



Data Center Presentation to the Joint Subcommittee on Tax Policy

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Director
August 19, 2026

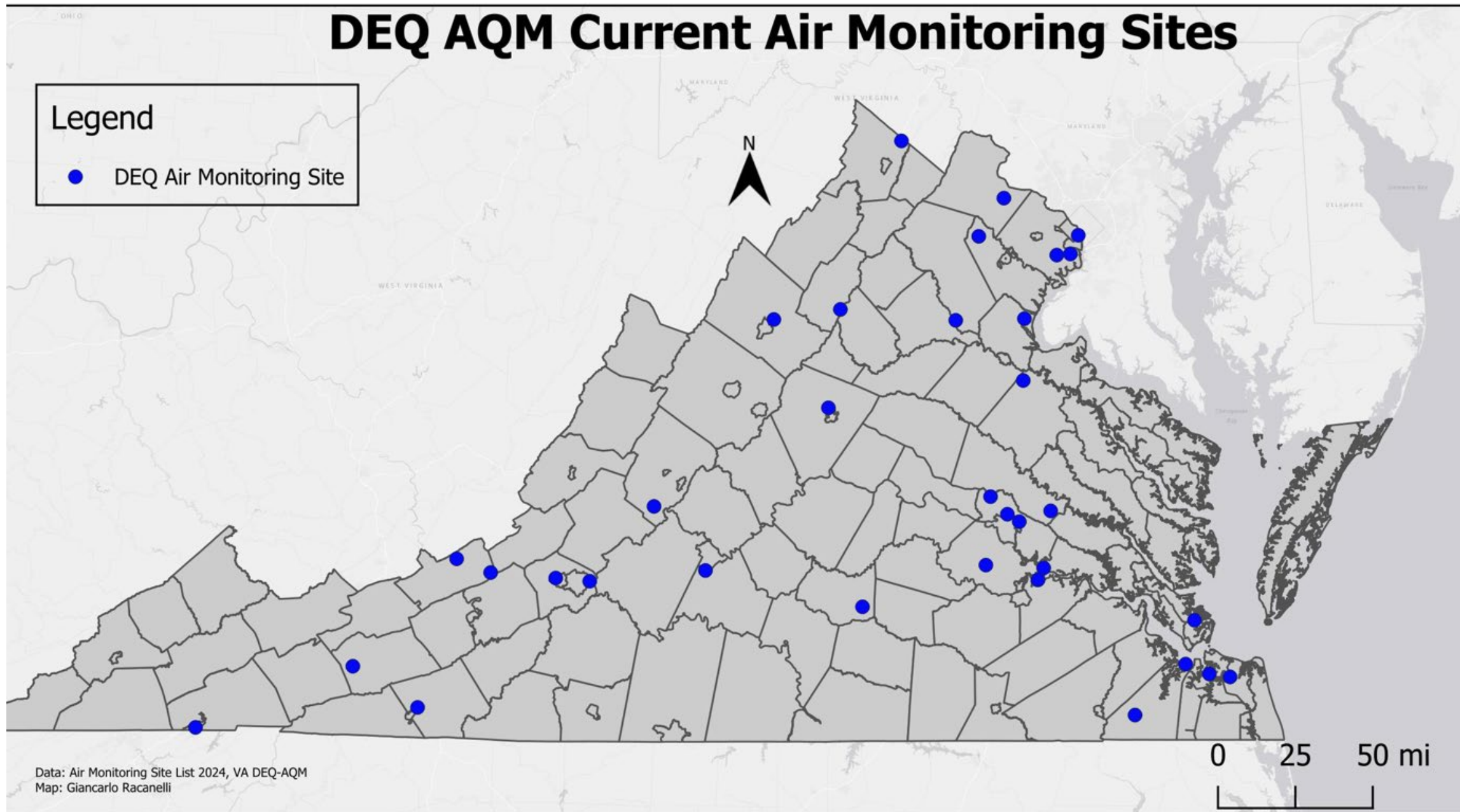
Regulatory Responsibilities

Responsibility	Regulatory Entity
Data Center Siting	Localities
Transmission Line Locations	State Corporation Commission (SCC)
Power Plant Locations	SCC and Localities
Noise Regulation	Localities
Wetland Impacts	DEQ and U.S. Army Corps of Engineers
Water Withdrawal	DEQ or buy from Municipalities
Land Disturbance, Erosion & Sediment Control (ESC), and Stormwater Management (SWM)	DEQ or Localities (if locality has ESC/SWM program authority)
Air Permits	DEQ
Water Discharges	DEQ or discharge to Municipal sewer

