



# Virginia DEQ Air Quality Monitoring

## Northern Virginia monitoring program

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# Virginia DEQ Air Quality Monitoring Mandates

- 42 U.S.C. §7403(c)
  - the Administrator shall conduct a program of research, testing, and development of methods for sampling, measurement, monitoring, analysis, and modeling of air pollutants.
- 40 CFR part 58 Appendix A
  - Quality Assurance Requirements
- 40 CFR Part 58 Appendix D
  - Network Design Criteria
- 40 CFR Part 58 Appendix E
  - Probe and Monitoring Path Siting Criteria

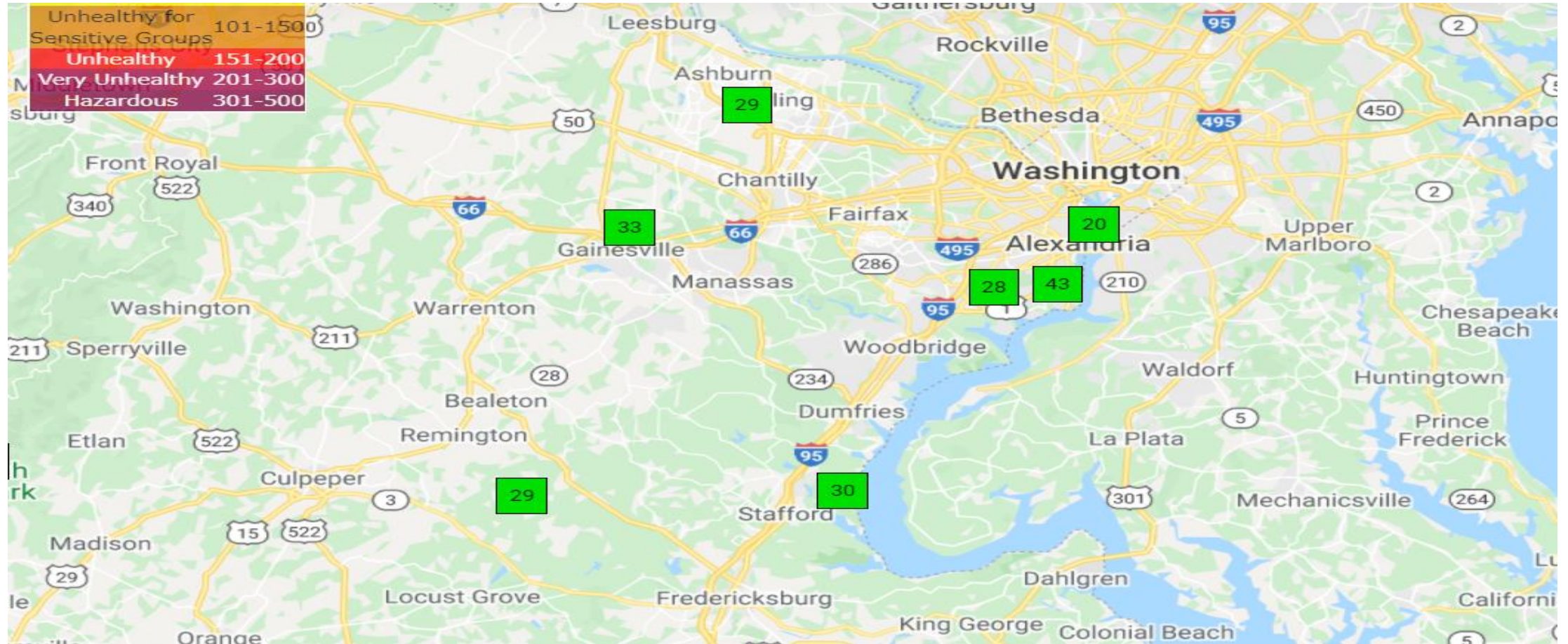
# Definitions

- **Nonattainment area** means any area which is shown by air quality monitoring data or, where such data are not available, which is calculated by air quality modeling (or other methods determined by the board) to exceed the levels allowed by the ambient air quality standard for a given pollutant
- **PM<sub>2.5</sub>** means particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers (microns) as measured by the applicable reference method or an equivalent method.
- **Ozone (O<sub>3</sub>)** is a gas composed of three oxygen atoms. It is not usually emitted directly into the air, but at ground-level is created by a chemical reaction between oxides of nitrogen (NO<sub>x</sub>) and volatile organic compounds (VOC) in the presence of sunlight.

# Virginia DEQ Air Quality Monitoring Network

- Virginia currently has 35 monitoring sites around the Commonwealth
- Included in Virginia's network are 2 industrial Monitors maintained by the companies
- In addition there are 2 federal CASTNet sites located in Prince Edward County and Giles County (Ozone only sites)
- The Virginia air monitoring network contains 110 separate instruments measuring Ozone, CO, SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>, Toxics and Meteorological information

# Virginia DEQ Air Quality Monitoring Network Northern Virginia continuous sites



# Virginia DEQ Air Quality Monitoring Network Northern Virginia (Part I)

- Aurora Hills – Arlington County
  - Continuous Analyzers – Ozone, Nitrogen Dioxide, Carbon Monoxide; Sampler PM2.5 (1/3 day)
- **Lee District Park – Fairfax County**
  - **Continuous Analyzers – Ozone, Sulfur Dioxide, PM2.5 (T640x - FEM), PM10 (T640x - FEM); Samplers – PM2.5 (1/3 day)**
- Broad Run HS – Loudon County
  - Continuous Analyzers – Ozone, NO2; Sampler PM2.5 (1/3 day)



