of time.” *Id.* Additionally, an analysis of certain equipment, such as rail cars, is necessary to understand the availability, and thus feasibility of using such equipment (*id.*). No such analysis was performed by the Region. Finally, Region 2 has failed to evaluate the rail capacity needed to transport material for disposal. (See Attachment F, Appendix A, Section B.6.c.)

The Region should not have proposed a massive dredging remedy without evaluating the availability and use of a CAD or the identification of an upland processing facility with adequate rail capacity.

The 2014 FFS does not address significant implementation issues. The Region ignores critical uncertainties, such as bridge clearances and the number of bridge openings; navigational constraints, such as tides, currents, channel width and depth, and shoals; and utility easements that will require identification and dredging off-sets. These implementation issues, discussed in detail in Section V.C.2., Appendix A, Section B.6., and Attachment D, will severely limit the feasibility of the Preferred Alternative.

The 2014 FFS uses a dredging production rate that has never been achieved in an environmental dredging project. Region 2 has failed to consider, or even to acknowledge, the uncertainties associated with its proposed dredging production rate. The Region has not addressed obstructions such as pilings, bridges, and other non-removable support devices that will require smaller equipment, thus resulting in a lower production rate (Attachment D at p. 4). The Region also failed to address issues associated with utility crossings, and buried gas, oil, and sewage pipelines that require special dredging and further constrain production rates (Id.). Debris is another serious issue that has not been considered. The existence of a significant amount of debris in the river is well known (Id.; Attachment H). Debris should be removed prior to dredging; failure to do so will result in higher resuspension and residuals and will seriously lengthen the project (Attachment D at p. 3). A debris management analysis is integral to maintaining production goals and maintaining time management (Attachment D, p.3). However, the Region has not considered the issue and has not prepared a debris management analysis.

The uncertainty associated with obstructions, infrastructure, utilities, and debris all impact production rates, which means that the Region's ability to achieve its anticipated dredging rate is unlikely to a virtual certainty.

The Region also failed to adequately consider downtime for equipment maintenance, weather, and fish migration windows. A fish migration window on the lower Passaic restricts dredging for 17 weeks each year. However, the Region only assumed 12 weeks of downtime to cover the fish window, maintenance and weather. Clearly, 12 weeks will be insufficient to accommodate a 17-week fish window, and the Region has provided no explanation, justification, or information that supports a modification to the fish window. Taking these additional considerations into account could prevent dredging from occurring for several months each year and further reduce the dredging rate. (See Appendix A, Section B.6.a.)

Furthermore, Region 2's reliance on the 2005 Pilot Study as the cornerstone to support many of its assumptions and dredging rates is improper as the pilot dredging study was performed in a small, physically, geologically, and anthropogenically unique area (see Attachment D). The area was free of debris and the project suffered from many operational issues that make its usefulness inappropriate for application to a 4.3 million cy dredging project (see Attachment D).

As more fully explained in Appendix A, Section B.6.a. and Attachments D and G, Region 2's assumptions concerning dredge rates are questionable, broad, undocumented assumptions that

are not supported by the actual dredging rates from the 2005 Pilot Study. Although there is no explanation or justification for doing so, Region 2 assumed an efficiency that the 2005 Pilot Study was unable to achieve.

The use of a limited pilot study to develop a dredging production rate that is so staggeringly high that it has never been achieved in an environmental dredging project, and certainly not in a river facing the implementation challenges of the Passaic, is arbitrary and capricious and represents a clear error of judgment.

The Proposed Plan defers critical issues to the design stage, misleads the public as to the true extent of the project duration and impacts, and therefore violates the public participation requirements of the NCP. The Proposed Plan fails to include critical information that the public needs in order to be able to evaluate the remedial alternatives and provide informed comments on the Proposed Plan.⁴ The Sediment Guidance (USEPA 2005) identifies the need to “[c]reate realistic expectations up front for both public involvement and sediment cleanup.” The NCP requires EPA to involve the public in the remedy selection process by, among other things, informing them of the impacts on them from the conduct of the proposed remedy. Region 2 has failed to do so.

Region 2 has misled the community regarding key issues, such as duration. Combined with the unrealistic dredging rate, the duration of the Preferred Alternative is likely 2 to 4 times as long as the Region estimates (Appendix A, Section B.6.a.). As a result, the Region has artificially minimized the community impacts. Furthermore, Region 2 has completely avoided certain issues, such as impacts from bridge openings, by telling the public that these matters will be dealt with in the remedial design. Appendix A, Section B.6. However, there is no way to prevent the surrounding communities from bearing the brunt of significant impacts for many years and perhaps decades to come, and to remain silent on these issues is misleading. The impacts of traffic and rail disruptions due to the thousands of bridge openings necessary to move sediments down the river were not evaluated. A study has estimated that openings of passenger rail bridges would delay 8,000 to 9,000 rail passengers daily at the Amtrak and PATH bridges in Newark and would also cause passenger delays at the NJ Transit Newark-Harrison bridge, disrupting the nation’s busiest intercity and commuter railroad network (see Attachment E). In addition, each vehicular bridge opening would delay 80 to 230 additional vehicles (*id.*). Barges that require all three bridges to open would delay up to 1,100 vehicles and cost 180 to 310 passenger hours of delay (*id.*).

These delays are not without cost. An aggressive dredging program, like that proposed by Region 2, could require 10 barge passages per day, resulting in \$118,000 per day in rail passenger delay and more than \$20,000 per day in vehicular passenger delay (*id.*). At these rates, Region 2’s Proposed Plan could result in \$3.6 million in travel delays every month (*id.*). Even under Region 2’s unrealistic 5-year project completion estimate, the Proposed Plan will result in tens and hundreds of millions of dollars in travel delays.

⁴ The public participation requirements of the NCP assume that the public will be sufficiently informed about the Proposed Plan to be able to make intelligent comments. Here, that was not the case. No amount of public meetings will give the community an opportunity for meaningful input if they are not informed of the impacts of the proposed remedy on their lives and communities.

Aside from these travel issues, the Preferred Alternative will result in associated greenhouse gas and carbon monoxide emissions from the idling cars, and potentially passenger and freight rail delays. Appendix A, Section B.5. This will further burden a part of the State which is already a non-attainment area.

In addition, the Region has not addressed the issue of resuspension of contaminants from the Proposed Plan alternatives. The 2014 FFS, in essence, proposes a remedy in a vacuum. The community is being led to believe that they will have a clean river in 5 years; however, 8 miles of sand cannot remain “clean” in a tidal estuary when portions of the upper 9 miles requiring remediation remain unaddressed.

Finally, Region 2 has failed to correct the misconception by members of the public that the sediment remediation of the LPRSA will make the Passaic fishable and swimmable. The public has not been informed about the risks that will continue to exist following any remediation. Even apart from the risk the 2014 FFS is purportedly designed to address, the sediments and water column are heavily contaminated with pathogens, many of which are disease-causing agents that present a greater acute health risk than COCs. Appendix C, Section C.3. However, the Proposed Plan does not address these additional contaminants and Region 2 has not taken enforcement measures to control them. When the CPG worked with the Lyndhurst first responders as to their safety needs, they were primarily concerned about the pathogens, not the contaminants in the river.⁵ Nothing in the 2014 FFS addresses the pathogens (see Attachment I). As a result, the LPRSA will remain unusable for fishing and swimming even after the sediment remediation is complete. That fact is likely to come as a surprise to much of the public.

Since Region 2 has failed to provide sufficient information, the public cannot adequately comment and Region 2 cannot make any conclusions regarding community acceptance.⁶

The Proposed Plan and FFS defer until the remedial design phase critical issues that will impact communities. Therefore, the public will not be aware of the true impacts until after a final decision has been made. The public will not have any meaningful participation in the remedy selection decision. Such an approach violates the public participation requirements of the NCP and makes it impossible for Region 2 to evaluate community acceptance.

The alternatives in the Proposed Plan are not cost-effective and use a discount rate that is unrealistic and out-of-date. The importance of conducting a cost-effectiveness evaluation of potential remedial alternatives is emphasized in CERCLA, the NCP, and several EPA guidance documents. A remedy is deemed cost-effective if its costs are proportional to its overall effectiveness. The NCP provides that “Each remedial action selected shall be cost effective A remedy shall be cost effective if its costs are proportional to its overall effectiveness” (40 CFR§ 300.430(f)(1)(ii)(D); see also *U.S. v. Am. Cyanamid Co.*, 786 F.Supp. 152 (D.R.I. 1992):“The NCP directs EPA to prospectively choose a remedial action that EPA believes will clean-up the site for the least cost”).

⁵ Similarly, one of the primary concerns of local residents is flooding, not the sediments. See Comment Letter from Lyndhurst Mayor Robert Giangeruso to Alice Yeh, dated August 13, 2014 (“I believe the EPA has heard the residents of Lyndhurst loud and clear that one [of] their major concerns is flooding”... “ and “...EPA has no plans to perform any work ‘out of river’...”)

⁶ As evidence of Region 2’s failure to properly inform the public, please see Attachment K.

To determine whether the costs are proportional to a remedy's overall effectiveness, the preamble to the NCP recommends the following comparative analysis: "[i]n comparing alternatives to one another, the decision-maker should examine incremental cost differences in relation to incremental differences in effectiveness" (55 Fed. Reg. 8728). "[I]f the difference in effectiveness is small but the difference in cost is very large, a proportional relationship does not exist" (*id.*).

Based upon the Region's own modeling data, the 2014 FFS alternatives are projected to be only marginally protective for certain parameters, but at unprecedented and enormous cost. The Region itself recognizes that its Preferred Alternative may barely achieve protectiveness. However, in reality and based upon the significant flaws discussed herein, it is doubtful that the Preferred Alternative will even achieve the Region's projected levels. See Section V.C.2.; Appendix B, Section V. Therefore, the Preferred Alternative is extremely costly and will not be effective.⁷ Under the NCP definition, the Preferred Alternative is not cost-effective (Appendix A, Section A.3.) and must be rejected on that ground alone. Furthermore, the Region's cost estimates are highly suspect. See Appendix A, Section B.6.b. In addition to materially underestimating the time it will take to complete the project, which results in artificially low cost projections, the Region arbitrarily applied a 7% discount rate that is over 20 years old. See Attachment C. The discount rate is not appropriate as it does not reflect current interest rates, realistic rates of return for private funds reserved for future remediation costs, the U.S. Office of Management and Budget's (OMB's) recognition that the number should be updated periodically, and Region 2's own use of lower discount rates more reflective of current economic conditions. See *id.*; Appendix A, Section B.7. Since the objective is to rely on accurate cost estimates in the 2014 FFS, use of such an outdated interest rate is arbitrary and capricious.

Therefore, the estimated cost of the Proposed Plan remedy is likely understated, but it is clearly "grossly excessive compared to the overall effectiveness of [the] alternatives." 40 CFR § 300.430(e)(7)(iii). Under the NCP, the Preferred Alternative should have been screened out even before it was subjected to a detailed analysis. Furthermore, in accordance with the Sediment Guidance, high remedy costs can also lead to a decision to phase a cleanup, such as is proposed in the Sustainable Remedy.

Region 2 used a discount rate of 7% which is too high, outdated, not reflective of current economic conditions, and inconsistent with OMB and other guidance.

In sum, the NCP requires an unbiased analysis of alternative remedial approaches before selection of a remedy. In contrast, Region 2's fundamental rejection of any remedy other than its Preferred Alternative is apparent in its actions since it issued the 2007 Draft FFS:

⁷ The excessiveness of the estimated cost of the Preferred Alternative is further evident from EPA's own guidance. Because no private parties have expressed a willingness to perform or pay for the Preferred Alternative, EPA must evaluate the Preferred Alternative as a Fund financed remedial action. EPA must balance the use of the Fund to pay for the Preferred Alternative against the needs for Fund financing at other sites. The estimated cost of the Preferred Alternative is so massive that EPA guidance contemplates that ARARs would be waived just on the basis of the excessive cost. "EPA's policy is to consider this [ARAR] waiver when the total cost of a remedy is greater than four times the national average cost of remediating an operable unit (currently, 4x\$10million, or \$40 million)" The Role of Cost in the Superfund Remedy Selection Process, Publication 9200.3-23FS (September 1996) at p. 6 The Preferred Alternative is estimated to cost more than 40 times the national average cost of remediating an operable unit. Furthermore, use of the Fund to pay for the Preferred Alternative would leave nothing left in the Fund for the hundreds of other Superfund sites throughout the United States.

- In no public forums or meetings since has Region 2 ever stated that it was reconsidering the FFS. Rather, it has consistently stated that the FFS would be issued, and the only variable was the schedule under which it would be issued.
- In meetings with the CPG where the concept of a targeted remedy was discussed, Region 2 representatives have indicated that it was too late for the targeted remedy to be considered.
- Region 2 has told the CPG that it could not consider the CPG's Sustainable Remedy because the CPG had not provided all of the detailed support for it. However, Region 2 has not provided the CPG with the time to complete the RI/FS dictated by the NCP.
- A targeted remedy alternative was not presented in the 2007 Draft FFS. Its evaluation, albeit insufficient and misleading (see Section V.A.6.; Appendix B, Section IV.E.), was only included by Region 2 in the Proposed Plan at the insistence of EPA Headquarters and as a result of comments from CSTAG and the EPA's NRRB.

5. Region 2 Failed to Balance the Nine NCP Remedy Selection Criteria in the Proposed Plan

Under the NCP, the selection of a remedy requires the analysis of nine NCP remedy selection criteria. The NCP categorizes the criteria into three groups: threshold criteria, primary balancing criteria, and modifying criteria (40 CFR § 300.430(f)). The threshold criteria require that a remedy be protective of human health and the environment and comply with ARARs. However, this is not where the analysis ends. The Region must then consider the five primary balancing criteria, which include implementability (discussed above and in Section V.B.5.), cost (discussed above), and short-term effectiveness (see Section V.C.2.). The Region failed to balance these critical criteria by either ignoring significant issues or by improperly deferring their analysis until after remedy selection. The Region also failed to consider other alternatives that could provide comparable protectiveness, thereby meeting the threshold criteria, and satisfying the balancing criteria. Furthermore, while ignoring some criteria, Region 2 has given significant weight to issues, such as navigation, that are not provided for in the NCP and are not CERCLA response actions.

Finally, state and community acceptance are modifying criteria that must be considered in remedy selection. Rather than considering the State's views, the Region has apparently allowed the State to veto certain aspects of the remedy selection, such as the use of a CAD as a viable disposal option. Furthermore, Region 2 appears to have deferred to the State's position that nothing short of a bank-to-bank remedy will be accepted. Nowhere does CERCLA or the NCP provide that the State shall have such authority over EPA (see discussion in Section V.F.).

Region 2 should have thoroughly and fairly evaluated a CAD, either in Newark Bay or elsewhere, instead of rejecting it out of hand, thereby arbitrarily increasing remedy costs by \$850,000,000 under Region 2's estimates. Indeed, Region 2's own consultant concluded that a CAD was technically feasible (see Appendix A, Section B.6.e.). Furthermore, the State of New Jersey and the USACE had previously identified locations in Newark Bay that were suitable for disposal of dredged materials. Extensive surveys of Newark Bay were prepared to find a site that would be cost-effective and environmentally acceptable (see p. 6 of Douglas et al. 2004, *A Comprehensive Strategy for Managing Contaminated Dredged Materials in the Port of New York and New Jersey*). In 1997, the Newark Bay Confined Disposal Facility was initially approved and fully permitted to consist of three separate CAD facilities (see p. 12 of USACE's

2008 *Dredged Material Management Plan for the Port of New York and New Jersey*). One CAD was ultimately constructed and the permits to construct the additional two CADs subsequently lapsed (*id.*). However, disposal in a CAD has clearly been used and accepted in the past, and the State of New Jersey's opposition to disposal of LPRSA sediment in Newark Bay is arbitrary and unjustified.⁸ Therefore, Region 2 should not bend to the state's political positions and should fully evaluate use of a CAD. Failure to do so in light of the significant additional cost of off-site disposal violates the NCP.

6. The Proposed Plan Provides Insufficient Information to Allow for Complete NCP Evaluation

Finally, as discussed in Section IV.B., the Proposed Plan lacks sufficient technical detail and supporting documentation/data to allow a full evaluation of the alternatives against the criteria in the NCP. Many of Region 2's results are not capable of being reproduced and are not supported by and are inconsistent with documentation in the administrative record file. The CPG has submitted multiple FOIA requests seeking key information that should have been considered by the Region in developing the Proposed Plan. However, the Region has not provided key components of the information requested and has indicated that such information will be provided on a rolling basis through September 2014—after the close of the public comment period. (See list of attached documents for the Administrative Record, including FOIA requests to which EPA has not fully responded.) Therefore, the CPG reserves its right to supplement these comments upon receipt of the missing information and to seek supplementation of the administrative record pursuant to 40 CFR § 300.825.

C. *The Proposed Plan Fails to Address EPA Principles and Guidance and Fails to Address CSTAG's Comments on the 2007 Draft FFS*

The Region has failed to follow numerous aspects of its guidance, raising serious questions as to why Region 2 is deviating from the standards EPA intended to apply to sites nationally. Region 2's proposal prevents an iterative, adaptive management approach to remediation of the lower eight miles of the LPRSA and eliminates the chance that Region 2 will learn new information and be able to adapt accordingly. Furthermore, CSTAG documented a number of flaws and inconsistencies with the Principles and Sediment Guidance, and these flaws still permeate the Preferred Alternative and the Proposed Plan.

1. CSTAG Comments and Principles

On February 12, 2002, building upon a 2001 report by the National Research Council, EPA issued a memorandum entitled *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites* (USEPA 2002b). The stated objective of the Principles was to help EPA managers "make scientifically sound and nationally consistent risk management decisions at contaminated sediment sites" (emphasis added). Although the Principles purport to be nonbinding on EPA, they were in fact an informal rulemaking that was intended to be applied by EPA nationally.

⁸ In summarily rejecting a CAD in Newark Bay, New Jersey has exaggerated its concerns and has overlooked the potential benefits a CAD could provide to the citizens of the state. For example, any short term, temporarily damaged natural resources could be restored. At the same time, New Jersey could stand to earn reasonable tipping fees or a CAD could also be designed to provide valuable ratables to adjacent communities.

On April 1, 2008, CSTAG provided written recommendations to Region 2 with respect to the 2007 Draft FFS. CSTAG presented a point-by-point analysis to demonstrate why Region 2 had not followed the Principles. Six years later, the Region's Proposed Plan and supporting documentation still do not address some of the CSTAG recommendations and key Principles. (See Appendix G.)

Principle #1 - Control Sources Early. CSTAG recommended that “the Region needs to evaluate more quantitatively the relative contribution of risks from dioxin and polychlorinated biphenyls (PCBs) entering from upstream (i.e., over Dundee Dam), from tributaries, from [combined sewer overflows (CSOs)⁹], and from in-stream sediments above mile 8 and from Newark Bay.” (See also Sediment Guidance at 1-5; EPA Contaminated Sediment Management Strategy April 1998 at 55 (one of the key risk management principles is to control sources early; “[b]efore initiating any remediation, active or natural, it is important that point and nonpoint sources of contamination be identified and controlled.”)) However, instead of proposing measures to eliminate or control ongoing sources of contamination to the lower eight miles of the LPRSA, Region 2 apparently ignored this comment and minimized the significance of those sources.

Principle #3 - Coordination with States and Local Governments. CSTAG recommended, and the Region agreed, to evaluate a new alternative in the FFS that includes capping the sediments, with predredging so as not to cause additional flooding, but with no navigation channel. As discussed in detail in Section V.C.1., the Region has failed to include such an alternative.

Principle #4 - Develop and Refine a CSM that Considers Sediment Stability. When the 2007 Draft FFS was released, the Region prepared a CSM that hypothesized, on the basis of very limited data, that all the sediment in the lower eight miles was an unstable “well mixed box,” and then failed to update that model when extensive data became available showing that much of the sediment was stable. (See Principles at p. A-5 (the CSM “should be updated periodically whenever new information becomes available, and EPA's understanding of the site problems increases.”)) Region 2's CSM still depicts a lack of sediment stability in RM 0 to RM 8, when the available data, some of which the Region has not considered, shows that much of the sediment in RM 0 to RM 8 is stable. The Region's continued failure to fully incorporate the RI/FS data for the 17-miles is inconsistent with Principle #4 and CSTAG's recommendation to “use the information being collected as part of the RI/FS for the 17-mile[] [LPRSA] to refine the CSM and verify the basis for the early actions proposed for the lower eight miles.” An accurate CSM is critical to the development, evaluation, and selection of an effective remedy. Region 2's flawed CSM cannot be used as the basis for such a critical decision. Because the Region failed to update the CSM, the 2014 FFS remedy is based on an analysis of site conditions that has been proven to be wrong.

Principle #5 - Use an Iterative Approach in a Risk-Based Framework. Region 2's Proposed Plan cannot be considered an iterative or adaptive approach. Instead, it is a final, massive, monolithic remedy that is the antithesis of an iterative approach. While Region 2 has said it will use “adaptive management” in the implementation of the remedy, such an approach negates the benefit of considering this important concept during the remedy decision-making process. The purpose of an iterative approach is to inform future decision-making. Region 2 has ignored the Principle and cemented the decision. In contrast, the Sustainable Remedy is an interim remedy consistent with the Principles that will continue to be refined using all available data.

⁹ With rainfall exceeding 0.5” of precipitation, raw, untreated sewage will discharge directly to the River.

Thus “[e]ach iteration might provide additional certainty and information to support further risk-management decisions”

Principle #7 - Select Site-Specific, Project-Specific, and Sediment-Specific Risk Management Approaches that will Achieve Risk-Based Goals. CSTAG recognized that “projections of post-cleanup sediment concentrations appear unrealistically low” and that CSTAG “supports a more robust assessment of the potential for post-cleanup recontamination from upstream, lateral, and downstream sources” discussed in Principle #1. Instead of addressing CSTAG’s comment, the Region has decided to treat the lower eight miles in isolation; ignoring river processes that are likely to impact any cap. The Region also continued to project unrealistically low post-cleanup sediment concentrations.

The downstream movement of material and the tidal influence, including movement of the salt wedge, mean that material from the areas within the upper 9 miles of the LPRSA will continue to be transported to the lower eight miles of the LPRSA. That contamination will cause the 2014 FFS remedy to become recontaminated almost immediately. Additionally, the CPG’s agreement to conduct the RM 10.9 Removal Action demonstrates the importance of addressing portions of the upper river. Similarly, combined sewer outlets and stormwater outfalls are known sources of continuing contamination. On October 4, 2011, the Region entered into an Administrative Settlement Agreement and Order on Consent for Combined Sewer Overflow/Storm Water Outfall Investigation with OCC to investigate the extent of that ongoing contamination, but then issued the Proposed Plan before the investigation was completed and chose to rely upon default values from sites that have nothing to do with an urban river such as the LPRSA. By failing to assess the potential for post-cleanup recontamination, the Region is ignoring a serious threat to the long-term protectiveness of the Proposed Plan and is establishing unattainable PRGs. See V.C.2. and Appendix B, Sections II and III.D. for more extensive discussion on how Region 2 has not adequately considered background and recontamination.