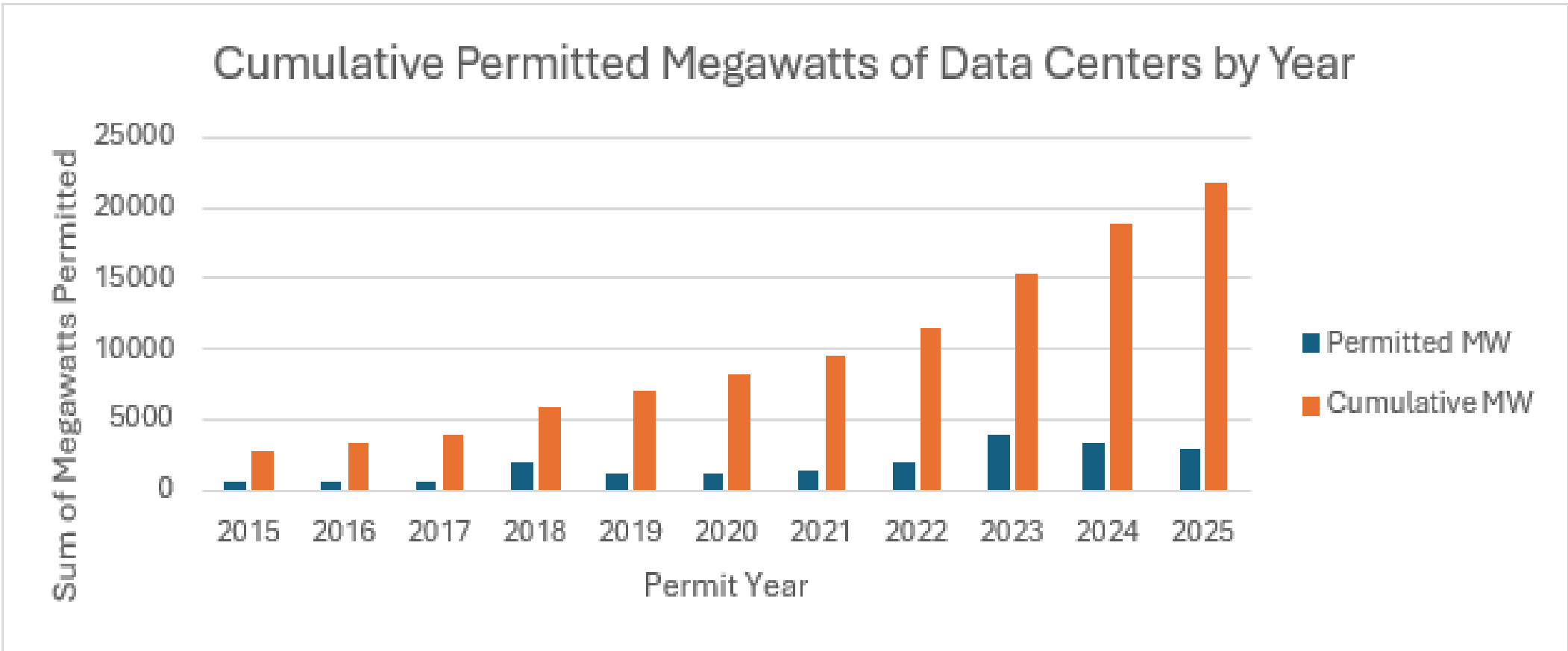
DEQ AQM Current Air Monitoring Sites

Legend

- DEQ Air Monitoring Site

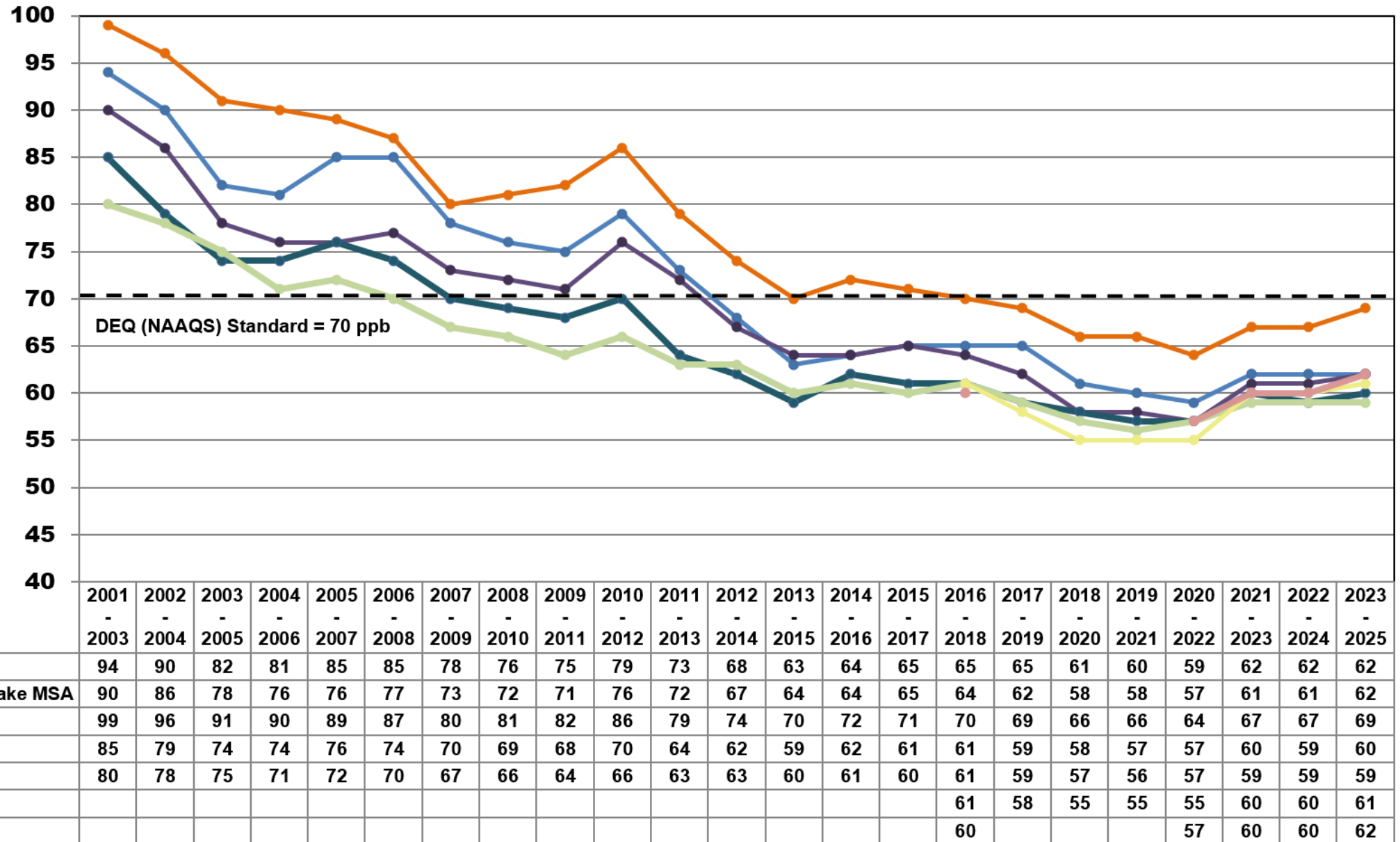


Cumulative Permitted Megawatts of Data Centers (Yearly)

