# Data centers and the Delaware River Basin


Michael Thompson, P.E.

*Senior Water Resource Engineer*


**November 7, 2025**

*SAN Annual Meeting*

Delaware River Basin Commission

DELAWARE • NEW JERSEY

PENNSYLVANIA • NEW YORK

UNITED STATES OF AMERICA

# Outline

1. Why is DRBC thinking about data centers
2. Water use and power in the Delaware River Basin
3. All about data centers (background info)
4. Data centers and the DRB

# Section 1

Why is DRBC thinking about data centers?

Delaware River Basin Commission
DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

# FY26-28 Water Resources Program

## Section 1.5 Emergent Issues

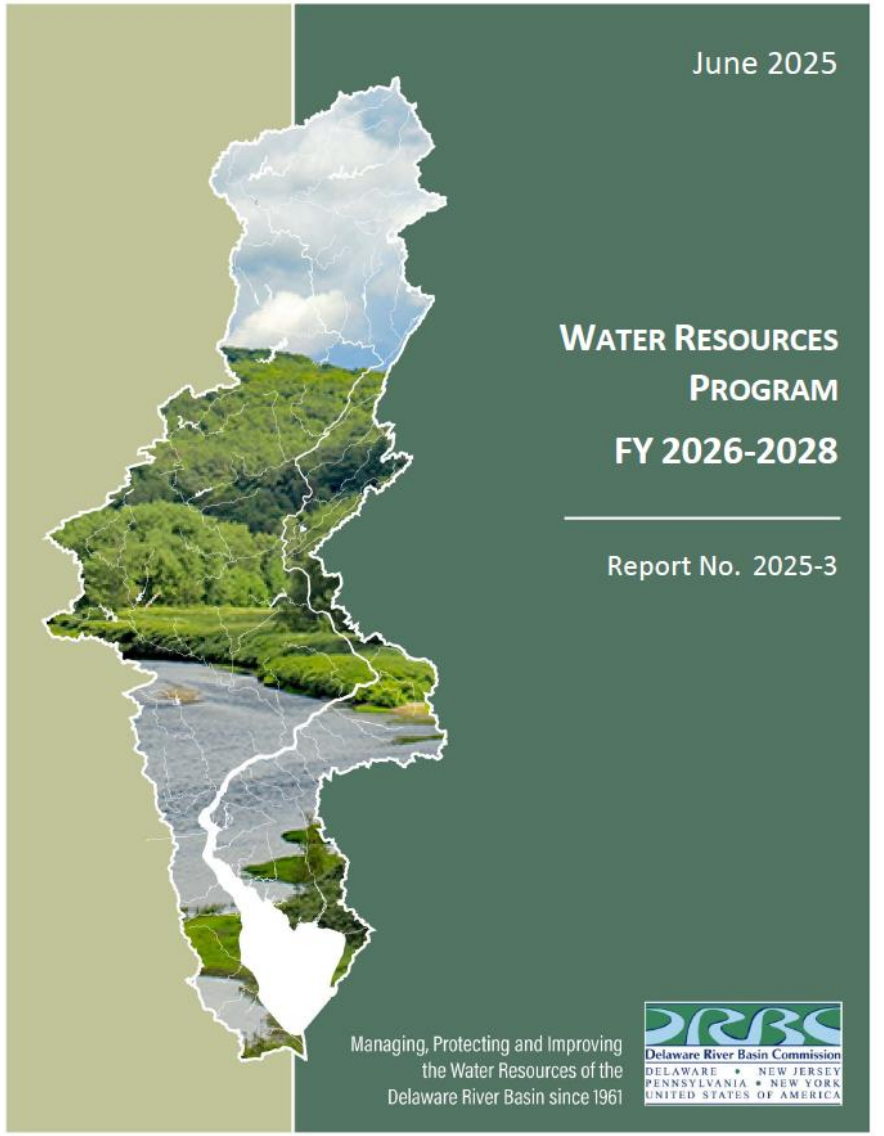
- 1.5.8 Data Centers

The growing importance of data centers and their potential impacts on water resources within the Basin are important to understand. Data centers consume large volumes of potable water for various purposes, primarily for cooling systems and humidity control, and the Commission has received inquiries for construction of data centers in recent years. DRBC will research and develop a briefing document on the potential impacts that data centers may have on water resources in the Basin.

## Section 2.2 Work Program

- 2.2.1.1.1 Water Supply Planning for a Sustainable Water Future 2060

DRBC will work to develop a briefing document on the potential impacts that data centers may have on water resources.



# Section 2

Water use and power in the Delaware River Basin

# FY26-28 WRP : 2022 DRB Water Withdrawals

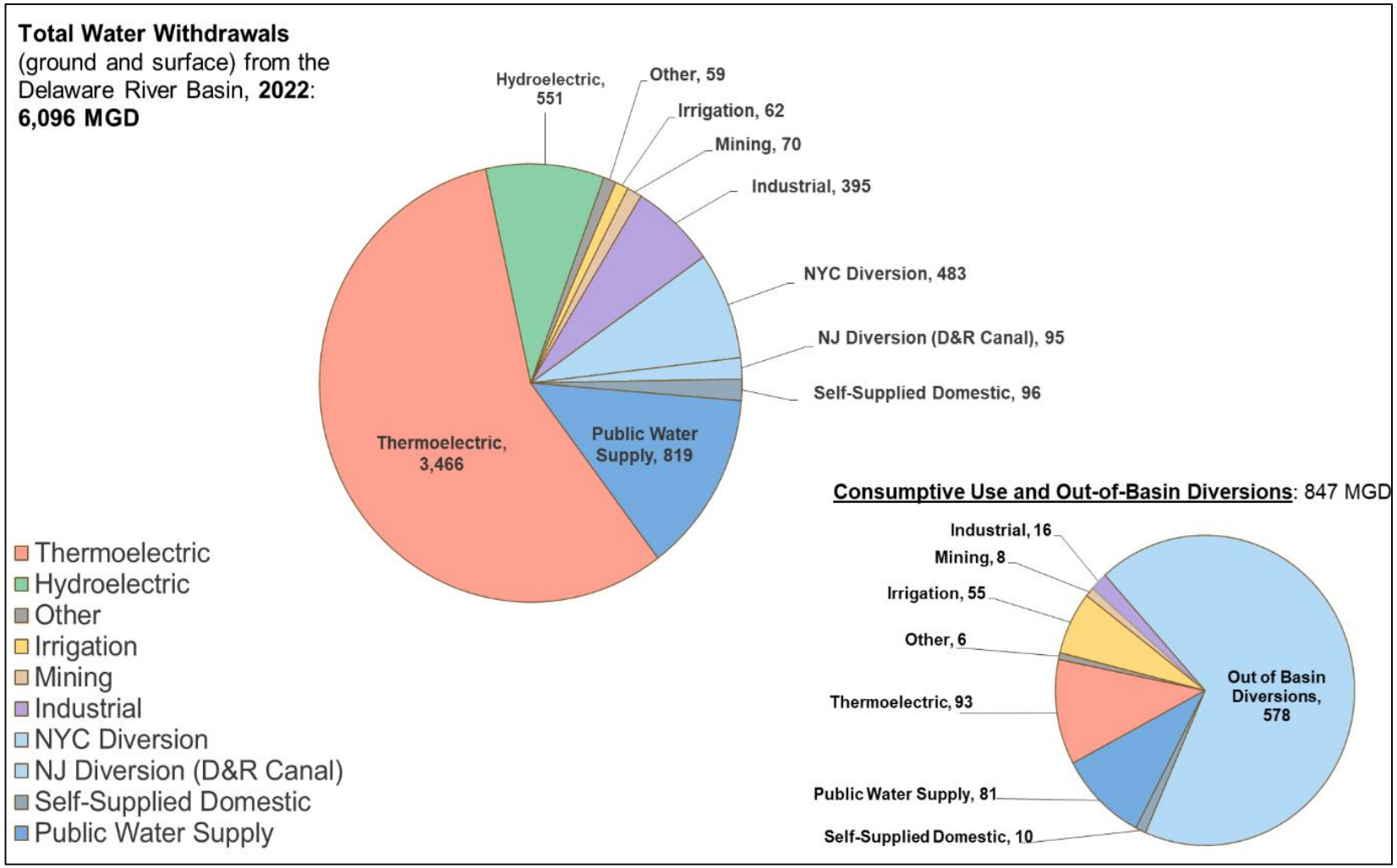



***Figure 7.*** *Total water withdrawals and consumptive use / major exports from the Basin in CY 2022.*

~ 6 BGD in 2022

- ~3.5 BGD is thermoelectric
- 0.8 BGD is PWS

Delaware River Basin Commission
DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

