UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

December 6, 2010

Michael J. Hornbrook
Chief Operating Officer
Massachusetts Water Resources Authority
100 First Avenue
Charlestown Navy Yard
Boston, MA 02129

Re: Massachusetts Water Resources Authority, Permit Number MA0103284 -- EPA and MassDEP Approval of the Proposed Revisions to the Ambient Monitoring Plan for the MWRA Effluent Outfall

Dear Mr. Hornbrook:

The United States Environmental Protection Agency Region 1 (EPA) and Massachusetts Department of Environmental Protection (MassDEP) have reviewed the final revision to the Ambient Monitoring Plan (AMP) for the Massachusetts Water Resources Authority Effluent Outfall (Revision 2, dated July 2010).[1] This revision includes changes made in response to comments and suggestions made by the Outfall Monitoring Science Advisory Panel (OMSAP), MassDEP, Massachusetts Office of Coastal Zone Management, Stellwagen Bank National Marine Sanctuary Office, and EPA. EPA and MassDEP believe that the proposed monitoring plan revisions are focused and appropriate; meet the goals of the monitoring plan; are sufficient to ensure that NPDES permit requirements will be met; and will detect impacts to water quality, biological resources and listed endangered species. Therefore, we approve these changes. A summary of the changes in the AMP Revision 2, July 2010, is provided in the Attachment to this letter.

The MWRA submitted proposed revisions in April 2009. EPA considered these revisions to be significant enough to require review as an MWRA annual submission. The OMSAP reviewed the plan at its June 29, 2009 public meeting and in two public conference calls on August 18, 2009 and October 28, 2009. OMSAP provided written comments to EPA and MassDEP in a letter dated December 18, 2009. The July 2010 proposed revisions include changes made in response to the comments received from OMSAP. This version was also subject to public comment. Notice of the comment period was given to the public through the Environmental Monitor (noticed on July 21, 2010). A notice was also distributed on the EPA-MWRA listserv on July 21, 2010, and posted at the MWRA and EPA web sites. By the deadline of August 20, EPA

[1] Ambient Monitoring Plan for the Massachusetts Water Resources Authority Effluent Outfall, Revision 2 July 2010. Report 2010-04. Available at: http://www.mwra.com/harbor/html/amp_modifications.htm.

and MassDEP received two comment letters on the proposed revisions; both letters supported the revisions. Staff from the Stellwagen Bank National Marine Sanctuary office also reviewed earlier versions of the plan and provided comments that we believe improved the plan. Their request to ensure continued monitoring in Cape Cod Bay and Stellwagen Bank is addressed by the inclusion of monitoring stations in those areas in the final version of the monitoring plan. This strengthens the ability of the plan to detect potential impacts to endangered species.

EPA and MassDEP would like to note that the AMP was always viewed by our agencies as a "living document" that would continually be reviewed and revised based on current scientific understanding and in response to the analysis and assessment of information derived from the monitoring. We are fortunate that we have nine years of baseline monitoring and now over nine years of additional post-discharge monitoring data obtained since the new outfall became operational on September 6, 2000. We are also pleased that the MWRA undertook a rigorous, scientifically-based approach in developing proposed revisions to the monitoring plan.

In addition to the technical review by the OMSAP, EPA, in coordination with the National Marine Fisheries Service (NMFS), conducted an evaluation of the AMP Revision 2, July 2010, to determine whether it will remain sufficient to detect impacts to listed endangered species, especially baleen whales. As part of its independent review of the revisions, NMFS asked EPA to determine whether the ambient monitoring results to date affirm NMFS's conclusion, as articulated in its 1993 Biological Opinion,[2] that the effluent outfall is not likely to jeopardize the continued existence of any listed species or critical habitat in Massachusetts and Cape Cod Bays. Specifically, NMFS asked EPA to: 1) review the monitoring data collected to date; 2) compare the data with the Biological Opinion's findings and assumptions; and 3) determine whether the AMP, with the proposed modifications, continues to be adequate to identify effects on listed species.

EPA conducted this review by focusing on questions raised by NMFS and concluded that AMP Revision 2, July 2010, remains adequate to evaluate impacts on listed endangered species from effluent discharge of nutrients, organic matter and chemical contaminants. Most importantly, EPA concluded that the measured effects from the outfall as shown by more than nine years of post-discharge monitoring are consistent with or less significant than anticipated in the NMFS Biological Opinion. By letter dated November 10, 2010, NMFS concurred with EPA's conclusion that in light of the information and analysis provided, reinitiation of formal consultation on the AMP under the Endangered Species Act is not necessary at this time.

