



November 27, 2023

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Claire Goldin
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Dear Ms. Barden and Ms. Goldin:

The Outfall Monitoring Science Advisory Panel (OMSAP) appreciates the opportunity to provide comments on the draft National Pollutant Discharge and Elimination System (NPDES) Permit for the Massachusetts Water Resources Authority (MWRA) Deer Island Treatment Plant and combined sewer overflows (CSOs) prepared by the U.S. Environmental Protection Agency (EPA) in collaboration with the Massachusetts Department of Environmental Protection (MassDEP). Given the complexity of the issues addressed in the NPDES Permit, we appreciate the extension of the deadline for comments.

By the mid-1980s, Boston Harbor was highly polluted and MWRA was established to provide water and sewer facilities that would result in a new wastewater treatment plant discharging into Massachusetts Bay. The public was concerned that the outfall discharges would pollute Massachusetts Bay similar to what had occurred in Boston Harbor. An advisory committee—the Outfall Monitoring Task Force—composed of scientists, agency staff, MWRA staff and their consultants, and the public developed a monitoring plan with a goal of evaluating the impacts of the outfall based on the issues raised by the public: Is it safe to swim? Is it safe to eat seafood? Are aesthetics being maintained? and Are natural resources being protected? A monitoring program was developed to address those questions, to review whether the monitoring approach answers the questions, and if necessary, to revise the plan to optimize responses.

The current NPDES Permit was issued in August 2000, which created the OMSAP to advise the EPA and the MassDEP “on scientific and technical matters related to the Massachusetts Water Resources Authority’s Boston outfall in Massachusetts Bay and any potential impacts of the discharge on its receiving waters.” In addition to the OMSAP, two other panels—a Public Interest Advisory Committee (PIAC) and an Inter-Agency Advisory Committee (IAAC)—were created to advise the OMSAP, MWRA, EPA, and MassDEP on regulatory matters related to discharges from the operation of the outfall. We appreciate the dedication of MWRA to

maintaining and operating the facility and for their commitment to minimizing impacts. We especially appreciate the support of the Environmental Quality Department throughout the years for their reporting and meeting with OMSAP to discuss ongoing results. We also thank the state and federal agencies and the public for their concern to do no harm to Massachusetts Bay.

The 2000 NPDES Permit required an extensive monitoring program both near the outfall and at a number of far-field sampling points. It also allowed for modification of the plan. For a record of changes proposed by OMSAP that reduced duplicative monitoring, while retaining data to answer questions posed by the established monitoring plan, see <https://www.epa.gov/npdes-permits/outfall-monitoring-science-advisory-panel#rmp>.

OMSAP has worked closely with EPA, MassDEP, MWRA, and many other stakeholders over the past 23 years to review data collected to determine if the MWRA ocean outfall was adversely affecting Massachusetts and Cape Cod Bays. Our conclusions are based on the original monitoring plan and its measured parameters, specified in the Ambient Monitoring Plan (<https://www.epa.gov/npdes-permits/outfall-monitoring-science-advisory-panel>). The basic conclusion is that on the basis of parameters (namely legacy contaminants) measured in the nearfield and farfield stations, there was no detectable impact of the outfall on the ecosystem of Massachusetts and Cape Cod Bays. We did, however, observe concerning changes in the ecosystem over this period, although the current monitoring program did not allow us to determine if there are links to the MWRA outfall. The OMSAP and other stakeholder groups interested in the long-term health of this ecosystem believe it is critical to investigate these possible links into the future. In this letter we included input from our two advisory groups PIAC and IAAC and from attendees at a listening session. These include changes in key species in the ecosystem, and more frequent low-oxygen events that were detected during the last few years of monitoring. Further, though not included in the original design of the monitoring program because they were not previously recognized, multiple contaminants of emerging concern (CECs) are being discharged by wastewater treatment plants and other dischargers into Massachusetts coastal waters. These CECs should be monitored in the effluent and in the receiving waters, and their effects evaluated by an independent group of scientists.