# FY26-28 WRP : 1990 – 2022 DRB Water Withdrawals

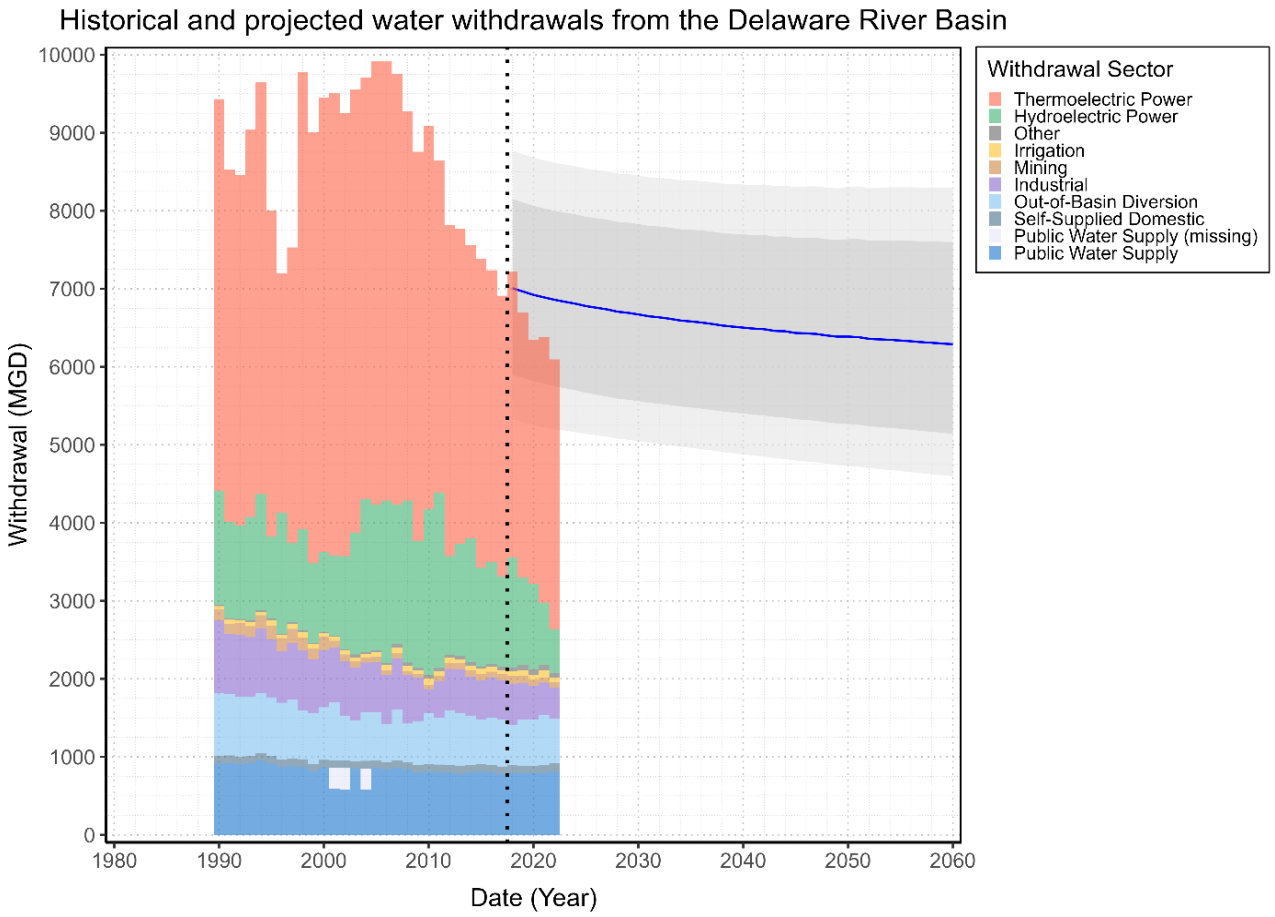



***Figure 8.*** *Historical and projected water withdrawals from the Delaware River Basin, initially published in Thompson & Pindar, 2021 through 2017. The predictive interval shown represents the aggregated predictive intervals for all sectors. The figure has been amended with complete years of data through 2022.*

## Water Withdrawals 1990 - 2022

~ 10,000 MGD in 2005 (10 BGD)

~ 6,000 MGD in 2022 (6 BGD)

~ 4,000 MGD *decrease* (4 BGD)

## Decrease Projected to 2060

Delaware River Basin Commission
DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