The Region also ignored or failed to comply with the rest of the Principles. For example, although the Principles advocate that EPA “coordinate” with the states and natural resource trustees, the Region interpreted that as allowing the state and the trustees to veto remedial approaches that were obviously relevant, such as a CAD in Newark Bay. See Sections V.B.5. and IV.F. Further, the Principles admonish EPA to carefully evaluate the assumptions and uncertainties associated with site characterization data and site models. Instead, as described in more detail later in these comments, the Region relied upon a model to establish initial site conditions, even though actual data collected in the LPRSA showed the initial conditions to be materially different. See Section V.A.6.

The Principles direct EPA to be flexible and to consider new information as it becomes available. Since the 2007 Draft FFS was issued, a wealth of new data and other information has become available which substantially furthers the understanding of the sediments in the LPRSA. Instead of exhibiting the flexibility the Principles mandate, the Region appears focused on defending its 2007 Draft FFS, even though the central assumptions in that study have been discredited (see Attachment J).

Finally, the Principles require EPA to design remedies to minimize short-term risks while achieving long-term protection. The 2014 FFS, by contrast, maximizes short-term risks and makes assumptions about how the 2014 FFS remedy will be implemented that represent clear errors of judgment. See Section IV.B. The Region’s disregard of the Principles in developing

the 2014 FFS renders the Proposed Plan, upon which it is based, arbitrary and capricious and in violation of law.

In written recommendations provided to Region 2 in April 2008, CSTAG identified flaws and inconsistencies with the Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites (EPA, 2002b) in the 2007 Draft FFS. These flaws and inconsistencies (including consideration of ongoing sources, not using the information being collected as part of the RI/FS for the 17-mile LPRSA, the need for an alternative without navigational dredging, consideration of an iterative/adaptive approach, and a more robust assessment of post-remediation recontamination) have not been addressed by Region 2 in the 2014 FFS

In 2005, EPA issued the Sediment Guidance. First and foremost, the Sediment Guidance affirmed the Principles. Like the Principles, the Sediment Guidance purports to be nonbinding on EPA, but it was in fact informal rulemaking that the Region was required to follow in developing the Proposed Plan and 2014 FFS. As it did in the case of the Principles, the Region largely ignored the Sediment Guidance, with the result that the Region's approach is inconsistent with EPA's national policy and with approaches taken at other sediment sites.

Use of Site-Specific Data. The Sediment Guidance expresses a strong preference for the use of site-specific data. While the CPG is focused on the data, Region 2 makes assumptions, models current conditions, and uses default values that are inconsistent with site-specific data and that skew the Region's evaluation in order to justify the Proposed Plan. See discussion in subsection (3) below and in Section V.A.

Use of Adaptive Management. The Sediment Guidance also addresses the importance of using an iterative decision-making approach, which allows for adaptation if "new information becomes available that changes the nature or understanding of the problem" (Sediment Guidance at 1-7). The Sediment Guidance calls for phased approaches and adaptive management when "risks are high, yet some important site-specific factors are unknown" (Sediment Guidance at 2-21). Furthermore, "[h]igh remedy costs, the lack of available services and/or equipment, and uncertainties about the potential effectiveness or the risks of implementing [] can also lead to a decision to phase the cleanup" (Sediment Guidance at 2-22).

This iterative approach is the essence of the "adaptive management" advocated by EPA to be used in the remedy selection process for complex sediment sites, and is particularly appropriate for application to the LPRSA. All of the uncertainties identified in the Sediment Guidance exist with respect to the alternatives in the Proposed Plan. The remedy costs are enormous; there is uncertainty about infrastructure, the availability of upland sites for sediment processing, and the likelihood of Region 2 achieving its risk goals. See Attachments B, C, D, F and I. Furthermore, the significant risks of implementation, some of which were identified during the RM 10.9 Removal Action, only underscore the benefits of an adaptive management approach here (see Section IV.C.2., Attachment H).

Nonetheless, the term "adaptive management" and its underlying concepts are absent from the 2014 FFS (see Appendix A, Section A.2.). Region 2's selection of a bank-to-bank remedial approach as the Preferred Alternative is fundamentally at odds with the core principles of adaptive management. The 2014 FFS selects what purports to be a *final* remedy for the sediments in the lower eight miles of the LPRSA and then proposes to use adaptive management during remedial design, after the remedy has already been selected. Such an

approach is backwards. The Sediment Guidance calls for an iterative or adaptive management decision-making process. The Region is proposing to make a final, massive and unprecedented remedial decision that precludes any interim decisions on how best to approach the remedy given the many complexities and highly urbanized setting. The Region's approach will not lead to new information that can be incorporated in the decision-making process and will not allow for modifications when the anticipated result is not reached, which is highly likely given the uncertainties that have been ignored.

Given that Region 2's Proposed Plan is the largest proposed remedy in EPA history, Region 2 should not reject alternatives that are based on a phased remedial approach. An adaptive management approach can be modified and supplemented to ensure acceptable progress towards remedial goals while effectively managing human health and environmental risks.

In contrast to Region 2's Proposed Plan, the CPG is committed to completing the RI/FS pursuant to the processes required by the NCP. Through such work, the CPG is developing the Sustainable Remedy, which ongoing data analysis and modeling will serve to refine. The Sustainable Remedy is proposed as an interim measure, so that adaptive management can inform the remedial process and adjustments to the remedy can be made as more is learned during implementation. As described herein, upon completion, the Sustainable Remedy will be compliant with the NCP, and will closely follow the Principles and the Sediment Guidance. In short, the Sustainable Remedy will provide an adaptive management approach that is consistent with the national approach adopted by EPA for the remediation of complex sediment sites. The Region should not issue a ROD on the basis of the Proposed Plan. Instead, the Region should wait until the RI/FS is complete and give full and careful consideration to the NCP-compliant Sustainable Remedy.

3. Other EPA Guidance Documents

Region 2 has Failed to Follow its Risk Guidance. As discussed in Section V.A.2., and Appendix C, Section A, the Region has used many default or surrogate values in performing the human health risk assessment (HHRA), when site-specific information is available. Those values include exposure assumptions that defy logic and common sense. Region 2 has refused to acknowledge the CPG's Creel Angler Survey and the results of that study, preferring instead to use literature or surrogate values that bear no resemblance to the River or the human population using the River. On the ecological side, Region 2 has ignored its own guidance to produce an assessment that is nothing more than a screening level analysis, which disregards site-specific data and relevant information that is contrary to the Region's conclusions. See Section V.A.3., Appendix D.1., Section I.A.

Region 2 Has Failed to Follow the Peer Review Handbook. CSTAG's April 1, 2008, memorandum to the Region recommended that certain aspects of Region 2's modeling program undergo an external peer review. However, Region 2 did not conduct the peer review consistent with EPA's 2006 Peer Review Handbook (USEPA 2006). Several of the external peer reviewers were intimately involved in the development of aspects of the modeling or providing peer input as the modeling program was being developed. For example, Dr. Wilbert Lick served as a peer reviewer when he was, in fact, one of the authors of the original SEDZL modeling code and required Region 2's modeling contractor to revise ECOM (sediment transport model) to incorporate SEDZLJ. The "L" in SEDZLJ stands for Lick. Therefore, he was asked to critique his own model.

Similarly, the Region used interested parties to conduct a peer review of its CSM back in 2008. For example, Dominic Di Toro participated as an external peer reviewer when his resume lists him as technical Senior Consultant for HydroQual, Inc., the Region's primary consultant in the development of the numeric model for the 2014 FFS. Someone who provides peer input or has a stake in the program cannot serve as an independent peer reviewer as "that expert is no longer independent, but rather a contributor to the work product." Handbook at p. 13.

Most troublesome is the participation of Richard Bopp, who was listed as a Technical Assistance Committee member (peer input) in 2006 on the ourpassaic.org website. Subsequently, he was listed as a technical consultant on QAPP Worksheet #9¹⁰ and thereafter participated as an external peer reviewer on the 2008 CSM that he relied on this work he helped to scope. Dr. Bopp was also a peer reviewer on the 2013 numeric model peer review. Since at least 2006, he has served as a technical adviser, technical consultant and "external" peer reviewer on the same project.

Finally, it should be noted that, even with a flawed process, many of the CSM peer reviewers identified critical issues that the Region failed to address. The peer reviewers were concerned about recontamination from above RM 8 and Newark Bay. They expressed concern that remediation of the lower eight miles might not be effective in the long term, based on the potential for erosion and sediment transport from these fine-grained sediment deposits. Furthermore, some of the peer reviewers supported a targeted remedy. Region 2 has not adequately addressed these comments or explained why it has ignored the comments. The Region should reevaluate and further subject its CSM and model, to a truly independent, external peer review.

As discussed in more detail in Section V.B, the Region has failed to follow its guidance with respect to setting PRGs consistent with background conditions. Region 2's extreme departure from so many aspects of EPA guidance without justification, other than favoring its Preferred Alternative, is arbitrary and capricious.

D. The Proposed Plan Contemplates Activities Beyond the Scope of EPA's CERCLA Authority

The Preferred Alternative (as well as Alternative 2: Deep Dredging with Backfill) contemplates activities beyond the scope of CERCLA authority—namely, dredging for navigation purposes, and operation and maintenance of aging transportation infrastructure—and is therefore arbitrary and capricious and is a violation of law.

1. Navigational Dredging is Not Appropriately Addressed in the Proposed Plan

The Preferred Alternative would require dredging to restore the navigational channel in the lower 8.3 miles of the Lower Passaic River not for purposes of environmental protection, but for navigational purposes. The Lower Passaic River is federally authorized for dredging to different depths for different parts of the river. Historically, the river has been dredged and maintained by the USACE, but has not been dredged since 1983, except for limited dredging by certain berth operators. The Preferred Alternative would seek to amend the federal navigation channel authorization and require dredging of the navigation channel "to accommodate continued and reasonably-anticipated future use" between RM 0 and RM 2.2, as well as dredging the channel

¹⁰ in QAPP/FSP Addendum for Lower Passaic River Restoration Study Empirical Mass Balance Evaluation Study, Lower Passaic River Restoration Project, Site Location: Newark, New Jersey Revision Number 2, Revision Date: December 2007

between RM 2.2 and RM 8.3 to accommodate recreational uses” (emphasis added). Remarkably, at least 70% of the proposed dredging volume in the lower 2.2 miles is for commercial navigational purposes alone. On the scale of the full lower 8.3 miles of the river, this volume constitutes at least 48% of the entire volume proposed to be dredged in the Preferred Alternative. (See Appendix A, Section A.1 and Attachment C).

Region 2’s Preferred Alternative to require dredging for navigational purposes is beyond the scope of CERCLA authority. The Proposed Plan has failed to demonstrate any responsibility of potentially responsible parties (PRPs) to pay for navigational dredging and has further failed to establish a basis for the necessity of navigational dredging.

a) *Navigational Dredging is Outside of the Scope of CERCLA Authority and is the Responsibility of the USACE*

Navigational dredging to accommodate continued and reasonably anticipated future use does not constitute a CERCLA response action. It is not necessary to achieve the cleanup standards, will not serve to prevent or minimize the release of hazardous substances so that they do not cause danger to public health or the environment, and would be based on a consideration of factors outside of the NCP’s remedy selection criteria. See 42 USC §9601(24); *Motor Vehicle Mfrs. Ass’n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (an agency decision is arbitrary and capricious if “the agency has relied on factors which Congress has not intended it to consider...”); *U.S. v. Taylor*, 1993 WL 760996 (W.D. Mich. 1993) (costs to make the site less dangerous to the public, such as from dilapidated buildings, are not recoverable under CERCLA, which deals solely with abating dangers from the releases of hazardous substances); *A&W Smelter and Refiners, Inc. v. Clinton*, 962 F.Supp. 1232 (N.D. Cal. 1997) (a selection of a response action will be upheld as long as it is supported by facts in the administrative record and not based upon legally impermissible considerations); *W.R. Grace & Co.-Conn. v. Zotos Intern., Inc.*, 559 F.3d 85 (2d. Cir. 2009) (describing CERCLA’s primary purpose of encouraging the timely cleanup of hazardous waste sites).

The Proposed Plan attempts to justify Region 2’s decision to require navigational dredging as necessary to accommodate reasonably anticipated future uses for both commercial and recreational users of the river. However, although EPA guidance supports *considering* the reasonably anticipated future land use of a site in a manner that supports the reuse of sites, the primary purpose is to understand “the types of exposures and the frequency of exposures that may occur to any residual contamination remaining on the site, which in turn affect [] the nature of the remedy chosen” (USEPA 1995a, p. 3). In *A Guide to Preparing Superfund Proposed Plans, Records of Decisions, and Other Remedy Selection Decision Documents* (1999). EPA indicates that the current and reasonably anticipated future land uses at the site should precede the summary of the risk assessment, as it forms the basis for reasonable exposure assessment assumptions and risk characterization conclusions. Consistent therewith, the guidance makes clear “when a Region selects a Superfund remedy, it must be within the scope of EPA’s authorities as defined by the CERCLA, the NCP, and existing guidance” (USEPA 2010a). If actions related to the cleanup that could facilitate the reasonably anticipated future land use and help preserve the integrity of the remedial action are not within the scope of EPA’s authority, “some other party (e.g., state, PRP, local government, tribes, developer) must fund the entire additional costs associated with those actions” (*id.*).

The NRRB has recognized that dredging for navigational purposes falls outside of CERCLA's authority. In comments related to the Outboard Marine Corp. Superfund Site, the NRRB noted: "[b]ased on the information presented to the Board, it was unclear how the federal authorization of the channel is being considered by the Region in selecting a remedy that addresses contaminated sediments and makes the channel available for USACE to maintain at the specified depth." (See *Response to National Remedy Review Board Recommendations for the Waukegan Harbor Operable Unit of the Outboard Marine Corp. Superfund Site* [USEPA 2008]). The NRRB further commented that: "the [USACE] has not dredged the harbor in many years, and the cost of dredging uncontaminated sediments is significant. To the extent that the USACE would have had to spend this money even if the harbor was not contaminated, the Board recommends that the Region investigate the opportunity for a mutually beneficial partnership with USACE" (*id.*). This limit in authority was similarly noted by the U.S. Fish and Wildlife Service (USFWS) in response to comments on the Portland Harbor Natural Resource Damage Assessment. See <http://www.fws.gov/oregonfwo/contaminants/portlandharbor/Documents/NavClaimCommentResponses.pdf>; see also Palermo and Wilson 2000 ("[t]he [USACE] has regulatory responsibility for all dredged material management activities, regardless of contamination level, whose fundamental purpose is to construct, restore or maintain navigation").

Although it may be appropriate for EPA to consider the authorized navigation channel dimensions in evaluating whether capping would be a feasible alternative or interfere with the navigational channel, Region 5 at the Outboard Marine Corp. Superfund Site recognized that "the USACE's navigational interests in a particular [waterbody] and its dredged depth is not an applicable [Section 121(d)(2)(A) ARAR]" (*id.* at Response to Comment 10). This is consistent with the Sediment Guidance, which provides that alternatives should "consider the need to maintain [an authorized navigation depth] when evaluating whether capping is or is not a feasible alternative for the entire site." Sediment Guidance at 3-10. However, the Sediment Guidance, the Reasonably Anticipated Future Land Use Guidance, CERCLA, and the NCP do not provide EPA with the authority to select a remedy for the purpose of navigational dredging.

Rather, navigational dredging is a federally authorized responsibility of the USACE. The USACE's obligations for maintaining the Lower Passaic River navigation channel are provided under Rivers and Harbor Acts dating back more than 100 years.¹¹

Although the USACE has not dredged the Lower Passaic River since 1983, the USACE's responsibility to maintain the federal navigation channel is not in dispute. Region 2's Preferred Alternative recognizes this responsibility and indicates that the Region wants to change the authorized depths of the channel. In fact, the Preferred Alternative is premised on changing the federal navigation channel authorization dimensions within the lower 2.2 miles of the river and deauthorizing federal navigation channel maintenance responsibilities entirely for RM 2.2 to RM 8.3, both of which require uncertain Congressional action.

¹¹ The first Passaic River navigation project was authorized in the Rivers and Harbor Act of 1872 (June 10, 1872). The second Passaic River navigation project, connecting the original project with Newark Bay, was authorized in the Rivers and Harbor Act of 1880 (June 14, 1880). These two projects were consolidated into one project by the Rivers and Harbor Act of 1892 (July 13, 1892). That project was replaced by a new project, which is the origin of the present project, authorized in the Rivers and Harbor Act of 1907 (March 2, 1907) and modified in 1911, 1912, 1927 and 1930. The project authorized a 30 foot deep, 300 foot wide channel from Newark Bay to RM 2.6, 20 foot deep, 200 foot wide channel to RM 7.0, a 16 foot deep, 200 foot wide channel to RM 8.1, and a 10 foot deep, 150 foot wide channel, to RM 15.4 for a total authorized length of 15.4 miles. See Annual Report of the Chief of Engineers, United States Army 1907 (p.154) and 1936 (p.236). Note that the portion of the channel between RM 4.6 and RM 7.0 was only constructed to 16 feet deep, not the authorized depth of 20 feet.

With respect to RM 2.2 to RM 8.3, because of the lack of commercial traffic, Region 2 seeks to deauthorize that stretch of the river as a federal navigation channel so that the USACE is no longer responsible for navigation maintenance. Ironically, the Preferred Alternative also proposes dredging the channel along the same stretch of the river that Region 2 wants to deauthorize in order to accommodate reasonably anticipated future recreational use. Once deauthorized, however, maintaining the navigational channel between RM 2.2 to RM 8.3 would no longer be the responsibility of the USACE. Instead, the USACE's responsibility would shift from one of navigational maintenance to one of regulatory implementation and oversight (e.g., issuance of dredging permits which must occur before maintenance dredging along RM 2.2 to RM 8.3 may occur). Any maintenance for RM 2.2 to RM 8.3 would become the responsibility of a non-federal sponsor of that recreational channel. The Preferred Alternative, however, does not identify the local or state non-federal sponsor, and it would be inappropriate and legally unsupportable to assign the cost of maintaining the channel for recreational purposes to PRPs.

Thus, to the extent navigation dredging is economically justified for the federally maintained portion of the river, funding should be provided from the Harbor Maintenance Trust Fund (HMTF). This is recognized in the USACE's (2010) *Lower Passaic River Commercial Navigation Analysis* (USACE 2010), which notes that "[f]uture maintenance dredging by the USACE would require economic justification of project costs to obtain federal funding," as well as in the USACE's February 6, 2014, letter to Region 2, which provides that "the current and projected future level of commercial activity is sufficient to justify maintenance dredging of the channel should it be required, subject to budget limitations." Conversely, to the extent that the navigation dredging is not economically justified or if funding is not available, the costs of navigation maintenance dredging cannot be shifted to PRPs. Requiring others to assume liability for navigation maintenance dredging of a federally authorized channel, which would be required in perpetuity, would be tantamount to reimbursing the USACE for navigation dredging maintenance costs.

Navigational dredging is not necessary to achieve cleanup standards, will not serve to prevent or minimize the release of hazardous substances so that they do not cause danger to public health or the environment, and would be based on a consideration of factors outside of the NCP's remedy selection criteria. Further, dredging to accommodate continued and reasonably anticipated future use does not constitute a CERCLA response action

Additionally, the recently enacted Water Resources Reform and Development Act of 2014 (WRRDA, Pub.L. 1130121) includes provisions that are directly relevant to funding of Region 2's Preferred Alternative for the Lower Passaic in both the lower 2.2 miles and between RM 2.2 and RM 8.3. 33 USC 2238, as amended by WRRDA, expands the eligible use of HMTF funding for dredging and disposal of legacy contaminated sediments located in or adjacent to certain eligible federal navigation projects and directs the USACE to use a portion of the HMTF for these eligible expanded uses. To be eligible for these funds, a harbor's cargo must have paid more in harbor maintenance taxes over the preceding 3 years than the project received in harbor maintenance work by the USACE. The USACE has not received funding for maintenance work in lower Passaic River since 1983 and would be eligible for these funds.

33 USC 2238(e), as amended by WRRDA, also directs the USACE to prepare and submit a Report to Congress by March 2015, assessing total future costs to maintain constructed dimensions for each federally authorized navigation project. This report should provide an

indication of the priority that the USACE will place on dredging the Lower Passaic, as well as the USACE's estimate of the cost to restore the Lower Passaic's navigation channel to constructed dimensions and to dredge and dispose of legacy contaminated sediments.

b) Region 2 Has Not Demonstrated that Navigational Dredging is Economically Justified or that the Costs Would Be Proportionate to Any Purported Benefit

Apart from Region 2's lack of authority to include dredging for navigational purposes in the proposed CERCLA remedy for a portion of the LPRSA, it has not been demonstrated that navigational dredging is economically justified or that the costs would be proportionate to any purported benefit.

The Proposed Plan relies upon the 2010 USACE Analysis, in which the USACE concluded that future maintenance dredging would require an economic justification of project costs and would be influenced by the commitment from terminal operators to maintain their berths. However, neither Region 2 nor the USACE has prepared such an economic justification or an assessment of berth operator dredging commitments.

Further, as described in Attachment C, the significant cost of navigational dredging is disproportionate to any potential economic benefits. Navigational dredging will increase the costs of the proposed remedy by an astonishing figure of approximately \$850,000,000. See Appendix A, Section A.1. However, the potential benefits associated with such dredging have not been studied and quantified by Region 2 or the USACE. See *Land Use in the CERCLA Remedy Selection Process* (USEPA 1995a, p. 7) (if the remedial alternatives under consideration for achieving a level of cleanup consistent with the reasonably anticipated future use are not cost-effective or practicable, the remedial action may be revised which may result in different, more reasonable land use). Further, the unknown and unquantified potential benefits, if any, would accrue to very few commercial users in the lower reaches of the River. *Id.* Attachment E. Indeed, only a few companies responded to the 2010 USACE Analysis (which has not since been updated). Additionally, from 2006 to 2011, the tonnage of material transported via the river has dropped by 36%, which further indicates that the use of the river is limited and trending downward (see Attachment C). The deepening of the channel would also not alleviate various river constraints, such that any potential benefits that may result from deepening the channel are limited to just one type of ocean-going cargo carrier. *Id.* Similarly, Region 2 has not provided any analysis as to the identification of reasonably anticipated recreational future uses that might result from the deeper dredging.

Navigational dredging comprises \$850,000,000 of the Region's estimated costs of the Preferred Alternative. However, the potential benefits associated with such dredging have not been studied or quantified. Until such analyses are conducted, any conclusion that navigational dredging is necessary is premature and unsupported, even assuming such dredging is authorized as a CERCLA response action, which it is not.

2. Aging Infrastructure is Not Properly Addressed

With respect to infrastructure, the Proposed Plan fails to adequately consider the aging infrastructure of the bridges over the lower eight miles of the LPRSA. Region 2 should consider, prior to selecting a remedy, how the operation and maintenance of these bridges will be addressed, particularly where "[t]he authority to regulate drawbridges across the navigable

waters of the United States is vested in the Secretary of Homeland Security” and governmental owners of those bridges are legally obligated to perform those tasks pursuant to applicable Coast Guard regulations (see 33 CFR Part 117). Such work must be addressed by the parties who are legally obligated to do so, and EPA has no authority under CERCLA or the NCP to shift those legal obligations, which would be arbitrary and capricious and inconsistent with law. See 42 USC § 9613(j)(2); 5 USC § 706(2); *Motor Vehicle Mfrs. Ass’n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. at 43; *Washington State Dept. of Transp. V. Washington Natural Gas Co., PacifiCorp*, 59 F.3d 793, 806 (9th Cir. 1995) (holding WSDOT’s actions were inconsistent with the NCP, in part, because the WSDOT failed to evaluate alternatives in the matter prescribed in the NCP); *Bello v. Barden Corp.*, 180 F.Supp.2d 300 (D. Conn. 2002) (“CERCLA’s cost recovery provisions can only be used to obtain compensation or reimbursement for costs of cleaning up actual or threatened releases of hazardous substances into the environment”).

