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Massachusetts 2020 Air Monitoring Network Plan and Network Assessment Response to Comments

December 22, 2020

MassDEP operates a network of 22 ambient air quality monitoring stations at locations across the Commonwealth as part of a comprehensive program to provide information about air quality to the public and to determine compliance with National Ambient Air Quality Standards (NAAQS). Each year, MassDEP is required to submit to the U.S. Environmental Protection Agency (EPA) an Air Monitoring Network Plan in accordance with Title 40 CFR Part 58.10. On August 7, 2020, MassDEP published a draft 2020 Network Plan and Network Assessment for a 30-day public comment period. MassDEP received comments on the draft Plan from EPA and from citizens and local officials, and comments on the Network Assessment from EPA. MassDEP has summarized and responded to these comments below.

EPA's Comments

1. **Comment:** The addition of information to the annual network plan is appreciated, especially the final section where each site is identified separately with siting information as well as a picture of the shelter. The Wampanoag/Aquinnah ozone site should be included as well in this list since it is part of Massachusetts Department of Environmental Protection (MassDEP) primary quality assurance organization (PQAO). Be sure to be consistent when describing PM2.5 monitoring at sites. In some cases, it says continuous PM2.5, others it does not when there is a continuous monitor at the site. Also make sure all measurements are listed for all sites including collocated instruments and frequencies. We are attaching a .pdf of your plan with comments pointing out these discrepancies.

   Response: MassDEP has incorporated EPA's comments into Attachment 1.

2. **Comment:** Page 7, Ozone (O3) Network – The Chelmsford Manning Road Near Road site does not meet siting criteria for ozone and should be mentioned in the initial paragraph. A footnote can often be missed.

Response: MassDEP has moved the language in the footnote into the body of the document.

3. **Comment:** Page 10, Nitrogen dioxide (NO2) – There should be greater clarity on the current NO2 network. We have made some suggested edits in the .pdf file.

   Response: MassDEP has incorporated EPA's comments into the NO2 section.

4. **Comment:** Page 14. PM2.5 Network – On January 15, 2013, EPA revised the PM2.5 standard. In that rule, EPA also established that all continuous PM2.5 FEM monitors operating for more than 24 months should be used for comparison to the NAAQS unless a State specifically requests that the data be excluded under 40 CFR 58.11(e) and EPA approves that request. All of MassDEP's BAMs (and a T640) have a Federal Equivalent Method (FEM) designation. We are pleased that MassDEP will use data from all its continuous FEM monitors for comparison to the NAAQS. Please note our suggestions in the .pdf regarding greater clarity of the actual measurements being performed - continuous, filter based, and colocation along with frequency of any sampling.

   Response: MassDEP has incorporated EPA's comments into Attachment 1.

5. **Comment:** Page 16. Photochemical Assessment Monitoring Stations (PAMS) – MassDEP operates a gas chromatograph at the Lynn site but it is not mentioned in the Monitoring Site Description on page 26. Please make sure all information is included in the site pages. Beyond this, to be clear relative to enhanced ozone related monitoring activities, we formally approved your PAMS implementation plan for your Lynn site on May 9, 2018; and on August 15, 2019, we approved your Enhanced Monitoring Plan (EMP). We expect that those portions of your overall monitoring plan will be implemented.

   Response: MassDEP has incorporated EPA's comments in the PAMS description.

6. **Comment:** Page 17. Black Carbon - This is included in the Air Toxics section, whereas in previous year Annual Network Plans, it has been its own section. Whether in this section or not, some added text may be helpful.

   Response: MassDEP has added text explaining that MassDEP monitors black carbon monitors as an indicator for wood smoke and diesel combustion emissions.

Relative to your 5 Year Network Assessment, provided as a separate document also on August 7, we have the following observations:

7. **Comment:** On page 3, MassDEP indicates that it is designated as attainment for all ambient air quality standards. Portions of Massachusetts remain designated nonattainment of the 2008 ozone standard.

   Response: MassDEP has noted that Dukes County continues to be formally designated as nonattainment with the 2008 ozone standard even though air quality meets the standard.