Concerns about the 2023 MWRA NPDES changes

Elimination of a Contingency Plan

The proposed MWRA draft Permit is a major departure from the existing Permit, including several substantial changes regarding discharges, responsibilities for maintenance, and timelines to address recommended changes. Based on demonstrated decreases in legacy contaminants in sediments at monitoring sites in Massachusetts Bay, it has been interpreted that the effluent has no effect on Massachusetts and Cape Cod Bay ecosystem health. As result, the draft Permit has retained a water-quality monitoring portion at near- and far-field sites, but it has eliminated many other monitoring components such as benthic sampling and monitoring for contaminants in fish, and shellfish. Especially concerning is the elimination of monitoring designed to ensure no harm to natural resources. Without knowing what is being discharged from the outfall and

accumulating in sediments and in the bodies of organisms, it is not possible to determine whether there is an effect on the ecosystem. In addition, the contingency plan that identified issues that needed to be watched or studied was eliminated. Without identifying exceedances as identified in the contingency plan, there is no path for collective scientific or public input to comment on, or to call for additional action. We note that on p. 64, section k there is the option for individuals to propose changes to the monitoring plan, contingent on approval by EPA, however, the process does not appear to benefit from thoughtful discussions on recommended changes based on questions, approaches to answering questions, and evaluation of data by a group of informed individuals outside of MWRA and EPA.

We recommend retaining the Contingency Plan caution and warning levels to guide evaluation of monitoring results. These values were based on 9 years of monitoring before the outfall became active and have been modified, as appropriate, to reflect realistic expectations. We recognize that the Contingency Plan is not the only option for setting expectations of exceedances, but until another option is proposed and accepted by scientists and the public, the current Contingency Plan should be used.

Elimination of the Outfall Monitoring Science Advisory Panel

The proposed Permit will no longer require a scientific oversight committee which is currently OMSAP or its equivalent hereafter Science Advisory Panel (SAP). The monitoring plan will be the responsibility of MWRA and the staff from EPA and MassDEP who will review it. Under the proposed Permit, without a SAP, it will be much more difficult to recognize new issues such as CECs and to make changes to the monitoring that are timely and that adequately protect the ecosystem and the public. OMSAP believes that the absence of an outside scientific committee with the ability to examine potential toxic compounds in influent and effluent is the wrong approach, and is not forward-looking or environmentally responsible. There are numerous examples where SAPs provide advice in nearly all types of scientific and technical studies conducted by EPA and MassDEP.

Even without a change in the political structure in Massachusetts NPDES permitting, there is an opportunity now to use the success of OMSAP as a model for a group of scientists to help organize a wider monitoring program to focus on CECs and other ecological changes that are being observed in the coastal waters of Massachusetts. The new permit should contain language that obligates MWRA, MassDEP, EPA, and this next scientific group to work together to frame and periodically update the new AMP based on evaluation of its data.

A new SAP can help integrate science for the entire Massachusetts Bay system and can also act as a bridge to the wider Gulf of Maine (see “Taking a Regional Approach to Monitoring” below). However, in order to have a real impact, the new SAP will need to be affiliated with a group that has some leverage on the research being done in these systems. In the existing MWRA Permit, OMSAP had a prescribed role and therefore had some influence and some leverage on what was done. Issues raised by the OMSAP were carefully considered by all constituents of the Massachusetts Bay community through public meetings and with advice from the PIAC and IAAC, as well as other scientists and the public. As currently proposed, there is no

formally established public input into a review of the monitoring activity, only ad hoc contributions are accepted and reviewed by EPA (p. 64 section k¹.) which OMSAP believes is not adequate.