Further, the Coast Guard regulations stipulate the limitations on bridge openings for marine traffic including when a bridge cannot be opened; the time requirements and procedures to request an opening; and changes to drawbridge operations/schedules and closures for repairs (33 CFR Part 117). Therefore, Region 2 must coordinate with the entities legally obligated to maintain the bridges to determine the ability of the infrastructure to support Region 2’s Preferred Alternative. Valid concerns have been expressed by these entities during Region 2’s public meetings to consider the Proposed Plan; Region 2 has not engaged in any discussions with these entities to date related to these issues. See Letter from NJ TRANSIT to Region 2, dated August 18, 2014 (submitting comments and concerns regarding the Proposed Plan and noting that: “NJ TRANSIT is unaware of any attempts by the EPA or EPA consultants to meet with NJ TRANSIT to discuss this ambitious multi-year project” or “to discuss bridge openings and potential impacts of the FFS on NJ TRANSIT’s infrastructure...”).

Region 2 should determine, prior to selecting a remedy, how the operation and maintenance of the aging infrastructure of the bridges along the River will be addressed. Such work must be addressed by the parties who are legally obligated to do so, and EPA has no authority under CERCLA or the NCP to shift those legal obligations.

E. The Proposed Plan Alternatives are Not Based on Reliable or Sound Science

An agency action is arbitrary and capricious if the agency “offered an explanation for its decision that runs counter to the evidence before the agency” (*Motor Vehicle Mfrs. Ass’n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. at 43). Similarly, “the Administrative Procedures Act demands that agency decisions not be based on unreasonable evidence...” (*McElmurray v. U.S. Dep’t of Agriculture*, 535 F.Supp.2d 1318, 1325 (S.D. Geo. 2008)).

In the context of admissible expert testimony before a court, the standards a court must evaluate in its role as gatekeeper are well established under *Daubert*. Factors to be considered include: (1) whether the “theory or technique” utilized by the expert “can be (and has been) tested;” (2) whether the “theory or technique has been subjected to peer review and publication;” (3) “the known or potential rate of error” of the technique; and (4) whether the technique has achieved “general acceptance” among a “relevant scientific community” (*id.* at 593-94). Although the federal rules of evidence may not apply to federal administrative proceedings, and thus, strictly speaking, neither does *Daubert*, “the spirit of *Daubert*” and “the

principles underlying [*Daubert*]” do apply to administrative proceedings and decisions (*Niam v. Ashcroft*, 354 F.3d 652, 660 (7th Cir. 2004); *McElmurray v. U.S. Dep’t of Agriculture*, 535 F.Supp.2d at 1325 (S.D. Geo. 2008)). Logically, “‘Junk Science’ has no more place in administrative proceedings than in judicial ones” (*Niam v. Ashcroft*, 354 F.3d at 660).

The spirit of *Daubert* as applied to administrative decisions is supported by the Data Quality Act (Treasury and General Government Appropriations Act for Fiscal Year 2001 [Public Law 106-554]), which directed the OMB to issue guidelines “that provide policy and procedural guidance to Federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by Federal agencies...” Consistent therewith, EPA issued *Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by the Environmental Protection Agency* (USEPA 2002a). “Objectivity” under these guidelines “focuses on whether the disseminated information is being presented in an accurate, clear, complete, and unbiased manner, and as a matter of substance, is accurate, reliable, and unbiased.” For disseminated influential original and supporting data, “EPA intends to ensure reproducibility according to commonly accepted scientific, financial, or statistical standards.”

As demonstrated throughout these comments, the Proposed Plan and the Preferred Alternative are not based on reliable or supported science that complies with the spirit of Daubert or EPA’s guidelines (USEPA 2002a) issued pursuant to the Data Quality Act. The Proposed Plan, FFS, and Preferred Alternative suffer from numerous flaws, inconsistencies, technically invalid approaches, unexplained conclusions, and inappropriate deferrals such that they do not comply with the standards established in Daubert.

In order to be technically defensible, an appropriate and qualified expert in the field would have:

- Conducted the RI pursuant to and consistent with the work plan(s) and quality assurance project plan (QAPP) that Region 2 had required for the entire 17-mile LPRSA; otherwise, Region 2 has endorsed a double standard
- Used all the relevant data for the LPRSA;
- Used an appropriately sophisticated bioaccumulation model consistent with the modeling work plan that its contractors prepared and the Region approved;
- Not deferred basic implementability evaluation to the remedial design phase;
- Not relied on superficial analyses to support the largest proposed sediment remediation conducted under CERCLA;
- Complied with the Principles and Sediment Guidance, as well as other current and applicable EPA guidance;
- Applied the same standards to its own work that Region 2 has required of the CPG in the RI/FS;
- Applied the learning gained from the RM 10.9 Removal Action and other sediment megasites¹² to its analysis in the 2014 FFS;

¹² In fact the Data Quality Act Guidelines (USEPA 2002a) and Sediment Guidance are precisely the type of technical materials that one would use to determine if the *Daubert* factors had been satisfied as they are established to “make

- Rejected a Preferred Alternative that is not even close to being cost-effective under the standards of the NCP; and
- Addressed the comments from CSTAG and the modeling peer reviewers to fix the material problems noted with Region 2's analysis and conclusions in the 2014 FFS and Proposed Plan.

Instead:

- Region 2 has effectively ignored thousands of sediment, water, and biota samples Region 2 required the CPG to collect under the RI/FS AOC, and as a result, the Proposed Plan reaches incorrect conclusions about the River. See, e.g., Appendix C, Section I.A. and Section I.C.1.; Appendix D.1., Section I.A., Section I.A., Table 1, and Section B.
- Region 2's analyses and tools used to reach its conclusions are incomplete, scientifically deficient and internally inconsistent, which renders the Proposed Plan seriously flawed. Significant issues have been identified related to the operation and calibration of Region 2's Organic Carbon and Fate and Transport Models. See Appendix B, Section IV.B. In addition, Region 2 uses the model results to predict initial conditions in lieu of available data. See Appendix B, Section IV.C. The failure to properly design and construct a model framework that correctly represents the variability observed in the data results in a tool that is inadequate to evaluate remedial alternatives and inconsistent with the practices of the relevant scientific community (see *City of Wichita v. Apco Oil Corp. Liquidating Trust*, 306 F. Supp. 2d 1040 (D. Kan. 2003), in which the court declined to credit the majority of an expert's modeling work because his testimony was not the product of reliable principles and methods, he did not independently confirm the accuracy of the data, he did not always truncate areas where the model showed contamination but the field data did not, and there was no evidence that his technique was accepted by the modeling community.)
- Region 2 used sediment and tissue datasets for the bioaccumulation calculations in the 2014 FFS that are not reproducible and rely on data collected outside of the LPRSA RI/FS. These data have not been provided by Region 2, and are not consistent with the datasets used in the 17-mile LPRSA baseline ecological risk assessment.
- Region 2's work contains numerous statistical errors in the analyses used to derive bioaccumulation estimates in Appendix A, Data Evaluation Report (DER) 6. See Appendix E, Section II.

These are only a few of the most egregious examples of the deficiencies in the 2014 FFS and Proposed Plan that make them inconsistent with the NCP (additional examples are provided in Section V), while contravening the spirit of *Daubert* and EPA's *Guidelines* issued pursuant to the Data Quality Act.

scientifically sound and nationally consistent risk management decisions at contaminated sediment sites" (emphasis added).

Because the Proposed Plan and its supporting appendices do not comply with the spirit of Daubert or EPA's Data Quality Act Guidelines, they should not form the basis for remedy selection for any portion of the LPRSA. Instead, Region 2 should await completion of the RI/FS for the 17-mile LPRSA, which will be based on complete, reliable, and supported data and scientific analysis in accordance with the NCP.

One critical principle from *Daubert* is that scientific conclusions reached by EPA must not only be relevant, but also reliable. The methodology for the work underlying those conclusions must also be reasonable and generally accepted among the relevant scientific community. As these comments demonstrate in great detail, the conclusions of the 2014 FFS and the Proposed Plan are not reliable and do not approach the standards of sound science established in *Daubert*. Likewise, the modeling and risk assessment work Region 2 relies upon to reach its conclusions are based on methodologies that cannot withstand peer review or legal scrutiny. In any court proceedings flowing from the 2014 FFS or the Proposed Plan, the CPG will move to strike from the administrative record or otherwise challenge key elements of the 2014 FFS and Proposed Plan (for example, among others, Region 2's CSM, the HHRA, the SLERA, the 2005 Pilot Study, the empirical mass balance [EMB] model, and the numeric models utilized by Region 2), for failing to satisfy the spirit of *Daubert* or the Data Quality Act and representing flawed science.

F. The Proposed Plan is Arbitrary and Capricious

The Proposed Plan, and the acts or omissions of Region 2 described in these comments, and otherwise in the Administrative Record, constitute arbitrary and capricious conduct within the meaning of Section 113(j)(2) of CERCLA and Section 706(2) of the Administrative Procedures Act (APA). CERCLA provides that courts “shall uphold [the EPA’s] decision in selecting the response action unless the objecting party can demonstrate, on the administrative record, that the decision was arbitrary and capricious or otherwise not in accordance with law.” 42 USC § 9613(j)(2). The APA requires a reviewing court to “hold unlawful and set aside” agency action that is found to be (5 USC § 706(2)):

- Arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law
- Unconstitutional
- Contrary to law, such as beyond the agency’s statutory authority
- Without observance of procedure required by law
- Unwarranted by the facts in contradiction to the terms of a valid agreement.

An agency decision is arbitrary and capricious if “the agency has relied upon factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.” See *Motor Vehicle Mfrs. Ass’n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983); *Great Basin Mine Watch v. EPA*, 401 F.3d 1094, 1098 (9th Cir. 2005). Under either statute, the court must examine “whether the decision was based on a consideration of relevant factors and whether there has been a clear error of judgment” (*id.*).

While courts give great deference to agency decision-making under CERCLA, “the arbitrary and capricious standard...contemplates a searching ‘inquiry into the facts’ in order to determine ‘whether the decision was based on a consideration of the relevant factors and whether there

has been a clear error of judgment” (*United States v. E.I. DuPont de Nemours & Co., Inc.*, 432 F.3d 161, 179 (3d Cir. 2005)); see also *In re Bell Petroleum Serv. Inc.*, 3 F.3d 889, 905 (5th Cir. 1993) (judicial review must be based on something more than trust and faith in EPA’s experience).

The Region’s actions constitute arbitrary and capricious conduct for the reasons outlined in these comments, including but not limited to, the following:

- **The Region Has Arbitrarily Changed PRGs to Below Background Levels, and Therefore Has Set Unattainable PRGs.** As discussed in detail in Section V.B., the 2014 FFS sets PRGs below background concentrations, when PRGs were previously set consistent with background in the 2007 Draft FFS. The Region has not justified this significant change in approach.
- **The Region Has Relied Upon Factors Which Congress Has Not Intended it to Consider and Has Acted Beyond the Agency’s Statutory Authority.** In developing the Proposed Plan, Region 2 considered, and gave significant weight to, factors that should not have been considered in the remedial selection process. Nowhere in the authorizing statute does Congress instruct the agency to make remedy selection decisions based upon potential future uses, such as navigation. See Section V.D. The statute also does not give states veto power over EPA. While the statute provides for coordination with the state, the statute also provides EPA with authority to move forward with a remedy, in the event the state does not concur. Therefore, Region 2 inappropriately allowed the State of New Jersey’s political position regarding a CAD to direct the outcome of the Proposed Plan, which is inconsistent with CERCLA. See discussion Section IV, B. Furthermore, the Proposed Plan contemplates activities related to operation and maintenance of bridges; however, as discussed in Section IV.D.2., governmental owners of those bridges are legally obligated to perform those tasks (see 33 CFR Part 117). EPA has no authority under CERCLA or the NCP to expand those legal obligations.
- **The Proposed Plan Does Not Satisfy Procedures Required by Law.** The Proposed Plan represents a premature decision in disregard of the NCP process for conducting an RI/FS, and courts have found agency conduct to be arbitrary and capricious when there is a high degree of inconsistency between the NCP and the agency action. See *Washington State Dept. of Transp. v. Washington Natural Gas Co., PacifiCorp*, 59 F.3d 793, 806 (9th Cir. 1995); see also *Union Pacific R. Co. v. Reilly Industries, Inc.*, 981 F.Supp. 1229, 1238 (D. Minn. 1997), reversed in part on state law claims (RI/FS did not meet standards required by the NCP). Section V.B., Section V.F., and Appendix A provide a detailed evaluation of the 2014 FFS’s non-compliance with the NCP.
- **The Region’s Extreme Departure from EPA Guidance.** As discussed in Section V.C., Region 2’s failure to follow many critical aspects of its guidance suggests that the Region’s analysis is not for the purpose of reaching an appropriate remedial solution but to arbitrarily support the conclusions in the 2007 Draft FFS.
- **The Proposed Plan Fails to Consider Important Aspects of the Problem.** As discussed in detail in Section IV.B.4., Section V.C.2., and Appendix A, the Proposed Plan and 2014 FFS fail to consider important aspects of the remedy, including its ability to be implemented. It is highly inappropriate, and inconsistent with the NCP, for the Region to ignore feasibility issues until after the remedy has been selected. Such an approach would allow any remedy to be selected, deferring any consideration of

practical barriers to implementation until later, which effectively makes the feasibility study requirement of the NCP superfluous.

The Proposed Plan is based upon significant deficiencies that represent a high degree of inconsistency with CERCLA, the NCP, and EPA guidance, and that demonstrate conduct by Region 2 that must be considered arbitrary and capricious. Accordingly, Region 2 should not use the Proposed Plan to select a response action for any portion of the LPRSA. Instead, Region 2 should withdraw the Proposed Plan and rely on the NCP-consistent RI/FS being conducted by the CPG to make all remedy selection decisions for the LPRSA consistent with CERCLA.

V. THE PROPOSED PLAN IS SCIENTIFICALLY AND TECHNICALLY UNSOUND BASED UPON THE CURRENT UNDERSTANDING OF THE RIVER THROUGH THE COMPREHENSIVE RI/FS PROCESS

A. Region 2's Analyses Misrepresent River Conditions and Risks

Region 2 has based its Proposed Plan on:

- An outdated CSM, which fails to utilize data collected as part of the LPRSA RI/FS (see Appendix B);
- An HHRA in which critical exposure parameters were not obtained from either EPA guidance documents or peer-reviewed literature (see Appendix C);
- An ecological risk assessment (ERA) that was no more than a screening level study and that ignores the facts known about the LPRSA (see Appendix D.1.);
- Modeling work that is so woefully inadequate it would not withstand peer review or scrutiny by a court (see Appendix B); and
- Simplified bioaccumulation calculations, instead of the bioaccumulation model which the Region required for the RI/FS, that incorrectly reflect the biology and ecology in the Lower Passaic River, and ignore the available site-specific data (see Appendix E).

Region 2's analyses do not correctly portray the river or the risks posed by contaminated sediment in the river. They further prevent a balanced comparison of remedial alternatives as required by the NCP.

This section includes a detailed discussion of the multiple technical deficiencies of these analyses, as well as a discussion of how, in their application, Region 2's Focused Capping Alternative appears designed to fail by under predicting the benefits of a targeted remedy.

1. Region 2's Physical and Chemical CSM is Inaccurate and Misrepresents the Distribution of Contaminants in the Lower Eight Miles of the LPRSA Which Leads to Unsupported Conclusions and a Technically Deficient Preferred Alternative

Region 2's 2014 physical and chemical CSM for the LPRSA is basically the same as it was in the first FFS released in June 2007. It considers the lower portion of the LPRSA (roughly the

lower eight miles) to be unaffected by upstream background conditions. Also, it considers the nature and extent of contamination in the lower eight miles to be structureless with respect to patterns of sediment contamination and instead describes randomly distributed “hot spots” of COCs. Further, Region 2’s CSM asserts that, while natural recovery of sediments, surface water and biota previously occurred, the river has reached a quasi-steady state where deposition and erosion are in balance, and COC concentrations are no longer declining. These three unsupported concepts (high concentrations are random, no ongoing recovery, and background does not influence the lower eight miles) form the basis for the recommended bank-to-bank remedy. To the contrary, the river data and its analyses show that there is structure and pattern in the data, COC concentrations are continuing to decline but at a lower rate than in the past, and background does influence the lower eight miles. (See Appendix B, Section II.)

Region 2’s CSM, which is based on the outdated EMB model (Appendix C of the 2014 FFS), does not evaluate or integrate all of the RI data collected since 2007. While Region 2’s CSM is still based on the EMB model, Region 2’s modelers have recognized there is structure in the data and have developed sediment transport and contaminant fate and transport models to estimate contaminant concentrations within this structure after implementation of alternative remedies. If Region 2 had incorporated all the data and conducted a data analysis that is consistent with accepted professional practice, Region 2 should have developed a CSM capable of recognizing the contaminant patterns present in the lower eight miles of the LPRSA. It would have also provided insight distinguishing the areas of the river that act as sources of contamination and those areas of the river where there is ongoing recovery. In turn, this understanding of the river would have supported a remediation alternative that is less vast in scope but capable of achieving an equivalent level of success in reducing human health and ecological risks.

Hundreds of sediment cores and thousands of data points for sediment, surface water, and biota in the LPRSA have been collected since 2007. Inexplicably, the Region has not incorporated all of the data collected for the entire 17-mile LPRSA into its Proposed Plan and 2014 FFS for the lower eight miles (see, e.g., Appendix C, Section I.A. and Section I.C.1., Appendix D.1., Section I.A. and Table 1, and Section I.B.).

Although Region 2’s 2014 FFS RI lists 65 studies, mostly conducted prior to the current RI/FS, (Table 2-1 of DER 1, 2014 FFS Appendix A), the FFS RI does not rely on or include the more than 1,000 samples collected from eight data collection programs collected as part of the 17-mile LPRSA RI/FS; these sampling programs were conducted pursuant to Region 2-approved QAPPs and with Region 2 oversight:

- 2013 Supplemental Sediment Sampling Program 2 (SSP2)
- 2012 Bathymetry Survey
- 2012 Background Tissue - Upper Passaic River
- 2012 Background Sediment – Upper Passaic River
- 2012 Background Sediment Toxicity – Upper Passaic River
- 2013 Low Volume Chemical Water Column Sampling (used only datasets from 2011 and 2012)
- 2013 High Volume Chemical Water Column Sampling

- 2011-2012 RM 10.9 Characterization Data – sediment, bathymetry, surface water monitoring.

See also Appendix D.1, Table 1.

Region 2's use of older datasets in the FFS RI, which in some cases date back to the late 1980s, and the failure to utilize the eight recent RI datasets collected between 2011 and 2013 are not explained by Region 2 in the FFS RI. Seven of these eight recent datasets were considered critical by Region 2 in completing the 17-mile RI/FS, and the RM 10.9 characterization data became the basis for the RM 10.9 Removal Action. Most notably, the 2013 High Volume Chemical Water Sampling that includes data from the lower eight miles has been ignored by Region 2. Region 2 directed this sampling in order to provide site-specific partitioning coefficients for the chemical fate and transport model; however, Region 2's 2014 FFS model does not use these data, but rather utilizes older non-site-specific partitioning coefficients from the CARP program that it criticized and required to be updated in the 17-mile RI/FS model (see Appendix B, Section IV.B.).

The older datasets collected prior to initiation of the 17-mile RI/FS in 2004 are likely to include outdated analytical methods and different data quality objectives and are not consistent with the Uniform Federal Policy for Quality Assurance Project Plans that have been used to develop and implement data collection for the 17-mile RI. As part of the 17-mile RI/FS, under Region 2's oversight and with its approval, the CPG submitted on May 15, 2014, a revised *Lower Passaic River Restoration Project Data Usability and Data Evaluation Plan for the Lower Passaic River Study Area Risk Assessments*; this document was revised and resubmitted based on comments provided by Region 2 on April 10, 2014. This document establishes the principle that data collected prior to 2004 and non-LPRSA data will not be used in developing quantitative risk estimates (see V of this summary and Appendix D.1.) because, among other things, the data were analyzed with older analytical methods and the CPG (and the public) do not have sufficient information to verify the accuracy of the data.

A complete and careful examination of the information obtained through the 17-mile LPRSA RI and other investigations has produced a revised CSM that demonstrates the Lower Passaic River is acting as would be predicted in a tidally influenced estuary. There are clear patterns in the distribution of COCs, and these patterns are largely explainable by sediment transport mechanisms and the release histories of the COCs (see Appendix B, Section II):

- Deposition of sediments in the river was impacted by the cessation of maintenance dredging of the navigation channel (see Attachment C).
- There are defined locations where elevated concentrations of risk-driving COCs are present because these COCs accumulated in the sediment during the 1950s and 1960s (the peak of contaminant loading in the river) and the sediment has remained stable, or because the highly contaminated sediment has been exposed by erosion to a depth that correlates to the time of peak loading (see Appendix B, Section II.B.).
- In other locations, deposition of cleaner sediment has buried the more highly contaminated sediment so that surface concentrations are relatively low (see Appendix B, Section II.C.).
- In other parts of the river, mixing of sediments originating from upriver with the sediment already present is ongoing (see Appendix B, Section II.B.).

Contrary to Region 2's conclusions, the nature and extent of COCs in the river is not random and can be explained by known sediment transport mechanisms.

The unsupported conclusion that the entire river was and is a random, "well mixed box" was originally presented by Region 2 in support of the 2007 Draft FFS. That concept was inadequate in 2007. Since that time, a vast amount of new information has been collected showing that the distribution of COCs is predictable based on the history of contaminant releases, river dredging, and the way the river functions—just like any other tidally influenced river functions.

The ability to predict locations where the highest concentrations of risk-driving COCs will be found was demonstrated by the RM 10.9 characterization and SSP 2 work at RM 7.5 and RM 10. The initial mapping of sediment by the CPG at RM 10.9 successfully predicted the nature and extent of the hot spot at RM 10.9. Investigation of this area prior to the removal action confirmed the initial prediction was correct.

As early as 2009 when the draft Low Resolution Coring (LRC) report was submitted, the CPG provided Region 2 with information contradicting the conclusion that the distribution of COCs in sediment is random. Further, Region 2 has been presented with the results of COC mapping in sediment which demonstrated that, because Region 2 had not considered all of the RI sediment data in its analysis, it had incorrectly characterized high- and low-concentration areas. The CPG has also provided electronic files to Region 2 showing the areas where the highest concentrations of COCs are present. Region 2 has ignored all of this information and continued with its random, technically deficient "well mixed box" concept first advanced in 2007.

The preliminary CSM for the entire LPRSA (Anchor QEA 2013 Interim Conceptual Model. Draft submitted to Region to December 2013) was provided to Region 2 in December 2013 and explains why portions of the river, recognized by Region 2's own numeric modeling analysis, are currently recovering at a faster pace than an average or median value for the entire river would suggest. Region 2's overly simplified analysis of the data has ignored its own modeling and incorrectly concluded that there is no ongoing recovery in the river when, in fact, there are many locations where recovery is occurring (see Appendix B, Section II).

