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MEMORANDUM

TO: ENVIRONMENTAL REVIEW COMMISSION
The Honorable Jimmy Dixon, Co-Chairman
The Honorable Chuck McGrady, Co-Chairman
The Honorable Trudy Wade, Co-Chairman

FROM: Mollie Young, Director of Legislative Affairs, NCDEQ

SUBJECT: Ambient Air Monitoring Report

Pursuant to S.L. 2015-286, "The Division of Air Quality, Department of Environment and Natural Resources, shall report to the Environmental Review Commission no later than November 1, 2016, on the status of the ambient air monitoring network and the Division's implementation of the requirements of this section."

If you have any questions or need additional information, please contact me by phone at (919) 339-9433 or via e-mail at mollie.young@ncdenr.gov.

Cc: Don Van der Vaart, Secretary, NCDEQ
Tom Reeder, Assistant Secretary for Environment, NCDEQ
Sheila Holman, Director of Air Quality, NCDEQ
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Ambient Air Monitoring Legislative Report, Session Law 2015-286

Introduction

This report was prepared to meet the requirements specified in Session Law 2015-286, section 4.25(d), which requires the Division of Air Quality, Department of Environmental Quality to report to the Environmental Review Commission on the implementation and status of the ambient air monitoring network:

AMBIENT AIR MONITORING

SECTION 4.25.(a) The Department of Environment and Natural Resources shall review its ambient air monitoring network and, in the next annual monitoring network plan submitted to the United States Environmental Protection Agency, shall request the removal of any ambient air monitors that are not required by applicable federal laws and regulations and that the Department has determined are not necessary to protect public health, safety, and welfare; the environment; and natural resources.

SECTION 4.25.(b) No later than September 1, 2016, the Department of Environment and Natural Resources shall discontinue all ambient air monitors not required by applicable federal laws and regulations if approval from the United States Environmental Protection Agency is not required for the discontinuance and the Department has determined that the monitors are not necessary to protect public health, safety, and welfare; the environment; and natural resources.

SECTION 4.25.(c) Nothing in this section is intended to prevent the Department from installing temporary ambient air monitors as part of an investigation of a suspected violation of air quality rules, standards, or limitations or in response to an emergency situation causing an imminent danger to human health and safety.

SECTION 4.25.(d) The Division of Air Quality, Department of Environment and Natural Resources, shall report to the Environmental Review Commission no later than November 1, 2016, on the status of the ambient air monitoring network and the Division's implementation of the requirements of this section.

The North Carolina Division of Air Quality (DAQ) works with the state's citizens to protect and improve outdoor air quality in North Carolina for the health and benefit of all. To carry out this mission, the DAQ has programs for monitoring air quality, permitting and inspecting air emission sources, developing plans for improving air quality and educating and informing the public about air quality issues.

The DAQ has completed the annual network review and believes that the annual Monitoring Network Design plan for 2016 describing monitoring network changes for 2016-2017 is consistent with S.L. 2015-286, section 4.25.

Additionally, the DAQ's assessment of the monitoring network and the anticipated changes between 2016 and 2020 as described in the Five-Year Network Assessment are and remain consistent with the requirements in S.L. 2015-286, section 4.25.

Background

The Clean Air Act provides the principal framework to protect air quality. Under the Clean Air Act, the EPA is responsible for setting air pollution standards known as national ambient air quality standards (NAAQS). Ambient air quality refers to the quality of outdoor air in our surrounding environment, and the NAAQS define how much air pollution is safe in the outdoor air for people and the environment with an adequate margin of safety. Standards are set for the criteria air pollutants of carbon monoxide, particulate matter, ozone, lead, sulfur dioxide and nitrogen dioxide.

In North Carolina, Chapter 143, Articles 21 – Water and Air Resources and 21B - Air Pollution Control, authorizes the Department of Environmental Quality to administer the air quality program of the State. Monitoring conducted by the Division of Air Quality complies with all state and federal requirements.