A key question is whether the outfall discharge has or could cause or contribute to the generation of harmful algal blooms. The revised AMP makes extensive use of tools to evaluate the occurrence and distribution of harmful phytoplankton blooms (specifically *Alexandrium*, or red tide, and *Phaeocystis*). These include use of satellite imagery as well as communication with the network of scientists and agencies that routinely monitor these blooms (especially red tide). The Contingency Plan states that actions will be implemented if the red tide bloom exceeds the

[2] National Marine Fisheries Service (NMFS). 1993. Endangered Species Act – Section 7 Consultation, Biological Opinion on the Boston Harbor Project: Issuance of a National Pollutant Discharge Elimination System (NPDES) Permit for the Massachusetts Water Resources Authority (MWRA) Outfall. Northeast Region Office, NMFS. September 8, 1993.

threshold value[3], and the MWRA has established a rapid response survey plan to track the red tide bloom.[4] Regarding *Phaeocystis*, satellite imagery clearly shows the regional nature of the bloom. Current research is trying to determine the factors (e.g. temperature) that contribute to the frequency and extent of this regional bloom, but there has been no indication that the outfall discharge contributes to this bloom. The MWRA has also evaluated whether the nutrients in the effluent discharge are likely to have contributed to the increase in duration of the red tide blooms that have occurred since 2005. Modeling studies indicate that the addition of nutrients from the outfall is not sufficient to contribute significantly to the algal growth.[5] In light of the evidence that the outfall is: 1) not causing or contributing to the blooms, and 2) the AMP requires extensive and synoptic continued monitoring, EPA and MassDEP believe that the proposed monitoring design, in concert with implementation of a rapid response survey, is sufficient to detect any potential contributions of the outfall discharge to the presence, duration, or spatial extent of harmful algal species.

EPA's review of the 2009 proposed revisions resulted in two key changes that are reflected in the final version. First, an additional water column monitoring station was re-established at station N21 to evaluate nutrient levels at the edge of the zone of initial dilution.[6] Second, the plan includes two additional rapid response surveys to evaluate environmental conditions after plant upsets or blending events. To monitor floatables, MWRA will conduct two wet weather net tow surveys annually, subsequent to Deer Island Treatment Plant (DITP) blending events of greater than three hours and within 24 hours of the end of the event. MWRA will also carry out chemical analyses for PCBs, PAHs, pesticides, and mercury on samples of the fat particles which are collected in the net tows. Also, to evaluate solids discharges, MWRA will conduct a hard bottom survey within 45 days of a 7-day average total suspended solids discharge at DITP exceeding 180,000 lbs/day, during a year when a hard bottom survey is not planned.

EPA and MassDEP support the strategic changes proposed in AMP Revision 2, July 2010, to reduce the number of water column stations sampled from 33 to 14, and change the annual survey schedule from 12 nearfield station surveys and six farfield station surveys to nine synoptic surveys of five nearfield stations, six reference stations and three Cape Cod Bay-Stellwagen Bank National Marine Sanctuary stations. The proposed water column design results in more phytoplankton and zooplankton sampling than the current design. The proposed plan includes nine farfield stations sampled nine times per year compared to ten stations (not including Boston Harbor) sampled only six times per year, a 35% increase in plankton samples on an annual basis. We believe that this monitoring design is improved because it potentially increases the effort to characterize the plankton community in the temporal scale, the component of the system with the most variability.

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[3] See footnote 3 to Tables 1-1 and 5-1 in MWRA. 2001. Massachusetts Water Resources Authority Contingency Plan Revision 1. Boston: Massachusetts Water Resources Authority. Report ENQUAD ms-071. 47 p.2001.

[4] Libby PS. 2006. Standing Survey Plan: Rapid Response *Alexandrium* Survey. Boston: Massachusetts Water Resources Authority. Report 2006-05. 19 p.

[5] Anderson DM, Libby PS, Mickelson MJ, Borkman DG, He R, McGillicuddy DJ. 2007. The 2005 New England red tide of *Alexandrium fundyense*: observations, causes, and potential outfall linkages. Boston: MWRA Report 2007-10. 85 pp. + appendices.

[6] Plankton will not be sampled at station N21.

EPA had requested comment on whether station F15, F14, or a location intermediate between the two is most appropriate for monitoring the southward extent of the plume. Because no comments were received from the public on this issue, and because the OMSAP supported the original station location of F15, EPA and MassDEP approve the location of station F15 as part of the water column monitoring program.

Thank you for conducting a rigorous analysis of the ambient monitoring plan. If you have any questions or concerns about this response, please do not hesitate to contact Matthew Liebman, EPA, at (617)918-1626 or Cathy Vakalopoulos, MassDEP, at (617)348-4026.