Region 2's failure to acknowledge the important contribution of sediments from above Dundee Dam to the lower eight miles is another reason why the agency reaches the incorrect conclusion that there is no ongoing recovery. Region 2's CSM dismisses the importance of solids from upriver by maintaining they represent only a small fraction of the total volume of sediment that is routinely resuspended and deposited in the lower eight miles of the river. However, Region 2 does not acknowledge that the total resuspension and deposition volume it cites is actually a repetitive counting of the same solids as they are resuspended and deposited many times over the course of a year. This greatly overstates the mass of sediments actually available for mixing with the upstream solids. The result is to inaccurately minimize the significance of upstream sediments. When the total volume of sediment available for mixing in the lower eight miles is compared to the volume of sediment originating upriver, it is clear that mixing within the bed is contributing to recovery in those areas where mixing occurs (Appendix B, Section II).

The fact that sediment from outside the lower eight miles of the LPRSA is deposited on and mixes with sediment in the lower eight miles also shows that Region 2 has misrepresented the effectiveness of the bank-to-bank remedy (see Section V.C.2.). Contrary to Region 2's steadfast position that background sediment concentrations are unimportant in the LPRSA, it

has been shown over and over in studies of other rivers that background concentrations of COCs in sediment will contribute to both recovery and to recontamination for any remedy. The testing has demonstrated that the LPRSA is no different than other locations in this regard, and Region 2's attempts to ignore the effects of background on the LPRSA are contrary to both policy and science and call into question Region 2's rationale and basis for the 2014 FFS remedy.

In summary, actual river conditions, including contaminant distribution and the influence of background on the lower eight miles of the LPRSA, are very different than those presented by Region 2 in support of its recommended remedy. Region 2's portrayal of river conditions is essentially unchanged from 2007, before the majority of the 17-mile LPRSA RI data were collected. The RI data and the conclusions they support have largely been ignored by Region 2. Region 2 should not have required the CPG to conduct a RI/FS costing more than \$100,000,000 if Region 2 intended to ignore the data. More than half of the RI/FS cost has been spent in the lower eight miles covered by the 2014 FFS.

Region 2's CSM misrepresents the behavior and distribution of LPRSA contaminants. It fails to integrate the current understanding of the mechanistic processes of the river that has been confirmed through extensive analysis of the sediment, surface water, and biota. It does not provide insights or explain observed contaminant concentration patterns, identify source areas and recovering areas, or show the contaminant fate and transport interactions that occur between the FFS study area and the upstream river. See Appendix B.

If Region 2's CSM was revised to incorporate the sediment, surface water, and biota data obtained since 2007 so that it correctly informed the remedy selection process, the results would lead to realistic PRGs and a targeted remediation approach rather than the bank-to-bank remedy selected by Region 2.

2. Region 2's Human Health Risk Assessment Uses Arbitrarily Developed Exposure Parameters and Specifically Ignores Site-Specific Data, Which Results in Unrealistic PRGs and Selection of an Unnecessary Bank-to-Bank Remedy

a) *Region 2's exposure assumptions used in the 2014 FFS HHRA are not realistic and do not reflect site-specific data, resulting in overstated estimates of current and future risk*

Some of the exposure assumptions used by Region 2 in its HHRA were obtained from accepted sources, such as EPA's *Risk Assessment Guidance for Superfund* (RAGS). However, the most critical assumptions affecting the risk assessment results (including the amount of fish and crab eaten, consumption of only fish from the LPRSA, the number of years fish from the LPRSA are eaten, and no loss of contaminants during cooking) were developed and mandated by Region 2 using a series of overly conservative values not based in fact or reality. When combined with other conservative aspects of the risk assessment process (e.g., upper-bound exposure point concentrations [EPCs] and toxicity values), the exposure assumptions used by Region 2 arbitrarily portray both current and future risk in a manner that overestimates these risks.

The fish and crab consumption rates in the 2014 FFS HHRA were internally developed by Region 2 and relied on studies that were clearly not applicable to the LPRSA and ignored the

uncertainties and limitations of those studies. The consumption rates were presented by Region 2 in the February 2, 2012, technical memorandum, *Fish and Crab Consumption Rates for the LPRSA Human Health Risk Assessment* (Tech Memo) (USEPA 2012) and represent nothing more than Region 2's opinion on consumption rates, with no reliance on site-specific information. See Appendix C, Section A.1. This document has never undergone any sort of peer review or external analysis. See also Section V.A.4. Further, the consumption rates specified by Region 2 do not reflect either current or projected consumption rates in the LPRSA. Region 2 specifically rejected the CPG's request to collect site-specific fish consumption data through a CAS.¹³

Region 2 based its fish consumption rates on two surveys of anglers that were conducted outside of the LPRSA, not on published guidance such as EPA's *Exposure Factors Handbook* (USEPA 2011). A detailed evaluation of these sources (see Appendix C, Section A.1.) clearly demonstrates that both the selection of sources upon which Region 2 based the analysis, and the estimation of consumption rates were completely subjective efforts by Region 2. As an example, one of the studies used by Region 2 was updated by the same author, but this newer study, which found lower fish consumption rates, was not used by Region 2. This highlights the question of whether Region 2 selected the more conservative studies, without consideration of their applicability or validity, to ensure higher fish consumption rates and, therefore, greater human health risks in support of its selection of the bank-to-bank remedy.

- One of the studies (Connelly et al. 1992) was a mail survey of licensed New York anglers on multiple lakes and rivers. The results of this study represent fishing patterns on water bodies that are hundreds of miles away from the LPRSA, by anglers of an entirely different demographic than in the LPRSA, and fish species that are different than those found in the LPRSA. Further, this study was clearly outdated, as the same author updated the survey in 1996. This more recent study, which found lower fish consumption rates than the 1992 study, was not used by Region 2. Again, the arbitrary and biased nature of selecting one study that is not relevant to the applicable water body rather than another, even when the study not selected is more recent, is apparent in how Region 2 developed its fish consumption rates.
- The other study relied on by Region 2 was a 1999 study designed to collect information about sociological reasons for angling and general patterns of fishing behavior and consumption. The Burger (2002) study was based on interviews with anglers in Newark Bay for only 4 months, between mid-May and mid-September 1999. No interviews were conducted for the other 8 months. The study collected no data on the lower eight miles of the Lower Passaic River; did not record any information on the number, species, or sizes of fish and crab kept by the anglers; and based all of its conclusions regarding annual consumption rates on only one interview for each angler conducted during warm weather when fishing and consuming are likely to be highest. Despite these limitations, Region 2 concluded that this was a valid study upon which to base a critical assumption in its risk assessment.

Region 2's risk assessment piles unsupported conservative assumption on top of more conservative assumptions to obtain a risk value that is dramatically overstated and bears no resemblance to the data. This risk value is then used to justify the need for immediate action and Region 2's selected bank-to-bank remedy. For example, Region 2's risk for a fish consuming angler assumes:

¹³ As will be discussed, the CPG conducted this survey anyway, to gather site-specific data.

- The angler will eat 56 to 75 meals per year solely of LPRSA fish, despite evidence that significantly fewer fish meals are consumed.
- The 56 to 75 LPRSA fish meals will be eaten every year for 30 years only from the LPRSA, despite evidence that many anglers fish the LPRSA for less than 30 years.
- Carp and American eel, which contain the highest concentrations of bioaccumulative COCs, are always a part of the fish diet, despite evidence that not all anglers eat these species;
- The fish consumed in every meal contain the highest concentrations of all LPRSA COCs, despite evidence that anglers eat fish of varying size and age (and thus varying COC body burdens).
- Cooking does not remove any of the COCs from the fish, despite extensive documentation that cooking loss will occur.
- The fat, skin (of some species), and cooking juices are always consumed, despite evidence that anglers eat only fillets and not the cooking juices.

See Appendix C., Section A.1.b; see also Appendix G (regarding the Region's failure to address CSTAG's recommendations related to Principle #8).

The CPG agrees that a risk assessment is intended to ensure that a selected remedy is protective and even that the assumptions used should be conservative. When using conservative assumptions in conducting risk assessments, those assumptions must bear some relationship to reality. Otherwise, the assumptions arbitrarily replace sound science, a violation of law. However, the assumptions used by Region 2 are grossly overstated and well beyond "protective" and do not reflect actual or projected consumption patterns in the LPRSA. The assumptions are so far removed from reality as to constitute arbitrary and capricious actions. Therefore, the risk assessment information does not provide realistic information upon which to base remedial decisions. Rather, because of the numerous unsupported arbitrary and conservative assumptions in the risk assessment, the results arbitrarily bias remedial decision-making to an unnecessary bank-to-bank remedy and fail to fully and fairly evaluate other remedial alternatives.

Real site-specific fish consumption information would have been collected as part of the RI if Region 2 had chosen to allow the CPG to perform a CAS for the LPRSA RI/FS. On October 29, 2009, CPG representatives met with Region 2 to discuss CPG's proposal to conduct a CAS of the 17-mile LPRSA reflecting recent and realistic fishing and consumption patterns as part of the RI/FS. At that meeting, the CPG explained to Region 2 that site-specific fish consumption exposure parameters were a fundamental data need for conducting a baseline risk assessment at a large and complex sediment site with bioaccumulative contaminants. As explained by the CPG, site-specific data would best characterize the LPRSA, accurately assess site risks, and provide the foundation for sound risk-based decision-making. Region 2 declined to undertake the study because of its own resource constraints and the anticipated challenges of gaining Partner Agency¹⁴ concurrence, eliminating the opportunity for gaining the insights site-specific information would provide. See Appendix C, Section A.1.

Although Region 2 declined to participate or to allow the CAS to be part of the RI, the CPG independently conducted the CAS, which was subjected to independent peer-review throughout

¹⁴ The Partner Agencies are USACE, NJDEP, NOAA, and USFWS.

the survey. The CAS found among other things, that the fish consumption rate for LPRSA anglers was less than half that estimated by Region 2. The CAS also found that carp was one of the fish caught and consumed by anglers. Carp was not one of the target species identified in the approved Fish/Decapod QAPP (Windward 2009), which presented the plan for sampling species to be used in the RI risk assessments.

Arbitrarily, Region 2 accepted the finding that carp is consumed by LPRSA anglers, but has failed to address or incorporate any of the CAS findings that may contradict its fish consumption estimates. The CAS work plan (AECOM 2011), which the CPG submitted to Region 2 in November 2011 as a courtesy, the CAS Data Report (AECOM 2014a), and a technical memorandum describing catch and consumption data (AECOM 2014b) are provided in Attachment B. See also Appendix C, Section A.1.

An alternative, scientifically supported, analysis of human health risks that utilizes site-specific data, including the results of the CAS, and more realistic exposure assumptions is provided in Attachment B. This analysis shows that Region 2's 2014 FFS HHRA overestimates risk from consumption of LPRSA fish and crab by at least a factor of 10. The CPG's site-specific HHRA found cancer risks from crab consumption to fall within EPA's target risk range. The site-specific HHRA found risks from fish consumption to only slightly exceed EPA's risk management benchmarks. These findings suggest that a remedy as drastic as bank-to-bank removal of sediment in the lower eight miles is not necessary. In short, the site-specific HHRA illustrates the extreme, arbitrary over-conservatism in Region 2's 2014 FFS HHRA, which in turn, has resulted in exaggerated risks and unrealistic PRGs.

Region 2 has also not adequately addressed either the variability or uncertainty in the fishing and consuming behaviors of LPRSA anglers. EPA's own guidance recommends the use of probabilistic methods to propagate variability and uncertainty through risk models to support risk-based decision-making at complex sites (USEPA 2001). As discussed in EPA's guidance, there are several advantages of probabilistic risk assessment (PRA) including the following: use of the full range of data to characterize exposures, the ability to perform sensitivity analyses to identify influential exposure factors, accounting for dependencies between input variables, and perhaps most importantly, providing risk managers with the full range of estimated risks and the likelihood of values within the range (EPA 2001). Region 2's simplistic and overly conservative 2014 FFS HHRA provides risk managers with limited information for making such an important decision about the need for and extent of sediment cleanup. Further, because a PRA was not performed, the risk manager has no idea where on the range of risks the reasonable maximum exposure (RME) and central tendency exposure (CTE) risk estimates fall. Given the overly conservative assumptions employed, it is likely that the RME risks fall at the extreme upper end of the distribution of risks. Such extreme estimates of risk are numerically unstable and highly uncertain, and not suitable or sufficiently robust for risk-based decision-making (EPA 2001).

A PRA is part of a tiered approach that typically starts with a point estimate risk assessment, and moves on to more complex and data intensive risk analysis methods. The decision to move on to subsequent tiers should consider whether risks are clearly above or below levels of concern and the level of confidence in the risk estimates (EPA 2001). By stopping at the first tier of risk analysis, Region 2 has concluded that uncertainties in their calculated risks are low and the level of confidence in the RME current and future risk estimates is high. For the many reasons discussed in these comments and supporting attachments, this conclusion is seriously flawed and has resulted in an analysis that is deficient and inadequate for informed risk management decision-making.

b) Region 2's toxicity assessment approach has resulted in overestimates of PCB and dioxin risks, and key uncertainties in the dioxin toxicity equivalence scheme are not acknowledged or addressed.

In addition, Region 2's toxicity assessment approach has resulted in overestimates of PCB and dioxin risks, and key uncertainties in the dioxin toxicity equivalence scheme are not acknowledged. Region 2's approach of summing non-dioxin-like PCB and dioxin-like PCB cancer and non-cancer risks does not account for a variety of issues and uncertainties associated with this compound class, and results in an overestimation of PCB risks. Region 2 evaluates dioxins and furans having mechanisms of toxicity similar to that of TCDD using a toxicity equivalence factor (TEF) scheme, where each dioxin/furan congener is assigned a TEF that equates the toxicity of the congener to that of TCDD. The TEFs are applied to the measured congener concentrations in environmental media and the results are summed to provide a toxic equivalency (TEQ) concentration. The cancer slope factor (CSF) for TCDD is then applied to the average daily dose of TEQ calculated in a risk assessment to estimate potential risk due to the exposure scenario(s) evaluated. Region 2 has identified a subset of 12 PCB congeners as "dioxin-like," and has assigned a TEF to each of these congeners (USEPA 2010b). However, evaluation of the dioxin-like toxicity of the presumed dioxin-like PCB congeners is not appropriate. The CSF for PCBs already includes the carcinogenic potential of the dioxin-like PCB congeners in the PCB (Aroclor) mixtures tested in the animal studies that form its basis. Region 2's approach of subtracting the dioxin-like PCBs from total PCBs does not address the double-counting, and the resulting PCB risks are overstated. See Appendix C, Section B. This process is not sound science.

c) Region 2's incomplete background evaluation underestimates the contribution of upriver sources and significantly overstates the risk reduction that can be achieved by the Preferred Alternative. The 2014 FFS HHRA also fails to effectively quantify and compare regional background risks from above Dundee Dam.

Consistent with the chemical and physical CSM, Region 2 also ignores the impact of background on human health risk. While Region 2 correctly identifies the Upper Passaic River (UPR) as background for the FFS Study Area, the majority of the available background data (collected under Region 2 oversight) was not used to estimate background human health risk. Not only was Region 2 selective in its use of available background sediment data, it failed to acknowledge the significant volume of background fish tissue data collected above Dundee Dam, electing instead to use its regression model to estimate tissue concentrations from its limited sediment data. As a result, the fact that human health risks in the LPRSA for contaminants other than 2,3,7,8 TCDD are similar to those in the UPR is arbitrarily ignored by Region 2. See Appendix C, Section C.

d) Region 2's selection of PRGs is flawed and inconsistent with Agency policy and results in remedial goals that are unattainable.

Region 2 has presented tissue PRGs that are based on the same overly conservative RME exposure and toxicity assumptions used in the 2014 FFS HHRA. PRGs have been derived for the three chemicals of concern with individual cancer risks above 1×10^{-4} (TCDD-TEQ and total

non-dioxin-like PCBs¹⁵) or an individual non-cancer hazard index (HI) above 1 (TCDD-TEQ, PCBs, and methylmercury).

Not only are the resulting tissue PRGs inappropriately low due to the overly conservative and unsupported RME exposure and toxicity assumptions that were used, they are not attainable, especially for PCBs and methylmercury. Levels of PCBs and methylmercury in fish collected from the background area above Dundee Dam exceed even the highest (least stringent) PRGs developed by Region 2. Region 2 has significantly and arbitrarily underestimated the contribution of background to the lower eight miles.

Region 2's presentation of risks and PRGs in the 2014 FFS incorporates only the RME results of the HHRA, and ignores the CTE scenarios that were evaluated for current and future baseline risks. The intent of evaluating both RME and CTE scenarios is to provide risk managers with a range of risk results, and promote more informed and reasonable remedial decision-making (USEPA 1992, 1995b).

Region 2 has not provided a sound rationale for excluding tissue PRGs that are based on CTE consumption rates, as well as other CTE exposure assumptions (i.e., cooking loss, exposure duration). The CTE scenario should be considered in the development of interim PRGs, in addition to the interim PRGs corresponding to 12 meals per year. This would provide a more representative and realistic set of tissue levels for use in setting interim remediation goals and monitoring remedy performance, particularly given that some species (e.g., carp) may take longer to attain levels considered safe for consumption.

See Appendix C, Section D for additional details.

e) Region 2's 2014 FFS does not evaluate or acknowledge the significant non-chemical pathogen risks that will not be addressed by the sediment remedy

The 2014 FFS does not address or even acknowledge a significant source of non-chemical risk in the LPRSA. Any remediation and restoration activities directed at improving water quality and reducing public health risks need to take into account the CSOs that are a major ongoing source of microbial risks to receptors using the river for recreation and other purposes. Using the same exposure assumptions directed by Region 2 for the baseline assessment of chemical risks for recreational receptors, the CPG has performed a quantitative microbial risk assessment using surface water data for bacteria and protozoa (see Attachment I). For all recreational receptors, including boaters, swimmers, and anglers, potential risks of gastrointestinal illness from one time and annual (repeated) exposures to surface water are significant and at or above acceptable risk guidelines established by EPA. For transient/homeless receptors who may be present along the banks of the river, the risks approach 100% probability of infection.

Based on the results of the quantitative microbial risk assessment, it is clear that the release of pathogens via CSOs poses a significant public health threat to recreational users of the LPRSA and others who may be present in the LPRSA. Region 2's 2014 FFS has failed to consider or even acknowledge that the Proposed Plan will not render the river safe for recreational users and others because of non-chemical stressors that will not be addressed by the remedy.

¹⁵ Only the total non-dioxin like PCB congeners were included in the development of the PRG for PCBs. Region 2 based this approach on the similarity of the calculated risks in the FFS HHRA for total non-dioxin-like PCBs and PCB-TEQ, and the assumption that any remedial action based on PRGs for total non-dioxin-like PCBs would address the dioxin-like congeners.

See Appendix C, Section C.3.; Attachment B.

The exposure parameters used by Region 2 in its human health risk assessment are based on unrealistic and arbitrary assumptions that bear no relationship to actual site conditions. These parameters could have been informed by site-specific data if Region 2 had chosen to use information from the CAS. The exposure parameters used for the Lower Passaic River result in overestimated risks that do not provide a meaningful basis for risk management. As a consequence of failing to perform a credible HHRA, Region 2 has grossly overestimated risk, resulting in unrealistic PRGs such that an unnecessary, cost-disproportionate, and counterproductive bank-to-bank remedy has been proposed.

3. Region 2 has Based Remedial Decisions on Ecological Screening Level Assumptions that Disregard Site-Specific Data and Relevant Information that are Contrary to Its Conclusions

Ecological risks have been oversimplified and overestimated by Region 2 through improper definition of site-specific conditions. This improper definition starts with faults in Region 2's ecological CSM and is compounded by a cursory ERA process that fails to comply with accepted standards of professional practice and EPA's own guidance (an analysis of the 2014 FFS ERA is presented in Appendix D.1.).

As a result, Region 2's ERA wrongly concludes that there is severe ecological impairment, a portrayal of ecological conditions that supports Region 2's selection of a bank-to-bank remedy. However, as with the CSM and the HHRA, a properly designed ERA conducted in accordance with EPA's guidance and accepted professional practice would have concluded that ecological risks are relatively minor and that most COCs pose no meaningful ecological risks. The implications of the inaccurate assessment of risks to the environment concluded in the 2014 FFS are significant. Bank to bank removal of all sediment will result in the destruction of habitat that is functioning within the expected range of urban aquatic systems in the NY/NJ Harbor estuary. On the other hand, execution of a focused remedy will eliminate unacceptable exposure pathways while preserving ecological services that are to be expected in an urban estuary having significant non-chemical stressors such as high sediment total organic concentrations, periods of low dissolved oxygen concentrations, and extensive habitat modifications associated with the development of the lower portions of the Passaic River as an historical industrial center.

EPA guidance is very clear on the steps involved in conducting an ERA. The first step is a *screening level* ERA in which chemical concentrations in the sediment and surface water are compared to reference values. Based on this step, a more refined analysis of ecological risks is performed using several different types of site-specific information, including the concentrations of chemicals in sediment, the toxicity of the sediment in comparison to background conditions, and the health of the ecosystem in comparison to background conditions. The product of this step in the process is a baseline ecological risk assessment (BERA), upon which decisions regarding the need for remedial actions can be made. See Appendix D.1., Section I.A.

This is a logical, step-wise process, and it is followed by all EPA regions and state environmental agencies. It is also the process Region 2 has required the CPG to follow for the 17-mile RI. Several detailed work plans for the data collection and analyses to support preparation of the BERA have been submitted to and approved by Region 2 during the course of the RI. Within these work plans, the CPG has provided details on what data would be

collected, how these data would be analyzed, and what exposure assumptions and effects thresholds would be used. See *id.*

In its ERA for the 2014 FFS, Region 2 has ignored its own guidance and established professional practice, and the approach to conducting the BERA approved for the CPG’s RI. Instead, it has produced an ERA that is nothing more than a screening level analysis, and it relies on this document to erroneously conclude that there is widespread and significant ecological impairment in the lower eight miles of the river due to COCs. Instead, this watershed has been impaired since long before chemicals were introduced into the LPRSA by loss of wetlands, discharge of sewage beginning in the 19th century (destroying the fishing industry), hardening of banks, and channelizing of tributaries.

