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VIA FEDERAL EXPRESS AND E-MAIL
Lisa Jackson, Administrator
Arthur A. Elkins, Jr., Inspector General
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

RE: Great Bay Nutrient Criteria and Permit Development - Documentation of Apparent Scientific Misconduct and Agency Bias; Request for Transfer of Matter to Independent Panel of Experts for Review

Dear Administrator Jackson and Inspector General Elkins:

This correspondence is submitted on behalf of the Great Bay Municipal Coalition, which is comprised of the cities of Dover, Exeter, Newmarket, Portsmouth, and Rochester, NH. In recent months, EPA Region I has issued three draft NPDES permits for Exeter, Newmarket, and Dover that seek to impose a 3 mg/l total nitrogen (TN) effluent limit based on a draft numeric TN water quality criterion of 0.3 mg/l that has never been formally adopted by the state of New Hampshire or approved by EPA. These severe effluent limits and related stormwater reduction requirements are expected to cost the regulated communities in the watershed more than *one billion dollars* in additional capital and operating costs. The affected communities have repeatedly provided Region I with detailed analyses of the relevant Great Bay water quality data and studies conducted by independent researchers that show there are fundamental errors underlying the Region's mandates. The same concerns regarding oversimplified "stressor-response" analyses were highlighted by EPA's Science Advisory Board (SAB) in April 2010 and by an internal EPA Region I assessment in September 2010. Moreover, an independent, federally funded Technical Advisory Committee (TAC) for the Great Bay Estuary had also identified many of the same errors and deficiencies in 2008. Nonetheless, Region I has ignored all of these findings.

It is now apparent that serious regulatory violations, bias, and scientific misconduct underlie the Region's actions. The history regarding this matter is summarized on the attached timeline (Attachment A) and discussed in greater detail below for your consideration. For the reasons detailed herein, in accordance with the *EPA Scientific Integrity Policy* and the *Federal Policy on Research Misconduct*, the Coalition requests that (1) the review of Great Bay water quality criteria compliance and permitting be

withdrawn from EPA Region I and transferred to an independent panel of experts who can assess the scientific basis of the Region's position and that (2) the Region's actions leading to this request be investigated by the Office of Inspector General.

Background on Great Bay Estuary Impairment Evaluation

The following provides a brief synopsis of key scientific and regulatory issues affecting Region I's decision to impose "limits of technology" TN regulation mandates on municipal dischargers to Great Bay.

1. Technical Advisory Committee (2005 – 2008) Concludes TN/Transparency is Not the Cause of Eelgrass Declines in the Great Bay Estuary

The New Hampshire Estuaries Project (NHEP) (a federally-funded state project) formed a Technical Advisory Committee (TAC) in September 2005 to address the development of appropriate numeric water quality standards for the Estuary. The TAC members included EPA Region I, New Hampshire Department of Environmental Services (DES), University of New Hampshire (UNH) professors, municipal representatives, the Conservation Law Foundation (CLF), and a number of environmental consultants. Detailed site-specific research was conducted on the factors influencing the ecology of the Estuary and in particular the effect of nutrient concentrations on both the tidal rivers and Great Bay. Over the course of several meetings from 2006 to 2008, the TAC evaluated the results of these detailed studies, reaching the following scientific consensus:

(1) The classic model of eelgrass loss due to TN-induced transparency decrease is inapplicable to Great Bay because transparency reduction was not the cause of the eelgrass losses and there is minimal phytoplankton growth in Bay and Piscataqua River due to physical characteristics of those waters;

(2) Increasing total inorganic nitrogen (TIN) levels since the 1980s did not significantly increase algal blooms;

(3) The main factor controlling transparency in Great Bay [and tidal rivers] is color and turbidity from the tidal rivers (algal levels in the Bay are low and only account for 8% of the light extinction in Bay waters);

(4) Using data from other estuaries (i.e., Chesapeake Bay) to set Great Bay standards is not appropriate due to significant physical differences (eelgrass in Great Bay apparently tolerate higher TN loadings than other estuaries due to short retention times);

(5) It should not be presumed that TN is the cause of eelgrass losses; analyses that combine data from different areas of the Estuary to justify a TN/transparency connection do not prove causation and may be misleading; and

(6) DES should not claim eelgrass impairments exist in the tidal rivers (e.g., Squamscott River) if the area in question is no longer suitable for eelgrass growth [several tidal rivers exhibit naturally low transparency].

See Ex. 1 – TAC Meeting minutes, at Meeting Minutes dated June 10, 2008, and November 17, 2008.