Contaminants of Emerging Concern (CECs)

OMSAP recognizes the commitment of MWRA to operate and maintain a highly effective, functioning wastewater treatment plant. However, it is also the largest discharger into Mass Bay. During treatment, some contaminants and pollutants are removed with biosolids, whereas others are removed in primary and secondary treatment facilities and some are made more toxic during treatment. The Clean Water Act require states to develop water-quality standards that prevent degradation of water bodies that protect water quality, human health, and natural resources. Legacy contaminants such as metals and some organic compounds such as PCBs, are regulated, but numerous CECs are not yet regulated in spite of growing evidence for their harm to humans and wildlife. We are concerned that neither the state nor EPA will consider adding CECs that are potentially toxic or harmful to humans and/or wildlife. We are advocating for a tiered approach to examining contaminants that are likely to be found in Massachusetts discharges. We propose a three-step approach that determines whether the contaminant is present in the influent, present in the effluent, or potentially accumulated in aquatic life. Non-regulated compounds (such as brominated flame retardants that are ~ 20% of the market, basically replacing PFAS retardants and often used in furniture and other household products) should be evaluated for their toxicity, bioaccumulation, and longevity in the environment. There are many other such CECs that need to be examined for their presence and potential risk. This approach is similar to the joint state (California) and EPA NPDES permit for the Orange County Southern District that tests local impacts and shares results regionally.

Responding to concerns of the PIAC and IAAC to review the effectiveness of the current monitoring program and to identify issues of emerging concern, OMSAP along with Save the Harbor/Save the Bay, convened a workshop to address these issues (OMSAP, 2018. accessed at EPA OMSAP website; <https://www3.epa.gov/region1/npdes/mwra/omsap/pdfs/framework-understanding-contaminants-emerging-concern-marine-waters.pdf>). The consensus was that the effectiveness of MWRA to reduce measured contaminants at the source resulted in decreased legacy contaminants, and in either decreases or no increase in PCBs, DDT, and Chlordane. However, there has been little effort to address CECs that may impact the ecosystem, three of which were identified at the workshop— pharmaceuticals and personal care products (PPCPs), per- and polyfluoroalkyl substances (PFAS), and microplastics. Some PFAS compounds are now being regulated and included for monitoring in newly adopted NPDES permits, but no levels of concern in receiving waters are identified. The time between identifying toxic compounds and

¹ k. Modifications to Ambient Monitoring Plan

By November 15 of each year, the Permittee or any member of the public shall submit a list of any proposed modifications to the ambient monitoring plan to EPA and MassDEP. These modifications shall become effective upon written approval by EPA and the MassDEP.

(1) The Permittee or any member of the public may also propose modifications at any time. Such modifications will become effective thirty (30) days after the Permittee provides written notice to EPA and MassDEP, unless there is written objection from EPA or MassDEP. Such approvals will be effective until EPA and MassDEP take action on the Permittee's or the public's next annual request.

taking actions to limit them may take years or decades. For example, in 2008-2009 PFOA and PFOS were considered contaminants that could be present in drinking water and that constitute a health concern, but it was not until 2021 that drinking water regulations were promulgated. Unfortunately, there are many other compounds and chemicals that EPA lists in its Contaminant Candidate List (CCL) that are not presently regulated for drinking water quality. These CCLs are difficult to regulate; they may have no known lethal or acute impacts, and no immediate cause-and-effect relationship to human health or ecosystem impacts but continue to be studied by EPA. As a result, new contaminants are rarely added to water-quality regulations. Without a forward-looking approach to monitoring of potential CECs, the Permit is not addressing critical issues on CECs. We recommend that the new permit includes a strategic approach to identify CECs, and to determine if they are found in influent or effluent, and, when appropriate, determine if they are bioaccumulated in bivalves, crustaceans like lobsters and crabs, and fishes.

Similarly, microplastics are now recognized as a particularly insidious threat to marine organisms as they can be mistaken for food, impact scope for growth, and cause mortality at many life stages of the marine resources living near the outfall. They too should be examined more closely even though they are diluted during discharge, they are long-lived and disruptive to ecosystems.

As noted above, there is precedent for joint state and EPA NPDES permits to adopt a precautionary strategy for evaluating and monitoring contaminants, including those that may be present in effluent but are still under review as CCLs. The joint permit for California's Orange County Sanitation District (OCSD) facilities has a list of contaminants that have different "endpoints" either as regulated chemicals monitored frequently, others as potential threats, and some as the equivalent of "special studies" (<https://www.epa.gov/npdes-permits/ca0110604-orange-county-sanitation-district-reclamation-plant-no-1-treatment-plant-no>). In the OCSD NPDES permit, justification for the monitoring comes from criteria in the Clean Water Act and the need to monitor not only in the effluent but also to ensure that they are not degrading the quality of the receiving water.