# FY26-28 WRP: 1990 – 2022 DRB Consumptive Water Use

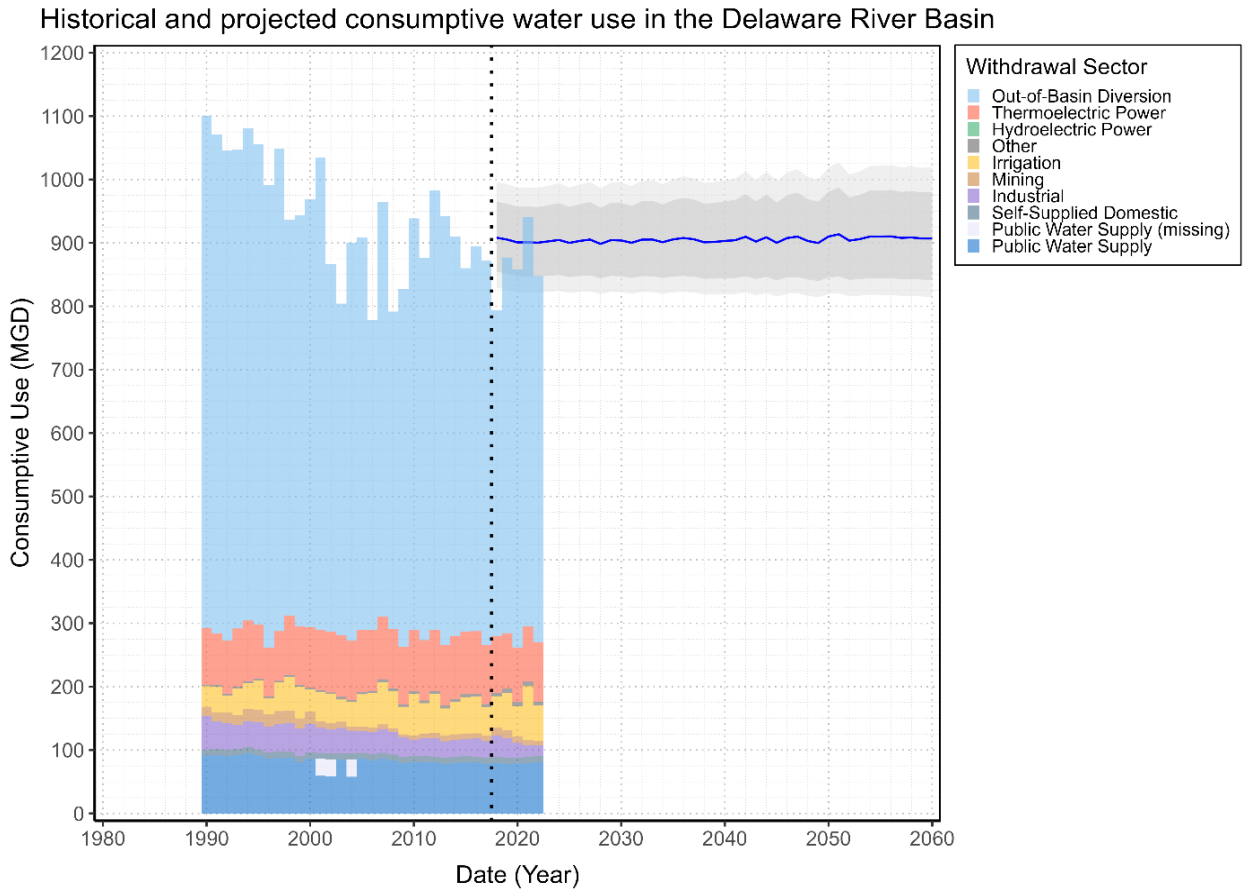



***Figure 9.*** *Historical and projected consumptive use of water in the Delaware River Basin, initially published in Thompson & Pindar, 2021 through 2017. The predictive interval shown represents the aggregated predictive intervals for all sectors, excluding the out-of-Basin diversions which did not have a calculated predictive internal. The figure has been amended with complete years of data through 2022.*

## Consumptive Water Use

~ 1,100 MGD in 1990 (1 BGD)

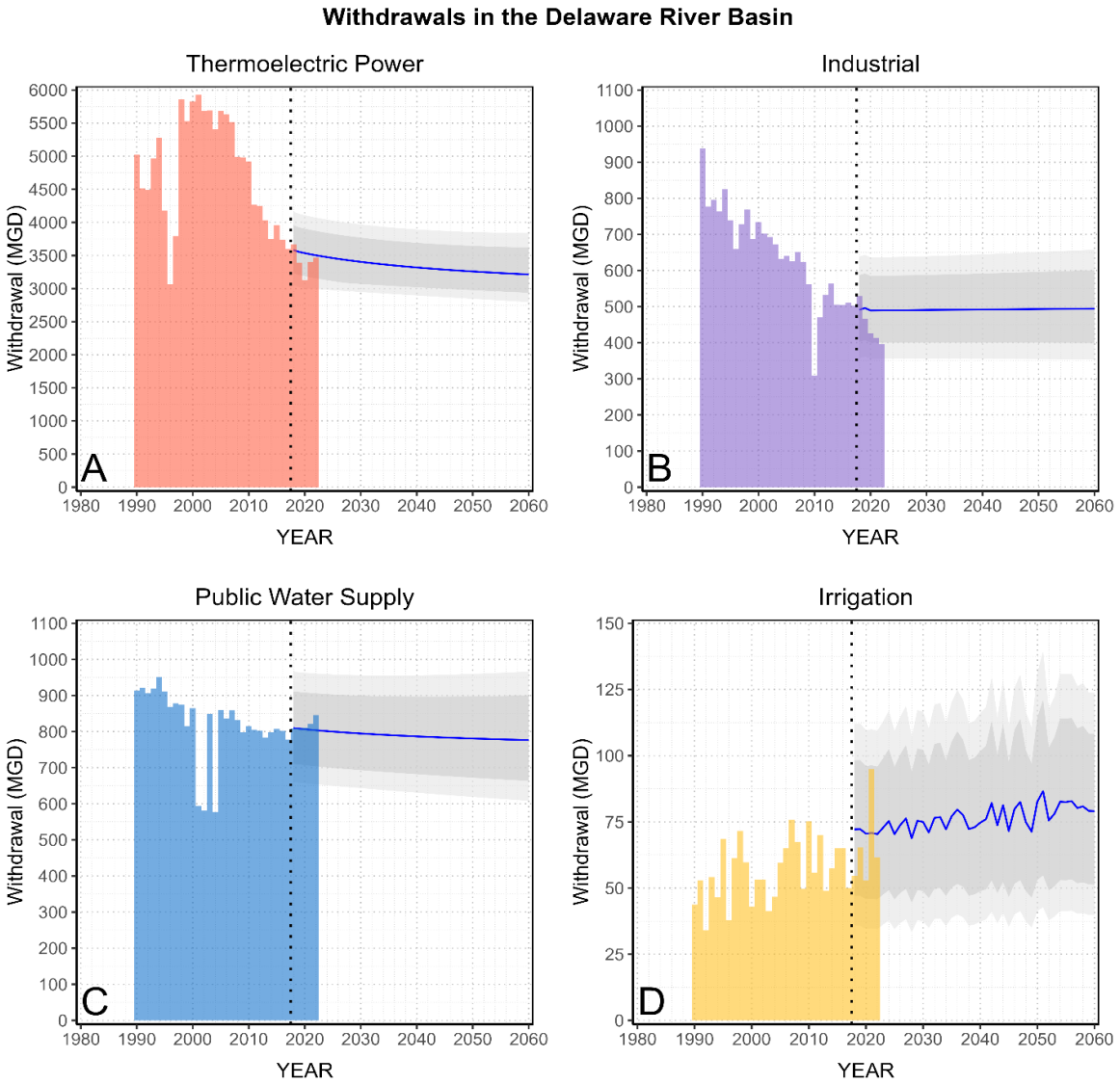
~ 850 MGD in 2022 (0.850 BGD)

~ 300 MGD decrease (0.3 BGD)

## Projected to remain constant

Delaware River Basin Commission
DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

# FY26-28 WRP – 4 Sector trends




## Notes

- Thermoelectric **at** projection
- Industrial **below** projection
- PWS shows **increase**
- Irrigation shows **increase**

***Figure 10.*** *Historical and projected water withdrawals for the major sectors within the Delaware River Basin. These data used to generate these figures have been adopted from Thompson & Pindar, 2021 through 2017; however, the historical data has been updated through 2022.*

Delaware River Basin Commission
DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

# PJM Grid

- Regional Transmission Organization (RTO)
- Largest grid in U.S.
- ~65 million customers
- 13 states + D.C.
- HQ in Valley Forge, PA
- Regulated by FERC