Directive for Air Monitoring

Under the Clean Air Act every state or where applicable, local agency, is required to establish and maintain an air quality surveillance system that consists of a network of monitoring stations for measuring levels of regulated pollutants in the outdoor air. Due to other state or federal needs, monitoring may be conducted for pollutants for which a NAAQS does not exist, to address public health or emergency situations or on a temporary basis as part of an investigation. Additionally, some sites are operated on a rotating basis to obtain ambient monitoring data for siting new emission sources that would otherwise be the responsibility of an industrial facility.

An air monitoring network must meet specific criteria related to the air pollutant to be measured as well as the type of sites and the requirements for their location, monitoring equipment and methodology, operating schedules, quality assurance procedures, and data certification and reporting requirements. To comply with these requirements, the Division of Air Quality currently operates a network of 38 monitoring sites across the state. The monitoring duties are performed by the Division in accordance with EPA regulatory requirements.

The requirements for how states are to accomplish required monitoring activities are promulgated in the Code of Federal Regulations, Title 40 Parts 53 and 58. Because states must

show that ambient air quality standards are met, air monitoring networks are designed to produce high quality data that are used to assess compliance with the NAAQS.

The EPA requires states or local agencies to periodically review their air monitoring networks and publish an annual plan of changes to its monitoring network. Annual plans are required to review the purposes of each monitor and provide evidence that monitoring requirements are met. Annual plans are subject to EPA approval. Since 2010, an additional federal requirement directs monitoring agencies to conduct and publish a network assessment every five years. While the annual plan contains details of the monitoring network, the five-year network assessment is a look forward at the projected needs of the ambient air monitoring program. The DAQ's most recent five-year network assessment was 2015.

The annual monitoring network plan must be made available for public review for at least 30 days prior to submitting the plan to EPA for approval. Annual plans are required to be submitted to EPA by July 1 of each year.

The DAQ completed its most recent annual [Monitoring Network Design](#) plan dated July 1, 2016, describing monitoring network changes for 2016-2017. Assessment of the monitoring network and the anticipated changes that will be needed between 2016 and 2020 are described in the [Five-Year Network Assessment](#) for 2015 to 2020.

The Purpose and Use of Air Monitoring Data

Monitoring provides raw measurements of air pollutant concentrations, which can then be analyzed and interpreted. Among other needs, collection of ambient monitoring data is used to determine if air quality is meeting federal standards, evaluating the effectiveness of emission reduction programs, improving air quality models, air quality forecasts and for permitting of new industrial facilities. Unless otherwise specified by federal law, ambient air quality is typically measured near ground level, away from direct sources of pollution.

Description of Current Air Monitoring Sites in North Carolina

Once a monitor is established, the conditions that originally required the monitor may change. The need for changes is influenced by a number of factors and may vary by pollutant. These include changes due to a new or revised regulation, improvements or degradation in air quality, increases or shifts in population distribution, new emission sources, changes in technology and the availability of funding and other resources. The ambient monitoring network is continuously adapting due to these and other influences such that the number of sites and monitors vary from year to year. The bulk of the monitoring network consists of ozone and particulate matter monitors.

At the beginning of 2014, the ambient monitoring network consisted of 56 sites collectively measuring carbon monoxide, particulate matter (two particle sizes), pollen, ozone, lead, sulfur dioxide, nitrogen oxides, mercury, hydrocarbons, ammonia, aerosols and volatile organic compounds. At most sites there are often multiple monitors measuring more than one pollutant. Fourteen of these sites also measured up to four meteorological parameters such as wind speed, wind direction, solar radiation and atmospheric pressure.

The three local air pollution control programs in Buncombe, Forsyth and Mecklenburg counties also maintain monitors. Although these are considered part of the state network, DAQ and the local programs negotiate where the monitors are to be located and who will operate them. (Local programs receive grant funding directly from EPA to operate their monitors and may supplement this support with their own funding.)