# Virginia DEQ Air Quality Monitoring Network Northern Virginia (Part II)

- Long Park – Prince William County
  - Continuous Analyzers – Ozone, Nitrogen Dioxide
- Phelps Wildlife Preserve – Fauquier County
  - Continuous Analyzer – Ozone
- **Backlick Road Near Road site – Springfield**
  - **Continuous Monitors – Oxides of Nitrogen, Carbon Monoxide, PM2.5 (Beta Attenuation – FEM)**

# Virginia DEQ Air Quality Monitoring Network Northern Virginia (Part III)

- Not listed but Shown in Map – Stafford and Caroline County
- Required number of ozone monitors for the Washington D.C. MSA is 3 monitors.
- Required number of PM<sub>2.5</sub> monitors for the Washington D.C. MSA is 2 monitors.



# Northern Virginia Air Quality Monitoring Ambient Values (Part I)

- Air Quality Status of an Area is characterized by the “Design Value”.
- A Design Value is a statistic that describes the air quality of an area relative to the National Ambient Air Quality Standard or the NAAQS.
- The NAAQS standards are classified as Primary Standards which are protective of Human Health and Secondary Standards which are protective of environmental and property damage.

# Northern Virginia Air Quality Monitoring Ambient Values (Part II)

- Primary Standard for PM<sub>2.5</sub>:
- 24-Hour concentration – the 3 year average of the 98<sup>th</sup> percentile of 24-hour concentrations must not exceed 35 mg/m<sup>3</sup>.

<b>Site</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>3-Year Average</b>
<b>Loudoun</b>	16.6	19.8	19.3	<b>19</b>
<b>Arlington</b>	15.9	19.2	17.7	<b>18</b>
<b>Lee Park</b>	16.5	20.3	14.6	<b>17</b>
<b>Springfield</b>	19.7	25.2	16.3	<b>20</b>

# Northern Virginia Air Quality Monitoring Ambient Values (Part III)

- Primary Standard for PM<sub>2.5</sub>:
- Annual Arithmetic Mean – the 3 year average of the weighted annual mean PM<sub>2.5</sub> concentration must not exceed 12.0 mg/m<sup>3</sup>.

<b>Site</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>3-Year Average</b>
<b>Loudoun</b>	7.0	7.2	6.2	<b>6.8</b>
<b>Arlington</b>	7.4	8.0	6.6	<b>7.3</b>
<b>Lee Park</b>	6.9	7.2	6.6	<b>6.9</b>
<b>Springfield</b>	8.9	9.1	7.9	<b>8.6</b>

# Northern Virginia Air Quality Monitoring Ambient Values (Part IV)

- Primary Standard for O<sub>3</sub>:
- Maximum 8-hour average concentration of 0.070 ppm, based on 3-year average of the annual fourth highest daily maximum 8-hour averages.

<b>Monitor</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>3-Year Average</b>
<b>Loudoun</b>	.065	.060	.060	.061
<b>Prince William</b>	.065	.060	.057	.060
<b>Arlington</b>	.070	.068	.062	.066
<b>Lee Park</b>	.066	.070	.057	.064

# Northern Virginia Air Quality Monitoring Ambient Values (Part V)

- Primary Standard for NO<sub>2</sub>
- 3-year average of the 98<sup>th</sup> percentile 1-hour daily maximum values not to exceed 100 ppb.

<b>Monitor</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>3-Year Average</b>
<b>Loudoun</b>	<b>32.6</b>	<b>37.5</b>	<b>30.7</b>	<b>34</b>
<b>Prince William</b>	<b>21.0</b>	<b>24.3</b>	<b>21.3</b>	<b>22</b>
<b>Fairfax</b>	<b>46.6</b>	<b>48.1</b>	<b>42.5</b>	<b>46</b>
<b>Arlington</b>	<b>41.9</b>	<b>44.8</b>	<b>37.9</b>	<b>42</b>

# Northern Virginia Air Quality Monitoring Ambient Values (Part VI)

- Primary Standard for NO<sub>2</sub>
- Annual Arithmetic Mean not to exceed 53 ppb (.053 ppm).

<b>Monitor</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
<b>Loudoun</b>	<b>6</b>	<b>7</b>	<b>5</b>
<b>Prince William</b>	<b>4</b>	<b>4</b>	<b>3</b>
<b>Fairfax</b>	<b>15</b>	<b>16</b>	<b>14</b>
<b>Arlington</b>	<b>9</b>	<b>10</b>	<b>7</b>

# Changes to the Northern Virginia Network

- EPA has required since 2020 in Northern Virginia, because it is part of the Ozone Transport Region, DEQ to implement an “Enhanced Monitoring” plan.
- Virginia is running the impacted ozone instruments year round not just during the ozone season (March 1 – October 31).
- Lee Park ozone monitor is currently a year round ozone monitor.



# Air Quality Information

## DEQ Website

<https://www.deq.virginia.gov/air/monitoring-assessments/air-quality-forecast>

## DEQ Annual Air Monitoring Data Report

<https://www.deq.virginia.gov/air/air-quality-monitoring-assessments/air-quality-reports>

## DEQ Air Monitoring Network Review

<https://www.deq.virginia.gov/air/air-quality-monitoring-assessments/air-quality-reports>