CY2023 net power generation

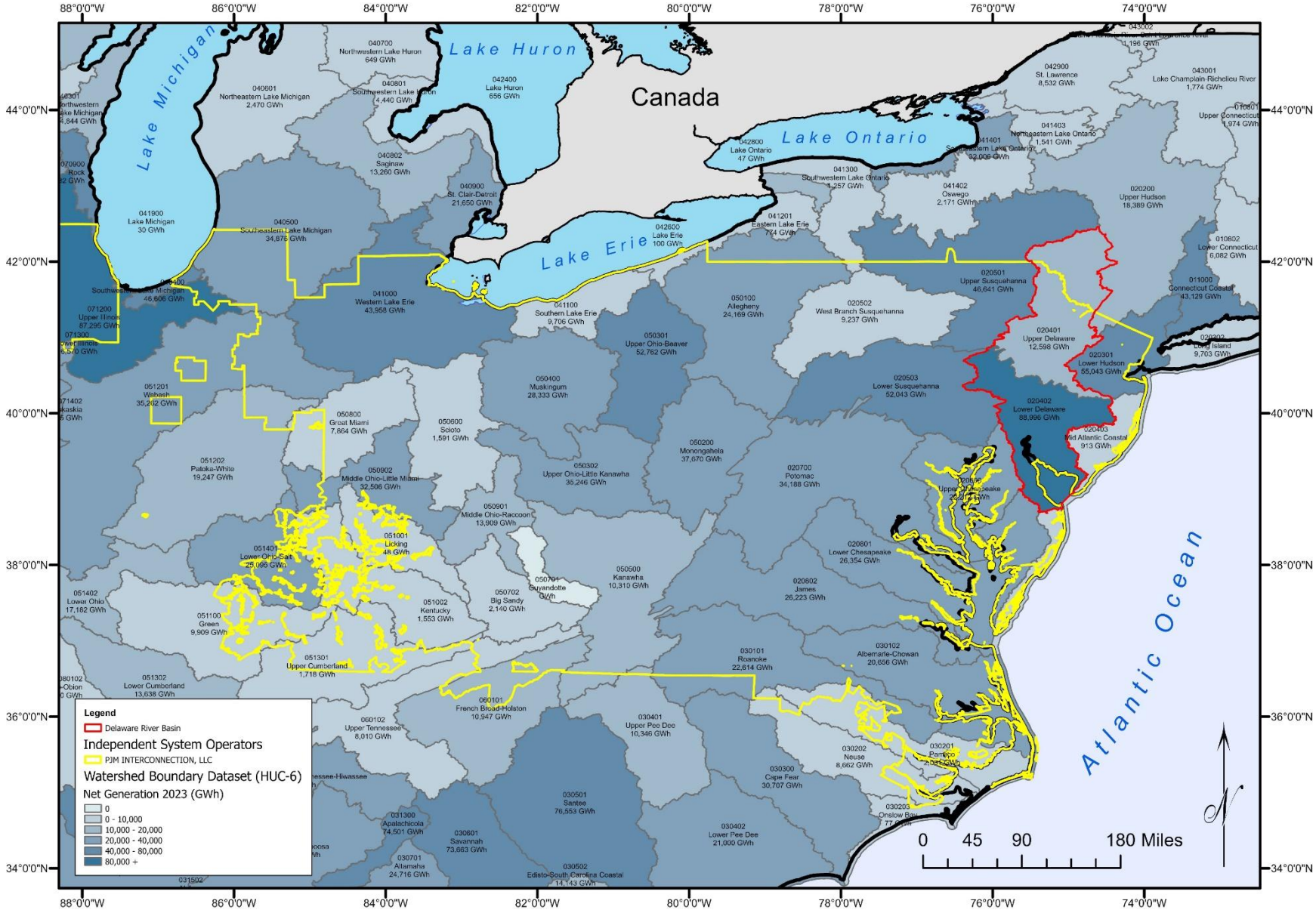
**Lower Delaware HUC**

---

2nd in the country

1st in the PJM

88,690 GWh in 2023




Total net power generation (from all sources) as reported through EIA Form-923 (CY2023), aggregated to a HUC-6 scale for the entire country. Labels within each watershed indicate the watershed name, as well as the net generation in gigawatt-hours (GWh).

**Sources:**

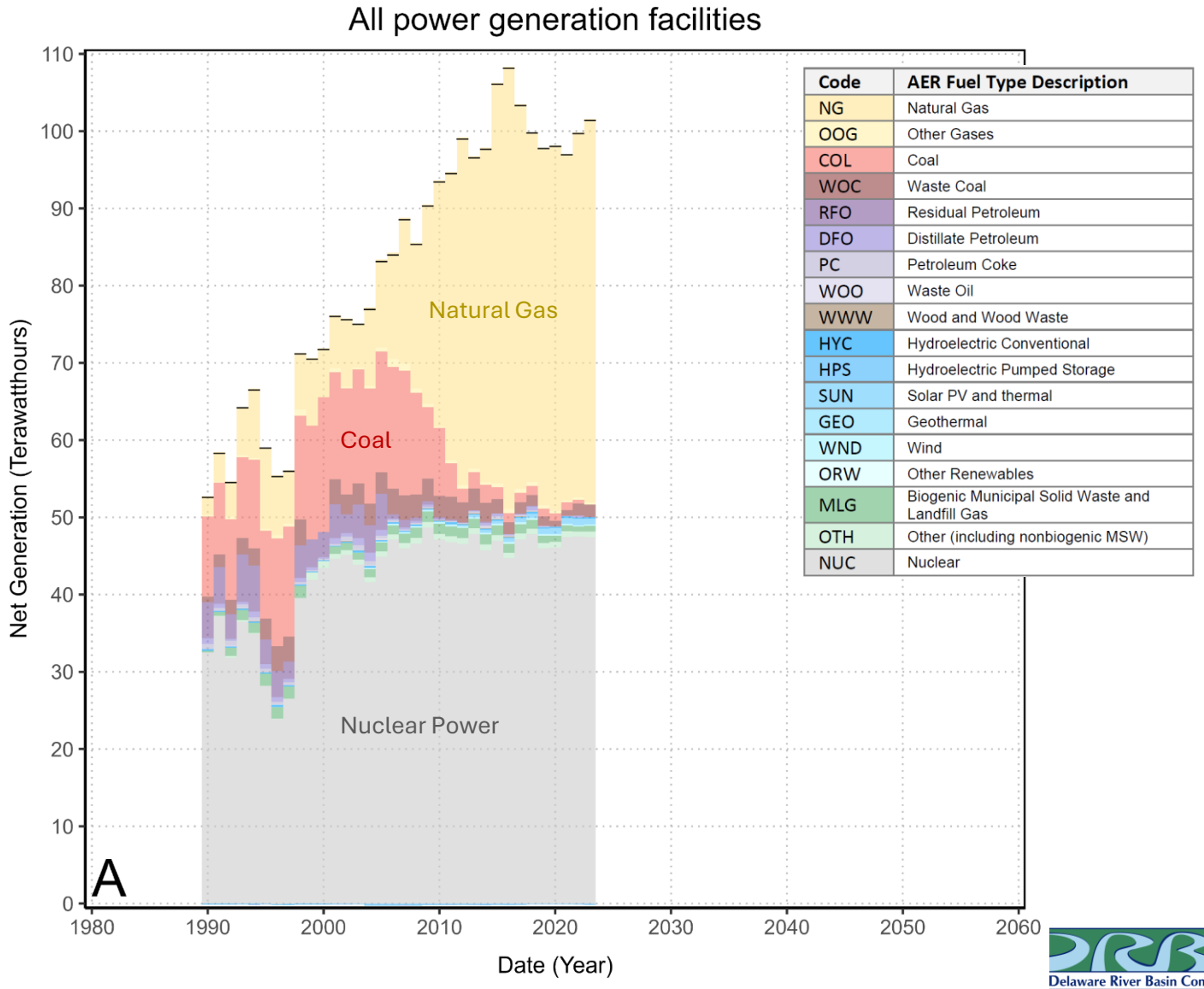
United States Energy Information Administration (EIA) Form 923, Form 860 and "PowerPlants" shapefile.

USGS Watershed Boundary Dataset (HUC-6 boundaries)

Delaware River Basin Commission
DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

**The Delaware River** historical context for essential power generation

## Power Facility Net Generation in the Delaware River Basin Categorized by AER Fuel Type




| Code | AER Fuel Type Description |
|---|---|
| NG | Natural Gas |
| OOG | Other Gases |
| COL | Coal |
| WOC | Waste Coal |
| RFO | Residual Petroleum |
| DFO | Distillate Petroleum |
| PC | Petroleum Coke |
| WOO | Waste Oil |
| WWW | Wood and Wood Waste |
| HYC | Hydroelectric Conventional |
| HPS | Hydroelectric Pumped Storage |
| SUN | Solar PV and thermal |
| GEO | Geothermal |
| WND | Wind |
| ORW | Other Renewables |
| MLG | Biogenic Municipal Solid Waste and Landfill Gas |
| OTH | Other (including nonbiogenic MSW) |
| NUC | Nuclear |

*Total net power generation includes facilities in the Upper Delaware (020401) and the Lower Delaware (020402).

Delaware River Basin Commission
DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

# Section 3

All about data centers

# What is a data center?

Gemini

2.5 Flash

What is a data center? Specifically those which are developed to support things like Machine Learning or Artificial Intelligence.

A **data center** is a centralized physical facility—a building, a dedicated room, or a collection of buildings—that houses computer systems and associated components, such as servers, storage systems, and networking equipment, which are necessary for storing, processing, and managing large amounts of data and applications. They serve as the critical infrastructure backbone for IT operations.