8. **Comment:** On page 3 and 66, and as noted in comment 5 above, we believe the PAMS discussion should also discuss or reference commitments made as part of your approved enhanced monitoring plan for ozone.

   Response: MassDEP has clarified that the approved enhanced monitoring plan is being implemented.

9. **Comment:** On page 17, the discussion piece indicates that no county had a population growth of more than 0.4% between 2010 and 2018, yet table 3-2 shows the population in Suffolk County increased by 0.6% in that timeframe.

   Response: MassDEP has corrected the text in the discussion to match the information in table 3-2.

10. **Comment:** On page 21 and 22, we note that the reported probability of exceeding the ozone NAAQS is driven by the EPA analysis tool and images shown on page 69. That said, it is probably important to note that those estimates likely don't reflect reality. For example, page 21 reports Lynn and Chicopee having 2 the highest probabilities of exceedances. While that may be the case for Chicopee, reality doesn't reflect that for Lynn. Having Fall River, Aquinnah and Truro being less likely to exceed than Lynn does not seem realistic.

    Response: MassDEP has revised the discussion to note that the monitors in Fall River, Aquinnah and Truro are in fact those with the greatest probability of exceeding the ozone NAAQS due to ozone transport.

11. **Comment:** Page 30. The map showing the location of the monitors seems off. The 2 Chelmsford monitors seem to be located in Billerica, and the Fall River monitor appears to be in Swansea, MA.

    Response: MassDEP has updated the accuracy of the map in Figure 3-11.

12. **Comment:** Page 52. Figure 5-9 for PM2.5 shows the number of monitors required by EPA versus the number of monitors in the network, but it does not consider the Providence, RI-MA multistate area. (We do note that the overall area does have the adequate number of monitors.)

    Response: MassDEP has updated Figure 5-9 to include the Providence, RI-MA area.

13. **Comment:** Page 67. Figure 5-22 for ozone shows the number of monitors required by EPA versus the number of monitors in the network, but it does not consider the Providence, RI-MA multistate area. (We do note that the overall area does have the adequate number of monitors.)

    Response: MassDEP has updated Figure 5-22 to include the Providence, RI-MA area.

Comments Related to Air Monitoring in the Fore River Basin

MassDEP received many similar comments from citizens and local officials expressing opposition to the natural gas compressor station in Weymouth and expressing concern regarding the delay in establishing a permanent monitoring station and the possible placement of the station on Town-owned property on Monatiquot Street. These comments are summarized below.

14. Comment: We are concerned that the Monatiquot Street Location is less than optimal for the permanent monitoring station because it is surrounded by trees and behind the Calpine power plant which likely would block winds coming from East Braintree and Quincy Point. Trees may also alter the weather data from the station which is essential to know the coastal inversion. Additionally, the trees are a buffer that was part of mitigation for the permitting of the Calpine power plant for the North Weymouth neighborhood. Cutting of trees would result in more noise, air pollution and remove vegetative screening. Is there a reason that a location between the front side of Calpine and Route 3A - potentially in or near Lovell's Grove - cannot be utilized? With respect to the specs of the monitoring plan, local residents and experts have reviewed the current monitoring plan. Although it shows NO2 will be monitored, we are greatly concerned that it will not include the 1-hour NO2 measurement. Additionally, the Monatiquot location might also be less suitable to accurately measure the 1-hour NO2 levels. We request 1-hour NO2 measurements in the permanent station.

Additionally, the promise to the community was that the permanent air monitoring station would also measure weather and all meteorological data, and that was unclear in the plan. We must have weather data to monitor coastal zone inversion and other localized coastal weather patterns in the basin.

Residents are anxious to receive information from MassDEP about the date of placement. As this permanent air monitoring station was originally scheduled to be in service by July 1, 2020, time is of the essence. It is important that it be placed in service at least two months before the compressor might become operational to get baseline information. Since MassDEP does not deign to consider all relevant background pollution sources before permitting another polluting facility in the Environmental Justice neighborhoods of the Fore River Basin, we must insist on having provided proper information on background pollution before and after the compressor station is operational. Although the temporary air monitoring station at the MWRA pumping station provided some information, the NO2 and Ozone levels are of great concern and are not being measured at this time.