Currently there are many more anthropogenic contaminants that need to be evaluated for their effect on ecological and human health than can possibly be assessed using traditional bioassays. While there are several approaches available, the Structured Activity Modelling is used by EPA and in Europe to screen and prioritize the contaminants for monitoring and has been applied to estimating the impacts in receiving waters and is based on scientific literature and reliable databases.²

We strongly disagree with the statements in the draft MWRA NPDES Permit such as: "Currently, there are no National Recommended Water Quality Criteria for CECs, PPCPs as a

² EPA IRIS database: The Integrated Risk Information System (IRIS) is a database of chemical toxicity information maintained by the U.S. Environmental Protection Agency (EPA); ATSDR TOXNET database: The Toxicology Data Network (TOXNET) is a database of toxicological information maintained by the Agency for Toxic Substances and Disease Registry (ATSDR); PubChem: PubChem is a database of chemical information maintained by the National Institutes of Health (NIH); and scientific literature

group, or individually or microplastics. As such, EPA is unable to evaluate the data further or determine reasonable potential.”³ The EPA is *actively* researching the threat posed by microplastics and methods for monitoring them, with 95 items listed in the agencies scientific inventory.⁴

We have specific recommendations for CECs (including PPCPs and microplastics) that include some quarterly monitoring of influent and effluent and some monitoring of bivalves, crustaceans like lobsters and crab, and fishes based on independent, scientific evaluations. Some chemicals should be monitored quarterly in grab samples, and for selected chemicals a special study should be initiated to evaluate the extent to which chemicals are found in marine organisms. Along with quarterly monitoring of PFAS compounds, we suggest adding brominated flame retardants that are known to cause neuro- and endocrine disruption and other long lasting chemicals that are likely to be present in the MWRA collection system. For PFAS and other known harmful chemicals present in the system, MWRA should coordinate with the Massachusetts Division of Marine Fisheries biannual fish surveys and collect livers from fish likely to be exposed to the discharge to evaluate what compounds may be bioaccumulated. This approach is a tiered approach such that only chemicals that are likely to be found in Massachusetts are examined in the influent and effluent, and those chemicals that are in concentrations of sufficient concern would warrant additional analysis of their presence in fish liver, initially, and also bivalves and crustaceans should be examined. The choice of evaluating bioaccumulation of contaminants in liver, hepatopancreas and other similar organs is relevant to predators many of which have high concentrations of PFAS and other long-lived contaminants (OMSAP white paper at <https://www3.epa.gov/region1/npdes/mwra/omsap/pdfs/framework-understanding-contaminants-emerging-concern-marine-waters.pdf>; (Dassuncao et al. 2017⁵; Dassuncao et al. 2018⁶). We also recommend that selected pesticides that are likely to be used or manufactured in the MWRA system be monitored in the influent and if present in substantial amounts in the effluent and ultimately in marine organisms as recommended by SAP. This approach recommends ongoing evaluations that should be continuous as new chemicals of concern are identified.

In addition to chemicals that are long-lasting we recommend that at least five selected chemicals from pharmaceuticals and personal care products (e.g., medications, antibiotics, salves, creams, lotions and shampoos, detergents, specific additives among others). These should be monitored quarterly from grab samples and revisited periodically. The periodicity of the sampling should be based on the specific questions that are being addressed and variability that is observed in pilot sampling.

³ <https://www3.epa.gov/region1/npdes/mwra/pdf/2023/mwra-2023-fact-sheet.pdf>, pp 89-95

⁴ (https://cfpub.epa.gov/si/si_public_search_results.cfm?showcriteria=2&timstype=&timssubtypeid=&epanumber=&ombcat=Any&datebeginpublishedpresented=&dateendpublishedpresented=&datebeginupdated=&dateendupdated=&deid=&personname=&personid=&role=Any&journalname=&journalid=&publishername=&publisherid=&sortby=pubDate&count=25&searchAll=Microplastics).