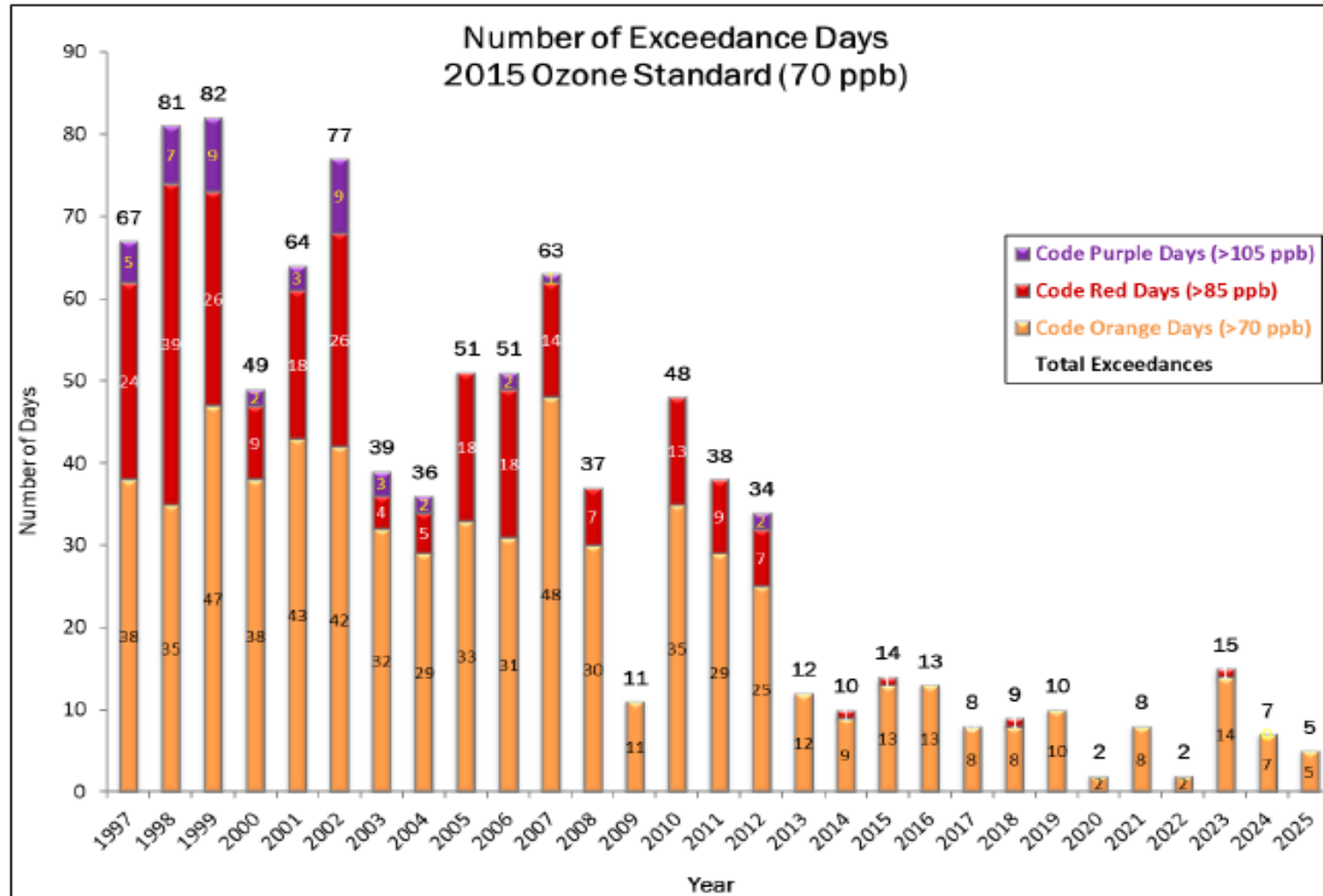


Virginia Ozone Standard Trends

Ozone Design Values, ppb



Number of 8-hour Ozone Exceedance Days in Northern Virginia*, 1990-2025



**Attained National
Ambient Air
Quality Standard
(NAAQS)! -
90 FR 14730 (Apr.
4, 2025)**

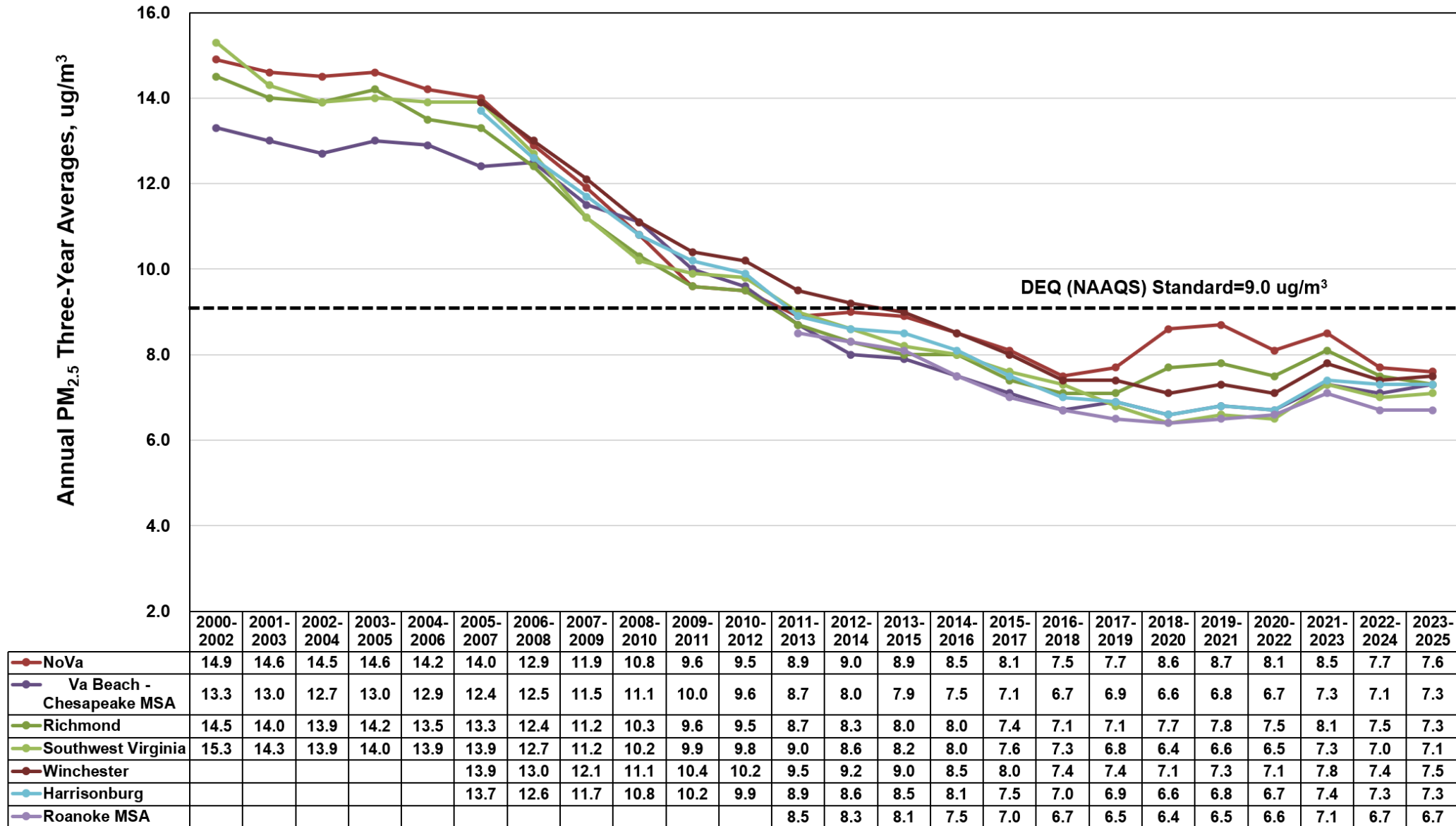
***Excludes Stafford County**

Code Orange: “Unhealthy for Sensitive Groups”, 8 hr. avg. 71-85 ppb