Response: The planned permanent monitoring station for Weymouth is included in MassDEP's Ambient Air Monitoring Network Plan and will monitor volatile organic compounds (VOCs), fine particulate matter (PM2.5), ozone, nitrogen dioxide (NO2), and meteorological parameters. The monitoring station will include 1-hour NO2 monitoring and meteorological parameters such as wind speed and direction.

After considering several potential locations MassDEP and the Town of Weymouth agreed that the Town-owned parcel on Monatiquot Street was the most suitable location for the

permanent monitoring station that would be representative of air quality that nearby residents breathe.

The distance from the Calpine power plant to the Monatiquot location is sufficiently far enough so that air flow from the surrounding area will not be impeded. EPA has siting criteria regarding distance from buildings that account for adequate air flow and the Monatiquot location meets these criteria. On October 13, 2020, MassDEP and EPA air monitoring personnel, along with Town officials, visited the property and confirmed the suitableness of the location relative to siting criteria, including adequate air flow. Some trees will have to be removed at the site; however, tree removal will be minimized to the extent possible and MassDEP will ensure that there will be continued vegetative screening for the local neighborhood along Monatiquot Street by planting new trees as necessary.

MassDEP has actively worked with the Town of Weymouth, EPA and other parties to identify and assess suitable locations for the permanent monitoring station and obtain agreement for siting of the station. MassDEP recognizes that local residents would like to have the permanent monitoring station operating as soon as possible. While identifying a final location has taken longer than expected, MassDEP is working quickly to establish the station now that a final location has been determined. MassDEP has ordered the monitoring station and anticipates that it could be placed at the site by February 2021. In the meantime, MassDEP will continue to perform air monitoring at the temporary air monitoring station that was established in early February 2020.

Other Comments

15. Comment (Kathy Dopp): Because MassDEP cares about the climate, and because methane gas, CH4, comprises most of the buoyant natural gas -- MassDEP should be measuring CH4 airborne levels at all its measurement stations. CH4 causes almost 100 times the greenhouse gas effect as CO2 emissions to within the first year and 30 times as much greenhouse gas effect as CO2 averaged over a 100-year period. We need to know how much fugitive CH4 is escaping into the atmosphere here in Massachusetts if we are to achieve any climate change goals going forward. Please add CH4 to the list of air quality measurements routinely taken at all the measuring stations so Massachusetts can accurately evaluate whether or not it is achieving its climate goals.

Response: MassDEP's monitoring network is designed primarily to determine compliance with EPA's National Ambient Air Quality Standards (NAAQS) for criteria pollutants. EPA's current list of criteria pollutants does not include methane gas (CH_4) and EPA has not issued NAAQS for CH_4, nor has EPA established federal reference monitoring methods for CH_4. The Commonwealth's climate goals are expressed in terms of reductions in greenhouse gas emissions rather than ambient concentrations. These goals include reductions in CH_4, which is a powerful greenhouse gas. For example, MassDEP has adopted regulations at 310 CMR 7.73 that impose annually declining CH_4 emission limits on Massachusetts gas operators. While MassDEP is committed to reducing CH_4 through its GHG emissions reductions programs, MassDEP does not plan to add CH_4 sampling to its existing monitoring stations because such monitoring would not provide useful information relative to achieving ambient

air standards. In addition, there are other metrics that are being used to assess progress on climate goals. MassDEP will continue to review information on studies of methane in the atmosphere.

16. **Comment** (Lynda Strom): Could you tell me what if anything is being done to monitor air quality from the newly established marijuana cultivation facilities in Massachusetts? I propose that monitoring of air quality near marijuana cultivation facilities be included in the 2020 Network Plan and 2020 Five-Year Network Assessment to track, monitor and regulate such facilities for the safety and well-being of humans and the environment in Massachusetts. Little concrete information is available on this new, growing industry yet ozone and human health may be at risk. There is a proposed facility less approximately 500 feet from my home. Although the property is industrial zoned, it is surrounded by residential homes, a lake and river, local wells, a highway, a fish hatchery, and sits on an aquifer protection district. The highway and potential ozone impacts for such a facility could prove to be a bad combination. I would be interested in hearing from you on this matter, and also on pursuing a monitoring station in this area.