⁵ Dassuncao, C., X.C. Hu, X. Zhang, R. Bossi, M. Dam, B. Mikkelsen, and E.M. Sunderland. 2017. Temporal shifts in poly- and perfluoroalkyl substances (PFASs) in North Atlantic pilot whales indicate large contribution of atmospheric precursors. *Environmental Science and Technology* 51: 4512–4521. <https://doi.org/10.1021/acs.est.7b00293>.

⁶ Dassuncao, C., X.C. Hu, F. Nielsen, P. Weihe, P. Grandjean, and E.M. Sunderland. 2018. Shifting global exposures to poly- and perfluoroalkyl substances (PFASs) evident in longitudinal birth cohorts from a seafood-consuming population. *Environmental Science and Technology* 52: 3738–3747. <https://doi.org/10.1021/acs.est.7b06044>.

Dissolved Oxygen

Over the past few years, there are signals that dissolved oxygen (DO) concentrations in Massachusetts Bay are decreasing, related in part to increasing temperatures throughout the Gulf of Maine, including Massachusetts Bay. Other causes, such as strong pycnoclines that prevent vertical exchange of water and unusual plankton growth, can create hypoxia leading to significant mortality in lobster in traps as occurred in Cape Cod Bay in 2019 and 2020 (<https://bg.copernicus.org/articles/19/3523/2022/>). Data from the MWRA monitoring programs also show declining concentrations of DO at certain locations in Massachusetts Bay, especially near Stellwagen Bank and near some near-field monitoring areas (202212_NF_Stellwagen_DO_20221207_signed). While no direct link has been established between DO concentrations in Mass Bay and the outfall, there is clearly a trend in declining DO concentrations over the last 20–25 years. This is a major concern and needs to be carefully monitored and discussed by the scientific and regulatory communities that focus on Massachusetts coastal waters.

While warming average sea temperatures affect DO due to the lowered capacity for warmer waters to hold dissolved oxygen, the impact of nitrogen loads on DO in warmer waters may be increasing. Nitrogen loads play a role in increasing plankton growth that can lead to eutrophication over time. Nutrient loading fuels additional primary production, which can lead to eutrophication, which exacerbates oxygen depletion, and so with increasing sea surface temperatures, the detrimental effects of nutrient loading will increase. Warmer waters with excess nutrients also can be increasingly hospitable to harmful algal species of concern to fisheries, including some species whose blooms have been noted in Mass and Cape Cod bays in recent years. The recent low DO in Stellwagen Bank and near-field stations was associated with the long-term persistence (April to July) of a dinoflagellate bloom, *Tripos muelleri* (formerly *Ceratium tripos*) and its die-off in early June and July (Letter to EPA and MassDEP from Rebecca Weidman, MWRA Deputy Chief Operating Officer, Nov. 3, 2023).

An additional possible confounding factor in the interpretation of data on effects of nutrient loads based on historical data from current monitoring sites is that current intensities and direction have the potential to change over time, OMSAP would like to see a special study initiated between stakeholder and regional academic groups to update our knowledge of current intensities and trajectories to determine how nutrients (and contaminants) are distributed from the outfall nearfield into far field locations in Massachusetts and Cape Cod bays. This knowledge will be integral to our understanding of increasing low DO events in these ecosystems. Much has changed over the last 30 years, but our monitoring approach has not kept up with the possibly compounding effects of increased temperatures and nutrients, the increased frequency and severity of storm events, and the thousands of new chemicals and compounds created for household products, cosmetics, medicines, and industrial purposes that become contaminants of emerging concern when they are discharged into our coastal waters. The increased frequency and severity of storm events and the concomitant increase in outfall discharge during these events would seem to warrant ‘event level’ monitoring to examine the dynamics of the diffuser plume in the near and far field, to see if the plume is truly confined below the pycnocline during these events. There are some observations of the plume reaching the surface during the stratified

season that warrant investigation, as the design of the diffuser was intended to prevent this. Autonomous sampling systems (gliders, AUVs, ASVs) that were in their infancy when the plant came online could now be leveraged with initiation of intentional and well-designed collaborative special studies to examine this issue.