Region 2’s assertion that the 2014 FFS ERA is not a screening-level assessment is wrong. The fact that certain “refinements” were made between the 2007 and 2014 FFS ERAs (page 6-4, FFS Appendix D) and other assumptions were used that are “more realistic and technically defensible...to support informed decision-making” (emphasis added)(USEPA 2014a) does not change the nature and substance of the document. These cited “realistic” assumptions and “refinements” do not satisfy the requirements of a BERA, which requires all site-specific data to be evaluated according to the purposes stated for data collection outlined in Region 2-approved work plans, and a systematic, transparent, and defensible process is used for selecting effects thresholds and exposure assumptions. Examples of the 2014 FFS ERA’s failure to meet EPA standards for an ERA are presented in the following table:

Comparison of SLERA, Region 2 2014 FFS ERA, and CPG LPRSA BERA Methods

General SLERA Methods	Region 2 2014 FFS ERA	CPG LPRSA BERA
Toxicological benchmarks		
Use generic thresholds	For characterizing benthic risks, used only generic sediment quality values equivalent to screening values and ignored site-specific Lower Passaic River sediment benthic toxicity tests and community data collected for characterizing benthic risks per the USEPA-approved Benthic QAPP (Windward 2009b) and LPRSA PFD (Windward and AECOM 2009).	For characterizing benthic risks, used site-specific SQT data
Use literature-based thresholds	Misleadingly cited two studies as “site-specific” to derive technically indefensible invertebrate 2,3,7,8-TCDD CBRs and sediment thresholds that are wrong.	Used site-specific data, when available (e.g., LPR benthic and ecological survey data)

General SLERA Methods	Region 2 2014 FFS ERA	CPG LPRSA BERA
Use easily available generic literature-based thresholds	Provided no rationale or specific criteria used to select baseline CBRs/TRVs, resulting in inappropriate CBRs/TRVs for determining baseline risks	Used refined TRVs based on thorough review and systematic evaluation of primary literature with transparent TRV selection process documented
Exposure concentrations and doses		
Based on maximum values	Based on UCL concentrations; however, the derivation of UCLs is not transparent in some cases, and UCLs do not accurately represent the current dataset and ecology (e.g., use of “generic fish”).	Based on UCLs representative of LPR ecology
Based on limited site-specific or modeled data	Used site-specific tissue data; however, omitted site-specific data collected with the intent of characterizing baseline risks in the LPRSA, including site-specific benthic toxicity and community data, lipid data (for egg modeling parameters), and additional sediment data.	Based on all available site-specific data, including benthic, LPR egg lipid, and complete sediment datasets
Based on generic exposure assumptions	Used “generic fish” as prey for birds and mammals, an assumption that is not ecologically accurate.	Based on ecologically supported assumptions
Problem formulation		
Based on generic receptors	Included carp as part of the “generic fish” to evaluate risk to fish populations, disregarding the presence of invasive carp as ecologically detrimental.	Based on site-appropriate receptors following the PFD and risk characterization plans
Spatially explicit exposures		
No use of spatially explicit exposures	Evaluated mudflat areas for specific receptors, but did not account for ecologically supported differences in fish exposure areas based on salinity tolerance and mammal exposure areas based on actual utilization of habitat.	Used spatially explicit exposures based on LPR ecology and receptor-specific life history

General SLERA Methods	Region 2 2014 FFS ERA	CPG LPRSA BERA
Risk assessment outcome		
Derive COPEC list based on HQs > 1.0	Generalized risk conclusions for informing cleanup levels based on HQs > 1.0 without discussion of population- or community-level risk and without evaluation of multiple LOEs (e.g., diet and egg LOEs).	Included discussion of population- and community-level risks and discussion of multiple LOEs
Derive COPEC list based on limited number of LOEs	For characterizing benthic risks, failed to conduct an SQT analysis, which should have included a comparison to reference area information per the USEPA-approved Benthic QAPP (Windward 2009b) and LPRSA PFD (Windward and AECOM 2009).	Determined benthic risk conclusions based on a WOE approach of the SQT data

BERA = baseline ecological risk assessment
 CBR = critical body residue
 COPEC = chemical of potential ecological concern
 2014 FFS = focused feasibility study
 HQ = hazard quotient
 LOE = line of evidence
 LPR = Lower Passaic River
 LPRSA = Lower Passaic River Study Area
 PFD = problem formulation document

QAPP = quality assurance project plan
 SLERA = screening-level ecological risk assessment
 SQT = sediment quality triad
 TCDD = tetrachlorodibenzo-p-dioxin
 TRV = toxicity reference value
 UCL = upper confidence limit on the mean
 USEPA = US Environmental Protection Agency
 WOE = weight of evidence

In addition, even in preparing its screening level risk assessment, Region 2 has arbitrarily revised some of the established sediment benchmarks it uses for comparison with the sediment data.

As with the CSM and the HHRA, there is a demonstrated pattern of decisions by Region 2 to skew the analysis of ecological risks in support of the Region's predetermined bank-to-bank remedy. Each of these decisions builds upon the others with the result being a substantial misrepresentation of ecological risks:

- Region 2 has constructed an ecological CSM in which the benthic community, fish and crab, and mammals and birds are assumed to be exposed to chemicals from sources where exposure is highly improbable, if not impossible. For example:
 - Region 2's ecological CSM has benthic and aquatic organisms being exposed to chemicals at depths below the redox boundary, in sediment that lacks dissolved oxygen and is subject to significant generation of methane. The benthic and aquatic organisms cannot survive under those conditions. Region 2 presumes benthic and aquatic exposure to constituents found throughout entire top 6 inches (15 cm) of

sediment, when all of the site-specific data, including studies conducted by Region 2 contractors, demonstrate that benthic communities in the lower eight miles reside *only* above the redox boundary (approximately the top 1 to 2 cm of sediment). See Appendix D.1., Section I.C.a.

- Instead of using readily available fish tissue data reported for numerous fish species, Region 2 elected to create a fake, “generic fish” for use in the 2014 FFS risk assessments—that is, an artificial “composite” of available fish tissue excluding mummichog. For the generic fish category, EPCs were calculated using whole-body tissue data for multiple fish species samples including American eel, white perch, white catfish, brown bullhead, common carp, smallmouth bass, and white sucker” (see Section 4.2.2 of 2014 Appendix D - Risk Assessments 2014 FFS.) The decision to create a “generic fish” blurs the significant differences in fish tissue concentrations between species, thereby significantly affecting risk outcomes. Furthermore, the artificial tissue concentration resulting from its imaginary “generic fish” misrepresents the relationship between fish exposure routes and sediment concentrations in the lower eight miles of the LPRSA because several of the fish species included in the “generic fish,” such as carp, smallmouth bass, and white sucker, are intolerant of saline waters and severely limited to incursions into only the lower reaches of the 8 miles of the Passaic River being considered in the 2014 FFS. **One thing is certain, the "generic fish" species will never be found in the lower eight miles.** See Appendix D.1., Section I.B.1.
- By simplifying the analysis of fish tissue and creating a “generic fish”, Region 2’s conceptual model presumes that portions of the diets of mammals and birds consist of fish that are simply too large for them to eat. For example, Region 2’s CSM presumes that a large portion of the diet for a 5-pound heron consists of carp that may weigh as much as 40 to 50 pounds. Clearly this presumption is wrong, but this is the arbitrary basis by which Region 2 has estimated wildlife risk. See Appendix D.1., Section II.B.5.
- The use of screening level comparisons with sediment benchmarks is designed to be a conservative analysis, and is normally used only for the purpose of identifying chemicals to be included in more refined risk assessment activities. Using this screening approach to quantify ecological risks, such as was done in the 2014 FFS ERA, is contrary to EPA policy and accepted professional practice.
- In conducting the comparison with CBRs/TRVs, Region 2 reduced some of the literature values by applying arbitrary and unexplained “extrapolation factors.” See Appendix D.1., Section I.B.2.
- Region 2 ignored the co-located sediment quality triad data which use sediment toxicity and benthic community survey information collected as part of the 17-mile RI. Those data demonstrate that there is no correlation between chemical concentrations in sediment and toxicity or benthic community health. This information was collected as per RI work plans approved by Region 2, and was available but was ignored by Region 2 when it prepared the 2014 FFS ERA.
- Similarly, Region 2 has ignored the comparison of LPRSA sediment toxicity and benthic community with background and reference locations which show that, in comparison to background, only a few locations in the lower eight miles indicate elevated risks to benthic organisms from only a few COCs.

The cumulative effects of Region 2's decisions are seen in the impact they have on estimated ecological risks. If Region 2 had conducted its ERA in a manner consistent with its own guidance and accepted professional practice, and had incorporated the data collected under the RI work plans it had approved, rather than the simple screening level assessment that was conducted, far different conclusions concerning potential risks to the river ecology would have been reached:

Region 2 reduced some of the literature values by applying arbitrary and unexplained "extrapolation factors." For example, the 2,3,7,8-TCDD sediment comparison value upon which Region 2 bases its conclusion that there is a hazard quotient of more than 1,000 for the benthic community, was based on an initial study where it was not definitively concluded that 2,3,7,8-TCDD was the contaminant causing the observed impairment. Further, the value was derived based on a comparison of tissue data from two different locations, so there was no control for other factors that may have influenced the results. Finally, the value was plucked from a conference presentation, not a peer-reviewed study in a scientific journal where the initial studies and the methodologies used could be critiqued.

- There is only limited impairment of the benthic community relative to reference data and chemistry data is a poor predictor of benthic toxicity; most COCs have no meaningful impact on ecological risk.
 - When compared to conditions in Jamaica Bay, the area Region 2 directed the CPG to use as its reference¹⁶ location for the estuarine portion of the LPRSA, only two of 47 locations in the lower eight miles had a benthic community that was different than that seen in Jamaica Bay. Similarly, when *Ampelisca abdita* toxicity testing results from the lower eight miles were compared to testing at Jamaica Bay, only two of 27 locations had toxicity that was different than Jamaica Bay.
 - In other words, nearly all of the benthic community in the lower eight miles of the LPRSA is no different, and is experiencing no greater sediment toxicity, than the benthic community in the "relatively uncontaminated" reference location.
- For the limited number of locations where benthic community structure and function are limited relative to reference data, the greatest degree of impairment to the benthic community is due to stressors other than COCs in sediment, such as high sediment total organic concentrations, low dissolved oxygen concentrations, and degraded habitat quality.
- The vast majority of fish species are not at risk from COCs in sediment when appropriate exposure concentrations and threshold values are used, and only a very few COCs contribute to risk. The only fish in which tissue concentrations exceed appropriate threshold values to any notable level is carp, an invasive species that EPA and other regulatory agencies are attempting to eradicate elsewhere in the United States (e.g., the Great Lakes).
- There is no unacceptable risk to the great blue heron, the surrogate bird species, when appropriately sized prey fish are used in the diet and the correct threshold values are used.

¹⁶ Region 2 has directed for the LPRSA RI/FS that reference areas are defined as "a relatively uncontaminated site used for comparison to contaminated sites in environmental monitoring studies." (EPA 2013) pursuant to EPA 1994 <http://www.epa.gov/oswer/riskassessment/ecoup/pdf/v2no4.pdf>.

- The risk to mink from dioxin and PCB exposure is dramatically less than that estimated by Region 2 (putting aside the fact that there is no evidence of the presence of mink in the FFS Study Area).
- Region 2 neglected to consider bioavailability and bioaccessibility of metals in contravention of well-established agency guidance documents – specifically, EPA’s Framework for Metals Risk Assessment, March 2007 (hereafter the “Framework”) and EPA’s Guidelines for Ecological Risk Assessment, April 1998 (hereafter “Guidelines”). The Framework requires consideration of bioavailability and bioaccessibility. Framework, 2-10 and 6-4. The Guidelines recommend a summary of each path of stressors from the source to the receptor. Guidelines, Section 4.2.2. Accordingly, EPA’s reliance on the assumption that all metals in sediment were both toxic and available would tend to overstate the metals impact on Lower Passaic River fish.
- In its assessment of ecological risks to fish and crabs from copper and lead, Region 2 failed to consider that the copper and lead concentrations in fish and crabs from the lower eight miles of the Lower Passaic River are not elevated above regional background levels of these metals in fish and crab. As detailed in Appendix D.1, Section II.B.20 of these comments, the CPG compared Region 2’s fish and crab EPCs to regional concentrations of copper and lead in fish and crab published by USEPA. Table 12 and the accompanying text clearly show the result of that analysis, demonstrating that the Region 2 copper and lead EPCs are comparable to concentrations in fish and crab tissues caught elsewhere in the U.S. northeast coastal region. This comparison illustrates that the concentrations of lead and copper in fish and crab in the lower eight miles are not elevated above regional background. Further, this comparison also highlights that the ‘critical body residue’ (CBR) toxicity values used by Region 2 to predict an ecological risk to these fish and crabs are simply untenable given the presence of similar concentrations of these metals in aquatic species outside the lower eight miles of the Lower Passaic River. In other words, if Region 2’s toxicity values were indicative of harm, essentially all fish and crabs in coastal northeastern waters would be facing a comparable ecological risk due to copper and/or lead, and there is no evidence to suggest such a finding. As part of their initial assessment of fish and crab tissue data, Region 2 should have screened copper and lead concentrations against the northeast regional coastal fish and crab data. If this had been done, then these metals would have been screened out, and they would not have been identified as COCs in the first place. As such, none of the fish/crab or piscivorous bird and mammal hazard quotient calculations for copper and lead should have been performed.

In short, ecological impacts are limited to a few COCs and the ecological impacts from those COCs are outweighed by environmental factors unrelated to COCs in the river. By contrast, as extensively documented in the detailed comments to the ERA (Appendix D), Region 2 has prepared a screening level document that grossly overstates ecological risks from chemicals in LPRSA sediment. Contrary to its own guidance and accepted professional practice, Region 2 has ignored site-specific data collected pursuant to work plans it had previously approved, that conflict with its conclusion that a bank-to-bank remedy is required for the river.

Region 2 is attempting to use a screening level ecological risk assessment that includes unpublished and unexplained sediment quality parameters. The ecological risk assessment is based on a conceptual model in which ecological receptors are exposed to sediment and prey sources where the potential for exposure is improbable, if not impossible. In portraying the river as being significantly ecologically impaired, Region 2 has ignored data and interpretations that were available but that are contrary to its preferred bank-to-bank remedy.

4. Region 2's Numerical Model Implementation Has Several Shortcomings That Prevent It From Being a Reliable Tool to Predict the Benefits That Will Be Achieved by the Various Remedial Alternatives in Either a Relative or Absolute Sense.

a) *Region 2's model is not calibrated. Model predictions for some of the most relevant variables that drive recovery and the human health risk are not at all comparable to actual measurements so that Region 2 is relying upon model predictions that contradict the actual facts known about conditions in the river.*

Region 2's numeric modeling includes a hydrodynamic model, a sediment transport model, organic carbon (OC) model, and a contaminant fate and transport model. Neither the OC nor the CFT model is calibrated. Calibration is necessary for a model to be of use. An uncalibrated model is not reliable and does not provide a sound, justifiable basis for decision making.

As discussed in more detail in Appendix B, the OC model has two deficiencies:

1. The OC model is biased toward the low end in the sediment bed concentrations, resulting in an overestimation of carbon-normalized contaminant concentrations. This allows a biased interpretation of remedial benefit in the risk assessment.
2. The OC in the water column, and the algae in particular, is not calibrated at all. The impact of this issue is significant as the current structure of the model results in the algae contributing to a greatly exaggerated depiction of the transfer of chemicals from the sediment bed to the water column.

Region 2's CFT model has been calibrated to the average of the 15-cm sediment bed concentration. Most importantly, this calibration does not consider that **the contaminant concentrations in the water column predicted by the model are 10 times higher than the levels actually measured in the river.** Having an error of this magnitude in the water column values calls into question the accuracy of the model's predictions of contaminant concentrations in the bioavailable layers of the surficial bed and its predictions of post-remedy recontamination. At any rate, the quality of the sediment bed calibration is difficult to interpret given the limited metrics provided and the lack of clarity in Region 2's rationale for the selection of the best calibration parameter.

The CFT model used to evaluate remedial alternatives in the 2014 FFS has not adequately considered several processes (including the presence of a thin, unconsolidated "fluff layer" at the top of the sediment bed and the specific transfer mechanisms for chemicals within the system) that impact interactions between the bed and water column and may be the reason for the lack of consistency between measured and predicted contaminant concentrations in the water column, specifically:

- Not accounting for the layer of unconsolidated sediment at the water-bed interface (i.e., the fluff layer) that is resuspended and deposited by the tides, results in the model incorrectly resuspending the underlying bed each tidal cycle and bringing too much of the chemicals into the water column.
- Incorrectly assuming that the resuspending particles instantly desorb chemicals and transfer them to other particles like algae that settle slowly causes the model to further over-estimate the flux of chemicals out of the sediment.
- The incorrect assumption that sands contain no carbon and sorb no chemicals.
- These deficiencies have caused the model to over-estimate COC concentrations in the water column and under-estimate the concentrations of COCs on sand.

The projections of natural recovery and the effectiveness of the active remediation alternatives start with model-predicted bed contaminant concentrations based on a 1995 to 2012 model run rather than actual measured concentrations available from the 17-mile LPRSA RI/FS sediment sampling programs. These model-predicted bed concentrations are very different than the measured LPRSA data. This fact alone highlights the arbitrariness of the model predictions and calls into question Region 2's rationale for utilizing inaccurate model predictions when actual river data were collected under Region 2's oversight and are available. The inaccurate initial condition model predictions are the basis for future predictions and introduce error into the future projections. Ignoring data that are available to define the current situation of bed contamination is neither an acceptable modeling practice nor reliable science. Relying on a model that demonstrates significant bias and poor predictive ability for important elements is fundamentally flawed and not based on sound science.

In summary, both models have not been calibrated and are critically flawed. The result is that important drivers of the human health risk such as water column and surficial bed contaminant concentrations do not reflect and are inconsistent with actual river conditions. Of major importance is that the deficiencies of the model have led to nonsensical predictions of post-remedy recontamination in which two-thirds of the FFS Study Area never accumulates any of the chemicals depositing there and a portion of the other third buries depositing chemicals at an inordinately fast rate. In fact, some portions of its model predict nonsensically that enough sediment accumulates to fill in the River to reach elevations above the water surface. This problem results in overestimates of risk reduction and an incorrect assessment of the relative differences among remedial alternatives.

b) Region 2 failed to properly design and construct a model framework that correctly represents the concentration patterns documented by the RI/FS data.

The Proposed Plan's Preferred Alternative does little to reduce contaminant concentrations in the water column and on recently deposited sediment. Based on a review of Region 2's model, the Preferred Alternative achieves water column TCDD concentrations that differ only slightly from the No Action alternative and will be higher during remediation (see Appendix B, Section III.C.). Therefore, the Proposed Plan remedy does not reduce the fish exposure to water column TCDD concentrations. The bank-to-bank remedy is estimated by Region 2 to cost \$1,700,000,000 (although it is likely to cost much more) but will only achieve a 21% reduction of the 2,3,7,8-TCDD flux to Newark Bay.¹⁷ Id. Further, such a remedy achieves long-term (15-

¹⁷ The reduction is even less for other COCs, which are far less elevated in the LPRSA relative to concentrations above Dundee Dam.

year) average contaminant concentrations in the top few centimeters of sediment and even the top 10 cm of sediment that are only modestly lower than those achieved under the No Action alternative (see Appendix B, Section V.B.). Therefore, Region 2's claim that it can meet its PRGs is false and the Proposed Plan must be withdrawn.

The tides and resultant estuarine circulation in the Lower Passaic River cause significant interaction over its lower 12 to 14 miles. The interaction means that areas upstream of the FFS Study Area can influence conditions within the FFS Study Area and vice versa. For example, natural recovery in the FFS Study Area and Newark Bay can be influenced by contaminants originating from upstream sediments or from the UPR basin. As such, remediation of upstream sediments could benefit the FFS Study Area and affect decisions on remediation within the FFS Study Area. However, Region 2 did not conduct a holistic examination of remedial options and did not consider the relative benefits of upstream versus downstream remediation. Such an examination is necessary to achieve an optimum remedy for the FFS Study Area. The Region's dataset and model show that a significant fraction of the contaminant concentrations in the water column of the FFS Study Area are derived from upstream (see Appendix B, Section III.B.) and Region 2's model predicts that the Preferred Alternative presented in the Proposed Plan will be largely ineffective in reducing water column concentrations relative to a smaller remedy or even natural recovery. *Id.* Since the food web in the Lower Passaic River, as in all water bodies, includes a pelagic component (consisting of the zone that is neither close to the bottom nor near the shore), the lack of benefit to the water column means that the 8-mile Preferred Alternative will be less effective than Region 2 has represented for both reducing fish contaminant levels and estimating human health and ecological risk.

Region 2 introduces two contradictory pieces of information. First, the EMB model estimates that the UPR and Newark Bay account for 32% and 14%, respectively, of the recently deposited sediments in the FFS Study Area, with deposition of resuspended solids accounting for 48% (RI Report, Appendix C, page 4-2). Second, in an apparent contradiction, the FFS RI Report uses the FFS's numeric modeling results to dismiss the impact of external solids sources (Appendix B III.C).

Although the EMB model conclusion appears plausible, albeit uncertain, it is based on a number of unsupported assumptions and an imprecise optimization. Further, the conclusion based on the FFS model is erroneous. Region 2's error is the failure to recognize that the estimate of the accumulated gross resuspension and deposition reflects the repetitive counting of the same solids as they are resuspended and deposited many times over the simulation period. This becomes clear when the stated average resuspension and deposition fluxes on the order of 5 million MT/yr are compared with the fact that there are less than 200,000 MT of solids in the top 6 inches of FFS Study Area sediment. This six inches of sediment over the entire FFS Study Area represents the likely mass interacting with the water column, given that bed elevation changes between bathymetric surveys (RI Report, Appendix B), show that most of the FFS Study Area experiences less than 6 inches of elevation change. (Appendix B III.C).

The Region also failed to recognize that its 2014 FFS model shows significant impacts to the FFS Study Area and Newark Bay from contaminated sediments upstream of RM 8.3. Model-predicted mass balance for RM 0.9 to 8.3 over the 17-year calibration period shows that the magnitude of the total flux from the Lower Passaic River into Newark Bay of 22 grams per year (g/yr) is comparable to the flux of 17 g/yr entering from above RM 8.3. Upstream sources clearly contribute a significant flux to the FFS Study Area, relative to that leaving the area. This suggests that the upstream areas are likely to be a sustainable source of recontamination to the FFS Study Area and ultimately Newark Bay (Appendix B III.C).

The FFS Report states that “Alternative 3 would produce substantial reductions in the transport of contaminants in the water column towards Newark Bay.” This statement is hardly supported by the Region’s own predictions, as the Preferred Alternative will result in 260 g of TCDD transported into Newark Bay compared to 330 g for No Action and 230 g for the deep dredge for the period from 2030 to 2050. This is a substantial effort for only a 21% reduction (Appendix B.III.C).

Region 2 is relying on the 17-mile LPRSA RI/FS to deal with the region upstream of the FFS Study Area, but this bifurcation is not feasible or technically defensible. Indeed, this is the very rationale for doing the 17-mile RI/FS in the first place. The interactions between the lower eight miles and the upper 9 miles mean that remedial options must consider the entire river to provide the information needed to compare and contrast alternatives. This conclusion demonstrates that the decision to limit the FFS Study Area to the lower eight miles of the LPRSA was not based on science.

c) CFT model results are inconsistent with Lower Passaic River data. The predicted lack of recontamination defies logic.

Region 2’s CFT model rapidly transfers chemicals from the bed to the water column at rates that are inconsistent with the slow rates of recovery of near-surface sediments expected, based on experience at other sites and data from the Lower Passaic River. For example, Region 2’s model predicts that at the end of the 15-year calibration period, the top 10 cm of sediment has an average 2,3,7,8-TCDD concentration of 125 parts per trillion (ppt), whereas the 2014 FFS reports an average concentration in recently-deposited sediment of 370 ppt. This is one of the many examples of how Region 2’s model does not reflect the actual conditions in the river.

Moreover, the model inexplicably predicts that contaminant and carbon deposited into the post-remedy cap are so rapidly lost to the water column that essentially no recontamination occurs in areas subject to net erosion or mild deposition and only transient recontamination occurs in areas subject to high deposition. This behavior causes Region 2’s model to erroneously predict that the Preferred Alternative attains essentially the same relative concentration reductions for all chemicals (e.g., 2,3,7,8-TCDD, total PCBs, and mercury), regardless of the extent of contamination upstream and downstream of the FFS Study Area. This result defies logic and the model’s strange behavior causes it to predict unrealistically low post-dredge-and-cap residual concentrations notwithstanding ongoing sources in the LPRSA and above the Dundee Dam. These errors impact remedy selection and conclusions about remedy protectiveness.