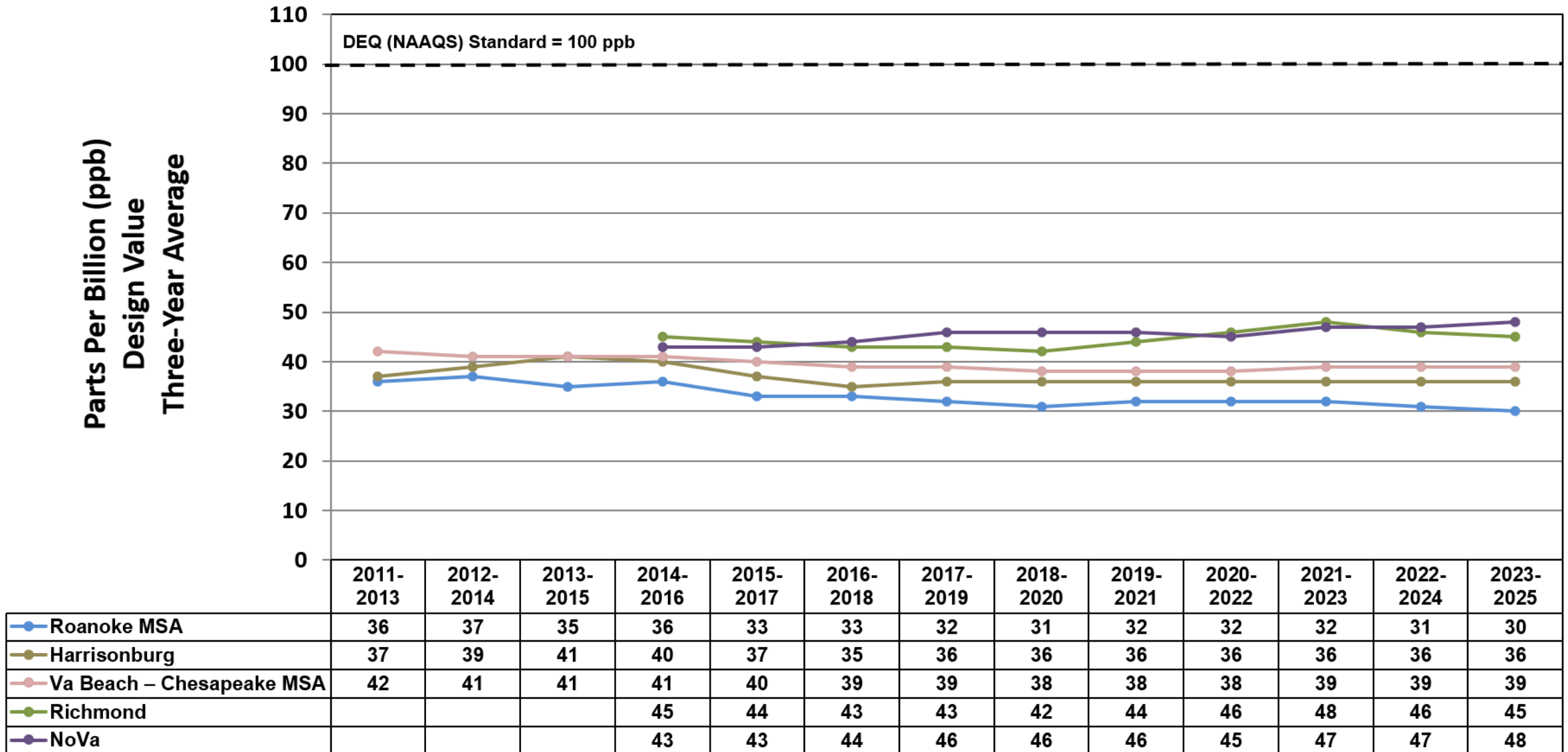
Code Red: “Unhealthy”, 8-hr. avg. 86-105 ppb

Code Purple: “Very Unhealthy”, 8 hr. avg. 106-200 ppb

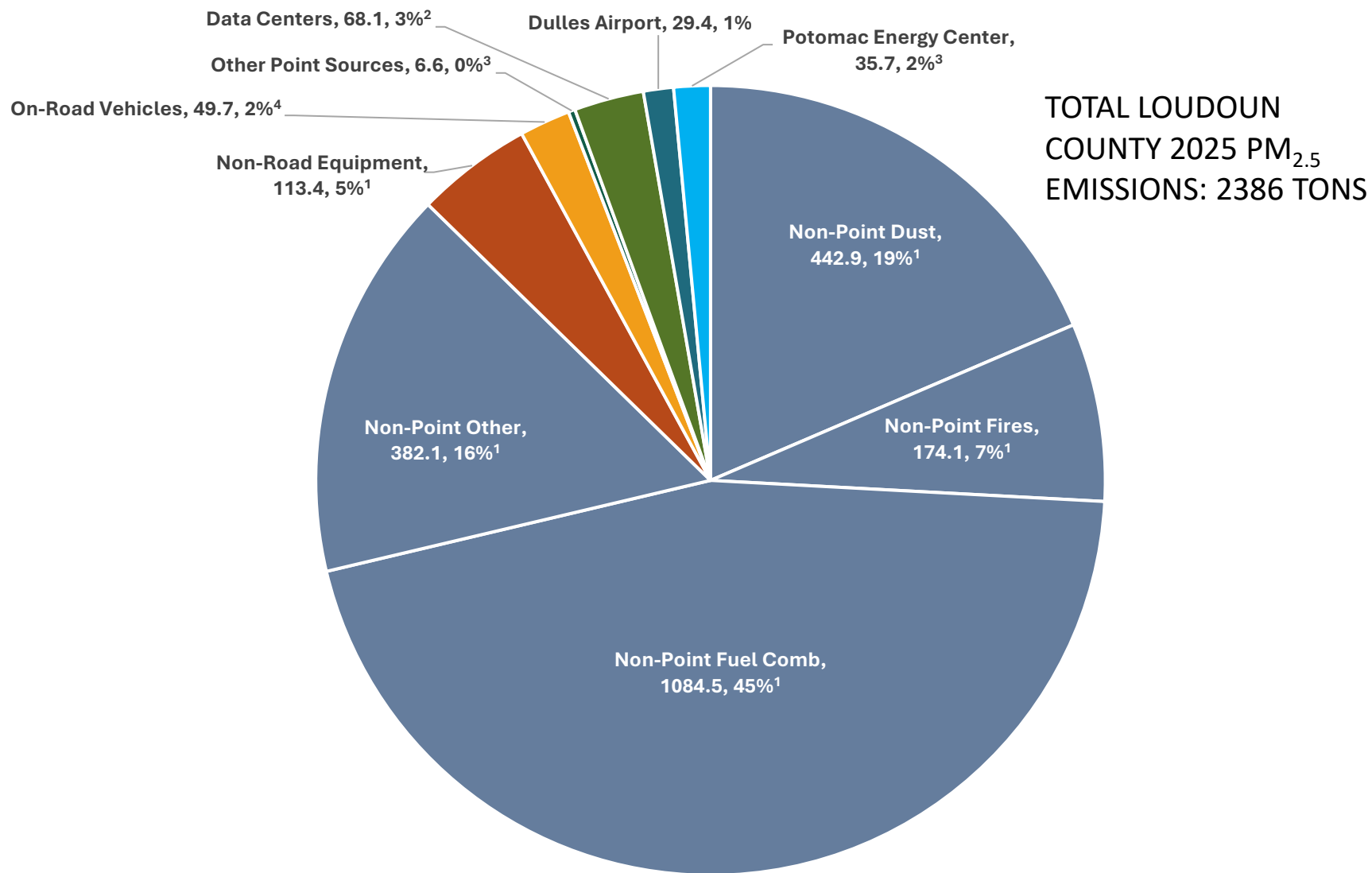
Virginia Fine Particulate Matter Standard Trends



Virginia Nitrogen Dioxide (NO₂) Standard Trends



CALENDAR YEAR 2025 LOUDOUN COUNTY PM_{2.5} EMISSIONS BY SOURCE (TONS/YEAR)