Elimination of Benthic Monitoring

In 2020 the OMSAP letter recommended some changes to benthic monitoring that eliminated the sediment profile monitoring, but we did not suggest eliminating the soft-bottom monitoring every three years. This is the only current long-term program in Massachusetts Bay and to eliminate it would be a loss of valuable data at a time when climate change is modifying communities and where the effects of the outfall may change in the future. The good news is that data suggest that diversity is being maintained but there are changes in species composition. Climate change is impacting the Mass Bay benthic ecosystem with new species arriving changing the composition of the communities. In other areas, the habitat seems to be deteriorating. For example, a polychaete worm, *Capitella* sp., is a harbinger of highly impacted benthic communities (e.g., it was formerly common in Boston Harbor); recently it has been found in Nahant Bay, indicative of a deteriorating benthic community (E. Gallagher, pers. comm., 2023). We have a window of opportunity to document these changes as a result of warming temperatures and to evaluate if the outfall will have an impact. We recommend that MWRA continue to monitor benthic communities every three years including identification of changes in keystone or dominant species. These data will provide valuable long-term information on any changes in community structure possibly related to outfall inputs, warming sea temperatures and/or other climate related environmental impacts.

Elimination of Fish and Shellfish Monitoring

It was disappointing to find that fish and shellfish have been eliminated from the monitoring program. The data show that legacy contaminants are below contingency plan levels, however, there is no effort to examine the presence of contaminants of emerging concern that should be monitored. We suggest at a minimum that PFAS be monitored in shellfish and fish, especially in livers. It is required to be monitored in newly issued NPDES permits. The earlier lack of action by EPA regarding limiting PFAS in drinking water resulted in numerous water supplies being contaminated from PFAS. From 2019 to 2022, the state spent \$30 million and the federal government \$140 million to clean PFAS-contaminated water supplies. OMSAP believes a proactive approach here is the most responsible. There are many other CECs that should be evaluated in fish livers and shellfish. Prevention is cheaper than clean-up, and clean-up is never guaranteed. Earlier in the section on CECs (including PPCPs and microplastics) we have recommended a that has a tiered approach to identifying CECs likely to be in Massachusetts effluent, and further examination of liver and other organs to determine if there is bioaccumulation that would impact humans and predators.

Elimination of Lobster Monitoring for PCBs

The addition of lobsters to the Ambient Monitoring Program was based in part on early studies conducted by EPA of lobsters in Quincy Bay that showed high concentrations of PCBs in the hepatopancreas and reports showing that PCBs were of concern especially to children and pregnant women (EPA, 1988; Assessment of Quincy Bay of Contamination: Summary Report). The proposed NPDES Permit eliminates sampling marine organisms, noting that lobsters were below Contingency Plan levels for legacy contaminants based on the contaminants in the current AMP. These contaminants do not necessarily represent CECs identified in the EPA Contaminants of Concern Lists or in the OMSAP white papers. Furthermore, monitoring organs that concentrate contaminants, e.g., liver and hepatopancreas, may be more representative of what predators consume. As noted earlier, we recommend monitoring for PFAS, other long-lived contaminants and other CECs, including PPCPs and microplastics lobster in hepatopancreas.

Harmful Algal Blooms

We support EPA's recommendation to continue to monitor harmful algal blooms (HABs). MWRA has been participating in monitoring *Alexandrium catenella* and reports on other phytoplankton blooms as well. We are not commenting on specific monitoring recommendations as we think this is an issue for a larger scientific advisory committee and experts in this field. We would add that providing a specific list without options for monitoring other species is limiting and does not reflect what happens in nature; changes often occur in the composition of microbial communities concurrent with environmental changes. The unexpected persistence of *Tripos muelleri* this summer is one case in point. *Pseudo-nitzschia* spp. is another complicated challenge to identify species and determine level of toxicity (e.g., 58 species are known and 28 of those have been shown to produce domoic acid), adding to the challenge of overall variability observed with plankton blooms (Spaulding et al. 2021, doi:10.1080/0269249X.2021.2006790⁷). We concur that MWRA should participate with other agencies, such as the Massachusetts Department of Marine Fisheries, the Department of Public Health and others involved in identifying and documenting the extent of HABs in Massachusetts Bays and impacts on human health. We support a special study to examine the underlying changes in the environment supporting more extensive blooms and recommend collaborating with the Northeast Regional Atlantic Coastal Ocean Observing System and the National Oceanic Atmospheric Administration and others.