Region 2’s modeling is contradicted by existing actual data and is based on unsupported assumptions that cannot withstand technical or legal scrutiny. As a result, the modeling in the FFS significantly underestimates the effectiveness of targeted remediation and overestimates the effectiveness of Region 2’s Preferred Alternative. The difference between the model and site data is off in some cases by a factor of 10, making the model unreliable, and use of it to make predictions in these circumstances is not sound science.

5. Region 2 Has Failed to Conduct Mechanistic Bioaccumulation Modeling for the 2014 FFS; Instead, Region 2 Used a Simplified Statistical Analysis Based on its Flawed Ecological CSM That Incorrectly Reflects the Biology and Ecology in the Lower Passaic River, and is at Odds With the Available Site-Specific Data.

For the 17-mile RI/FS being conducted by the CPG under Region 2 oversight, the CPG developed a bioaccumulation model (in accordance with the September 2006 Lower Passaic River Restoration Project Final Modeling Work Plan (Modeling Work Plan)) to analyze the effectiveness of remedial action alternatives at reducing contaminant concentrations in benthic organisms and fish in the Lower Passaic River.

Even though a bioaccumulation model is required pursuant to Region 2's Modeling Work Plan for the RI/FS (see Section 6.5 of the Modeling Work Plan), Region 2 has made no effort to conduct mechanistic bioaccumulation modeling for the 2014 FFS. Instead, Region 2 used a simplified statistical analysis based on its flawed ecological CSM that incorrectly reflects the biology and ecology in the Lower Passaic River, and ignores the available site-specific data. This analysis exaggerates the impact of contaminants from deeply buried sediments to enter the food chain.

The Region used incomplete and inconsistent data that are not reproducible. The sediment and biota data used for Region 2's bioaccumulation calculations have not been provided despite the CPG's repeated requests. It is uncertain whether these data were appropriately shown to be co-located, i.e., obtained from the same locations and at the same time.¹⁸ Instead, data from numerous different investigations of the Lower Passaic River and the NY/NJ Harbor were obtained from the various databases. As discussed in Appendix D of these comments, Region 2 has violated the December 2010¹⁹ Region 2-CPG agreement that only data collected within the 17-mile LPRSA and collected since 2004 will be used in the development of quantitative risk estimates. Specifically, Data Evaluation Report 6 of 2014 FFS Appendix A discusses how the Region used both non-LPRSA data and Lower Passaic River data collected before 2004 to develop the bioaccumulation (sediment-tissue) regression models. The results of Region 2's bioaccumulation regression models are used to develop inflated future tissue concentrations that invalidly over-estimate future risks that are presented in the 2014 FFS risk assessment (Section 6.1.2 of 2014 Appendix D).

Region 2 paired these sediment data and the biota data using unspecified criteria. Then, most of the sediment - tissue relationships were developed using multivariate regression analysis. In cases where the concentration range of sediment and tissue data was limited, biota-sediment accumulation factors (BSAFs) for organic contaminants and bioaccumulation factors (BAFs) for inorganic contaminants) were estimated (see Appendix E, Section I.A.).

Unfortunately, the CPG has been unable to conduct a thorough review and reconstruction of Region 2's bioaccumulation approach because Region 2 did not include the sediment and tissue datasets with the 2014 FFS and has failed to provide this critical information despite the

¹⁸ Using data from sediment samples obtained at the same location and at the same time as the biota samples is consistent with EPA's own recommendations on how to develop statistical relationships between sediment concentrations and biota concentrations.

¹⁹ See Data Usability and Data Evaluation Plan for the LPRSA Risk Assessments, April 18, 2014 ("During the December 14 and December 16, 2010 meetings between Region 2/USEPA and the CPG representatives, it was agreed that EPCs in the risk assessments will be calculated using only current (CPG) data that meet the DQOs specified in this document")

CPG's formal request for same.²⁰ In order to be transparent and allow interested parties to evaluate and reproduce Region 2's bioaccumulation calculations, Region 2 must provide information including the list of samples used, the list of which sediment samples were paired with which biota samples, how sums were calculated for classes of analytical compounds, and how non-detects were treated. Without this information, Region 2's assumptions and conclusions cannot be evaluated.

The CPG has tried to reproduce the Region's approach from the limited information provided, but the 2014 FFS bioaccumulation calculations are not reproducible and are inconsistent with the existing LPRSA BERA datasets (see Appendix E, Section I.A.).

The Region exaggerates the potential for buried sediment contaminants to enter the food chain. Based on the site-specific bioaccumulation model that Region 2 directed the CPG to prepare for the RI/FS, it is clear that the 2014 FFS significantly exaggerates the potential for buried sediment contaminants to enter the food chain by incorrectly presuming that the biologically active zone (BAZ) extends to 15 cm. Region 2 incorrectly considers the top 15 cm of the sediment bed as the BAZ, even though such a conclusion is in direct contradiction with its own sediment profile imaging (SPI) data, which show a BAZ of 1 to 2 cm, and a recent report from the USEPA Office of Research and Development (Burkhardt 2009), which supports a BAZ of 0 to 2 cm (see Appendix E, Section II.C.). This is another example of Region 2 ignoring the site-specific data in the 2014 FFS to reach the conclusion it wanted rather than a defensible result.

Region 2's 15 cm BAZ is clearly erroneous based upon the Region's own SPI data and a recent EPA report.

The 2014 FFS considers the future risks from eating fish contaminated with chemicals that bioaccumulate in the aquatic food chain by using the Region's bioaccumulation regressions, BSAFs, and BAFs to predict tissue contaminant concentrations from contaminant concentrations in the top 15 cm of the sediment bed. It is critical that these bioaccumulation estimates are accurate because of their role in estimating future risk which is key to the evaluation of protectiveness, a threshold criterion in the selection of a preferred alternative as the final remedy. However, Region 2's estimates are not accurate, as site-specific data show that organisms are exposed to the top 2 cm of sediment. Based on the limited information provided, there are a minimum of at least three critical errors in Region 2's approach (see Appendix E):

1. Region 2 has used a technically unsupportable and invalid ecological CSM for the benthic and pelagic community that assumes exposure to sediment as deep as 15 cm, which is contrary to the Region's own site-specific SPI data, the 17-mile RI benthic community surveys, and the life histories of the Lower Passaic River biota documented in the literature.
2. Region 2 has failed to account for site-specific food web interactions that affect how sediment remediation will affect EPCs for receptors. The benthic community data collected for the RI/FS under Region 2 oversight demonstrates that the community is predominated by organisms eating detritus at the surface of the sediment bed. These

²⁰ A FOIA request for this information was submitted to EPA on April 21, 2014 but the information has not been provided.

organisms form the base of the food chain. This means that contaminants in fish originate not only from the top 2 cm of the sediment bed but from contaminants in the water column and sorbed to recently deposited particles.

3. Region 2 has made significant technical errors in statistical analysis used to derive bioaccumulation estimates, which render Region 2's conclusions on bioaccumulation unable to survive a peer review by qualified bioaccumulation modelers or legal scrutiny.

As a consequence of these errors and omissions in its bioaccumulation estimates, Region 2's conclusions about future risk associated with its Preferred Alternative are technically indefensible and the conclusions about overall protection of human health and the environment for risk management decision-making are erroneous.

As stated in the 2014 FFS, sediment-biota relationships “are an important component in forecasting site-related risks at CERCLA sites in the absence of any remediation (the No Action alternative) as well as forecasting the reduction in risk that may be anticipated in response to various remedial activities.” (FFS, p. 3-1, Appendix A – DER 6). Sediment-biota relationships quantified in bioaccumulation calculations are critically important for evaluating the scientific defensibility of selected remedial remedies with respect to protection of human health and the environment.

Region 2 described the need for mechanistic bioaccumulation modeling in the Modeling Work Plan, which is consistent with current technically valid approaches. Nonetheless, this is not the approach that it has taken in both the 2007 and 2014 FFS. The 17-mile RI site-specific bioaccumulation model, which is based on a published, peer-reviewed model, improves on the model described in the Modeling Work Plan because it is informed by a large body of site-specific data and coupled with the site-specific CFT model. These site-specific data support using a 2-cm BAZ; help quantify the site-specific food web relationships in the Lower Passaic River, and allow site-specific calibration based on co-located sediment and biota data from the Lower Passaic River and not other water bodies.

Region 2 failed to:

- **Make the raw and post-processed data used for the FFS bioaccumulation calculations available for public review**
- **Incorporate the site-specific benthic community data collected as part of the 17-mile RI and correct its erroneous assumption about the BAZ (1-2 cm not 15 cm)**
- **Use the mechanistic, site-specific bioaccumulation model that it directed the CPG to develop for the 17-mile RI/FS to calculate bioaccumulation estimates.**

These steps are essential to make informed remedial action decisions for the site.

6. Region 2's Focused Capping Alternative (Alternative 4) Appears Designed to Under-Predict the Benefits of a Targeted Remedy

The technical deficiencies outlined above have not only resulted in a gross misrepresentation of the distribution of COCs and the risks posed by these COCs, but they have prevented a balanced comparison of remedial alternatives as required by the NCP. In that regard, Region 2's Focused Capping Alternative appears designed to under-predict the benefits of a targeted remedy.

Region 2's Focused Capping Alternative is the only active remediation alternative considered in the 2014 FFS that is less than bank-to-bank in scope (i.e., it is a targeted remediation approach). However, as described in Appendix B, Section IV-E, Region 2's design of the Focused Capping alternative is guaranteed to fail because it ignores the risk reduction that can be achieved with targeted remediation. In particular, the Focused Capping Alternative does not address hot spots of risk-driving contaminants throughout the entire river, and therefore leaves in place many areas with elevated 2,3,7,8-TCDD concentrations in surface sediment. In fact, Region 2 designed its Focused Capping Alternative based on one set of criteria (minimizing contaminant flux to the river), which did not include all of the hot spots in the FFS Study Area or above RM 8. However, Region 2 evaluated its protectiveness based on an entirely different set of criteria (surface 2,3,7,8-TCDD concentration reduction), which evaluated all hot spots, including the hot spots that Region 2 did not include in the design of the Focused Capping Alternative. By not addressing all hot spots throughout the entire LPRSA, recontamination resulting from sediments above RM 8 (where some of the highest TCDD concentrations in surface sediment are found) Region 2 biased the evaluation of remedy alternatives and effectively ensured its targeted approach could not effectively address risk.

Region 2's Focused Capping Alternative, included in the 2014 FFS only at the insistence of CSTAG (see Section IV.C.1.), can in no way be considered an equivalent to the targeted removal component of the Sustainable Remedy proposed by the CPG, which addresses the entire LPRSA (see Section VI). Region 2 brushes aside adaptive management, instead proposing a plan to remove all sediments regardless of composition in a two foot deep swath. The CPG has shared its approach to identifying hot spots throughout the LPRSA and evaluating the effectiveness of a realistic targeted remedy with Region 2, but the Region has disregarded the information.

The principal objections to Region 2's Focused Capping Alternative are:

1. **Region 2's Focused Capping Alternative did not consider the whole river.** A successful targeted removal scenario must address target areas throughout the entire LPRSA. As illustrated by the RM 10.9 data, there are locations above RM 8 where there are elevated concentrations of COCs in surface sediment. Ignoring these areas, as Region 2 did in its Focused Capping Alternative, significantly reduces the effectiveness of the targeted remedy and makes no sense. Region 2 is well aware of the areas above RM 8 where elevated concentrations of risk-driving COCs are present in surface sediment, yet it knowingly designed an alternative that disregarded these locations, thereby severely understating the effectiveness of the Focused Capping Alternative. A proper targeted remedy would first address the areas upstream causing recontamination before addressing areas within the FFS Study Area. See Appendix B, Section IV.E.
2. **Region 2's Focused Capping Alternative was designed with one set of criteria and assessed with another.** Region 2's Focused Capping Alternative was designed to target areas that "release the most contaminants into the water column." However, Region 2 assessed the effectiveness of a remedy by the reduction in COC concentrations in the surface sediment. The disconnect between design and evaluation is a major contributor to the ineffectiveness of Region 2's Focused Capping Alternative. See Appendix B, Section IV.E.

Region 2 has designed its targeted remedy to leave areas with high 2,3,7,8-TCDD concentrations in the top 15 cm of sediment unaddressed, while targeting large areas with low concentrations. The Focused Capping Alternative then evaluates the

effectiveness of the remedy based on the reduction in 2,3,7,8-TCDD concentrations. Only half of the cells in Region 2's Focused Capping Alternative have 2,3,7,8-TCDD concentrations greater than 500 ppt, and almost half of the cells have concentrations less than 200 ppt (see Figure V-16 in Appendix B). Thus, when Region 2's risk assessment evaluated the alternative using the 0 to 15 cm mean 2,3,7,8-TCDD concentrations, it found it not to be protective; a flawed conclusion based on the Region's design of the Focused Capping Alternative. See Appendix B, Section IV.E.

- 3. Region 2 used modeled initial conditions, not measured concentrations, and this misrepresents actual surface contaminant concentrations.** Region 2's initial conditions used for projections were based on *model results* not *empirical data* (although the empirical data were available to Region 2). See Section IV.B.3., Appendix B, Section IV.E.. Model results differ significantly from the actual, measured values. For the Focused Capping Alternative, initial conditions have a major impact on the selection of the areas to remediate and the potential recovery achieved. See Appendix B, Section IV.E.

Region 2 also did so much spatial averaging in defining the model's sediment initial conditions that localized trends were diluted and the effectiveness of the Focused Capping Alternative was further minimized. The riverbed was improperly divided into large geomorphic regions (rather than smaller regions that would more accurately depict actual and future river conditions). All sediment contaminant data collected within each geomorphic region were averaged to generate a representative concentration for that region. This approach reduced the variability of the concentration dataset, diminished the impact of localized high concentrations, and reduced the projected effectiveness of even Region 2's Focused Capping Alternative. There is simply no rationale for this approach, as the Region had directed the CPG to conduct numerous sampling rounds under the RI/FS, including Supplemental Sampling Programs 1 and 2, which were effectively ignored by Region 2 in the 2014 FFS.

By ignoring the upper portion of the LPRSA and knowingly leaving in place sediment with high concentrations of COCs, Region 2 designed a targeted remedy that was guaranteed not to provide a level of protectiveness comparable to Region 2's Preferred Alternative. As further discussed in Section VI, a properly designed targeted remedy that overcomes these deficiencies will provide acceptable risk reduction.

B. The Proposed Plan Should Set PRGs Consistent with Background Conditions

1. Overview

As discussed in Section V.B., Region 2 has ignored the effects of background on remediation, which is a clear error in judgment and therefore arbitrary and capricious. Region 2's analysis of the potential for recontamination and setting of PRGs is wrong, inconsistent with agency guidance and policy, and will not withstand an unbiased technical or legal review.

EPA guidance acknowledges the important role that background plays in the CERCLA remedial process. The term background refers to substances or locations that are not influenced by the releases from a site. Background is important in establishing PRGs, as it is EPA policy that the CERCLA program normally does not set cleanup levels below background. This policy is based upon considerations such as technical practicability, the potential for recontamination, and cost-

effectiveness. Technical practicability issues exist in attempting to cleanup a site to levels below background, but beyond the issue of feasibility is the certainty that any cleanup will be recontaminated to background levels. Therefore, such cleanup action cannot be cost-effective as the incremental cost associated with cleaning up to levels below background is completely wasted. Moreover, any PRG for the FFS Study Area set below background levels is unattainable.

The Sediment Guidance recognizes the importance of establishing background data for a site and cites EPA's 2002 policy, Role of Background in the CERCLA Cleanup Program (USEPA 2002c), which reflects that "the CERCLA program normally does not set cleanup levels below anthropogenic background concentrations" for reasons that include "cost-effectiveness, technical practicability, and the potential for recontamination of remediated areas" (emphasis added).²¹

Consistent with the guidance, the 2007 Draft FFS recognized the impact of background conditions on remediation efforts and developed PRGs equivalent to background concentrations above Dundee Dam (see table below). However, in the 2014 FFS, Region 2 inexplicably changed its approach to developing PRGs and addressing background conditions. Specifically, in this instance, Region 2 failed to consider sources above Dundee Dam and other upstream sources that should be considered background. The result is PRGs that are impossible to achieve.

2. The Proposed Plan and 2014 FFS Approach to Background is Deficient and Defies EPA Policy

Region 2's Proposed Plan and 2014 FFS are inconsistent with EPA guidance and policy with respect to background as follows:

- Region 2's use of background for the 2014 FFS is both inconsistent with EPA's 2002 background policy and different than its background developed for the 2007 Draft FFS which was consistent with EPA's policy. No evidence was provided to justify such a change.
- Region 2 asserts that one-third of the sediments in the lower eight miles come from above Dundee Dam. This contaminated sediment represents a source of *"constituents or locations that are not influenced by the releases from a site but represent an influence on the site."* (USEPA 2002c).
- Region 2 has failed to provide an evaluation of background concentrations and their impact on risk characterization in the 2014 FFS, which is not in compliance with EPA guidance (USEPA 2002c).
- Region 2 is arbitrarily selective in its use of available sediment data to estimate background.

²¹ See also ITRC (Interstate Technology & Regulatory Council). 2014. Contaminated Sediments Remediation: Remedy Selection for Contaminated Sediments (CS-2). Washington, D.C.: Interstate Technology & Regulatory Council, Contaminated Sediments Team. http://www.itrcweb.org/contseds_remedy-selection ("When developing cleanup strategies, background concentrations can be used to develop achievable cleanup levels that consider anthropogenic sources, recontamination potential, and pre-remedial contaminant concentrations. In most cases, background conditions are relevant to all remedial technologies. Recontamination potential from ongoing, nonpoint sources is a concern to all sediment cleanup sites regardless of the action taken").

- Region 2 fails to acknowledge the significant volume of background fish tissue data collected above Dundee Dam under its direction for the RI/FS, electing instead to use its regression model to estimate tissue concentrations from its limited sediment dataset.
- Region 2 has disregarded EPA 2002 guidance and established sediment PRGs for the contaminants that are well below background. As an example, the PCB goal in the 2014 FFS is 44 ppb, ten times lower than the 2014 FFS's reported background concentration from above Dundee Dam (460 ppb) and 13 times lower than the average concentration reported from Newark Bay (580 ppb).
- Region 2's tissue PRGs are inappropriate and are not attainable for PCBs and mercury given the fact that Region 2 has chosen to ignore the influence of background. Concentrations of PCBs and methylmercury in fish collected from the background area above Dundee Dam exceed even the highest (least stringent) PRGs developed by Region 2.
- Because the PRGs set by Region 2 will not be achievable because of the background conditions, the Preferred Alternative is doomed to fail.
- Regions 2's Proposed Plan and 2014 FFS fail to acknowledge that an ARAR waiver for New Jersey's promulgated surface water quality standards will be required for any remedial action in the LPRSA due to regional/urban background sources of contamination.

Moreover, the NRRB questioned the Region's use of background as it relates to PRGs. In its comments, which were responded to by Region 2 on April 11, 2014, the NRRB states that:

Based on the information presented to the Boards, the Region has established background concentrations of the risk-driving COCs. However, the package presented to the Boards does not clearly explain how background concentrations are to be used; it also is unclear regarding the Region's site-specific RAOs (e.g., it indicates both risk based PRGs and background-based "interim" PRGs were developed). Additionally, the risk based PRGs presented in the package appear to be based on either human health or ecological risk-based concentrations, and some of these values may be below background concentrations.

Region 2's April 11 response largely recites the guidance and erroneously claims its modeling supports its position; however, the Region fails to provide a sufficient and rational justification for ignoring EPA's 2002 policy on background and its influence on developing cleanup goals. Further, Region 2's FFS RI and modeling reports contradict the Region's current position; rather they support the fact that sediments coming from upstream of Dundee Dam have a significant contribution on the bed composition in the FFS Study Area.

While Region 2 concedes that conditions above Dundee Dam meet EPA's definition of "background", it no longer equates PRGs with background concentrations. In fact, in contradiction of EPA guidance and policy, Region 2 has developed PRGs for the FFS study area that are significantly less than background.

3. Region 2 Has Arbitrarily and Capriciously Changed its Decision from the 2007 Draft FFS

Region 2 also fails to adequately explain why it no longer considers conditions above Dundee Dam to be background for COCs and COPECS (other than 2,3,7,8-TCDD). In the 2007 Draft FFS, the Region recognized the existence of background conditions above the Dam and the significant impact of such conditions on the LPRSA and relied upon these conditions in selecting the 2007 Draft FFS PRGs. Region 2 concluded in its 2007 Draft FFS that:

“The chemical mass contributed with the solids load from the Upper Passaic River represents a significant source of all of the COPCs and COPECS, except 2,3,7,8 TCDD, and can be considered the background to the Lower Passaic River. Because of this contaminant load, any remedial effort within the Lower Passaic River can only be expected to meet the risk-based PRGs once the load from above the dam also meets the PRGs... The load from the Upper Passaic River can be considered a baseline that represents the maximum concentration that would be expected in the post-remediation Lower Passaic River (dilution from other, less-contaminated sediment sources would cause the concentrations in the Lower Passaic River to be less than what is contributed over the dam).” (Pages 2-16 and 2-17) (emphasis added).

However, the 2014 FFS that supports the Proposed Plan includes significant changes and the major omission of 2,3,7,8 TCDD as the outlier among COPCs and COPECS:

“The chemical mass contributed by the solids load from the Upper Passaic River represents a source for all of the COPCs and COPECS and can be considered to be representative of background conditions for the Lower Passaic River.” (Page 2-11)

After acknowledging that background conditions are significant and pose, in some cases, non-cancer and ecological risks, the Region asserts, with no supporting evidence, that background concentrations will be attenuated by mixing with the cleaner sediments resulting from the 8-mile remediation:

Post-remediation, the suspended sediment from the Upper Passaic River will mix with other sources into the FFS study area (Newark Bay, Saddle River, Third River, and Second River), with the cleaner solids in the water column resulting from a remediated FFS study area, and with any clean material placed on the riverbed as part of remediation. The result of this mixing in the water column along with settling, remobilization and redeposition, will be surface sediment concentrations of contaminants that are lower than the background concentrations above the Dam. (Page 2-14).

However, these alleged processes are undocumented, unsupported, and contradictory to Region 2's recognition in the 2007 Draft FFS that the load from the UPR can be considered a baseline that represents the maximum concentration that would be expected in the post-remediation Lower Passaic River, notwithstanding that dilution from other, less-contaminated sediment sources would cause the concentrations in the Lower Passaic River to be less than what is contributed over the dam.

Appendix B Figure III-11 (reproduced from FFS Report, Appendix B-II, Figure 6-8) shows that, in the LPRSA from RM 10 to RM 6, solids originating from above Dundee Dam account for approximately 60% of silt-sized solids accumulation. From RM 6 to RM 1, this fraction drops to approximately 40%. If the internal resuspension source of solids is discounted, which would be

an objective of the post-dredging cap (as discussed in FFS Report, Appendix B-I), the sediments upstream of Dundee Dam would account for approximately 60% of silt-sized solids accumulation (See Appendix B Section III.D) in the FFS Study Area.