Sincerely,

Stephen S. Perkins
Director, Office of Ecosystem Protection
Environmental Protection Agency Region 1

Ann Lowery
Acting Deputy Assistant Commissioner,
Bureau of Resource of Protection
Massachusetts Department of Environmental Protection

Attachment: Summary of changes to the MWRA Ambient Monitoring Plan Revision 2, July 2010 version as described in: MWRA. 2010. *Ambient monitoring plan for the Massachusetts Water Resources Authority effluent outfall revision 2. July 2010.* Boston: Massachusetts Water Resources Authority. Report 2010-04. 107p.

cc (via email):

**National Marine Fisheries Service**
Mary Colligan
**Stellwagen Bank National Marine Sanctuary**
Craig MacDonald
**Provincetown Center for Coastal Studies**
Rich Delaney

**Outfall Monitoring Science Advisory Panel**
Andrew Solow, WHOI (Chair)
Robert Beardsley, WHOI
Norb Jaworski, retired (EPA)
Robert Kenney, URI
Scott Nixon, URI
Judy Pederson, MIT Sea Grant

Michael Shiaris, UMass Boston
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**Public Interest Advisory Committee**
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Bruce Berman, SHSB
Ed Bretschneider, MWRA Wastewater Advisory Committee
Priscilla Brooks, CLF
Robert Buchsbaum, Mass Audubon
Joe Favaloro, MWRA Advisory Board
Maggie Geist, APCC
Sal Genovese, SWIM
Vivien Li, TBHA
Tara Nye, APCC

**Cape Cod Commission**
Tom Cambareri

# Attachment

## Summary of changes to the MWRA Ambient Monitoring Plan Revision 2, July 2010 version as described in: MWRA. 2010. *Ambient monitoring plan for the Massachusetts Water Resources Authority effluent outfall revision 2. July 2010.* Boston: Massachusetts Water Resources Authority. Report 2010-04. 107p.

***Effluent***

1. Discontinue effluent floatables monitoring.
2. Change special study metals and organic chemicals sampling frequency from "weekly" to "four times per month."

***Water column***

1. Reduce the total number of outfall monitoring stations sampled from 33 to 14, focusing the monitoring on the geographic area now known to have the possibility of being affected by the discharge. Reference stations are included, but most of the farther stations are removed.
2. Monitor in Cape Cod Bay and Stellwagen Bank NMS at three stations, two depths, including *in situ* water quality parameters, water column chemistry, and plankton measurements. These stations will be sampled synoptically with the nearfield stations and reference stations (*i.e.* target the sampling to occur within 48 hours of sampling at the nearfield and reference stations).[1]
3. Change survey schedule from 12 nearfield station surveys and six farfield station surveys annually to nine surveys annually of five nearfield stations, six reference stations and three Cape Cod Bay-Stellwagen Bank National Marine Sanctuary stations. This design will enable MWRA to sample all stations during every survey, and to measure physical, chemical, and plankton parameters at all stations.[2] This will provide a synoptic picture of a broader area than was previously possible, facilitating data interpretation. While the nearfield stations will be sampled less often than they are currently, reference stations will be visited more often than in the existing design.
4. Discontinue costly productivity measurements which have not found a substantial increase in outfall-related productivity.
5. Discontinue some water chemistry tests which have been rarely used in interpretive reporting.
6. Reduce frequency of net tow surveys for floatables, but do visual monitoring for floatables at the outfall site on each survey. Carry out two net tow surveys annually following blending events at Deer Island Treatment Plant.

[1] If it is logistically infeasible to sample within 48 hours of the targeted day, MWRA will provide EPA a courtesy notification. MWRA will provide further information in its annual outfall monitoring overview report including the actual dates monitoring was conducted and rationale for any monitoring which exceeded the 48 hours of the targeted day.

[2] Plankton will not be measured at station N21 at the edge of the mixing zone because the other four nearfield stations will provide sufficient characterization of plankton in the nearfield.

7. MWRA has augmented the Gulf of Maine Ocean Observing System mooring off Cape Ann with instrumentation for continuous chlorophyll measurements. In addition, MWRA has added water quality instrumentation to the NOAA weather buoy 44013 southeast of the outfall. Thus, continuous water quality data are available in real time on the internet.

***Seafloor***

1. Reduce the number of soft-bottom community monitoring stations sampled annually from 16 or 17 (depending on if it is an even or odd year) to thirteen, and change the present design which samples alternating sets of stations each year to one in which a consistent group of stations is sampled every year. Nearfield, reference, and Stellwagen Basin locations are included in the soft-bottom community surveys. The cost-effective sediment profile imaging at the current 23 nearfield soft bottom stations will be continued.
2. Reduce the sediment contaminant monitoring stations to the same thirteen stations used for soft bottom community monitoring. Continue the existing schedule of sampling every third year.
3. Discontinue the annual sediment contaminant sampling at two nearfield stations. These stations will now be sampled every third year with the rest of the stations.
4. Modify the sampling frequency for the hard bottom study to every third year, with samples collected the same year as sediment contaminant studies. A hard bottom survey in a year when none is planned would be triggered if the 7-day mass loading for total suspended solids exceeds 180,000 pounds/day.
5. End the nutrient flux study which has answered its monitoring questions.