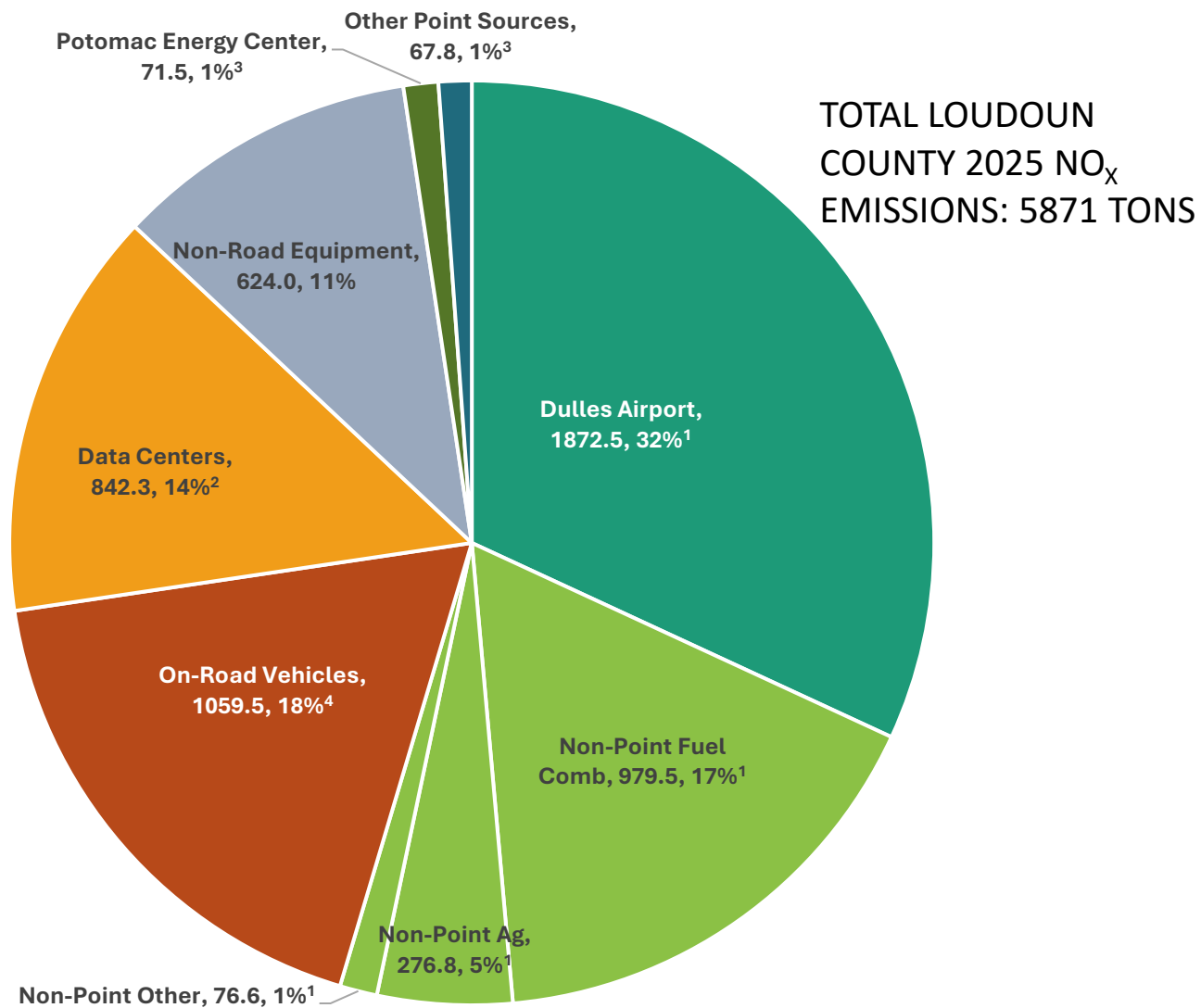
¹U.S Environmental Protection Agency. (2023). *National Emissions Inventory (NEI) Report* [Data set]. (Retrieved May 5, 2026) Non-Point and Non-Road grown to 2025 using appropriate growth factors. <https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei>

²Virginia Department of Environmental Quality. (2025). Draft *Data Center 2025 Emissions including Vantage LLC* [Comprehensive Environmental Data System - CEDS].

³Virginia Department of Environmental Quality. (2025). *Potomac Energy Center Facility Criteria Emissions* [CEDS].

⁴Virginia Department of Environmental Quality. (2025). On-Road Mobile emissions developed using the EPA MOVES model and 2025 activity data.

CALENDAR YEAR 2025 LOUDOUN COUNTY NO_x EMISSIONS BY SOURCE (TONS/YEAR)



¹U.S Environmental Protection Agency. (2023). *National Emissions Inventory (NEI) Report* [Data set]. (Retrieved May 5, 2026) Non-Point and Non-Road grown to 2025 using appropriate growth factors. <https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei>

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Virginia Data Center Air Monitoring Project

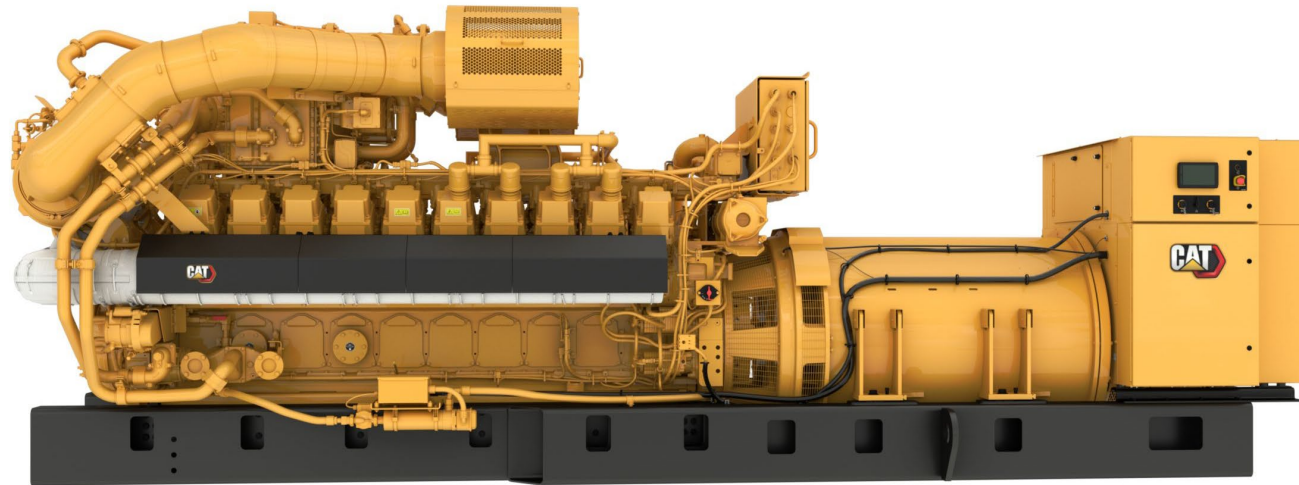
Interactive maps for Virginia Department of Environmental Quality's special northern Virginia data center air monitoring project.

More info available on DEQ website at:
<https://www.deq.virginia.gov/news-info/shortcuts/topics-of-interest/data-center-air-monitoring-project>



Data Center Emergency Generators

- Required to use Tier IV equivalent or better
 - Guidance #APG-576 - applicable July 1, 2026
 - HB507 (McAuliffe, 2026) - July 1, 2026
 - State Air Pollution Control Board Approval - August 18, 2026



Pictured: Tier IV generator (Source: Caterpillar, Inc.)