    Response: MassDEP operates an ozone monitoring network throughout the state that meets EPA requirements for monitoring compliance with the ozone National Ambient Air Quality Standards (NAAQS). Monitoring data indicate that air quality throughout Massachusetts meets the ozone NAAQS, and therefore MassDEP is not planning to add additional ozone monitoring stations at this time (beyond those mentioned in the Network Plan). Marijuana plants naturally emit volatile organic compounds (VOCs) called terpenes, and VOCs are a contributor to ozone formation. However, VOC emissions from marijuana cultivation in Massachusetts is not a significant contributor to ozone formation relative to other biogenic VOC emissions (such as from trees), and the air in Massachusetts meets the ozone air quality standards.

17. **Comment** (Conservation Law Foundation): CLF is particularly concerned about the air quality in neighborhoods of color and low-income communities where residents face systematic injustices and disproportionate exposure to harmful air pollutants and who suffer higher rates of asthma and other respiratory diseases as a result.

    CLF recommends that MassDEP modify the Massachusetts 2020 draft Air Monitoring Network Plan ("Network Plan") to add additional PM2.5, PM10, volatile organic compound ("VOC"), O3, NOx, CO, SO2, black carbon, and ultrafine particle ("UFP") monitoring stations in environmental justice ("EJ") populations facing disproportionate levels of air pollution and the resulting negative health effects, including in Boston's Chinatown neighborhood, in downtown Boston, in Chelsea, in East Boston, in Everett, and in Revere. CLF particularly stresses the need for additional VOC monitors in neighborhoods where petroleum and chemical tank facilities are located, including in Chelsea, East Boston, Everett, and Revere. CLF further recommends the deployment of twenty inexpensive mobile air quality monitors across the greater Boston area and five throughout Springfield. Adding monitoring stations to the above communities will equip MassDEP with better and more precise data regarding air pollution exposure and enable MassDEP to more effectively protect the health of residents.

CLF strongly supports MassDEP's plan to establish a PM2.5 monitoring station in Boston's Chinatown neighborhood; however, CLF encourages MassDEP to install two multi-parameter monitoring stations in Boston's Chinatown and two multi-parameter monitoring stations in downtown Boston (rather than installing one single-parameter monitoring station to cover both Boston's downtown and its Chinatown neighborhoods). The new monitoring stations in Chinatown and Boston should monitor for all pollutant parameters associated with tailpipe pollution – including PM2.5, PM10, VOCs, O3, NOx, CO, SO2, black carbon, and ultrafine particles (UFPs). It is important to site new air quality monitors in Chinatown close to the highway interchange of I-90 and I-93, not merely where Chinatown borders the downtown Boston neighborhood.

CLF supports the installation of nine mobile sensors and the plan to deploy a permanent air monitoring station in Chelsea. CLF recommends that these commitments be reflected in the final Network Plan. In addition to deploying mobile air quality sensors, CLF further urges MassDEP to install a permanent air monitoring station in Chelsea with the capacity to test for all pollutants associated with nearby industrial emissions and tailpipe pollution, including PM2.5, PM10, VOCs, O3, NOx, CO, SO2, black carbon, and UFPs.

CLF recommends that MassDEP add stationary air monitoring stations in East Boston, Everett, and Revere, to its air quality monitoring network. The new stations should have the capacity to test for all pollutants associated with nearby industrial emissions and exhaust pollution, including PM2.5, PM10, VOCs, O3, NOx, CO, SO2, black carbon, and UFPs. Each of these communities host or are near to industrial sources of pollution, including bulk petroleum storage facilities, chemical companies, metal finishing facilities, and Logan International Airport, and are affected by tailpipe emissions from major roadways. Residents from these communities suffer from high rates of chronic disease, including lung cancer, obstructive pulmonary disease, and asthma.