⁷SA Spaulding et al 2021. Diatoms.org: supporting taxonomists, connecting communities. Diatom Research 36:291-304. doi: 10.1080/0269249X.2021.2006790.

Taking A Regional Approach to Monitoring

MWRA is the major discharger in Massachusetts Bay but not the only discharger making an impact on the ecosystem⁸. There are other wastewater treatment plants (WWTPs) and dischargers of particular contaminants that are not conducting monitoring programs. As part of its mandate, OMSAP is expected to consider impacts in Mass Bay in the context of changes in the Gulf of Maine. OMSAP has consistently noted that the cumulative impacts of all of the dischargers should be evaluated and managed to preserve a balanced, functional ecosystem in which the anthropogenic impacts are understood and mitigated wherever possible. As the oceans continue to warm, major changes in the physical, chemical and biological components of Massachusetts Bay are occurring that are affected by local dischargers. With several WWTPs besides MWRA discharging into Mass Bay as well as discharges into the Merrimack River and other sources to the north, we anticipate that over time nitrogen levels will continue to increase. We strongly encourage regulators to begin looking at the dischargers into Massachusetts coastal waters as a community of dischargers for whom regulations and permits need to be considered not individually but holistically. Such an approach makes the most sense ecologically, and can lead to development of cohesive monitoring programs that are based on system-wide questions of status, trends, stressors, and responses to these stresses, but that also can be adapted for each location. Regulating based on single systems is not likely to address the general changes that already are being observed in Massachusetts coastal waters.

OMSAP strongly believes that there is a need for a system-wide scientific review committee. We recognize that there are two levels of monitoring—monitoring to ensure that the discharge is not causing harmful effects to human health or natural resources, and monitoring to develop a complete scientific understanding of the ecosystem and how it's changing. The second is more interesting, but not really the responsibility of MWRA or its rate-payers. A coordinated effort with other dischargers could assist in understanding the broader questions. The committee should lead an effort to clearly articulate the questions that need to be answered. We need a monitoring program that is specifically designed to answer those questions; plans for data collection, data management, data analysis, and timely public access to the data; and options for responses to any changes that are observed over time. OMSAP's relationship with the MWRA, EPA, and MassDEP is a model for how this can work effectively. While OMSAP believes that MWRA should expand its AMP going forward to examine links between its effluent and CECs, DO, and harmful algal blooms, it is not the only agency that discharges into Massachusetts coastal waters that should be contributing to the costs of such efforts. We think that the new Permit can stimulate a coordinated effort among dischargers to maintain and strengthen the monitoring program for dischargers into Massachusetts Bay that reflects the cumulative impacts on the ecosystem. The goal is to meet the Clean Water mandate to do no harm to the ecosystem and sustain it as a Category SA water body. We think doing no harm to Massachusetts Bay in the future will be more challenging with the combined effects from climate change and contributions from discharges throughout the region.

⁸MWRA is the largest, but not the only discharger to Massachusetts Bay. There are nine other WWTPs discharging an average total of 67.2 MGD (0.44-25.8 MGD). Based on the average of 299 MGD by MWRA, it contributes ~82% of WWTP discharge into Massachusetts Bay. Most of the discharges into Cape Cod Bay are from septic-system groundwater with only 6 MGD discharged from a WWTP. MWRA is currently the only discharger with a NPDES permit that requires significant ambient monitoring (data from MassDEP, 2022)

There are models in other states that have adopted this approach and comprehensively address issues on a regional scale. Examining WWTPs nationwide, we are impressed with what regional programs can accomplish. Two that have NPDES permits include the San Francisco Bay Regional Water Quality Control Board (SFB Waterboard) and the Orange County Sanitation District (OCSD) in southern California. The SFB Waterboard’s mission is to protect, restore, and manage the Bay region’s water resources for beneficial use and protection of the ecosystem (<https://www.waterboards.ca.gov/sanfranciscobay/>). Their system comprehensively integrates water-related issues such as runoff, stormwater discharges, and reclamation and supports a state-of-the-art Surface Water Ambient Monitoring Program (SWAMP). NPDES permits are issued for wastewater and stormwater discharges, and small discharges are issued state permits. We note that through regional planning agencies, watershed approaches are addressing stormwater and other water management issues⁹.