Data centers are equipped with robust supporting infrastructure, including:

- **Power Subsystems:** Uninterruptible Power Supplies (UPS) and backup generators to ensure continuous operation.
- **Cooling Equipment:** Systems to dissipate the significant heat generated by the IT hardware.
- **Security Systems:** Physical and digital measures to protect critical assets and sensitive data.
- **Network Infrastructure:** High-bandwidth cabling, routers, and switches for data transfer.

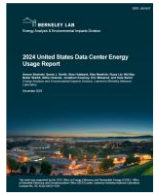
Delaware River Basin Commission
DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

# What is a data center?

**Table 4.1. Data Center Space Types Considered in This Study**

| Space Type | Description |
|---|---|
| **Telco Edge** | Deployment of small closets/rooms to micro data centers and network infrastructure by communications companies as points of presence throughout their network |
| **Commercial Edge** | Network closets, server rooms, and micro-data centers deployed to support modern digital, infrastructure, and software delivery services to edge locations for commercial (focused on customer and business operations) and industrial (focused on supply chain and channel operations) |
| **Small and Medium Businesses (SMB)** | SMB deployments in their own internal facilities |
| **Enterprise Branch** | Classic remote and branch office (ROBO) deployments for large enterprises in their own internal facilities (network closets, server rooms) |
| **Internal** | Data centers run by enterprises, internally, for their own use |
| **Communications Service Providers (Comms SPs)** | Data centers run by telecommunications/cable companies to support internal services required to enable provision of communications technology services to their customers |
| **Colocation – Sm/Med Scale** | Data centers built by local colocation companies typically providing retail leasing at smaller scale |
| **Colocation – Large Scale** | Data centers built by major colocation companies providing wholesale and retail colocation leasing, typically deploying large and mega datacenters |
| **Hyperscale** | Data centers built by companies that deploy internet services and platforms at massive scale |

Currently exist within the Delaware River Basin



**Reference:**

2024 United States Data Center Energy Usage Report

Arman Shehabi, Sarah J. Smith, Alex Hubbard, Alex Newkirk, Nuoa Lei, Md Abu Bakar Siddik, Billie Holecek, Jonathan Koomey, Eric Masanet, and Dale Sartor

*Energy Analysis and Environmental Impacts Division, Lawrence Berkeley National Laboratory*

Delaware River Basin Commission
DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

# Water use on a national scale?

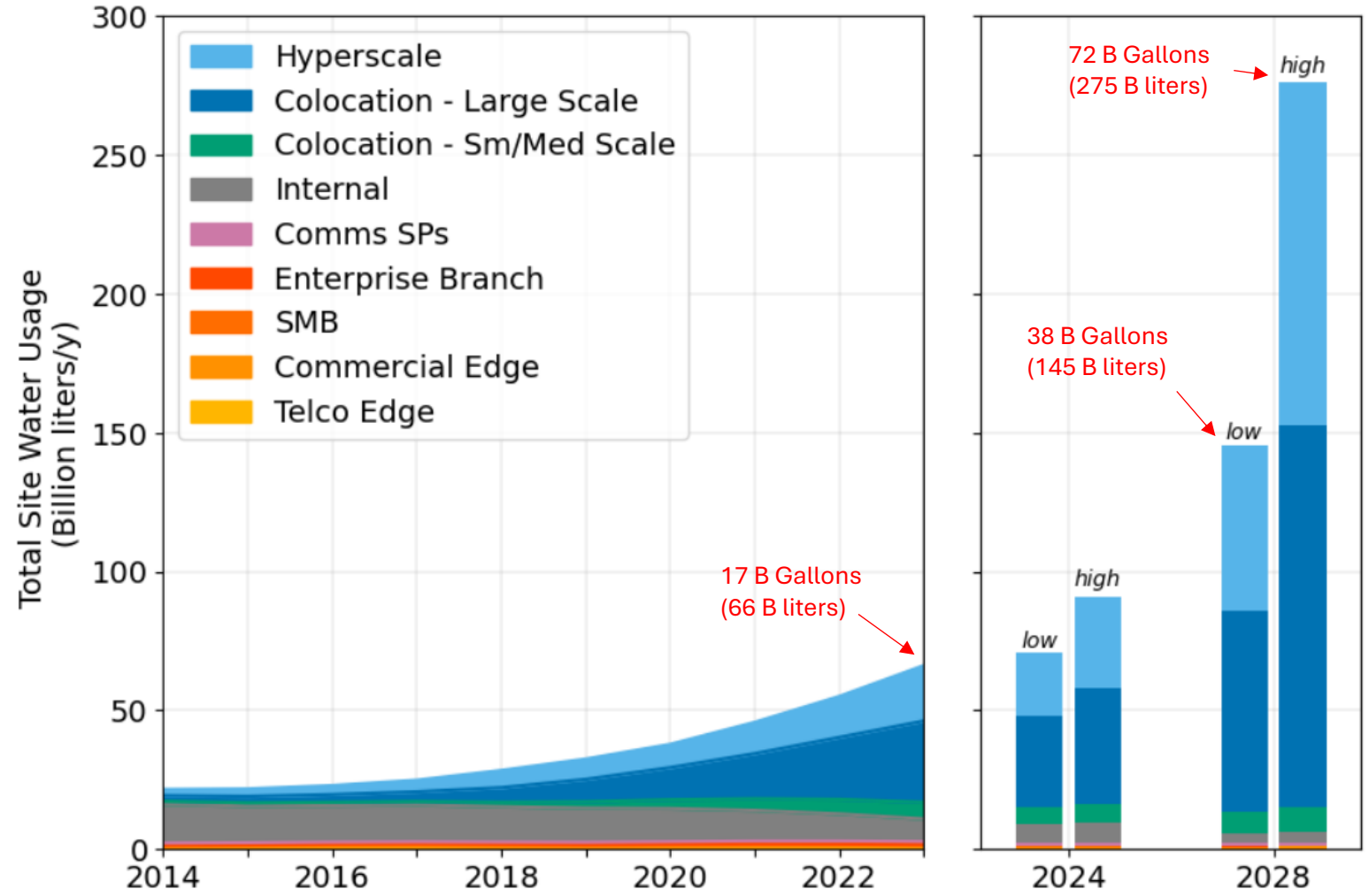



**Figure 5.9. Direct water consumption by data center type.**

**Reference:**

2024 United States Data Center Energy Usage Report

Arman Shehabi, Sarah J. Smith, Alex Hubbard, Alex Newkirk, Nuoa Lei, Md Abu Bakar Siddik, Billie Holecek, Jonathan Koomey, Eric Masanet, and Dale Sartor

*Energy Analysis and Environmental Impacts Division, Lawrence Berkeley National Laboratory*

Delaware River Basin Commission
DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

# Data centers electrical demand?

Increase in electricity consumption will likely impact water withdrawals for thermoelectric generation in DRB.