The DAQ is also required to operate sites in two metropolitan statistical areas (MSAs) that cross state boundaries; one in Virginia and one in South Carolina. The DAQ has a written memorandum of agreement (and EPA approval) with these two states to maintain the required number of air monitors for the MSA, fulfilling the North Carolina required monitoring objectives in those MSAs.

The Eastern Band of the Cherokees also operate monitors on tribal land. They receive funding directly from the EPA. These sites are not considered part of the state network, though DAQ may provide technical assistance as requested.

It should be noted that various federal government agencies independently operate monitoring networks within North Carolina. The Clean Air Status and Trends network or CASTNET includes four ozone monitors operated in the mountains (2), piedmont (1) and coast (1). The Interagency Monitoring of Protected Visual Environments or IMPROVE network includes three monitors that collect data associated with visibility and are operated in the mountains (2) and the coast (1). The National Atmospheric Deposition Program (NADP) is an atmospheric deposition network that includes nine monitors across the state in Macon, Yancey, Rowan, Wake, Bertie, Carteret, Onslow, Sampson, and Scotland counties.

Meeting the Purpose of Legislation

As of January 1, 2016, the current criteria air pollutant ambient monitoring network operated by DAQ consists of 38 sites including monitoring for pollen, hydrocarbon and volatile organic compounds. This is 14 fewer sites than was operated in 2014 and 2015. Additionally, some particulate matter monitors at sites with multi-pollutant monitors were discontinued. These changes resulted in a 52% reduction in particulate matter monitors, a 12% reduction in ozone monitoring and a total reduction in lead and ammonia monitoring. Over the next two years, progressive improvements in monitoring technology will support discontinuing up to 10 additional particulate matter monitors.

The Buncombe, Forsyth and Mecklenburg County local programs currently operate three, three, and five sites respectively. Since 2014, Forsyth County discontinued operating one ozone site. Mecklenburg County shut down one ozone site, discontinued one particulate matter monitoring site, discontinued lead monitoring and will discontinue a second particulate matter site by the end of the year.

Expected Future Monitoring Requirements

New ambient standards for ozone were promulgated in October 2015 (80 FR 65292) and few, if any, new changes in the ozone monitoring network are expected. However, the 2015

rule extended the ozone monitoring season by one additional month beginning in 2017. By 2019, the new standard also requires enhanced monitoring of ozone, nitrogen oxides and volatile organic compounds. To meet this new EPA requirement, two sites, in Wake and Mecklenburg counties must be established.

Currently there are two federally required near-road nitrogen dioxide monitoring sites in Charlotte and Raleigh. At each site, a carbon monoxide monitor and a particulate matter monitor must be installed by January 1, 2017. Proposed revisions in federal regulations to near road monitoring of nitrogen dioxide would remove the requirement to add three new sites in areas having populations between 500,000 and 1,000,000 persons. The pending rule affects Durham, Greensboro and Winston-Salem areas.

The final federal Data Requirements Rule (DRR) was promulgated on August 21, 2015 (80 FR 51051) and requires the characterization of air quality in areas with facilities whose emissions exceed 2,000 tons per year of sulfur dioxide, in order to comply with a 1-hour sulfur dioxide standard. If affected facilities choose air monitoring as their method of compliance with the DRR, these sites must be operational by January 1, 2017. Five facilities in North Carolina have chosen to monitor. DAQ proposed to EPA that a minimum of one monitoring site per facility would be sufficient to meet the requirements of the rule. Four new monitoring sites and one existing site have been proposed to meet the requirements of the rule. EPA indicated their general support for this approach, however formal approval is pending.

Conclusion

The DAQ believes that the annual Monitoring Network Design plan for 2016 describing monitoring network changes for 2016-2017 is consistent with S.L. 2015-286, section 4.25.

The DAQ's assessment of the monitoring network and the anticipated changes between 2016 and 2020 as described in the Five-Year Network Assessment are and remain consistent with the requirements in S.L. 2015-286, section 4.25.