Similar to the Massachusetts permit process, OCSD is issued a joint state and EPA NPDES permit that encompasses reclamations, treatment plants, wastewater collection systems, and outfalls (<https://www.epa.gov/npdes-permits/ca0110604-orange-county-sanitation-district-reclamation-plant-no-1-treatment-plant-no>). The OCSD NPDES permit has a tiered approach to water-quality parameters. In addition to the traditional pollutants such as nutrients, metals, organic compounds, bacteria, and sediments, they use technology-based effluent limits (TBELs) and water quality-based effluent limits (WQBELS) for CECs. Although there may not be regulatory standards for some compounds, the selected compounds are contaminants of concern and are likely present in the discharges of the facilities. Thus, OCSD is required to monitor as indicated in the permit—“Dischargers sampling and analytical effort may be reallocated to provide a regional assessment of the impact of wastewater discharges to the Southern California Bight; however certain core elements (i.e., monthly water quality monitoring, quarterly REC-1 benthic monitoring, semi-annual trawl fish monitoring, and weekly Orange County Regional Shoreline REC-1 cooperative monitoring) shall remain unchanged.” (<https://www.epa.gov/system/files/documents/2021-07/r8-2021-0010-ca0110604-oc-sanitation-district-2021-06-23.pdf>).

Supporting the California dischargers is the regional Southern California Coastal Water Research Project (SCCWRP) funded by wastewater, stormwater, and water-quality agencies. It is an intergovernmental agency that focuses on developing strategies, tools, and technologies to support regional water-quality management programs to sustain healthy coastal ecosystems. While SCCWRP does not manage discharges, it translates its research and scientific findings to support managers and policy-makers (<https://www.sccwrp.org/>). While each of these programs are structured differently than our WWTPs in Massachusetts and have different mandates, they are all regionally funded and focused on sustaining and improving local water quality as they conduct monitoring and undertake special studies to examine new and emerging issues such as CECs. The OCSD joint NPDES permit includes regular posting of results for the public and review by SCCWRP, an independent, external group that advises on scientific issues. The new

⁹ In general, the project found that the growth in water demand in the study area is likely to be gradual over the next 20 years. Therefore, communities can address the new regulatory requirements and substantially reduce impacts to waterways by being proactive in implementing a variety of incremental changes in the areas of water conservation, wastewater management, stormwater management, and optimization of withdrawals. <https://www.mapc.org/resource-library/neponset-river-watershed-water-management-act-planning/>

MWRA permit should be explicit in establishing a Regional Scientific Advisory Panel that is formally appointed with leverage to advise on scientific issues related to the outfall.

We have made several suggested changes to the permit many of which would benefit from having an SAP to review results and recommend revisions and modifications. With the goal of the Clean Water Act to do no harm to natural resources, a SAP can adhere to the mandate of protecting Massachusetts Bay with effective monitoring to address issues related to impacts from the outfall.

Sincerely,

A handwritten signature in cursive script that reads "Judith Pederson".

Judith Pederson, Chair on behalf of OMSAP members, Chair

MIT Sea Grant College Program, Retired

Peter Burn, Suffolk University

Loretta Fernandez, Northeastern University

Virginia Edgcomb, Woods Hole Oceanographic Institution

Robert Kenney, University of Rhode Island, Graduate School of Oceanography, Retired

Mark Patterson, Northeastern University

Jeffrey Rosen, Corona Environmental Consulting, LLC

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Juanita Urban-Rich, University of Massachusetts Boston