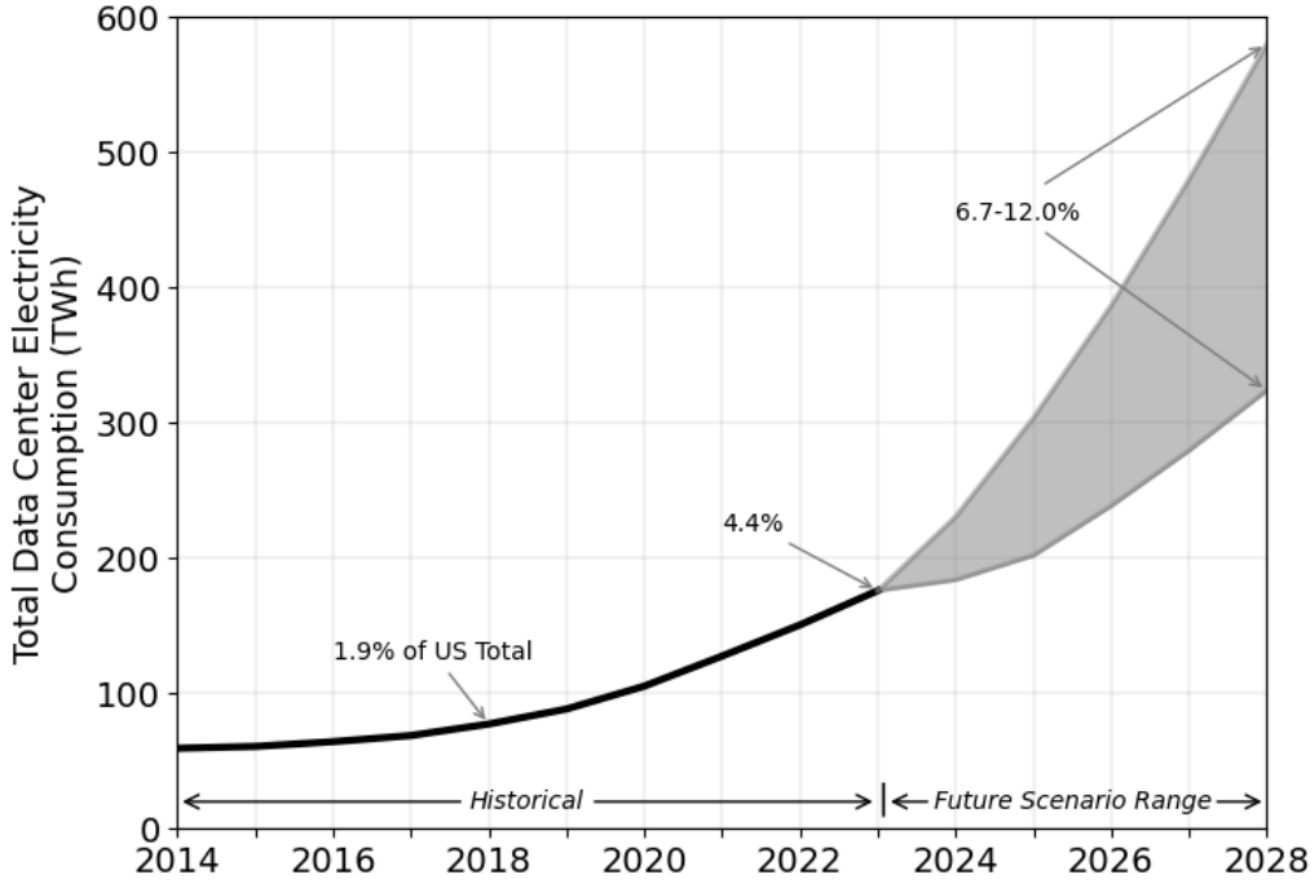



**Figure ES-1. Total U.S. data center electricity use from 2014 through 2028.**

**Reference:**

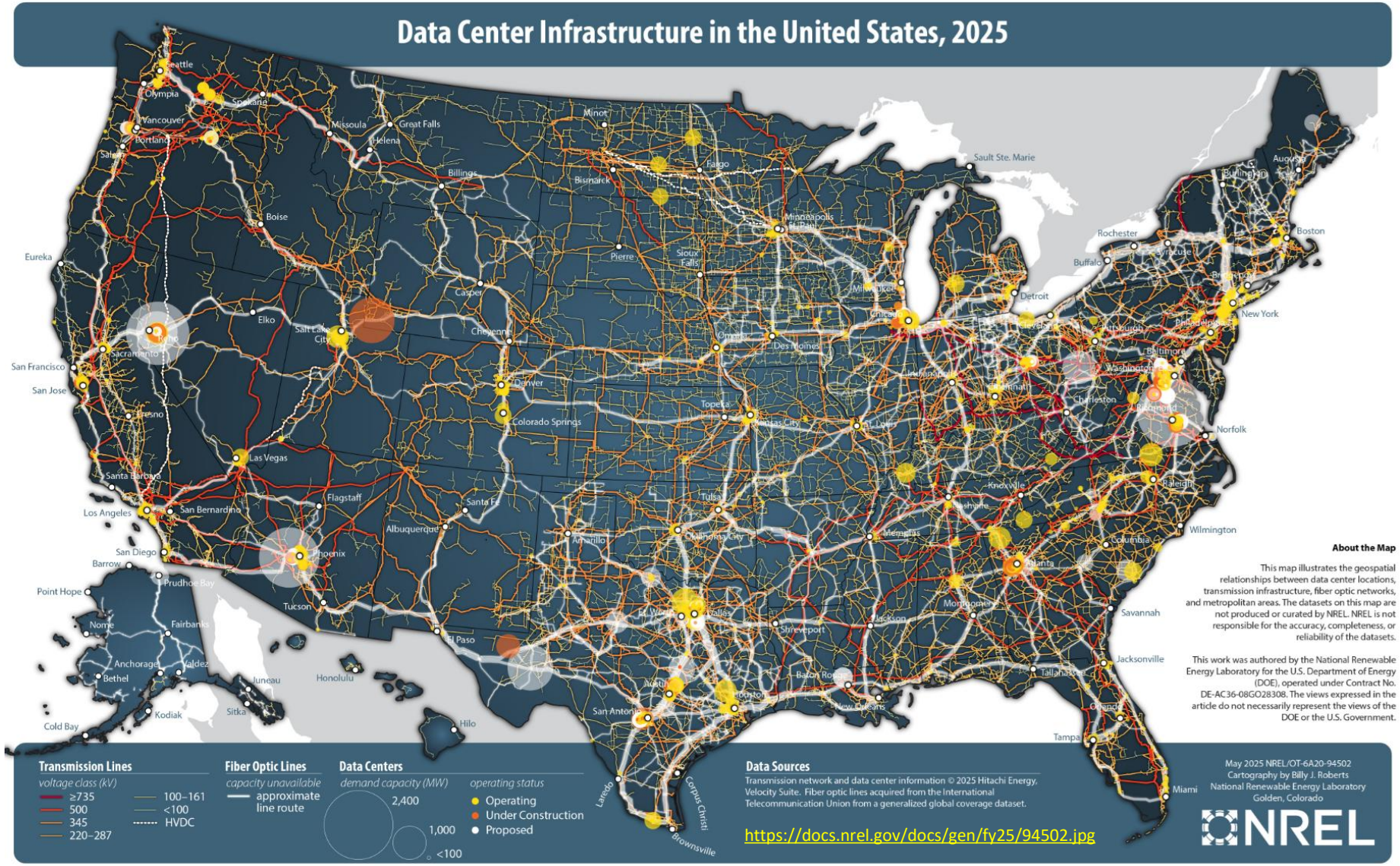
2024 United States Data Center Energy Usage Report

Arman Shehabi, Sarah J. Smith, Alex Hubbard, Alex Newkirk, Nuoa Lei, Md Abu Bakar Siddik, Billie Holecek, Jonathan Koomey, Eric Masanet, and Dale Sartor

*Energy Analysis and Environmental Impacts Division, Lawrence Berkeley National Laboratory*

Delaware River Basin Commission
DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