The Region's proposed PRGs for the contaminants are well below background; the total PCB PRG is 44 parts per billion, which is ten times lower than the reported background concentration of 460 ppb. Region 2 asserts that, although one-third of the sediment particles in the Study Area water column come from above Dundee Dam (page 18) (and therefore are at background concentration levels), these particles would not result in significant recontamination to the FFS Study Area. Following the implementation of a cap, the upstream and downstream boundaries would be the only sources of depositing sediment. Therefore, over time the surface concentrations within the FFS Study Area would approach the contaminant concentrations associated with these boundary sources, and as a result, the proposed PRGs would not be attained.

There is no rational basis for the Region's inexplicable change in its approach to developing PRGs. By ignoring the empirical data and its own modeling, as well as failing to follow applicable EPA policy and guidance, the Proposed Plan's approach to developing PRGs is arbitrary and capricious.

4. Impacts of Background on Media and PRGs

Sediments. Sediments coming from upstream of Dundee Dam have a significant contribution on the bed composition in the lower reaches of the river. The 2014 FFS shows that, in the LPRSA from RM 10 to RM 6, solids originating from above Dundee Dam account for approximately 60% of silt-sized solids accumulation (Appendix B-II, Figure 6-8). These sediments come with attached contaminants and have been described in the 2014 FFS as representing background conditions. The external solids sources are important factors in developing conclusions about contaminant trends and the extent to which remediation can achieve reductions in contaminant concentrations.

Consideration of background is critical when establishing PRGs. When comparing the 2007 PRGs to the 2014 PRGs, the inconsistency in Region 2's approach is stark (see table below):

	2007 FFS		2014 FFS		2012 UPR	
	Background	PRG	Background	PRG	Background	
Inorganics						
Copper	ng/g	80,000	80,000	63,000	-	74,000
Lead	ng/g	140,000	140,000	130,000	-	190,000
Mercury	ng/g	720	720	720	74	1,180
PAHs						
LMW PAHs	ng/g	8,900	8,900	7,900	-	53,000
HMW PAHs	ng/g	65,000	65,000	53,000	-	91,000
PCB Aroclors						
Total PCB	ng/g	660	660	460	44	307
Pesticides						
Dieldrin	ng/g	4.3	4.3	5	-	1.7
Total DDX	ng/g	91	91	30	0.3	14
Chlordane	ng/g	92	92	23	-	19
PCDD/Fs						
2,3,7,8-TCDD	ng/g	0.002	0.002	0.002	0.0071	0.0055

The 2007 sediment PRGs were set at the background concentration, consistent with EPA guidance; however, with the exception of 2,3,7,8-TCDD,²² the 2014 sediment PRGs are set at least 10 times lower than background. Additionally, the 2014 FFS PRGs are at least 10 times below the 2007 Draft FFS PRGs for mercury and total PCBs. Most notably, the 2014 FFS sediment PRG for total DDX is 300 times *lower* than the 2007 Draft FFS sediment PRG for total DDX.

With an influx of sediments to the FFS Study Area at background conditions, recontamination of the FFS Study Area sediments to background levels is certain to occur. As a result, the Proposed Plan is not likely to achieve long-term benefit for the COCs in the FFS Study Area, with the possible exception of TCDD.

The Proposed Plan fails to recognize that deposition of contaminated sediment from background sources will recontaminate a “clean” cap in the post-remediation LPRSA.

Surface Water. In addition to impacts to sediments, there will be continuing background impacts to surface water. Even after a remedy for the entire 17-mile LPRSA is implemented, the waters of the LPRSA will not attain New Jersey’s surface water standards due to urban background levels of contamination. The Proposed Plan and FFS acknowledge that implementation of Region 2’s Preferred Alternative will not attain surface water quality standards, but do not identify the need to obtain an ARAR waiver for implementation of a remedial action for the FFS Study Area, as required under CERCLA Section 121(d) and the NCP (40 CFR § 300.430(f)(1)(ii)(C)).

The 2014 FFS does not acknowledge the water column data that were collected during the 17-mile RI/FS in the LPRSA and above Dundee Dam under Region 2 oversight. These data indicate that background water column concentrations observed above Dundee Dam exceed

²² The value for 2,3,7,8-TCDD is likely higher because of the lack of a significant source of 2,3,7,8-TCDD above Dundee Dam.

New Jersey Surface Water Quality Standards (N.J.A.C. 7:9B) for several of the risk-driving COCs (2,3,7,8-TCDD, 4,4-DDE, 4,4-DDT, and total PCBs).

Furthermore, flows over Dundee Dam comprise more than 80% of the freshwater inflow into the LPRSA; these waters mix with tributary inflows and tidal flows exchanged with Newark Bay. Region 2 must acknowledge that background water column concentrations have a significant influence on water quality in the LPRSA, and that, even after a remedy for the entire 17-mile LPRSA is implemented, the waters of the LPRSA will not attain New Jersey's surface water standards because of urban background levels of contamination. Therefore, it is misleading for Region 2 to claim that the 8-mile bank-to-bank removal will not meet water quality standards but that with additional remedial actions above RM 8, these standards could be met.

An ARAR waiver will be required for any remedial action. There is recent precedent at several EPA sites for utilizing technical impracticability ARAR waivers due to ongoing urban/industrial influences (see Appendix A, Section B.2). In the Lower Passaic River, due to the continued urban/industrial influence, including upstream, downstream, and lateral loads of COCs, implementation of the alternatives in the Proposed Plan will not result in meeting the ARARs for water quality. Thus, the limitations of what can be achieved in the LPRSA because of its location should be recognized and, appropriately, a technical impracticability waiver should be proposed and approved for the ARARs for water quality.

The Proposed Plan and FFS acknowledge that implementation of Region 2's Preferred Alternative will not attain surface water quality standards because of urban background levels of contamination. As a result, an ARAR waiver is necessary. It also presumes with no support that surface water will be improved by remedial actions in the remaining portion of LPRSA.

Risk Characterization. While the 2014 FFS discusses a subset of background data from above Dundee Dam (but uses modeled background tissue data rather than the empirical tissue data collected from above Dundee Dam as part of the RI/FS), the 2014 FFS risk assessments fail to appropriately consider background data as part of risk characterization. Furthermore, the 2014 FFS fails to acknowledge existing estuarine tissue and sediment background data from regional areas that were identified by EPA (2013) for the 17-mile LPRSA RI risk assessments. As discussed in Section IV.E., Region 2's use of modeled background tissue concentrations when empirical data are available is inappropriate, introduces unnecessary uncertainty into the 2014 FFS HHRA and underestimates the contribution of background to site risk.

Human Health PRGs. As discussed in more detail in Section V.A.2., Region 2 has presented tissue PRGs that are based on the same overly conservative RME exposure and toxicity assumptions used in the 2014 FFS HHRA, resulting in inappropriately low tissue PRGs. The tissue PRGs are not attainable, especially for PCBs and methylmercury. Furthermore, Region 2 significantly underestimated the contribution of background to the lower eight miles. Levels of PCBs and methylmercury in fish collected from the background area above Dundee Dam exceed even the highest (least stringent) PRGs developed by Region 2.

Ecological PRGs. As discussed in more detail in Appendix D.2., the ecological PRGs in the 2014 FFS are based on inappropriate and technically indefensible toxicity thresholds and overly simplistic models, which result in indefensible and meaningless values.

5. Region 2's Modeling Projections Showing Post-Remedy Contaminant Concentrations Below Background are Flawed

Errors in Region 2's Contaminant Fate and Transport (CFT) model result in projected contaminant concentrations that are below background. For example, the CFT model predicts that the Preferred Alternative attains essentially the same relative concentration reductions for all chemicals (e.g., 2,3,7,8-TCDD, total PCBs, and mercury) regardless of the extent of contamination upstream and downstream of the FFS Study Area (see Appendix B, Section IV.B.2.). This result defies logic and the model's strange behavior causes it to predict unrealistically low post-dredge and cap residual concentrations. One reason for this error is that Region 2's CFT model does not include a "fluff layer"—a thin (a few millimeters) layer of solids between the parent sediment bed and water column (see id.). When Region 2 corrects this deficiency, its CFT model will more closely match reality and projection runs will show that contaminant concentrations below background cannot be achieved.

Basing a remedy on PRGs that cannot be achieved because of a failure to properly consider background conditions means that any remedy selected will not be successful.

C. Region 2's Development and Assessment of Alternatives is Deficient and Does Not Meet the Requirements of the NCP

The 2014 FFS develops and screens remedial alternatives for detailed evaluation. Improperly, however, Region 2's approach ignores a multitude of critical technical uncertainties while discounting the benefits of a phased or targeted approach. The scale and cost of the FFS Study Area cleanup mandates a far more rigorous analysis of the NCP criteria than is presented in the 2014 FFS.

The NCP requires that: (1) an appropriate set of alternatives be developed for evaluation; and (2) an appropriate evaluation of the alternatives be made against the nine remedy selection criteria (see 40 CFR 300.430; see also Section IV.B.). This section provides additional technical detail regarding how Region 2 has failed to comply with these requirements.

1. Region 2's Development of Remedial Alternatives Was Deficient, resulting in a defective and biased set of remedial alternatives that are retained for detailed evaluation

The first step in a feasibility study is to assess remedial technologies and develop retained technologies into a series of remedial alternatives that may be used at a site. However, Region 2's FFS both fails to include at least one obvious alternative and includes alternatives that are not consistent with CERCLA.

Four potential remedial alternatives were developed for evaluation. Except for a brief description of CERCLA's requirements for what must be considered, no explanation is provided as to how the four alternatives were developed:

- Alternative 1: No Action
- Alternative 2: Deep Dredging with Backfill (removal of all contaminated sediment would incidentally re-establish the federal navigation channel)
- Alternative 3: Capping with Dredging for Flooding and Navigation (Preferred Alternative)

- Alternative 4: Focused Capping with Dredging for Flooding (Focused Capping Alternative)

Several issues revolve around the idea of dredging for navigation. First, restoration of the federal navigation channel (FNC) is not within the scope of EPA's authority under CERCLA. See Section V.D.1. Second, the 2014 FFS fails to present critical information about the navigational dredging part of the Preferred Alternative including that channel deepening below RM 2.2:

- Accounts for **48% of the estimated dredged sediment volume** for the entire 8.3 miles of the Preferred Alternative
- **Constitutes approximately \$850 million of the estimated \$1.731 billion** cost of the Preferred Alternative
- Will **increase impacts on the community and environment** during construction
- **Is beyond CERCLA authority**
- Will **result in no additional risk reduction as navigational dredging does not contribute to the protection of human health and the environment**

See Appendix A.

Third, Region 2 has failed to provide economic justification for the additional dredging to support navigational needs. USACE has not performed the required cost-benefit analysis of channel restoration (see Attachment C). A survey conducted by USACE in 2010 revealed limited interest in commercial navigation on the Lower Passaic River and that survey has not been updated in 5 years. See Section V.D.1. Given the uncertainty in future use and the major increases in remedy scope, complexity, and cost associated with the channel deepening component of Region 2's Preferred Alternative, a bank-to-bank alternative *without* channel deepening should have been developed and evaluated in the 2014 FFS; however, it was not.

Region 2's failure to evaluate a bank-to-bank alternative without navigational dredging from RM 0 to RM 2.2 is inconsistent with the NCP because its absence makes it impossible for a decision-maker to consider the cost-benefit tradeoffs associated with navigational channel restoration and, therefore, to have a sufficient basis to justify the selection of an appropriate remedy.

Region 2's development and screening of remedial alternatives in the 2014 FFS is further technically flawed and inconsistent with the NCP for the following additional reasons discussed in other sections of these comments:

- Region 2 failed to consider a phased or adaptive management approach (See Section V.C.2.).
- Region 2's design of its Focused Capping Alternative was flawed and guaranteed to fail (See Section IV.B.4.).

These technical deficiencies result in a defective and biased set of remedial alternatives that are retained for detailed evaluation.

2. The Evaluation of Remedial Alternatives in the Proposed Plan is Inconsistent with the NCP

A CERCLA feasibility study requires consideration of the nine evaluation criteria outlined in the NCP. The NCP also requires a detailed and thorough analysis commensurate with the scope and complexity of the site. See Section IV.B.; Appendix A, Section B. However, for several of the NCP evaluation criteria, the assessment of remedial alternatives in the 2014 FFS is inadequate and is biased to support Region 2's Preferred Alternative rather than a reasoned evaluation of remedial options. As discussed in Section V.A., the technical deficiencies of the tools used by Region 2, including the CSM, HHRA, ERA, numeric modeling and bioaccumulation calculations, have resulted in a gross misrepresentation of the distribution of COCs and the risks posed by these COCs. These same deficiencies prevent a balanced comparison of remedial alternatives as required by the NCP. Information and conclusions are presented by Region 2 that lack foundation and are erroneous, misleading, and incomplete. Specific deficiencies in the 2014 FFS evaluation of NCP criteria are highlighted below.

The Preferred Alternative is not likely to meet the Region's protectiveness goals.

According to Region 2, it is proposing the "largest cleanup in EPA history" (April 11, 2014 Press Release) without acknowledging the uncertainties and inabilities of the 2014 FFS alternatives to achieve EPA's target risk levels. The Preferred Alternative would rely on institutional controls in the form of fish consumption advisories and enhanced public outreach to achieve protectiveness. These measures alone will have no benefit for ecological protectiveness and no greater impact on human health than if the no action remedial alternative or target remedy were undertaken.

Furthermore, Region 2's conclusions in the Proposed Plan regarding protectiveness of the Preferred Alternative are unreliable and not supported by the 2014 FFS:

- Region 2 did not consider the relative benefits of remediation outside the FFS Study Area, including the upper portion of the 17-mile LPRSA, Newark Bay, or above Dundee Dam (see Appendix B, Section III);
- Region 2 underestimated recontamination from the upper portion of the 17-mile LPRSA, Newark Bay and above Dundee Dam (see Appendix C, Section C);
- Region 2 did not properly consider contaminant load to Newark Bay as a protectiveness metric (see Appendix B, Section III.C.);
- Region 2 did not properly identify and evaluate a targeted remediation alternative (see Appendix B, Section IV.E.);
- Region 2 did not account for influence of COCs in the water column on fish contaminant levels (see Appendix B, Section III);
- Region 2 assumed biota exposure to the average concentration in the top 6 inches (15 cm) rather than in more near-surface sediments (~1-2 cm), which site-specific data show is the correct BAZ. This yields a significant bias because the Region's top 6-inch average is driven by concentrations it computes in the deeper 4- to 6-inch interval to which benthic invertebrates and fish are not exposed in the LPRSA (see Appendix B, Section V.B.);
- Region 2 provides an ERA which is screening-level in nature, fails to take into account available site-specific data, and relies frequently on assumptions that have no ecological

justification or relevance to the LPRSA (see Appendix D.1., Section I.A. and Table 1); and

- Region 2 has used exposure parameters for human health that have very little basis and are inappropriate for receptors in the LPRSA and result in overestimated risks that do not reflect real-world exposure and provide no benefit in managing human health risks. As a consequence of this poorly executed and unrealistic assessment, the Region has grossly overestimated risk and generated unrealistic PRGs. Those PRGs will not be achieved, resulting in remedy failure (see Appendix C, Section A and D).

Region 2's evaluation of *long-term effectiveness* fails to present a meaningful and technically supported recontamination evaluation. As discussed in Section V.B., the Region has recognized background conditions exist above the Region's PRGs, yet the Region has failed to take background conditions into consideration. Thus, any sediments remediated in the FFS Study Area will be subject to recontamination by background inputs. Therefore, estimates of long-term effectiveness and risk reduction for Region 2's Preferred Alternative are almost certainly overstated.

Region 2's evaluation of *short-term effectiveness* is deficient because it does not adequately evaluate impacts to the community and the environment.

- *Region 2's analysis of traffic and rail disruptions associated with the proposed remedy is incomplete, flawed and misleading.*

The 2014 FFS briefly acknowledges increased road traffic primarily due to construction activities and operations at the upland processing facility. However, traffic or rail disruptions due to bridge openings to accommodate barge movement are not mentioned. Region 2 not only fails to recognize the number of bridge openings necessary to transport the sediment, it obfuscates the impact with the statement: "All of the active alternatives would be equally affected by the need to open bridges." (Proposed Plan, p. 37). This statement obscures the issue that larger, bank-to-bank remedial alternatives would require significantly more bridge openings than more limited, targeted removals. The number of bridge openings is driven by the scale of the remedy

The CPG estimates 20,000 to 25,000 individual bridge openings will be required to implement the Preferred Alternative (typically seven or eight openings per bridge per day). An evaluation of existing traffic patterns indicates that the bridge openings required to implement the Proposed Plan will cause major traffic backups and disruptions on local streets (see Attachment E). The congestion following each bridge opening could take 30 minutes to 2 hours to dissipate, resulting in cumulative driver and passenger delays in the hundreds of hours at each bridge. Furthermore, the bridge openings will have to occur when the tides are high enough for barges to pass safely through shallow areas, guaranteeing that bridge openings will disrupt rush hour, events at the Prudential Center, Red Bulls stadium and NJPAC, and rail commuters (see Appendix A, Section B.6.b.). Some bridge owners are not required to open their bridges during rush hours (see Appendix A, Sections B.5.b and B.6.b.), and others may simply refuse to do so. There is no recognition of these implementability issues in the 2014 FFS or the Proposed Plan.

The evaluation of implementability of the remedial alternatives is technically deficient, poorly supported, and does not provide an adequate basis for an NCP-compliant evaluation of the alternatives.

Due to bridge openings, fish windows, rail access, estimated dredging production rates never achieved in an environmental dredging project, and siting of either a CAD or an upland processing facility, the alternatives in the Proposed Plan are not implementable in the time estimated, or perhaps not at all!

- *Region 2's claim that its Preferred Alternative can be implemented in 5 years is misleading, unsupportable and inconsistent with experience at other sites.*

Region 2's construction duration estimate is based on a dredging production rate of 1,000,000 cy/year. This rate is inconsistent with production rates at other large sediment sites (see Appendix A, Section B.6.a) and with the 2005 Pilot Study; see Section IV.B.4. On the Hudson River, for example, where considerably fewer urban constraints were encountered, an annual production of approximately 600,000 cy/year has been achieved. In the Proposed Plan for the Lower Duwamish River in Seattle (where urban constraints may be similar to those on the Lower Passaic River), dredging production estimates are approximately 100,000 cy/year for two of the larger alternatives (EPA 2013).

Furthermore, Region 2's construction duration estimate is based on the assumption that dredging will occur for 40 weeks each year. Region 2 acknowledges that no dredging will be possible for 12 weeks because of maintenance, bad weather, and a brief period to allow for fish migration (known as a fish window). Currently, the NOAA National Marine Fisheries Service fish window precludes dredging on the LPRSA for 17 weeks (March 1 to June 30) each year, in addition to an estimated 12 week shutdown period that would be necessitated by weather and/or operational delays. There is no justification provided in the 2014 FFS to support Region 2's assumption that the fish window can be minimized for multiple, successive years. Inclusion of the mandatory fish window will reduce the annual construction season and nearly double the total project duration all by itself (see Appendix A, Section B.6.a).

Finally, the construction duration estimate appears to take no account of the likely need to apply for and obtain permits or permit equivalents. This need and resulting schedule delays became apparent during the RM 10.9 Removal Action. See Attachment H.

- *Region 2's implementability analysis in the 2014 FFS does not address the realities on the river that will significantly increase the technical and administrative difficulty, construction duration, and cost of Region 2's preferred alternative.*

The urban setting of the LPRSA introduces significant challenges and constraints to the implementability of dredging and transport including multiple bridges that must open to permit barge movement, navigation constraints that limit sizing and timing of barge movement (including bridges, obstructions, shallow water, and fast currents), numerous utility crossings that create no dredge zones, and failing shoreline structures that limit the extent of safe removal activities. These constraints were encountered during the RM 10.9 Removal Action and approximately doubled the planned construction duration of the removal action. Region 2 provided oversight of both the design and conduct of the

RM 10.9 Removal Action, yet has ignored the lessons learned regarding such critical implementation issues. See Attachment H.

Bridge Openings – The RM 10.9 Removal Action required around 1,000 individual bridge openings. Based upon the lessons learned, the CPG estimates that over the course of the bank-to-bank dredge-and-cap remedy, there will be 20,000 to 25,000 individual bridge openings to transit barges up and down the river (see Attachment H). Mechanically, the bridges on the LPRSA are aged; the majority are deemed structurally deficient (National Bridge Inventory Database, (<http://nationalbridges.com/>)). Region 2's statement that the necessary coordination, including assisting bridge authorities with engineering evaluations and maintenance of the bridges, would occur during the remedial design phase is improper as the functionality of the bridges should be assessed prior to selecting such a massive dredging project, and such work should be undertaken outside of CERCLA because the maintenance of bridges so as not to impede navigation is a legal responsibility of the bridge operators alone and not a CERCLA response cost (see Appendix A, Section B.6.b).

Navigational Constraints – Tides, currents, channel width and depth, limited bridge clearances, obstructions, shoals, and outcrops restrict navigation and impact equipment sizing and timing of barge movement, all of which will result in a considerably longer duration and technical implementation challenges than estimated by Region 2 (see Appendix A, Section B.6.b). The 2014 FFS does not address conditions encountered in the RM 10.9 Removal Action including:

- Barges can only be moved at high tide because of shallow depth.
- Narrow bridge openings restrict barge size; smaller equipment is required above RM 4.6 because of the Jackson Street Bridge, which has a horizontal opening of 72 feet.
- High currents between bridge abutments necessitate a sufficiently powered tugboat (restricting the opportunity to use smaller vessels) and likely eliminate the ability to transport multiple barges with a single tug.

Utilities – During the LPRSA RI, the CPG identified more than 30 utility crossings in the lower 8.3 miles of the LPRSA. Region 2 does not present an evaluation of utilities or adequately consider their impact on remedy implementation in the 2014 FFS, or the impact which utility easements and other implementability issues could have on Region 2's proposed PRG attainment. Accurate location of utilities will be a challenge, and utility owners will require an offset, or no dredge zone, on either side of the utility crossing as experience has shown during the RM 10.9 Removal Action. (See Appendix A, Section B.6.b.; Attachment H.) Based on extensive inquiry during the RI, the utility corridors cover an estimated 133 acres, approximately 20% of the lower 8.3 miles of the LPRSA. Region 2 assumes incorrectly that dredging can occur above all utilities. However, it is unlikely that utility owners will permit dredging above their utility lines and even more unlikely that dredging contractors will be willing to accept the potential liability of doing so (see Appendix A, Section B.6.b). Therefore, there will have to be no-dredge zones in the FFS Study Area which Region 2 has not accounted for in its Proposed Plan

- *Region 2's 2014 FFS does not give any consideration to limitations on rail transport of processed sediment for off-site disposal.*

The ability to move the significant sediment volumes generated by Region 2's Preferred Alternative out of the region in a timely fashion must be considered in the development of production rates. In the 2014 FFS and Proposed Plan, the discussion of rail transport is limited to acknowledging that rail lines will be needed to connect the future sediment processing site(s) to the disposal facilities. They do not, as they must, evaluate the availability of rail transport for the sites that might process sediment. It is clear that many of the potential sites are not actually options, and even if they might be, there has been no determination that rail transport is available (see Attachment F). Additionally, Region 2 fails to consider the availability of rail cars and the capacity of regional rail (see Appendix A, Section B.6.c and Attachment F). On the Hudson River, the availability of rail cars was a rate-limiting factor of total production rates (as indicated above, the 2014 FFS assumes a production rate almost 50% higher than the production rates achieved on the Hudson River).