Definitions

Table 1: Comparison of EPA and Virginia Definition of “Emergency” for Gen-Sets

Service	EPA	Virginia
Emergency Operation	Unlimited	500 hours total for all purposes
Gen-set* Readiness + Maintenance	100 hours	
Operation for other non-emergency purposes	50 hours (also counts against the 100-hour allowance)	0 hours
Emergency Demand Response Operation	Considered to be non-emergency operation	Considered to be emergency operation

**Excludes switch gear testing, scheduled power outages or other similar activities*

What Does It Mean?

Table 2: Engine Technology Hierarchy

Type	Classification		Maximum Operating Service	NO _x Emissions
	State	Federal		
DIESEL ENGINES				
Tier II	Emergency	Emergency	Limit all operation to less than major source levels	18.0 lb/MW
Tier II + SCR* (aka Tier IV Certified Equivalent)	Non-emergency	Emergency	Limit all operation to less than major source levels	1.8 lb/MW
Tier IV	Non-emergency	Non-emergency	Limit all operation to less than major source levels	1.8 lb/MW
NATURAL GAS ENGINES				
EPA Compliant	Emergency	Emergency	Limit all operation to less than major source levels	6.0 lb/MW
EPA Compliant	Non-emergency	Non-emergency	Limit all operation to less than major source levels	3.0 lb/MW
EPA + Controlled	Non-emergency	Non-emergency	Limit all operation to less than major source levels	0.3-1.5 lb/MW
NATURAL GAS SIMPLE CYCLE COMBUSTION TURBINES				
Low-NOx	Non-emergency	Non-emergency	Limit all operation to less than major source levels	0.3-0.5 lb/MW
Low-NOx with SCR	Non-emergency	Non-emergency	Limit all operation to less than major source levels	0.1 lb/MW

*SCR = Selective Catalytic Reduction system, an active air pollution control system that reduces NO_x emissions; a Tier II engine equipped with an add-on SCR is sometimes referred to as a “Tier IV equivalent” engine

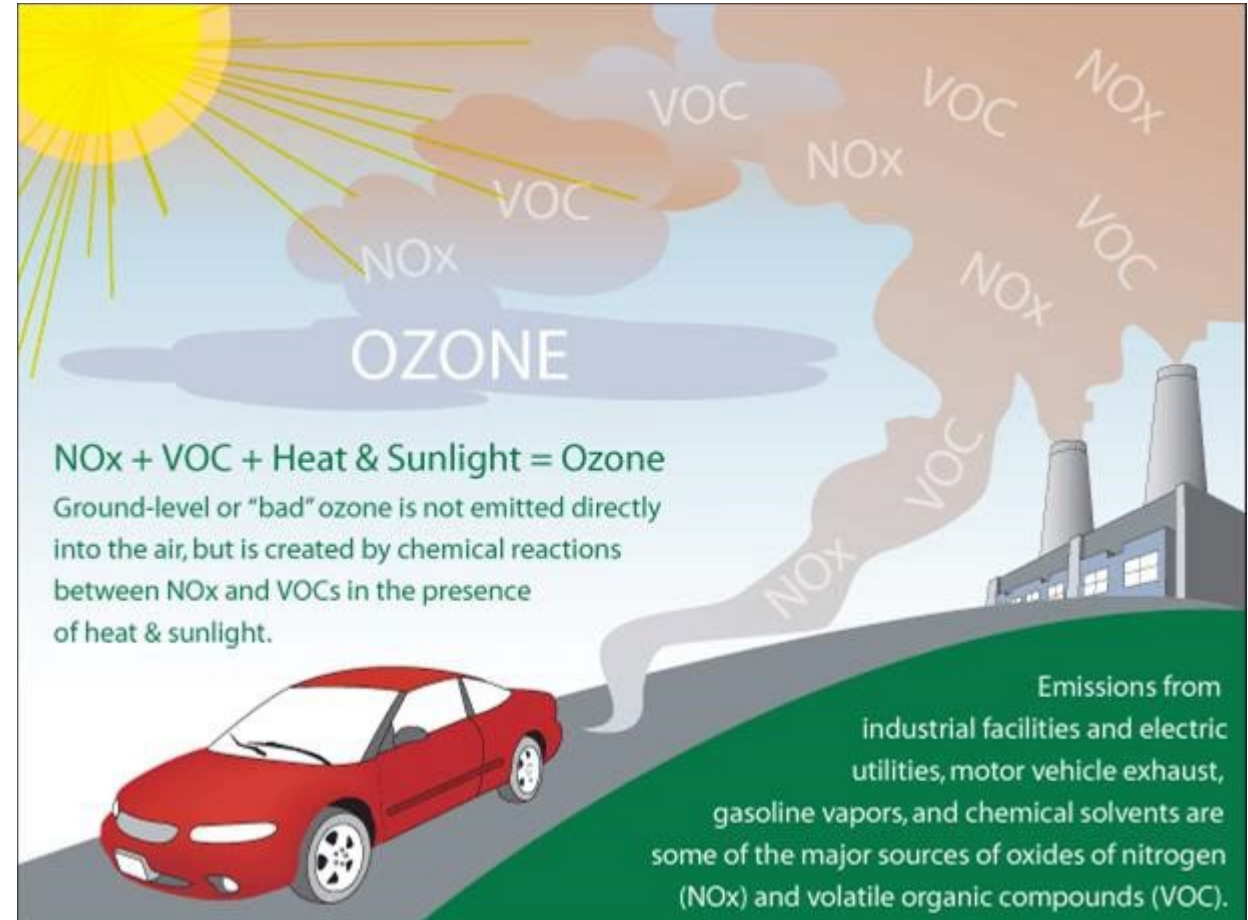
How Often Do They Run?

Table 3: Example Maintenance/Readiness Testing Schedule		
Activity	Annual Allowance (hours/generator)	Frequency (duration/event)
Readiness Testing	13	Weekly (15 minutes)
Maintenance & Testing: 3-Month	4	Quarterly (1 hour)
Maintenance & Testing: 12-Month	8	Annually (8 hour)
Maintenance & Testing: 36-Month	8	Once every three years (8 hours)
Total	33	

When Do They Run?