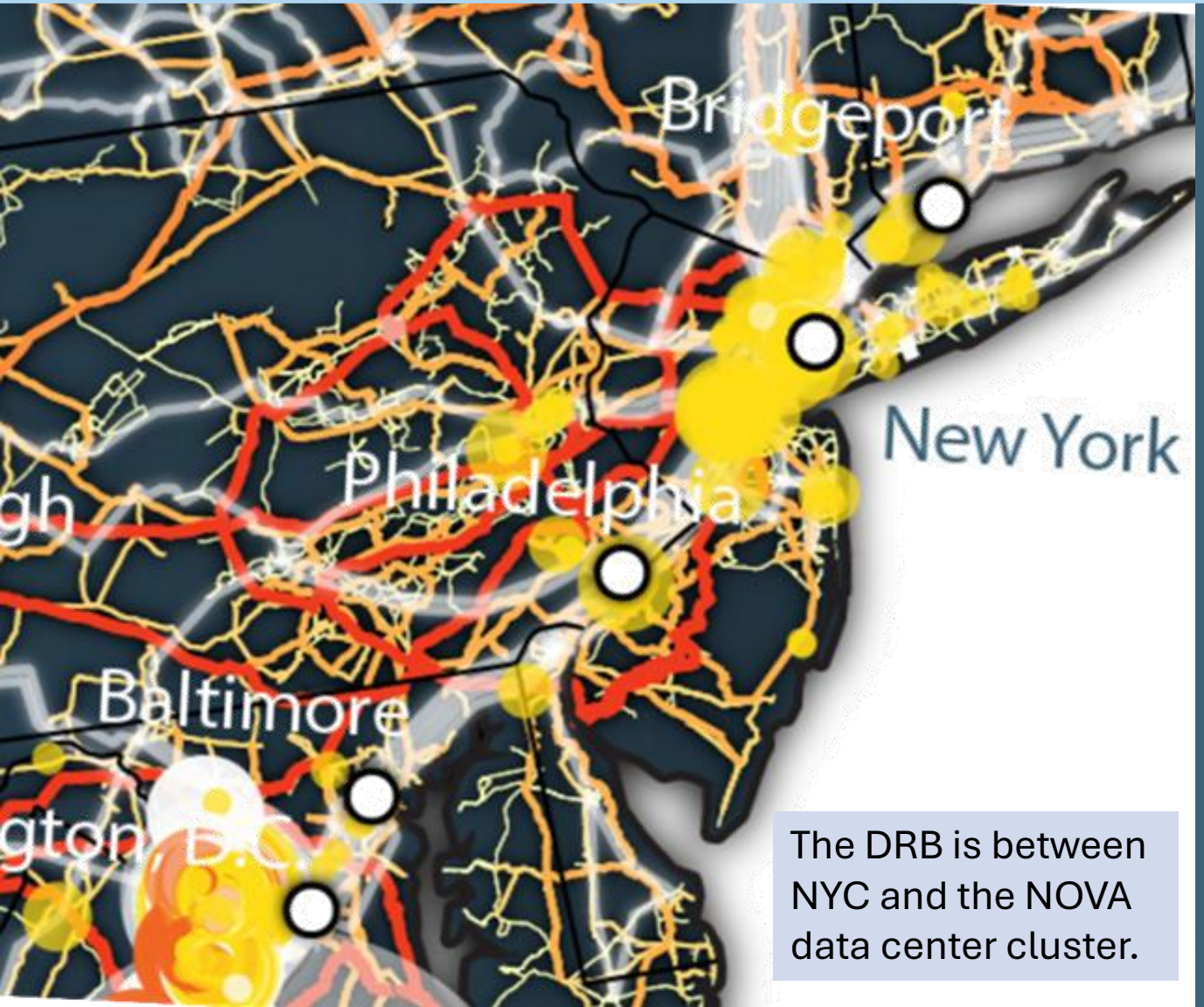
# Data Center Infrastructure




https://docs.nrel.gov/docs/gen/fy25/94502.jpg

Delaware River Basin Commission
DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

# Data Center Infrastructure




The DRB is between NYC and the NOVA data center cluster.

**Transmission Lines**

*voltage class (kV)*

- ≥735
- 500
- 345
- 220–287
- 100–161
- <100
- HVDC

**Fiber Optic Lines**

*capacity unavailable*

- approximate line route

**Data Centers**

*demand capacity (MW)*

- 2,400
- 1,000
- <100

*operating status*

- Operating
- Under Construction
- Proposed

https://docs.nrel.gov/docs/gen/fy25/94502.jpg

Delaware River Basin Commission
DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

# Section 4

Data centers and the DRB

Delaware River Basin Commission
DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

# What has the DRBC planning section up to?

## Research existing data centers in the DRB

- Establish a list using resources such as data portals, internet searches and NAICS
- Assess location intersection with public water supply service areas*
- Review industry characteristics (e.g. EIA, other agencies)


## Track proposed data centers in the DRB

- Only one inquiry with DRBC to date regarding data center
- No applications to date
- Review news releases & stay “in-the-know”

## Evaluate ways to reduce impacts

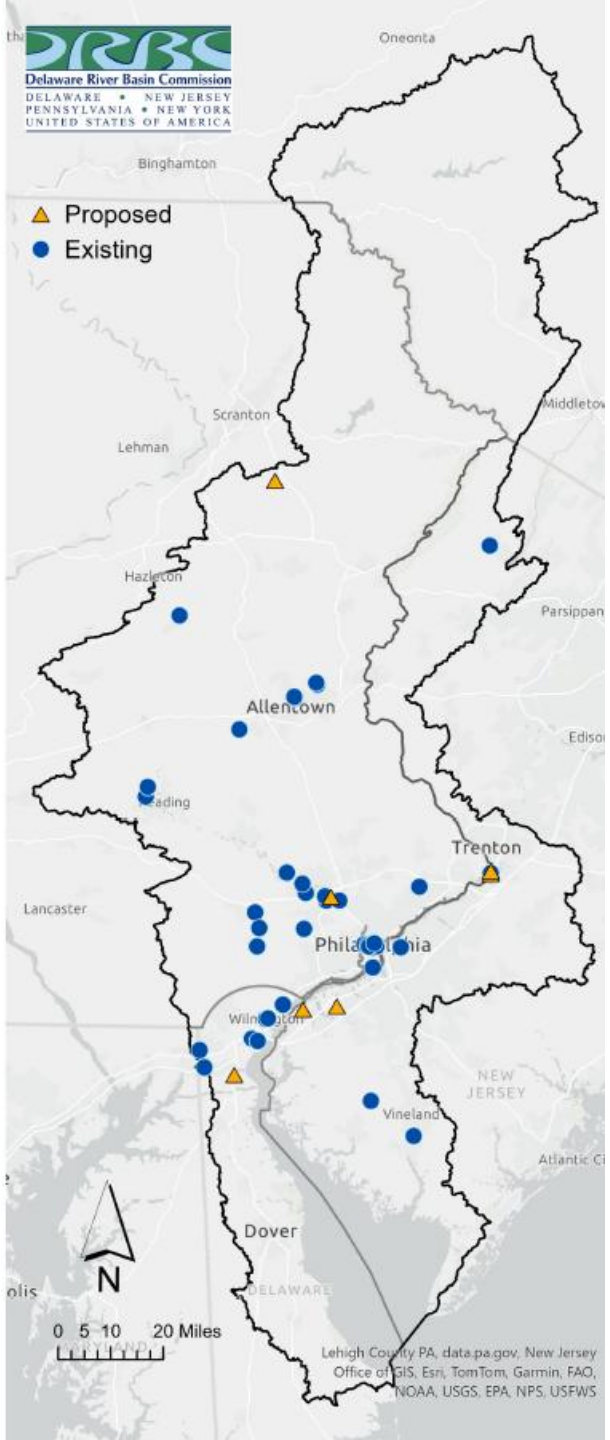
- This means understanding the potential impacts as well!