CLF encourages MassDEP to dramatically expand its air quality monitoring capacity by adding a number of inexpensive mobile PM air quality monitors to its network. Given their small size, ease of siting, and low cost, MassDEP could quickly deploy multiple mobile PM monitors to immediately increase its PM data. PM air quality monitors, such as those available from PurpleAir, can be purchased for less than $300 and installed on the side of any building, so long as there is internet access and electricity. Installing many mobile monitors would provide MassDEP with more granular air pollution data for particular neighborhoods leading to better, local solutions for specific communities' air quality problems. Suffolk County, the county which encompasses Boston, Chelsea, Revere, and Winthrop, is the Massachusetts county with the highest average PM2.5 concentrations, with average concentrations 88 percent above the state average. CLF encourages MassDEP to focus on ensuring comprehensive air quality monitoring coverage across and around Suffolk County and Greater Boston by installing at least twenty mobile PM2.5 monitors. These mobile monitors will provide both a comprehensive picture of air quality across Greater Boston and a focused view in EJ populations suffering higher rates of air pollution-related negative health effects, including in Chinatown, Chelsea, East Boston, Everett, and Revere.

CLF also recommends that MassDEP install at least five mobile PM2.5 air quality monitors in Springfield. Springfield suffers from extremely high rates of asthma prevalence compared with the rest of the state – the Asthma and Allergy Foundation of America ranked first Springfield in its list of U.S. "Asthma Capitals" due to its high rates of overall asthma prevalence (17.35 percent compared with a statewide average of 11.5 percent) and number of emergency room visits for asthma.

Finally, CLF recommends that MassDEP engage with the Environmental Justice Advisory Council established pursuant to Executive Order 552 to determine other appropriate locations for future mobile and permanent air monitoring locations, including locations that are disproportionately burdened by transportation infrastructure.

Response: MassDEP is concerned about disparate air quality impacts on communities of color and other communities with environmental justice populations. As noted in the Network Plan, MassDEP plans to establish a new $PM_{2.5}$ monitoring station in the Chinatown neighborhood of Boston, which has a designated Environmental Justice population. MassDEP is seeking to place this monitor near the I93 and I90 interchange. In addition, with grant funding from EPA Region 1, MassDEP is working with City of Chelsea officials and local citizens to establish a new monitoring station in Chelsea that will measure $PM_{2.5}$ and volatile organic compounds (VOCs) and to place an additional nine PurpleAir $PM_{2.5}$ sensors throughout the City. The goal of this project is to characterize local air quality and work with the community to identify potential sources of pollution as well as emissions reduction and mitigation strategies to protect human health.

MassDEP is evaluating opportunities to expand the use of PurpleAir $PM_{2.5}$ sensors in additional Environmental Justice areas and will consider the communities recommended by CLF. MassDEP is focusing on $PM_{2.5}$ monitoring because long-term exposure to $PM_{2.5}$ pollution adversely affects respiratory and cardio-pulmonary health and has been linked to increased susceptibility to COVID-19. In addition, the specific $PM_{2.5}$ sensor technology being used (PurpleAir sensors) has been evaluated by EPA and integrated into EPA's AirNow webpage so monitoring results can be displayed in near real-time for the public. The lower cost and size of the sensors also means they can be easily deployed in greater numbers to provide greater air monitoring coverage of affected communities.

Due to limited resources, MassDEP is not able to establish additional full-scale regulatory monitoring stations that measure all criteria pollutants in all of the communities CLF recommended. Such monitoring stations are very resource and labor intensive and the additional monitoring data obtained likely would have limited value since levels of all criteria pollutants are well below the NAAQS, including for $PM_{2.5}$, PM_{10}, O_3, NO_2, CO, SO_2, and lead. MassDEP also is not planning to add UFP monitoring at this time because EPA has not established NAAQS or standardized monitoring methods for UFPs and there would be significant uncertainty in interpreting monitoring results. MassDEP believes there would be more value in making greater use of new sensor technologies that can provide greater spatial monitoring coverage to help identify pollution sources affecting communities and to focus on the highest potential risks of adverse health effects, such as from $PM_{2.5}$ pollution. MassDEP will continue to seek input from Environmental Justice communities and

organizations on disparate air quality impacts including the Environmental Justice Advisory Council.