Operating Limitations (Ozone Season) –
No emergency diesel engine gen-set... shall be operated for scheduled maintenance checks and readiness testing (Scheduled MCRT), stack testing, or operation training (that involves fuel combustion) **between the hours of 7 a.m. to 5 p.m. any day during May 1 through September 30...**(9 VAC 5-80-1180)

Applies regardless of predicted or actual AQI, and no exceptions granted on high AQI days



Source: <https://www.epa.gov/ground-level-ozone-pollution/ground-level-ozone-basics>

National Defense Exemption

- SB 1407 (Sen. Reeves)
 - Affects gensets certified by the U.S. DoD or branch of the armed services as mission critical and essential to defense
 - If certified will be allowed to run for 50 hours per year for nonemergency use
 - Approximately 1066 generators covered as of Aug. 12, 2026

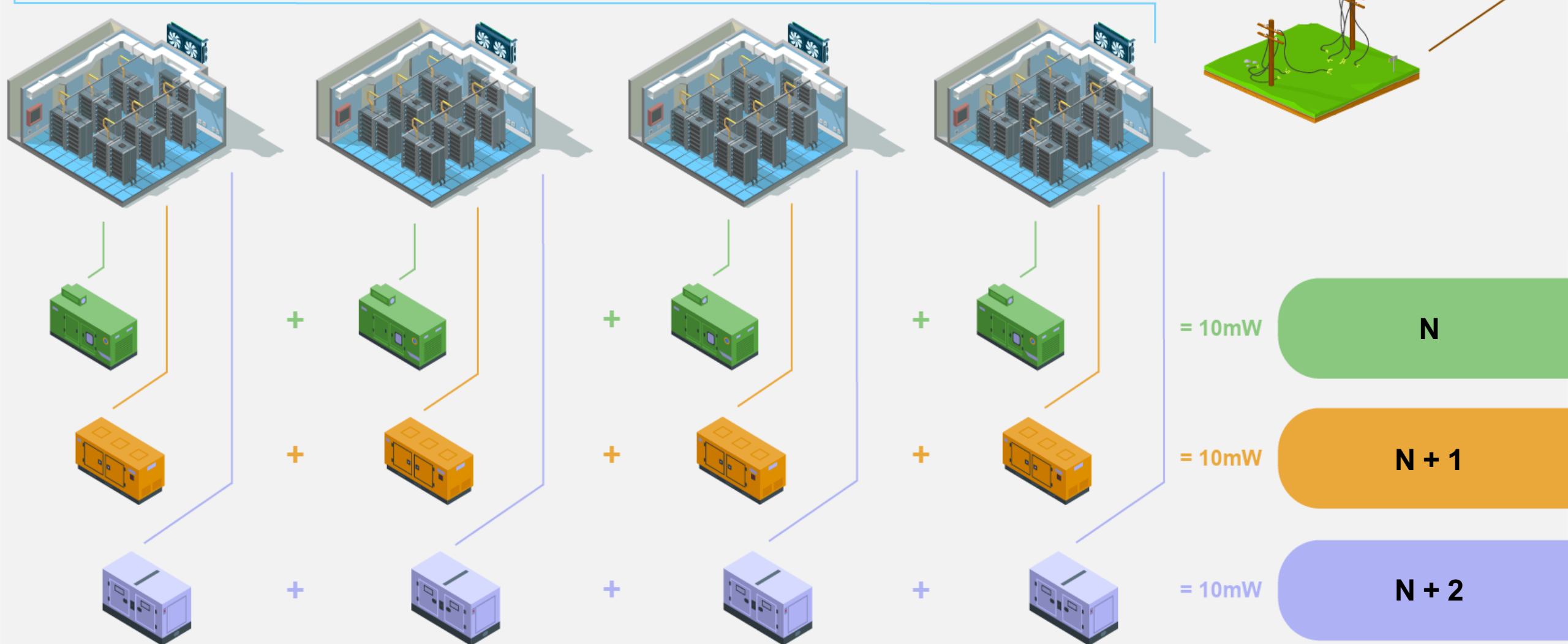


Image: Tier 4F equivalent retrofit on a Tier 2 generator. Steel pillars would be installed on either side of the enclosure supporting a platform and a walkway around the unit.

Data Center Redundant Generator Use

10 megawatts (mW) are needed to power this data center. Each genset is 2.5MW in this example.

The data center utilizes backup diesel engine-driven generator sets (engine generators) once there is a sudden loss of power from the grid.



Water Usage

- Joint Legislative Audit and Review Commission (JLARC) report concluded that most data centers use the same amount of water (or less) as an average large office building (Dec. 2024)
 - Water use varies depending on cooling system
 - Data center water use accounted for:
 - 0.2% to 21% of total water use at six water utilities
 - <0.5% of total state withdrawals
- The JLARC report does not account for indirect water use (e.g., electrical generation)

Interstate Commission on the Potomac River Basin (ICPRB) Water Usage Estimates

- Air Cooled Systems: 150 gallons/MW/day
- Water Cooled Systems:

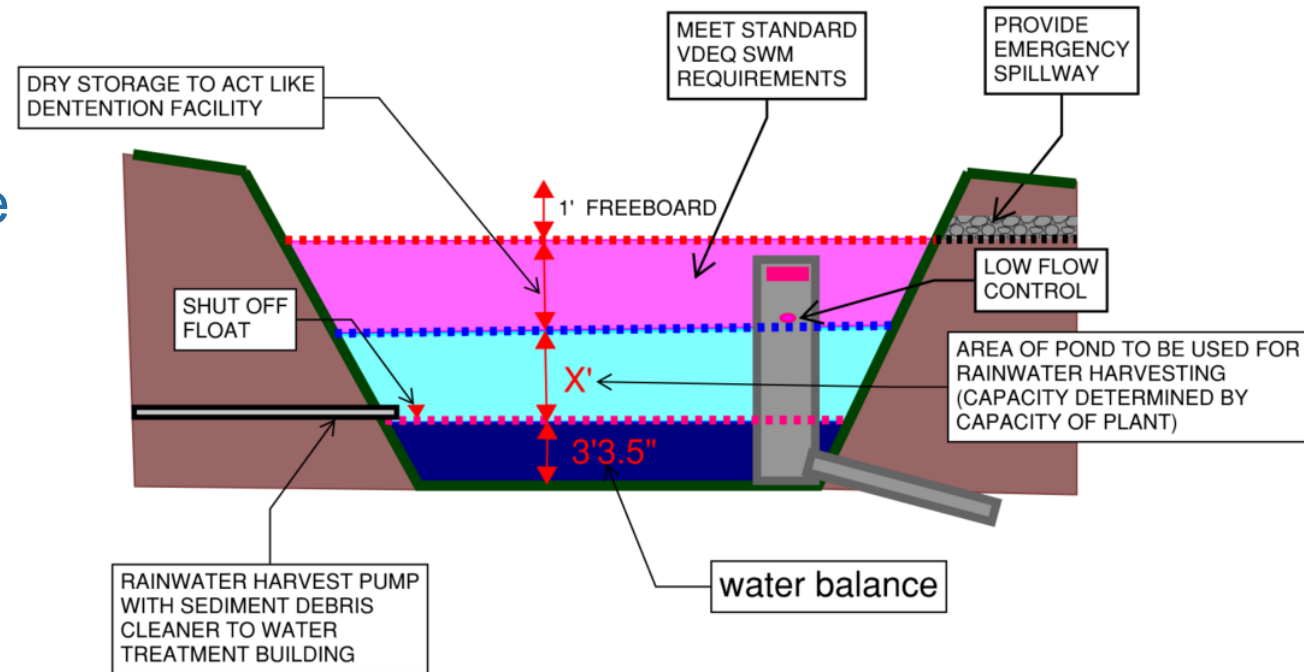
Scenario	Avg. WUP* (gal/MW/day)	Max WUP* (gal/MW/day)
Low	600	2100
Medium (Observed)	800	2900
High	1400	5200

*WUP: Water Use per unit Power demand

Source: Table 6-5, [2025 Washington Metropolitan Area Water Supply Study: Demand and Resource Availability Forecast for the Year 2050 – ICPRB](#) (pg. 6-15)