Subsequent to the TAC findings, DES prepared its Methodology and Assessment Results related to Eelgrass and Nitrogen in the Great Bay Estuary for Compliance with Water Quality Standards for the New Hampshire 2008 Section 303(d) List (August 11, 2008). *See* Ex. 2 - Methodology and Assessment Results related to Eelgrass and Nitrogen in the Great Bay Estuary for Compliance with Water Quality Standards for the New Hampshire 2008 Section 303(d) List (August 11, 2008). That document provides a detailed history of eelgrass declines unrelated to nutrient levels occurring in the Estuary. The main factor causing periodic eelgrass losses was noted to be a "wasting disease" that has decimated eelgrass populations around the globe. Consistent with the TAC findings, the Section 303(d) assessment concluded that eelgrass-related impairment listings for nutrients was not justified in Great Bay, Little Bay, the Upper and Lower Piscataqua River, or in Portsmouth Harbor and Little Harbor.

2. Region I Initiative to Develop TN Criteria and Generate TN-induced Eelgrass Impairment Designations (October 2008 – 2010)

In October 2008, subsequent to the TAC findings and DES completion of the 2008 impairment listings, CLF wrote a letter to Region I insisting that more restrictive impairment designations were needed for the Estuary. CLF claimed that TN should be designated the cause of eelgrass loss throughout the Estuary because TN *can* cause loss in *some* situations and, therefore, must be regulated. *See* Ex. 3 – October 6, 2008, CLF letter to EPA Region I. This position was contrary to the TAC technical conclusions and was not based on any new data or revised scientific analysis of the available information. Region I staff favored CLF's position and pressured DES to further change impairment designations and conclusions to reflect this position. *See* Ex. 4 – L. Hamjian, EPA Region I, letter to H. Stewart, NHDES, dated September 30, 2009, at 3. Region I's internal correspondence in November 2008 confirms that the Region knew that no cause and effect relationship between TN and eelgrass loss existed but, despite this knowledge, still pursued the development of stringent TN criteria for Great Bay to "restore" eelgrass populations. *See* Ex. 5 – M. Liebman, EPA Region I, email dated November 21, 2008. Federally-funded studies contemporaneously completed by Dr. Fred Short,[1] a local eelgrass expert, confirmed that eelgrass losses were occurring in areas with both elevated and low TN and transparency levels.[2] Moreover, Great Bay, which had the highest eelgrass populations, had much higher TN levels and lower transparency than Little Bay and the Piscataqua River, where eelgrass failed to recover after the last bout of wasting disease in 1988. Plainly, from these studies, there was no indication that TN or transparency levels were controlling eelgrass recovery anywhere in the Great Bay system.

[1] Dr. Short is a UNH professor whose supposed research Region I is relying upon to support the need for TN criteria to protect eelgrass in Great Bay.

[2] *See* Beem, N. T., and F. T. Short 2009, Subtidal eelgrass declines in the Great Bay Estuary, New Hampshire and Maine, USA. Estuaries and Coasts, 32: 202-205.

Nonetheless, from November 2008 through June 2009, EPA Region I supported the development of a new TN criteria approach based on transparency impacts (*the precise impact the TAC concluded did not exist*). By June 2009, the state began to implement Region I's recommended approach by developing draft TN numeric criteria for the Great Bay Estuary[3] and revising the impairment assessment for Great Bay using the June 2009 Criteria.[4] The Coalition Members did not find out about the revised impairment designations until after DES in August 2009 submitted a radically revised, final document to Region I, who promptly approved it in September 2009.[5] *See* Ex. 4 – L. Hamjian, EPA Region I, letter to H. Stewart, NHDES, dated September 30, 2009. A review of the impairment listing methodology and the draft criterion indicated that the foregoing represented a 180 degree shift from the TAC findings and the prior publically-released documents. All subsequent attempts by the regulated community to have an independent review of the revised scientific positions have been ignored by the regulatory authorities. Region I subsequently informed DES that it "must" apply the new draft TN criteria wherever eelgrass historically existed. *See* Ex. 6 – S. Perkins, EPA Region I, letter to H. Stewart, NHDES, dated December 9, 2009. By February 2010, Region I had begun internal discussions on the effluent limitation potentially applicable to Great Bay communities. *See* Ex. 7 – S. Silva, EPA Region I, email to C. Deloi, EPA Region I, dated Feb. 11, 2010. Region I acknowledged that a 5 mg/l TN limitation would be acceptable, but the Region would only propose this limitation "with CLF's agreement not to appeal." *Id.* at 1. Absent this agreement, Region I would impose a 3 mg/l TN limitation. *Id.* at 1.

In March 2010, without notice to the public, Region I initiated an internal "peer review" of the 2009 numeric criteria under EPA's N-STEPS program to deflect mounting criticism. *See* Ex. 8 – E. Tupper Kinder letters to EPA Region I dated April 9, 2010, and May 12, 2010 (with attached report). However, repeated Coalition requests to have public involvement in that process and a detailed scientific inquiry were rejected by the Region. The comments submitted by the Coalition to DES were never submitted to the peer reviewers for their consideration. Region I then issued its "peer review" document in June 2010, claiming that the review supported the revised June 2009 Criteria, despite the fact that critical issues raised by the Coalition were never evaluated. At nearly the same time, EPA's Science Advisory Board (SAB) was peer reviewing a draft guidance document on the use of "stressor-response" analysis to derive numeric nutrient criteria for EPA Headquarters. The SAB released its final report in April 2010, and EPA finalized

[3] *See* Numeric Nutrient Criteria for the Great Bay Estuary, NHDES June 2009 (hereinafter "June 2009 Criteria") (which claimed that the numeric water quality criteria for TN in the Great Bay Estuary should be set at 0.3 mg/l to improve transparency and restore eelgrass populations).