- *Region 2 does not adequately evaluate the design requirements and logistics of a processing facility and does not sufficiently evaluate the ability to site a processing facility capable of handling the large volume of sediments generated by the Preferred Alternative.*

Region 2's analysis of potential processing sites is deficient as it underestimates the minimum acreage needed for a processing site, it does not consider the proximity of the potential sites to the LPRSA, and it does not confirm the current availability or future development plans of the sites.

- Region 2 assumes a 26-acre site will be sufficient to build the necessary components of the processing facility including storage, sediment processing, water treatment, and rail siding. Region 2 assumes 10.5 acres for roads and load-out areas, with no provisions for rail car staging and train assembly areas. Region 2 states that 4.5 acres will be required for temporary storage of material awaiting processing. Using Region 2's average dredge rate and reasonable stockpile assumptions, storage for 6 months of dewatered dredged material would require approximately 20 acres. The experience at other comparable processing sites (Tierra's Phase I Removal – footprint of 10.4 acres for a processing facility that treated an average of 500 cy of sediment per day; the Hudson River Dredging project – 110-acre processing and staging site to process 650,000 cy of sediment per year) also indicates that Region 2's estimate of required acreage is arbitrary (see Appendix A, Section B.6.d).
- Region 2 lists 12 potential sites for the 2014 FFS processing facility based on a 2007 USACE study to locate a facility to process material from maintenance dredging of the NY/NJ Harbor. That seven year old study was not updated by Region 2. Of these 12 sites, five are located at least 20 miles from the FFS Study Area; two others are located in New York and three others are located in New Jersey on the Raritan River, south of Staten Island. Use of any of these sites involves additional transportation costs of moving the sediments long distances for processing. (The New York sites also have the additional logistical complications of using an out-of-state location.) Of the seven remaining sites within 20 miles of the FFS Study Area, four are outside of the Diamond Alkali Superfund Site (which contains the FFS Study Area) and will therefore be subject to permitting requirements under Section 121(e) of CERCLA. Use of these sites for a processing facility to accept Lower Passaic

River sediments is inconsistent with the CERCLA off-site rule (§121(d)(3)), which regulates the transport of contaminated material (see Appendix A, Section B.6.d).

- Of the three remaining sites located within the Diamond Alkali Superfund Site, two (Bergen Point and Kearney Point) have been sold since the 2007 USACE study and appear to be in varying stages of redevelopment. The remaining site, Port Newark, is currently under expansion by the Port Authority of New York/New Jersey to provide container capacity following completion of the Panama Canal expansion in 2015, and is not likely to be available (see Appendix A, Section B.6.d).
- Finally, Region 2 should thoroughly evaluate impacts to human health and communities from a processing facility in an urban area. Siting of a processing facility in a densely populated urban area is likely to face fierce opposition, but the 2014 FFS and Proposed Plan ignore the impacts of that likely opposition.

There are no sites in Region 2's evaluation that are within the Diamond Alkali Superfund Site and meet the requirements for the processing facility site. The other sites identified by Region 2 as potential locations are all located outside the Diamond Alkali Superfund Site and therefore would require separate federal and/or state permitting. Several locations are also distant, and would put significant demands on local transportation networks and impacts on impacted communities. It is inappropriate for Region 2 to leave such a large and critical component of the remedy to the remedial design phase when significant uncertainty exists around whether such a facility can ever be sited.

- *Region 2's selection of off-site disposal and incineration of dredged materials is not based on technical factors and will lead to significantly greater environmental impacts, construction costs, and project implementation timeframes than construction of a CAD facility in Newark Bay.*

The 2014 FFS and Proposed Plan include three dredged material management scenarios²³ (CAD disposal, off-site disposal, and local decontamination). However, off-site disposal is selected for the Preferred Alternative, despite the resulting \$780,000,000 increase in Region 2's cost estimate for off-site disposal over CAD disposal (see Appendix A, Section B.6.e). Region 2 states that a CAD is administratively infeasible based on concerns expressed by NJDEP and the Federal Trustees. However, its own contractor found it feasible. Furthermore, USACE stated that ". . . CAD cells can be constructed and utilized with only localized short-term impacts and with the least impacts to the surrounding communities" (Proposed Plan p. 36) It is not at all clear that Region 2 cannot force NJDEP to accept a CAD in Newark Bay. The decision is clearly Region 2's to make. Region 2 should carefully and thoroughly review the question of whether NJDEP can be forced to accept a CAD in Newark Bay. Failure to conduct that evaluation would be arbitrary and capricious. The fact is USACE has constructed CADs in the region around the Newark Bay and New York Bay area. USACE has the expertise and the experience.

²³ Region 2 screens out a CDF on the basis that implementability is hindered by siting challenges and permanent impacts on aquatic habitat.

Given the technical feasibility, limited and short-term (depending on the duration of the remedial action) environmental impact, and significant cost reduction of a CAD, Region 2 should explore options to work with other agencies to retain the CAD as a viable disposal option. Region 2 should also carefully and thoroughly consider whether it can select a CAD in Newark Bay over the objection of the State of New Jersey.

The 2014 FFS Fails to Adequately Address “Feasibility.” Region 2 has failed to adequately determine, consistent with the NCP, the feasibility of numerous aspects of their Preferred Alternative. Therefore, the Preferred Alternative identified in the 8-mile Proposed Plan can only be considered as highly conceptual and not properly evaluated. Region 2 has postponed evaluating the feasibility of its Preferred Alternative until the Remedial Design phase and has stated such in public meetings and forums (i.e., Region 2’s May 22, 2014 Public Meeting and Montclair State’s June 2, 2014 FFS Forum). The Region has intentionally failed to adequately consider critical implementation issues that will substantially increase the time, difficulty, cost, and short term effectiveness of completing the cleanup. (See Section IV.B.4.)

The Region has deferred so many critical issues to the remedial design phase that the FFS does not meet the standard for a feasibility study under CERCLA and the NCP as the FFS cannot reliably determine if the proposed alternatives are feasible. See Appendix A, Attachment D

The Preferred Alternative is not Cost-Effective and Uses a Discount Rate that is Unrealistic and Out-of-Date. See Discussion in Section IV.B.4., Attachment C.

The criterion of *community acceptance* cannot be evaluated because the 2014 FFS and Proposed Plan do not satisfy the NCP’s public participation expectations due to the incomplete and misleading information presented to the public. See Discussion in Section IV.B.4.

As a result, the Preferred Alternative is Inconsistent with the NCP and Will Not Achieve the Region’s Risk Goals. The unrealistically low PRGs described in Section V.B. resulted in selection of an unnecessarily extensive bank to bank remedy as the Preferred Alternative. Based on site-specific data and an understanding of the importance of background, Region 2’s Preferred Alternative will achieve much less benefit than portrayed in the 2014 FFS and will not provide a sustainable solution.

Even if one accepts the Region 2 numeric model, detailed evaluation of its results shows that it predicts that Region 2’s Preferred Alternative will achieve much less benefit than Region 2 predicts. The Preferred Alternative:

- Does little to reduce contaminant concentrations in the water column and on recently deposited sediment. It achieves water column 2,3,7,8-TCDD concentrations that differ only slightly from the No Action alternative and are higher during remediation. Therefore, it does not reduce the fish exposure to water column TCDD concentrations.
- Achieves only a 21% reduction of the contaminant flux to Newark Bay.
- Achieves long-term (15-year) average TCDD concentrations in the top few centimeters of sediment (and even the top 10 cm of sediment) that are only modestly lower than those achieved under the No Action alternative (See Appendix B, Section V.B.).

Region 2's Proposed Plan will also not provide a sustainable solution. Region 2's background evaluation *dismisses* the contribution of upriver sources to the FFS Study Area. Plus, the 2014 FFS was conducted without understanding the benefits of upstream versus downstream remediation. Such understanding is crucial because the existing data and even the Region 2 model show that sources upstream of the FFS Study Area are significant. These sources have large impacts on water column contaminant levels (and thus fish contaminant levels) that will prevent the Proposed Plan from achieving its claimed risk reduction and will likely cause significant recontamination of the area covered by the Proposed Plan for some COCs.

Combined with the misrepresentations of the distribution of COCs and of human health and ecological risks in the Region's RI, fundamental defects in the FFS and Proposed Plan make it impossible for Region 2 to select an appropriate preferred remedial alternative for the FFS Study Area that complies with CERCLA and the NCP. In the absence of an adequate FFS evaluation, Region 2 does not have sufficient information or a legitimate basis to put forth a Proposed Plan, select a remedy, and develop a Record of Decision.

VI. TECHNICAL CASE FOR THE SUSTAINABLE REMEDY

The CPG is nearing completion of the NCP-compliant RI/FS, at a cost in excess of \$100,000,000, designed to determine the most effective method(s) to reduce the risk to human health and the environment from the contaminants found in LPRSA sediment, water, and biota. All this work has been performed under Region 2's oversight, following Region 2's direction, and consistent with the NCP and applicable CERCLA guidance. Significant elements of the RI/FS have already been completed and submitted to Region 2 for review. The current conclusion from the ongoing RI/FS is that the optimal solution for the river is a program that includes the removal and capping of the most highly contaminated sediment in the river, as well as ecological restoration. This adaptive approach—the Sustainable Remedy—is part of a comprehensive approach, consistent with EPA guidance, for the entire 17 miles of the LPRSA, where risks to human health and the environment are reduced, water quality is improved, and communities can again value and enjoy the river. The Sustainable Remedy's holistic approach to the Passaic River cleanup, where natural resource restoration efforts are combined with sediment remediation, is precisely the program envisioned by the Urban Water Federal Partnership to which the Passaic River was added in May 2013.

The Sustainable Remedy provides a superior alternative to the final, bank-to-bank dredging approach selected by Region 2 as the Preferred Alternative. Specifically, the Sustainable Remedy is designed to address the entire 17 miles of the LPRSA, achieve equivalent—or better—risk reduction, be accomplished much more quickly (with less negative impact on the river and adjacent communities), and includes river restoration and interim risk management provisions that are not part of Region 2's Proposed Plan. Based on a detailed evaluation of the Sustainable Remedy and the bank-to-bank alternatives merely conceptualized by Region 2 in the FFS, the Sustainable Remedy better meets the nine CERCLA remedy selection criteria and better complies, unlike Region 2's approach, with EPA's Sediment Guidance.

The Sustainable Remedy consists of two integrated programs that will rapidly remediate contaminated sediment and help to restore the ecology along the entire 17 miles of the LPRSA:

1. Targeted removal and capping of approximately 150 acres of sediments in the Lower Passaic River that contain the highest levels of near-surface contamination. The removal targets surface sediments in areas where elevated concentrations are observed at or near the sediment surface due to limited burial or areas of recent erosion into historical contaminated sediments. Analyses performed as part of the ongoing FS indicate this remediation can be constructed in approximately five to seven years and will reduce the average 2,3,7,8-TCDD surficial sediment concentration by approximately 80%. After the cleanup, the excess cancer risk to human health during swimming, wading, and boating will meet EPA target levels (10^{-4} to 10^{-6}), and the risks from fish consumption will approach EPA target levels and be comparable to those achieved by Region 2's bank-to-bank FFS Preferred Alternative.
2. Restoration programs that will improve water quality, reduce the impacts of invasive species, and create and enhance habitat that will ultimately encourage a healthy watershed ecology. These programs are expected to include components such as bank softening, riverfront park improvements that create habitat and provide greater river access, and projects such as creating wetlands and riparian habitat, planting shade trees, and constructing rain gardens that will improve the watershed. Several of these projects are currently in the development stage within communities along the river.

The CPG has also proposed and is currently implementing a one-year fish exchange and veteran's training pilot study to determine the feasibility of a program to provide healthy fish, or vouchers which can be used to obtain healthy fish, by individuals who would otherwise catch and consume resident fish. This pilot study is based upon a similar program proposed by Region 10 as an institutional control for the Lower Duwamish Waterway Superfund Site (LDW)²⁴ in Seattle, WA. See "Draft Environmental Justice Analysis for the Lower Duwamish Waterway Cleanup," at 57 (EPA Region 10, February, 2013). The CPG pilot study includes a jobs training program, operated by Rutgers University, to prepare local, unemployed veterans for jobs in the community surrounding the LPRSA, including the operation of the fish exchange program. The objective of this program is to curtail short term risk from consumption of resident fish, while creating jobs for neighboring residents who are not likely to become employed on a dredging and capping remedy.

The development of the Sustainable Remedy is near completion within the RI/FS process and is scientifically sound. It has been developed through extensive technical evaluation of all the sediment, surface water, and ecological data collected by the CPG (with Region 2 oversight) during the RI and by Region 2 and others in previous investigations. The numerical modeling developed by the CPG used to predict the future concentrations of contaminants in sediment and fish provides assurance that the remedy will be protective of human health and the environment. However, safeguards are built into the Sustainable Remedy consistent with EPA's Principles and Sediment Guidance, including adaptive management. This is an iterative process whereby continued monitoring will be conducted after the sediment cleanup is

²⁴ On February 28, 2013, EPA Region 10 issued a proposed plan for the cleanup of sediments in the LDW, a five mile stretch of an urban river in Seattle, WA, contaminated, among other things, with dioxins and PCBs. Instead of a massive, bank to bank dredging and capping remedy, the LDW proposed plan adopts many of the approaches of the CPG Sustainable Remedy, such as targeted removals, innovative plans to lower risk to the community, and a holistic approach that applies different remediation strategies throughout the river to be most effective and protective. In addition, the LDW proposed plan was not issued until after the completion of the RI and FS. The Region should consider whether its far more massive cleanup is necessary in light of the analysis conducted by Region 10. The LDW proposed plan also included a state-prepared plan for controlling ongoing sources of contamination, a subject completely missing from the Region's Proposed Plan. Ignoring the impacts of ongoing sources is arbitrary.

completed and if progress towards the remedial goals is not achieved, the need for additional remediation will be evaluated and fully addressed.

Details on the Sustainable Remedy and the identification/removal of targeted areas are provided in Appendix F.

VII. CONCLUSION

These comments demonstrate that the Proposed Plan is not technically feasible, nor is it consistent with the NCP. Instead, the Proposed Plan was developed in a process that was arbitrary and capricious and in violation of law. For these reasons, and for all the other reasons set forth in these comments, the CPG is unwilling to perform or pay for the Preferred Alternative or any other active alternative in the Proposed Plan. Instead, the CPG urges Region 2 to select a remedy for the LPRSA on the basis of the NCP-compliant RI/FS.

Throughout the process of investigating the contamination in the sediments of the LPRSA, whenever Region 2 has asked the CPG for help, that help has been forthcoming. As always, the CPG remains willing to discuss with Region 2 its participation in the remediation of the LPRSA.

ACRONYMS AND ABBREVIATIONS

2,3,7,8-TCDD or TCDD	2,3,7,8-Tetrachlorodibenzo- <i>p</i> -dioxin
2,4,5-T	2,4,5-Trichlorophenoxyacetic acid
2007 Draft FFS	The draft focused feasibility study of the lower eight miles of the LPRSA, issued by Region 2 in June 2007
2014 FFS	Focused feasibility study issued by Region 2 of EPA on April 11, 2014, together with the Proposed Plan
ANCOVA	Analysis of covariance
AOC	Administrative Order on Consent
ANOVA	Analysis of variance
APA	Administrative Procedures Act
ARAR	Applicable or relevant and appropriate requirement
AWQC	Ambient water quality criteria
BAF	Bioaccumulation factor
BAZ	Biologically active zone
BERA	Baseline ecological risk assessment
BHHRA	Baseline human health risk assessment
BSAF	Biota-sediment accumulation factor
BSAR	Biota-sediment accumulation regression
CAD	Confined aquatic disposal
CARP	Contaminant Assessment and Reduction Program
CAS	Creel angler survey
CBR	Critical body residue
CDF	Confined disposal facility
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act, 42 USC 9601 <i>et seq.</i>
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CFT	Contaminant fate and transport
cm	Centimeter
CO ₂	Carbon dioxide
COC	Contaminant of concern
COPC	Contaminant of potential concern
COPEC	Contaminant of potential ecological concern
CPG	Lower Passaic River Study Area Cooperating Parties Group
CPG RI	Remedial investigation being conducted by the CPG as part of the RI/FS
CSH	Cancer slope factor
CSM	Conceptual site model
CSO	Combined sewer overflow

CSO AOC	Administrative Settlement Agreement and Order on Consent for Combined Sewer Overflow/Storm Water Outfall (CSO/SWO) Investigation, Occidental Chemical Corporation, Respondent, dated October 4, 2011
CSTAG	Contaminated Sediments Technical Advisory Group
CSV	Comma-separated value
CTE	Central tendency exposure
CTF	Contaminant fate and transport (model)
CWCM	Chemical water column monitoring
cy	Cubic yard
<i>Daubert</i>	<i>Daubert v. Merrell Dow Pharmaceuticals, Inc.</i> , 509 U.S. 579 (1993)
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyltrichloroethane
DDx	DDT and its metabolites
DER	Data evaluation report
Diamond	Diamond Shamrock
DOC	Dissolved organic carbon
DQO	Data quality objective
EMB	Empirical mass balance
EPA	U.S. Environmental Protection Agency
EPC	Exposure point concentration
ERA	Ecological risk assessment
FASB	Financial Accounting Standards Board
FFS RI	Region 2's remedial investigation issued with the Proposed Plan
FNC	Federal navigation channel
FOC	Fraction organic carbon
FOIA	Freedom of Information Act
FS	Feasibility study
GHG	Greenhouse gas
GRA	General response action
HHRA	Human health risk assessment
HMTF	Harbor Maintenance Trust Fund
HPAH	High-molecular-weight polycyclic aromatic hydrocarbon
HQ	Hazard quotient
HST	Hydrodynamic sediment transport
wID	Identification
LCL	Lower confidence limit
Lister Site	The manufacturing facilities, operated by predecessors of OCC, at 80-120 Lister Avenue in Newark, NJ.
LOE	Line of evidence
LPAH	Low-molecular-weight polycyclic aromatic hydrocarbon
LPR	Lower Passaic River

LPRSA	Lower Passaic River Study Area (i.e., lower 17 miles of the Lower Passaic River, from the mouth of the river to Dundee Dam)
LRC	Low resolution coring
MLW	Mean low water
mm	Millimeter
MNR	Monitored natural recovery
MSE	Mean square error
MT	Metric ton
NBCDF	Newark Bay confined disposal facility
NCP	National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300
Newark Bay AOC	In the Matter of the Diamond Alkali Superfund Site (Newark Bay Study Area), Occidental Chemical Corporation, Respondent, dated February 17, 2004, for RI/FS of Newark Bay, as amended.
Newark Bay RI/FS	The RI/FS of Newark Bay, being conducted under the Newark Bay AOC
ng/g	Nanograms per gram
NJDEP	New Jersey Department of Environmental Protection
NJDOT	New Jersey Department of Transportation
NJTRO	New Jersey Transit Rail Operations
NOAA	National Oceanic and Atmospheric Administration
NPL	National priorities list found at 40 CFR. Part 300
NPV	Net present value
NRC	National Research Council
NRRB	National Remedy Review Board (of the EPA)
NY/NJ	New York/New Jersey
O&M	Operation and maintenance
OC	Organic carbon
OCC	Occidental Chemical Corporation
OMB	U.S. Office of Management and Budget
OSWER	Office of Solid Waste and Emergency Response
OU	Operable unit
OU-1	Operable unit 1 of the Diamond Alkali Superfund Site, consisting of the Lister Site
OU-2	Operable unit 2 of the Diamond Alkali Superfund Site, consisting of the sediments in the lower 6 miles of the LPRSA
OU-3	Operable unit 3 of the Diamond Alkali Superfund Site, consisting of the sediments in the LPRSA
OU-4	Operable unit 4 of the Diamond Alkali Superfund Site, consisting of the sediments in Newark Bay
PAH	Polycyclic aromatic hydrocarbon
Partner Agencies	USACE, NJDEP, NOAA, and USFWS
PCB	Polychlorinated biphenyl
PCDD	Polychlorinated dibenzo- <i>p</i> -dioxin

PCDF	Polychlorinated dibenzofuran
PFD	Problem formulation document
POC	Particulate organic carbon
ppb	Parts per billion
ppm	Parts per million
ppt	Parts per trillion
PQL	Practical quantitation limit
PRA	Probabilistic risk assessment
Preferred Alternative	The preferred remedial alternative for the sediments in the lower eight miles of the LPRSA—Alternative 3 with offsite disposal, as identified by Region 2 in the FFS and Proposed Plan
PRG	Preliminary remediation goal
Principles	<i>Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites</i> , OSWER Directive 9285.6-08, dated February 12, 2002
Proposed Plan	Superfund Proposed Plan for the Lower Eight Miles of the Lower Passaic River Part of the Diamond Alkali Superfund Site, issued by Region 2 on April 11, 2014
PRP	Potentially responsible party
QAPP	Quality assurance project plan
RAGS	<i>Risk Assessment Guidance for Superfund</i>
RAL	Remedial action level
RAO	Remedial action objective
RARC	Risk analysis and risk characterization
RBTC	Risk-based threshold concentration
RCATOX	Row Column Aesop Toxics
Region 2	EPA Region 2
REMAP	Regional Environmental Monitoring and Assessment Program
RG	Remediation goal
RI/FS	Remedial investigation and feasibility study
RI/FS AOC	Administrative Settlement Agreement and Order on Consent for Remedial Investigation/Feasibility Study, dated May 8, 2007
RIR	The remedial investigation report prepared by Region 2 to support the Proposed Plan
RM	River mile
RM 10.9	River mile 10.9 of the LPRSA
RM 10.9 AOC	Administrative Settlement Agreement and Order on Consent for Removal Action, Arkema Inc. et al., Respondents, dated May 21, 2012
RM 10.9 UAO	Unilateral Administrative Order for Removal Response Activities, Occidental Chemical Corporation, Respondent, dated June 25, 2012
RME	Reasonable maximum exposure
ROD	Record of Decision

SAB	Staff accounting bulletin
SEC	Securities and Exchange Commission
Sediment Guidance	<i>Contaminated Sediment Remediation Guidance for Hazardous Waste Sites</i> , issued by the EPA, OSWER Directive 9355.0-85, dated December 2005
SLERA	Screening level ecological risk assessment
SOW	Statement of work
SPI	Sediment profile imaging
SQT	Sediment quality triad
SSP	Supplemental sampling program
ST	Sediment transport (model)
SWAC	Surface area-weighted average concentration
SWO	Stormwater outfall
TBC	To be considered
TCP	Trichlorophenate
TCRA	Time-critical removal action
TEF	Toxic equivalency factor
TEQ	Toxic equivalency quotient
Tierra	Tierra Solutions, Inc.
Tierra Removal AOC	Administrative Settlement Agreement and Order on Consent for Removal Action, Occidental Chemical Corporation and Tierra Solutions, Inc., Respondents, dated June 23, 2008
TMDL	Total maximum daily load
TOC	Total organic carbon
TRV	Toxicity reference value
UAO	Unilateral administrative order
UCL	Upper confidence limit on the mean
Upper Passaic River	Passaic River upstream of Dundee Dam
UPR	Upper Passaic River
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
VOC	Volatile organic compound
WRRDA	Water Resources Reform and Development Act of 2014
WSDOT	Washington State Department of Transportation