Water Needs

- Encouraging recycled wastewater use
 - Loudoun County is prime example
 - 3 other systems currently in early planning
 - Concern: consumptive use
- Encouraging stormwater use
 - 2 facilities currently under construction
 - VA Stormwater Handbook changes



DEQ Water Usage Data

- Most data centers purchase municipal water and do not have a water withdrawal permit from DEQ
- HB496 (Guzman, 2026) and SB553 (Srinivasan, 2026) require water withdrawers to report “in aggregate” data center water usage
 - DEQ Office of Information Services (OIS) completed data integration, updated Aug. 6, 2026
 - Water team working on public application – Jan. 2, 2027
 - Will provide aggregate water data over time

Stormwater Reuse

- Stormwater is a resource that is rarely utilized in Virginia
 - Perceived regulatory barriers
 - Lack of predictable water supply
 - Easier alternatives historically available
- DEQ began development of a new section of the Virginia Stormwater Management Handbook in 2025 to reduce perceived regulatory barriers
 - Draft to Handbook Technical Review Committee (TRC) Fall 2026
 - Add to Ver. 1.4 of the Handbook by Q2 2026
 - Future: Water budget computation model for large-scale cooling systems

Cooling Water Scarcity Areas (Budget Item 366 M)

- Statewide: Establish criteria for water scarcity areas by July 1, 2027
 - Request for recommendations sent to 4 state universities on Aug. 3, 2026
 - Develop standards to demonstrate that use of any water will be minimized
 - All data centers in a water scarcity area must demonstrate compliance by July 1, 2032

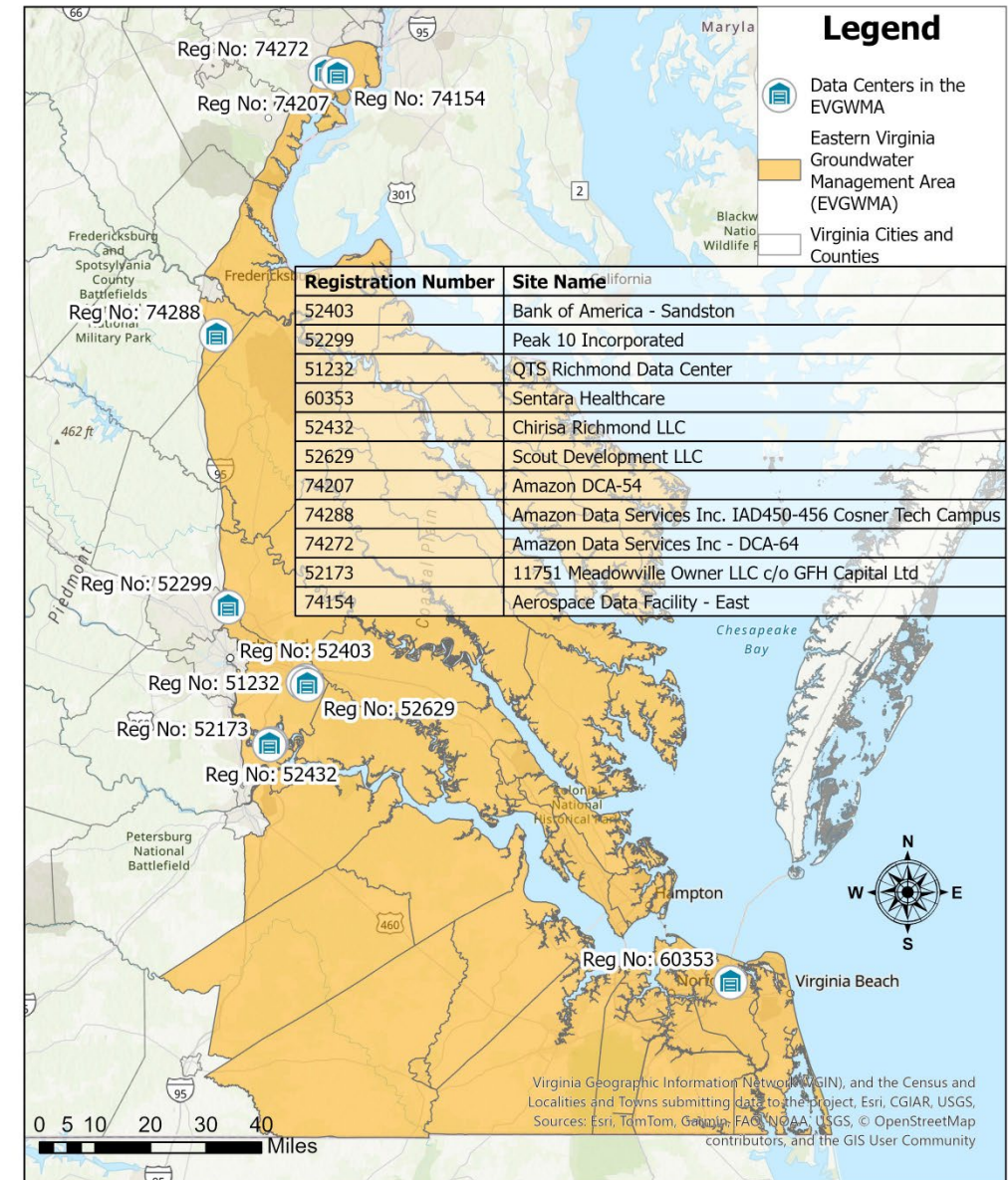
Cooling Water Scarcity Areas (Budget Item 366 M)

- Eastern Virginia Groundwater Management Area (EVGWMA) requirements: Applicable to data centers in the EVGWMA with air permit applications after Jan 1, 2027
 - DEQ is currently developing standards to demonstrate that use of any water will be minimized

EVGWMA Existing Data Center Retrofits

- Request for Proposals (RFP) issued July 14, 2026
- Contractor selected on Aug. 7, 2026
- Due to GA on Oct. 15, 2026

Data Centers within the Eastern Virginia Groundwater Management Area (EVGWMA)



Groundwater in Western Loudoun/Eastern Fauquier Counties (Budget Item 366 N)

- RFP issued July 16, 2026
- Response received Aug. 11, 2026
 - 3 proposals, ranging from \$50K - \$157K - \$177K
 - Target applicant selection date: Aug. 21, 2026
- Due to GA on Dec. 31, 2026

Data Center Air Emissions for Emergency Gensets (Thomas, HB154 – Bill Passed By)

- Database with reports:
 - Allow data centers to report usage online
 - Estimate pollutant loadings from maintenance
 - Allow scenarios to be developed by public users
 - Dynamic – new permits to be uploaded as issued
- Contractor selected on Aug. 6, 2026
- Estimated delivery: Jan. 2027
- Improvement over existing online permit database
 - Reduces DEQ and permittee time
 - Improved transparency to citizens

Noise Regulations (Budget Item 367 E)

- Determine lowest achievable noise level for a data center
- Effective by Dec. 31, 2029
- Initial information provided by Prince William County and Virginia Association of Counties (VACo)
- DEQ will engage a consultant
 - Study VA local ordinances
 - Survey similar ordinances in US & Europe

Questions?