[4] *See* revised 303(d) listing for Great Bay – 2009.

[5] The Region's approval letter noted that the Region had worked closely with DES in developing the eelgrass/transparency-based TN numeric criteria that were used to declare Bay and tidal river areas as eelgrass impaired due to nutrients.

its guidance in November 2010.[6] The SAB report and the EPA guidance document are relevant to this matter because the draft numeric TN criteria presented in the June 2009 Criteria were based on a similar stressor-response analysis. Both the SAB Report and the final Guidance confirm that the use of stressor-response analyses are only scientifically defensible when cause and effect has been demonstrated and significant confounding factors influencing the stressor-response relationship have been accounted for in the analysis. *Id.* at 6. The June 2009 Criteria did not address either of these fundamental considerations, and contemporaneous EPA Region I emails derided the need to make such a demonstration. *See* Ex. 9 – EPA Region I emails regarding cause and effect, dated July-August 2010. Unbeknownst to the Coalition, Region I subsequently conducted a review of the 2009 criteria document in light of the Coalition's technical comments and EPA's SAB Report. *See* Ex. 10 - M. Liebman, EPA Region I, document titled "Review of: Numeric Nutrient Criteria for the Great Bay Estuary, in light of comments made by John C. Hall and Thomas Gallagher (2010)" dated September 1, 2010.[7] This internal analysis confirmed the Coalition's observation that numerous scientific deficiencies underlie the June 2009 Criteria document, including the following:

> **Conceptual models**
>
> "They rely on literature and only sparingly rely on established results from the estuary itself. It would be better to document some of the connections within the estuary itself." [Ex. 10 at 2.]
>
> *Algal blooms*
>
> "The correlations between total nitrogen and 90th percentile chlorophyll *a* levels by assessment unit or by trend monitoring station are strong, but does this discount other factors, such as salinity and wind, or stratification? … Is there supporting information to suggest that the chlorophyll *a* levels observed in the estuary are consistent with a response from the measured or estimated nutrient loading to the estuary?" [Ex. 10 at 2.]
>
> *Macroalgae*
>
> "The conceptual model is that as TN increases, eelgrass is replaced by macroalgae, but the actual mechanism is not sufficiently explained. Are macroalgae better able to utilize nutrients in enriched conditions and thus outcompete eelgrass? Are there any literature or mesocosm experiments in Great Bay that document this? There is literature from Waquoit Bay, but is this area similar enough to Great Bay to explain the process?" [Ex. 10 at 3.]
>
> "Although there does seem to be supporting evidence of this replacement based on one aerial surveys, there is insufficient documentation of the loss of eelgrass and coincident replacement by macroalgae." [Ex. 10 at 3.]

[6] *See* "Using Stressor-response Relationships to Derive Numeric Nutrient Criteria." USEPA, EPA-820-S-10-001, November 2010.

[7] This document was provided to the Coalition by Region I in response to FOIA Request No. 01-FOI-00148-11.

Light extinction

"On page 15, the authors state that eelgrass is sensitive to water clarity without citing the specific experimental evidence in the Great Bay estuary. … For example, do the mesocosm experiments show the effects of increasing nitrogen enrichment on eelgrass in terms of light attenuation, or lengthening of blades, or loss of carbohydrate stores, or epiphytic growth? Are these loadings similar to loadings into Great Bay and are the responses in Great Bay expected based on the mesocosm experiments?" [Ex. 10 at 3.]

Confounding factors

Chlorophyll a

"The authors did not sufficiently evaluate whether salinity is more important than nitrogen in controlling phytoplankton abundance. … Does chlorophyll *a* track salinity as well? … This would provide supporting material to document that the chlorophyll *a* response is controlled primarily by nutrients, rather than habitat changes (i.e. low salinity vs. higher salinity zones)." [Ex. 10 at 3-4.]

Benthic indicators

"The authors state (on page 40) that organic matter comes from primary producers, but they don't evaluate the effect of organic matter from terrestrial sources, especially in the upper parts of the estuary. On page 41, they state that the regressions prove that total organic carbon in sediments is associated with nitrogen and chlorophyll *a* concentrations in the water column, but they don't say that they are caused by them. I suspect that terrestrial sources from nonpoint and sewage treatment effluent are more important than autotrophic sources of organic matter." [Ex. 10 at 4.]

Dissolved oxygen

"The dissolved oxygen section on page 45 presents an incomplete conceptual model, because they do not address other sources of organic matter, including sewage treatment effluent, and terrestrial runoff. … In addition, the relationships could be confounded by salinity stratification, or flushing, rather than nitrogen. The sonde data sources for low dissolved oxygen are all in the tributaries, which are really different than the Great Bay areas, and therefore the low dissolved oxygen could be partly related to poor circulation and salinity wedges and other sources of organic matter (e.g. terrestrial organic matter). Additional information should be presented to discount these other factors." [Ex. 10 at 4.]

Light extinction

"On page 63 and in Figure 34 the authors suggest that the particulate organic matter in the water column expressed as turbidity is caused by nitrogen and that this particulate matter is autochthonous (i.e. derived from phytoplankton). But, there should be supplemental evidence that discounts the possibility that this organic matter is related to the salinity gradient and is from upstream sources of terrestrial runoff." [Ex. 10 at 5.]

Despite the obvious, significant technical deficiencies and failure to provide analyses consistent with the SAB recommendations, Region I continued to claim that the June 2009 Criteria were scientifically defensible.

3. Coalition Members Meet with DES to Review Applicable Scientific Information and Develop a Memorandum of Agreement (2011)

Once the Coalition communities obtained the amended 303(d) listing and learned of Region I's decision to limit the "peer review" of the June 2009 Criteria analysis, they prepared and submitted site-specific data and analyses showing that elevated levels of TN could not possibly have caused eelgrass losses in the Estuary as a result of phytoplankton-induced light extinction and that the water quality criteria of 0.3 mg/l TN was unsupported by any of the site-specific data. In particular, the Coalition documented that there was no information showing that either transparency had significantly *decreased* or algal growth had significantly *increased* in the Estuary from 1990 to 2009. Therefore, it was indefensible to assert TN-induced transparency changes caused the eelgrass losses.

Several meetings were held with DES technical staff to review the information. By April 2011, in response to the presentation of these site-specific data analyses, DES agreed that there remained a significant degree of uncertainty with regard to the draft numeric TN standards and signed a Memorandum of Agreement (MOA) with the Coalition communities designed to investigate and resolve key technical issues. *See* Ex. 11 - MOA. The parties to the MOA agreed that appropriate TN criteria for the Estuary would need to be set for each tidal river on a site-specific basis. Under the MOA, open technical meetings were held with UNH researchers, DES and Region I. Those meetings culminated in a consensus that the impairment mechanism attributed to the loss of eelgrass in the June 2009 Criteria – loss of light transparency due to increased phytoplankton growth – *did not occur and was not the cause of eelgrass changes* in Great Bay. *See* Ex. 12 – MOA Meeting Minutes.

4. EPA Region I Ignores Terms of MOA and Drafts NPDES Permits with Stringent TN Limits (2011)

Throughout 2011 and 2012, the communities repeatedly presented data and analyses to Region I confirming that transparency reductions associated with TN *cannot* be the cause of the eelgrass declines and that TN-induced impacts on transparency (i.e., increased algal growth) are documented to be negligible. *See, e.g.*, Exs. 13, 14, and 15 – Transparency-phytoplankton relationship charts for the Squamscott, Lamprey, and Piscataqua Rivers. The Coalition also reconfirmed that the transparency in the tidal rivers was quite low due to natural factors (color, turbidity, etc.) and, due to these factors, apparently could no longer support eelgrass growth based on the degree of light penetration presumed by DES to be necessary to support such growth. *See id.* Despite the numerous, unrefuted studies confirming there is no "eelgrass-TN-transparency" paradigm controlling eelgrass populations in Great Bay or the tidal rivers, Region I continued to ignore the information submitted by the Coalition communities, without comment, and proceeded to issue three draft NPDES permits (Exeter, Newmarket, and Dover) that established limits-of-technology TN requirements based on the draft TN criteria of 0.3 mg/l from the discredited June 2009 Criteria. In response to comments made on the draft permits, Region I subsequently claimed that its TN-transparency-

eelgrass loss position was based on the scientific findings of Dr. Fred Short. *See* EPA Region I Response to FOIA Request No. 01-FOI-00053-12.[8] Because of Region I's reliance on Dr. Short's research claims, the Coalition requested that Dr. Short produce the research he claimed demonstrated that TN levels caused increased algal growth, reduced transparency, and the loss of eelgrass populations throughout the Estuary. *See* Ex. 17 – F. Short email to EPA Region I dated December 22, 2011; Ex. 18 – Correspondence from Coalition to F. Short, dated January 23, 2012, and February 9, 2012. To date, Dr. Short has been unable to produce any such information, and the Region has also failed to produce any such information.

5. Historical Summary

Based on these interactions and documented events it is apparent that Region I has purposefully ignored the valid scientific findings of the TAC and has taken, without support, a position that stringent TN limitations are required to improve transparency and restore eelgrass populations in Great Bay. Furthermore, although critical scientific deficiencies were confirmed by Region I, the Region has undertaken repeated efforts to thwart a comprehensive evaluation of the underlying science and has rendered its decision to impose stringent TN limitations based on administrative fiat, which it has no intention of altering regardless of whatever information is presented.

Basis for Requesting Inspector General Scientific Misconduct and/or Lack of Impartiality Investigation and Transfer of Matter from EPA Region I Due to Documented Bias

EPA's *Scientific Integrity Policy* and the *Federal Policy on Research Misconduct* specify the requirements for appropriate scientific and research conduct and specify the elements that constitute scientific misconduct. As further discussed below, Region I (1) based its regulatory assertions on the manipulation or misuse of data and analyses to support its desired outcome, as opposed to sound science; (2) refused and/or was unable to produce valid documentation to support its position; (3) prevented public involvement in its peer review process; and (4) has consistently demonstrated a lack of impartiality regarding the matter. The Region I's actions plainly violate these policies that are intended to ensure that sound science is used in the regulatory decision-making process. As such, these violations justify withdrawal of the matter from Region I and further investigation.

[8] As part of the publication of the draft NPDES permits, the Region also issued multipage "fact sheets" to support the application of stringent TN limitations for Coalition members. In order to obtain the underlying basis and support for Region I's various scientific assertions, the Coalition submitted a series of Freedom of Information Act (FOIA) requests to Region I. Upon review, Region I's FOIA responses confirmed that Region I's basis for imposing the new TN restrictions relied heavily on the claims of Dr. Fred Short. *See* Ex. 16 – EPA Region I Phone Logs of Conversations with F. Short, dated November 14, 2011, and November 18, 2011. The Region also made numerous other unsupported claims (i.e., organic nitrogen is rapidly converted to inorganic nitrogen within Great Bay justifying TN control; excessive nitrate levels are harming eelgrass, eelgrass restoration in the tidal rivers is dependent on TN reduction). The FOIA responses further confirmed that Region I did not have any other Great Bay studies or analyses supporting these claims.

1. **EPA Region I's Stance is Based on the Improper Use of Data and Analyses to Support a Desired Outcome and is Not Grounded in Sound Science**

Based on these interactions and documented events, it is apparent that EPA Region I has (1) purposefully ignored the valid scientific findings of the TAC that a "cause and effect" relationship between eelgrass loss, transparency, and TN did not exist, (2) ignored its own analyses identifying numerous significant scientific deficiencies regarding the June 2009 Criteria, and (3) adopted a contrary position that stringent TN limitations are required to improve transparency and thereby restore eelgrass populations in Great Bay. Additionally Region I has intentionally, knowingly, or recklessly adopted the scientific claims of a UNH researcher that it knows are factually unsupported, in order to justify the adoption of stringent TN criteria for the Great Bay Estuary. Individually and collectively, these actions constitute research misconduct. The *Federal Policy on Research Misconduct* states:

> "[r]esearch misconduct is defined as fabrication, falsification, or plagiarism in proposing, performing or reviewing research, or in reporting research results [65 Fed. Reg. 76262 at I], or ordering, advising or suggesting that subordinates engage in research misconduct." 65 Fed. Reg. 76262 at I n.2. "Fabrication is making up data or results and recording or reporting them." 65 Fed. Reg. 76262 at I. "Falsification is manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record." 65 Fed. Reg. 76262 at I. The federal policy further states that a finding of research misconduct requires that "[t]here be a significant departure from accepted practice of the relevant research community;" "[t]he misconduct be committed intentionally, or knowingly, or recklessly;" and "[t]he allegation be proven by a preponderance of evidence." 65 Fed. Reg. 76262 at II.

In this case, "[t]he significant departure from accepted practice of the relevant research community" began with the lack of any objective data regarding TN levels causing adverse transparency impacts on eelgrass in the Estuary and developed into the manipulation of real data to produce a false conclusion. Neither Region I, Dr. Short, nor DES can claim ignorance of the lack of scientific justification for the proposed transparency-based TN restrictions, as they were present at the TAC meetings wherein it was expressly concluded that increased TN concentrations *had not caused increased algal growth causing significantly lower transparency levels*. In contradiction to their later research claims, the federal research reviewed by the TAC expressly determined that a significant relationship between TN and transparency did not exist. The TAC minutes confirmed that the changing physical factors unrelated to TN (color, dilution (salinity), and turbidity) actually controlled the transparency existing at those different sites. *See* Ex. 1 – TAC Meeting Minutes, at Meeting Minutes dated December 7, 2007.

When this legitimate research (the conclusions of which were expressly agreed upon in formal State/Federal TAC meetings) produced findings that did not justify an imposition of stringent TN criteria, Region I requested that DES create alternative findings (numeric water quality criteria) specifically to back up their desire for stringent TN regulation and to supplant the properly documented research conclusions reached by the TAC. DES employee Philip Trowbridge (also a TAC member) then created a new "stressor-

response" analysis designed to support the falsified claim that TN had induced algal growth increases causing major changes in transparency in both the Bay and tidal rivers.[9] When these new DES analyses (later comprising the June 2009 Criteria) were presented to the TAC in June and November 2008, the TAC advised that the approach did not demonstrate cause and effect and should receive an independent peer review because of the unconventional methods employed. *See id.*, at Meeting Minutes dated June 10, 2008, and November 17, 2008. This independent peer review never occurred. Likewise, Region I internal correspondence demonstrates that it knew these analyses did not represent a "cause and effect" relationship, but nonetheless promoted the methods as scientifically defensible. *See* Ex. 9 – EPA Region I emails regarding cause and effect, dated July-August 2010. As such, the entire TN/transparency analysis used to justify the stringent TN criteria was a gross scientific misrepresentation.

Moreover, the Coalition noted that the simplified "stressor-response" procedures used to develop the draft TN criteria had been specifically rejected by EPA's Science Advisory Board as not scientifically defensible in April 2010.[10] In evaluating the Coalition's comments, Region I itself noted numerous "confounding variables" were not addressed in the development of the June 2009 Criteria. *See* Ex. 10 - M. Liebman, EPA Region I, document titled "Review of: Numeric Nutrient Criteria for the Great Bay Estuary, in light of comments made by John C. Hall and Thomas Gallagher (2010)" dated September 1, 2010. In particular, the Region noted a failure to confirm that salinity or upstream runoff did not control transparency/dissolved oxygen (DO) and a failure to confirm that algal growth actually increased due to higher TN loadings. *Id.* at 3-5. Nonetheless, Region I continued to assert that the June 2009 Criteria may be used to justify the application of stringent TN water quality criteria requiring effluent limits of 3 mg/l TN asserting that the "weight of evidence" justifies such findings.

Finally, all of these issues and fundamental scientific errors were again brought to the Region's attention at the Exeter, NH, NPDES draft permit modification hearing (NPDES Permit No. NH0100871) in June 2011. As demonstrated in the Coalition's reports,[11] which were submitted to Region I and Dr. Short, and the Coalition's response to Region I's request for comments regarding the Exeter draft permit modification, the development of the June 2009 Criteria by DES analysis violated fundamental scientific principles

[9] This analysis plotted data from dramatically different physical settings (river, bay, ocean) to conclude that TN "caused" the changes in transparency at these different locations, when in fact the data simply showed the inherent principle that TN levels decrease and transparency levels increase from the head of the Estuary to its mouth. *See* Ex. 19 - Relationship between Light Attenuation Coefficient and TN at Trend Stations (NHDES 2009).

[10] In 2010, EPA published guidance on the use of empirical approaches such as stressor response analysis to develop numeric nutrient criteria. (*See* EPA-820-S-10-001.) This guidance was subject to Science Advisory Board review prior to publication. The guidance affirms that stressor response analysis is a valid method *only after a cause-and-effect relationship has been established and confounding factors have been accounted for*. The June 2009 Criteria analysis did not consider either of these critical factors.

[11] Ex. 18 at Attachments to January 23, 2012, Coalition Correspondence to F. Short: HydroQual Reports dated June 14, 2010, and January 10, 2011.

governing water quality impact assessment and was specifically at odds with the TAC-reviewed site-specific information collected for Great Bay. Most notably, the Coalition pointed out that data were combined from dramatically different hydrologic and physical settings to mask the effect of other controlling parameters (e.g., turbidity, dilution (salinity), and color) and to claim that changing TN levels were the sole cause of changing transparency levels. *See id.* The Coalition also provided data plots for the Squamscott River confirming that algal growth was *not* the cause of low transparency in the tidal river. *See* Ex. 13 – Transparency-phytoplankton relationship chart for the Squamscott River. This information was ignored as well, and the Region continued to issue draft permits with identical TN effluent limitations under the claim that the June 2009 Criteria were properly conducted and determined by Region I to be "scientifically defensible."

To bolster its untenable position, Region I later claimed that Dr. Short had completed research for the Estuary that confirmed reduced transparency caused system-wide eelgrass losses. *See* EPA Region I Response to FOIA Request No. 01-FOI-00053-12.[12] That assertion was yet another serious misrepresentation. In fact, the prior TAC meetings that evaluated the proper water quality requirements for Great Bay *expressly concluded that this transparency mechanism for eelgrass loss DID NOT occur in Great Bay*. *See* Ex. 1 – TAC Meeting Minutes, at Meeting Minutes dated December 7, 2007. Federally-funded research completed by Dr. J. Ru Morrison (UNH Professor) had confirmed that transparency in Great Bay was negligibly impacted by algal growth and that color (originating naturally from the tidal rivers) controlled light penetration in those waters.[13] If Dr. Short actually had completed research relevant to that issue, it would have been presented to the TAC, of which he was a member. In reality, Dr. Short's research never looked at whether light transmission in the water column in the Estuary had changed over time due to increased TN and algal growth.

[12] Region I's FOIA responses confirmed that Region I was relying on the claims of Dr. Fred Short. *See* Ex. 16 – EPA Region I Phone Logs of Conversations with F. Short, dated November 14, 2011, and November 18, 2011. We understand that Dr. Short received extensive federal funding for eelgrass research in Great Bay and the Piscataqua River. Based on this federally-funded research that was supposedly conducted in the Estuary, Dr. Short made a number of very specific scientific claims regarding the factors that caused eelgrass losses in the Bay and tidal rivers. These unsupported claims were used by the Region and DES as the primary basis to link TN to eelgrass loss and to support imposition of a 0.3 mg/l TN water quality standard to improve transparency in the tidal waters of the Bay and to further impose 3 mg/l TN effluent limits to achieve that standard. Specifically, Dr. Short asserted that his research confirmed that increasing TN levels caused increased algal growth, significantly reducing water column transparency causing the demise of eelgrass throughout the system. However, the available records show that he never conducted research that was designed to demonstrate that TN-induced transparency reduction caused the eelgrass losses in Great Bay.

[13] *See* Morrison, J. Ru, et al. *Using Moored Arrays and Hyperspectral Aerial Imaging to Develop Nutrient Criteria for New Hampshire's Estuaries – A Final Report to The New Hampshire Estuaries Project* (September 30, 2008). Available at: http://ccom.unh.edu/sites/default/files/publications/Morrison_2010_Report_Using_Moored_Arrays_and_Hyperspecral_Areial_Imagery_to_Develop_Nutrient_Criteria_NH_Estuaries.pdf.

Despite repeated requests, no research or studies supporting Dr. Short's claims have been provided to the Coalition. *See* Ex. 18 – Correspondence from Coalition to F. Short, dated January 23, 2012, and February 9, 2012. Region I's continuing efforts to rely on a position it knows, or should know, is unsupported also violates EPA's Research Misconduct guidelines. Based on all of the records and documentation available to the Coalition, it is clear that the technical basis used to create the TN standard was, at best, recklessly prepared or, at worst, intentionally falsified. As the Region was directly involved in promoting these analyses based on research claims regarding Great Bay data it knew were unsupported, Region I has committed science misconduct.

2. Refusal to Allow an Independent Peer Review and Public Involvement in the Process

Region I has undertaken repeated efforts to prevent public input into an objective investigation of the underlying science. These activities confirm that EPA Region I has rendered its biased decision to impose stringent TN limitations based on administrative fiat, which it has no intention of altering regardless of whatever information is presented. Despite the TAC's open evaluation, with the participation of all interested stakeholders, of the detailed studies conducted on Great Bay and its subsequent conclusion that TN should not be designated the cause of eelgrass loss, CLF wrote a letter to Region I in October 2008 claiming that TN should be designated the cause of eelgrass loss in the Bay because TN *can* cause loss in *some* situations and, therefore, must be regulated. *See* Ex. 3 – October 6, 2008, CLF letter to EPA Region I. Following the CLF letter, Region I embarked on a mission to induce DES to change impairment designations and conclusions to reflect that TN was the cause of eelgrass loss. *See* Ex. 5 – M. Liebman, EPA Region I, email dated November 21, 2008. Region I's internal correspondence in November 2008 confirms that that no cause and effect relationship between TN and eelgrass loss existed in Great Bay but, despite this knowledge, Region I still pursued the development of stringent TN criteria for Great Bay. *See id.* Region I's letter approving the radically revised impairment listings for the Estuary acknowledged Region I's major role in developing the new TN criteria and in altering the original DES position that presented to the public. Ex. 4 – L. Hamjian, EPA Region I, letter to H. Stewart, NHDES, dated September 30, 2009.

By June 2009, the state had begun to implement Region I's recommended approach by finalizing the TN criteria and revising the impairment assessments for Great Bay. Region I promoted the state's immediate use of the unadopted numeric criteria, by now calling them a "narrative criteria interpretation."[14] Without further public review, DES submitted the radically revised impairment listings (based on the new, unadopted numeric TN criteria) in August 2009. Region I promptly approved the revised listings and impairment causes in September 2009. Both Region I and DES ignored all attempts by

[14] It should be noted that EPA itself, under the direction of the 11th Circuit Court of Appeals in *Florida Public Interest Group v. EPA*, 386 F.3d 1070 (11th Cir. 2004), developed the controlling analysis of what factors determine when new water quality standards have been developed. The June 2009 Criteria are clearly new water quality standards under this test. New water quality standards can only be adopted through formal rulemaking, which has never been conducted.

the regulated community to have an independent review of the revised scientific positions. *See* Ex. 8 – E. Tupper Kinder letters to EPA Region I dated April 9, 2010, and May 12, 2010 (with attached report). To provide some semblance of reliability and to deflect mounting criticism, the Region set up an extremely limited internal peer review in March 2010 with selected EPA contractors. All Coalition requests to have public involvement in that process and to ensure that appropriate technical questions prepared by the Coalition were addressed through the peer review process were rejected by the Region. The questions posed to the experts selected by Region I were designed to avoid any serious investigation into the lack of demonstrated cause and effect relationships. None of the earlier TAC recommendations or analyses was provided to the peer reviewers. The Coalition members strongly protested the scope of the questions presented and asked for a more public process to occur. *See* Ex. 8 – E. Tupper Kinder letters to EPA Region I dated April 9, 2010, and May 12, 2010 (with attached report). Region I refused to allow the peer review to address the scientific questions raised by the Coalition – in particular whether the analysis framework was consistent with EPA's Science Advisory Board recommendations on use of simplified regressions to establish "stressor-response" nutrient criteria for complex waters. No public input on this "peer review" was allowed.

Consequently, Region I's "independent peer review" document, issued in June 2010, amounted to little more than a contrived approval derived by withholding relevant scientific information and public input from the experts selected by Region I for the review. Subsequent responses to FOIA requests and permit "fact sheets" asserted that this "peer review" justified the Region's conclusion that the new restrictive TN criteria were "scientifically defensible." As noted earlier, all subsequent data and analyses submitted by the Coalition and its experts, confirming the TN-transparency connection did not exist, were ignored by Region I. This occurred even though the Region knew that the Coalition's objections were well-founded. *See* Ex. 10 - M. Liebman, EPA Region I, document titled "Review of: Numeric Nutrient Criteria for the Great Bay Estuary, in light of comments made by John C. Hall and Thomas Gallagher (2010)" dated September 1, 2010. As such, Region I's refusal to allow public participation in the internal "peer review," was plainly an attempt to conceal the Region's internal evaluation identifying critical deficiencies and to prevent an objective scientific assessment. In addition to violating EPA's policies against research misconduct, these actions plainly violate EPA's Scientific Integrity policy that "prohibits all EPA employees, including scientists, managers, and other Agency leadership, from suppressing, altering, or otherwise impeding the timely release of scientific findings or conclusions." EPA Scientific Integrity Policy at IV, Section A, Part 1.

Conclusion and Request for Action

The *Federal Policy on Research Misconduct* states, "[i]n deciding what administrative actions are appropriate, the Agency should consider the seriousness of the misconduct, including, but not limited to, 1) the degree to which the misconduct was knowing, intentional, or reckless; 2) was an isolated event or part of a pattern; and 3) had significant impact on the research record, research subjects, other researchers, entities, or the public welfare." 65 Fed. Reg. 76264 at V. The record is clear that Region I was determined to implement stringent transparency-based TN criteria and designate TN as the cause of eelgrass loss in the Bay. However, no objective scientific information from the Great Bay Estuary supported either action. Moreover, the Region's decision to impose the June 2009 Criteria even after internally identifying major scientific deficiencies with the numeric criteria confirms that the Region has no intention of conducting a competent and impartial scientific assessment for Great Bay. The Region's actions demonstrate that it is biased toward and intent on implementing a predefined regulatory agenda.

This misconduct is not an isolated event, as Region I has intentionally, knowingly, or recklessly committed violations of the *Federal Policy on Research Misconduct* and the *EPA Scientific Integrity Policy* in every step of these proceedings, including the following:

- Ignoring TAC conclusions based on federally-funded Great Bay research which confirmed that TN-induced transparency decreases did not cause the eelgrass losses;

- Promoting stringent transparency-based TN criteria, knowing that algal growth and transparency did not change over time due to TN load increases;

- Purposefully excluding the public from the peer review process and limiting the information provided to the peer reviewers;

- Continuing to support the June 2009 Criteria after internally identifying major scientific deficiencies and significant conflicts with the SAB recommendations on acceptable stressor-response-based criteria;

- Relying on the undocumented claims of a UNH researcher that the Region knew or should have known were unsupported; and

- Continuing to issue stringent NPDES permits, despite available data confirming the basis for these actions is clearly in error.

These actions have great potential to cause harm to the public welfare, as the watershed-wide costs of compliance with the excessive restrictions, if imposed, could easily exceed $1 billion. Consequently, in accordance with applicable policies intended to ensure the integrity of scientific decision making, the Coalition requests EPA Headquarters take the

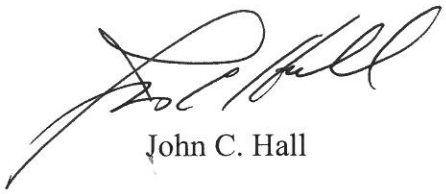
following actions:

1. Due to the severity and quantity of violations, we request that (1) a meeting be arranged with the Administrator's office to discuss the matter and (2) further review of Great Bay Estuary matters be withdrawn from Region I and transferred to an independent panel of experts who can evaluate the scientific information that is the foundation of the Region's position.

2. We further request that Region I's actions be reviewed by the Office of Inspector General.

We look forward to the Agency's swift resolution of this matter and the approval of scientifically defensible approaches to protect the resources of Great Bay.

Sincerely,



John C. Hall

Enclosures

cc: Coalition Members
Curt Spaulding, Administrator of EPA Region I
Thomas Burack, Commissioner of NH DES
Gov. John Lynch
Rep. Frank Guinta
Sen. Jeanne Shaheen
Sen. Kelly Ayotte
Rep. Bob Gibbs
White House Council on Environmental Quality