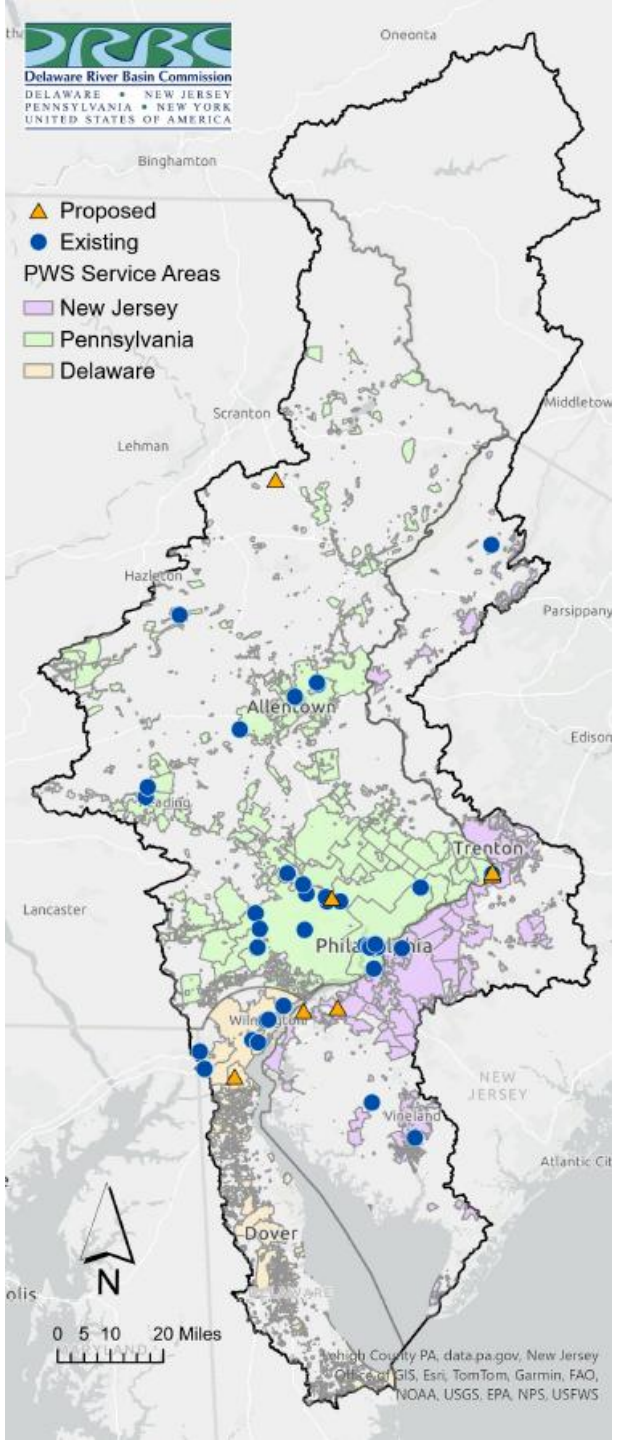
* *DRBC reviews water withdrawals above 100,000 gpd (or 10,000 gpd in the SEPA-GWPA). There are currently no approvals for self-supplied data centers.*

Delaware River Basin Commission
DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

# Data centers in the DRB?

| Basin State | Existing | Proposed |
|---|---|---|
| Pennsylvania | 48 | 6 |
| New Jersey | 6 | 2 |
| Delaware | 9 | 1 |
| New York | 0 | 0 |
| | **63** | **9** |




Delaware River Basin Commission
DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

# Proposed data centers

| | |
|---|---|
| 6 | Pennsylvania |
| 2 | New Jersey |
| 1 | Delaware |
| 0 | New York |


## Cleveland-Cliffs

**Address**: 900 Conshohocken Road, Montgomery County
**Parent Company**: MLP Ventures
**Scale**: unknown
**Nearby PWS**: Aqua PA Main Division

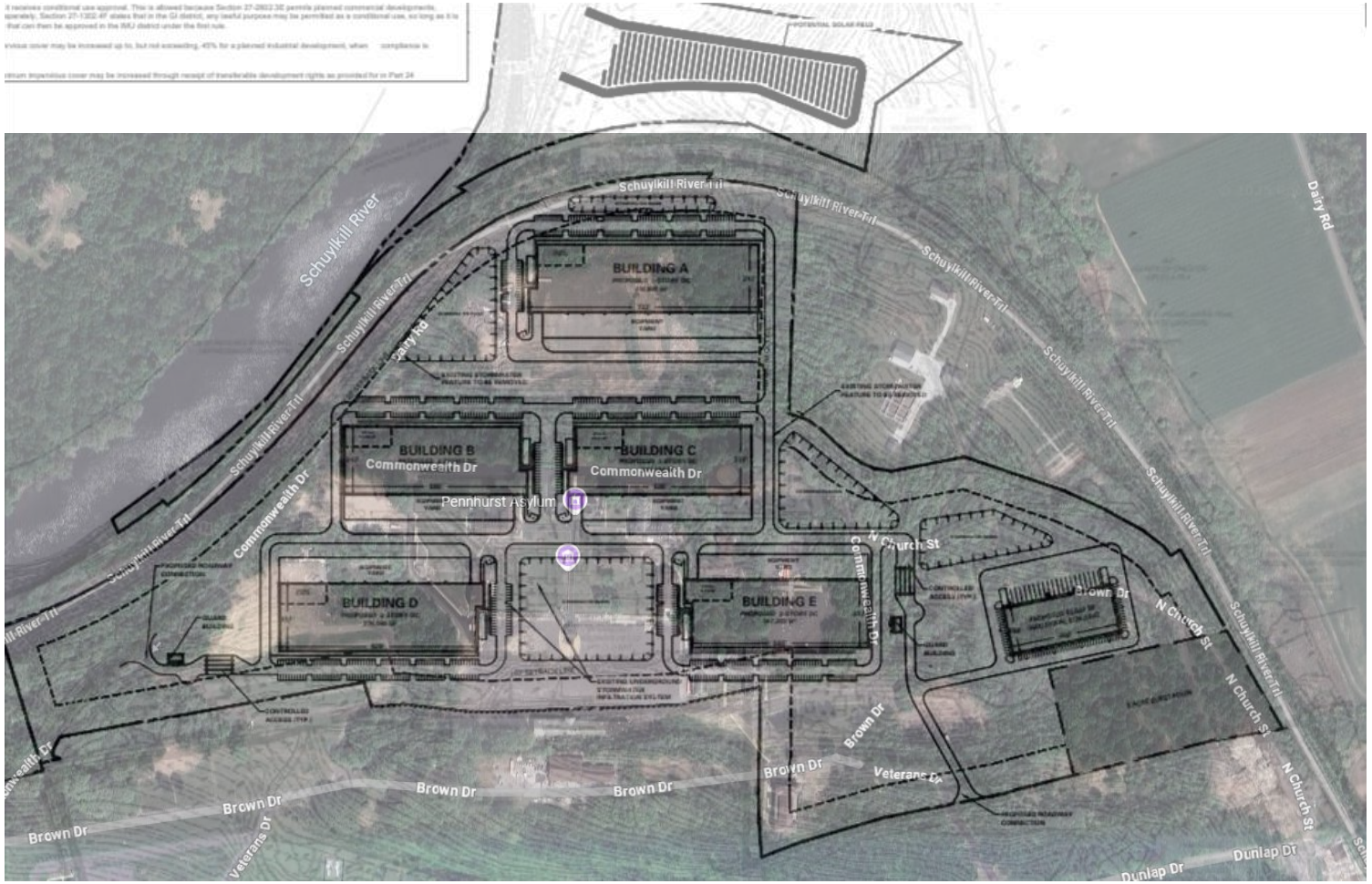

Delaware River Basin Commission
DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

# Proposed data centers

| | |
|---|---|
| 6 | Pennsylvania |
| 2 | New Jersey |
| 1 | Delaware |
| 0 | New York |


# Pennhurst

**Address**: 1205 Commonwealth Dr, Chester County
**Parent Company**: Pennhurst Holdings
**Scale**: ~125 acres, 5 buildings (1.3 million sq ft), 5-acre substation
**Nearby PWS**:



# What have we learned?

**There are about 60 operating in the DRB**

- All served by public water supply
- Not hyperscale


Water supply utilities likely have Non-Disclosure Agreements (NDA) with data center developers

Facility level data is difficult to obtain

Meetings with other regulatory agencies are helpful

Delaware River Basin Commission
DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

# Thank you!

DRBC website


Michael Thompson, P.E.
Senior Water Resource Engineer
---
Delaware River Basin Commission
E: Michael.Thompson@drbc.gov
P: (609) 883-9500 ext. 226


Delaware River Basin Commission
DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA