

Gas Well Development and Regulatory Requirements of the Susquehanna River Basin



August 6, 2008

Oneonta, New York



Susquehanna River Basin

The Basin

- 27,510-square-mile watershed
- Comprises 43 percent of the Chesapeake Bay watershed
- 4.2 million population
- 60 percent forested
- 32,000+ miles of waterways



The Susquehanna River

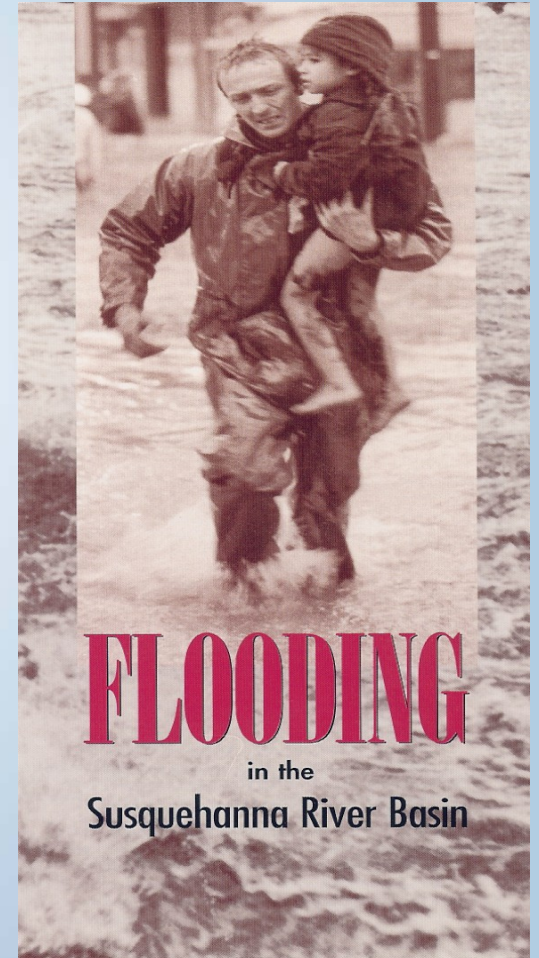
- 444 miles, largest tributary to the Chesapeake Bay
- Supplies 18 million gallons a minute to the Bay

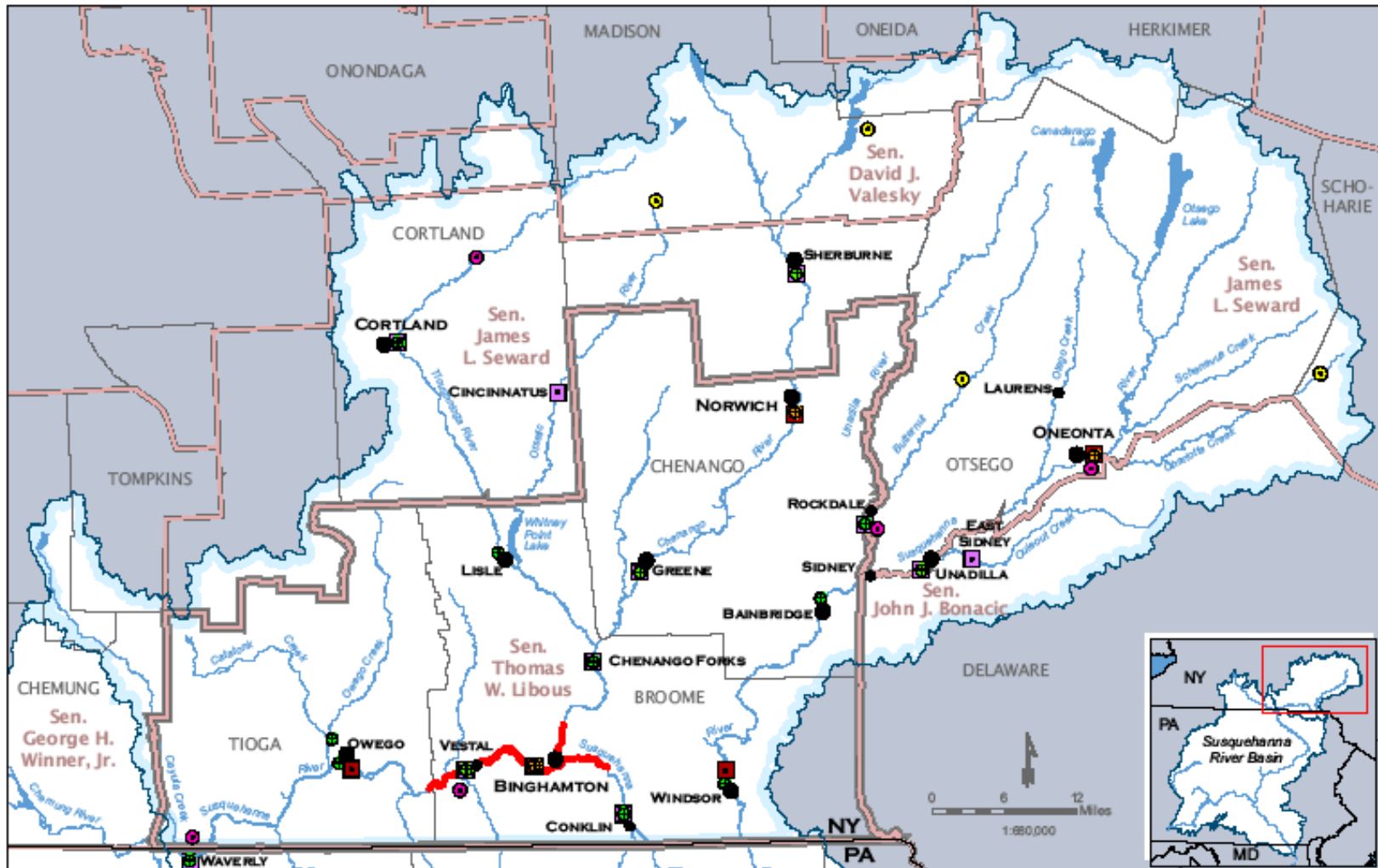
Susquehanna River Basin Commission

- Federal-interstate compact commission established by the federal government and the states of New York, Pennsylvania, and Maryland.
- Responsible for managing the basin's water resources.
- Currently comprised of 38 full-time staff
 - Water Resources Management (14 full time)
 - Regulatory program (7 full time)

Commission Programs

- Flood Forecast and Warning System
- Monitoring and Assessment
- Public Education and Outreach
- Water Resources Planning
- Drought Coordination
- Regulatory Program





RECOMMENDED IMPROVEMENTS TO THE SUSQUEHANNA FLOOD FORECAST & WARNING SYSTEM

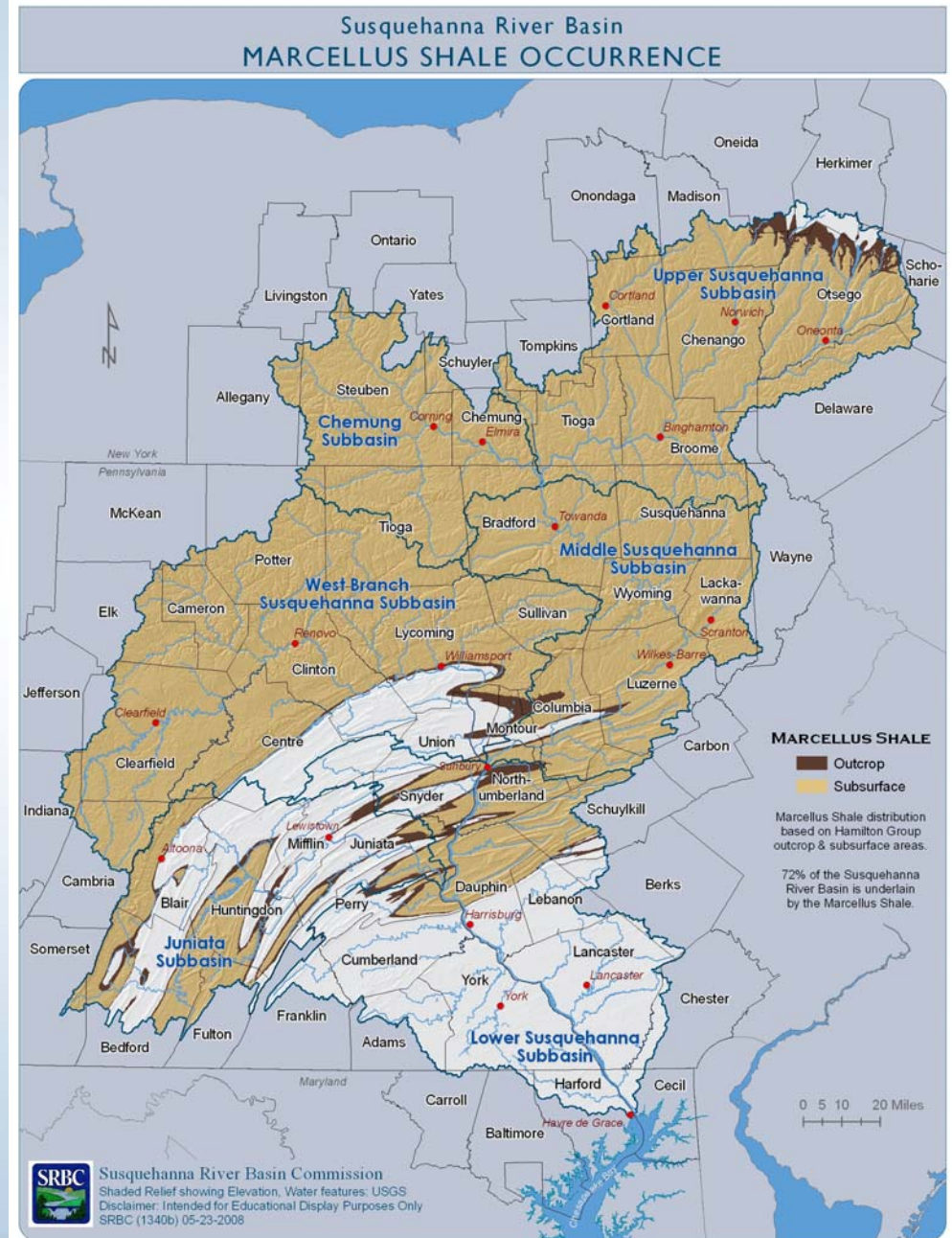
- | | | | |
|-----------------------------------|-------------------------------|-----------------------------------|------------------------|
| USGS STREAM GAGES | Current Rain Gage | Proposed Flood Inundation Mapping | Major City/Town |
| Proposed Upgrade to Existing Gage | Proposed Rain Gage | Major River | NY Senatorial District |
| Proposed Discharge Gage | Current River Forecast Point | Waterbody | County Boundary |
| | Proposed River Forecast Point | Upper Susquehanna Subbasin | State Boundary |

SRBC(1258) 0 8-1 8-2 006 Jeff Zimmerman, Jr.
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Geographic Location

- Appalachian Basin Province
 - NY to PA, OH, MD, WV and VA
 - Trending northeast, spans a distance of approximately 600 linear miles, and 54,000 square miles
 - 72 percent of the Susquehanna River Basin is underlain by the Marcellus Shale



Recent Commission Actions

May 30, 2008 - Cease and desist Orders were issued to two gas well drilling companies

June 6, 2008 - Letters to 23 gas well companies operating within the Susquehanna River Basin clarifying that water used for developing natural gas wells in the Susquehanna River Basin needs Commission approval

June 18, 2008 - Letters to an additional 29 gas well companies operating within the Susquehanna River Basin clarifying that water used for developing natural gas wells in the Susquehanna River Basin needs Commission approval

June-August 2008 - Commission staff has met with over 30 gas well companies operating within the Susquehanna River Basin

June-August 2008 - Commission staff has executed 6 consent order and agreements with gas well companies operating within the Susquehanna River Basin

Commission Regulation

- Consumptive water use definition (§806.3)
 - The loss of water transferred through a manmade conveyance system or any integral part thereof (including such water that is purveyed through a public water supply system), due to transpiration by vegetation, incorporation into products during their manufacture, evaporation, *injection of water or wastewater into a subsurface formation from which it would not reasonably be available for future use in the basin*, diversion from the basin, or other process by which the water is not returned to the waters of the basin undiminished in quantity.

Commission Regulation (cont'd)

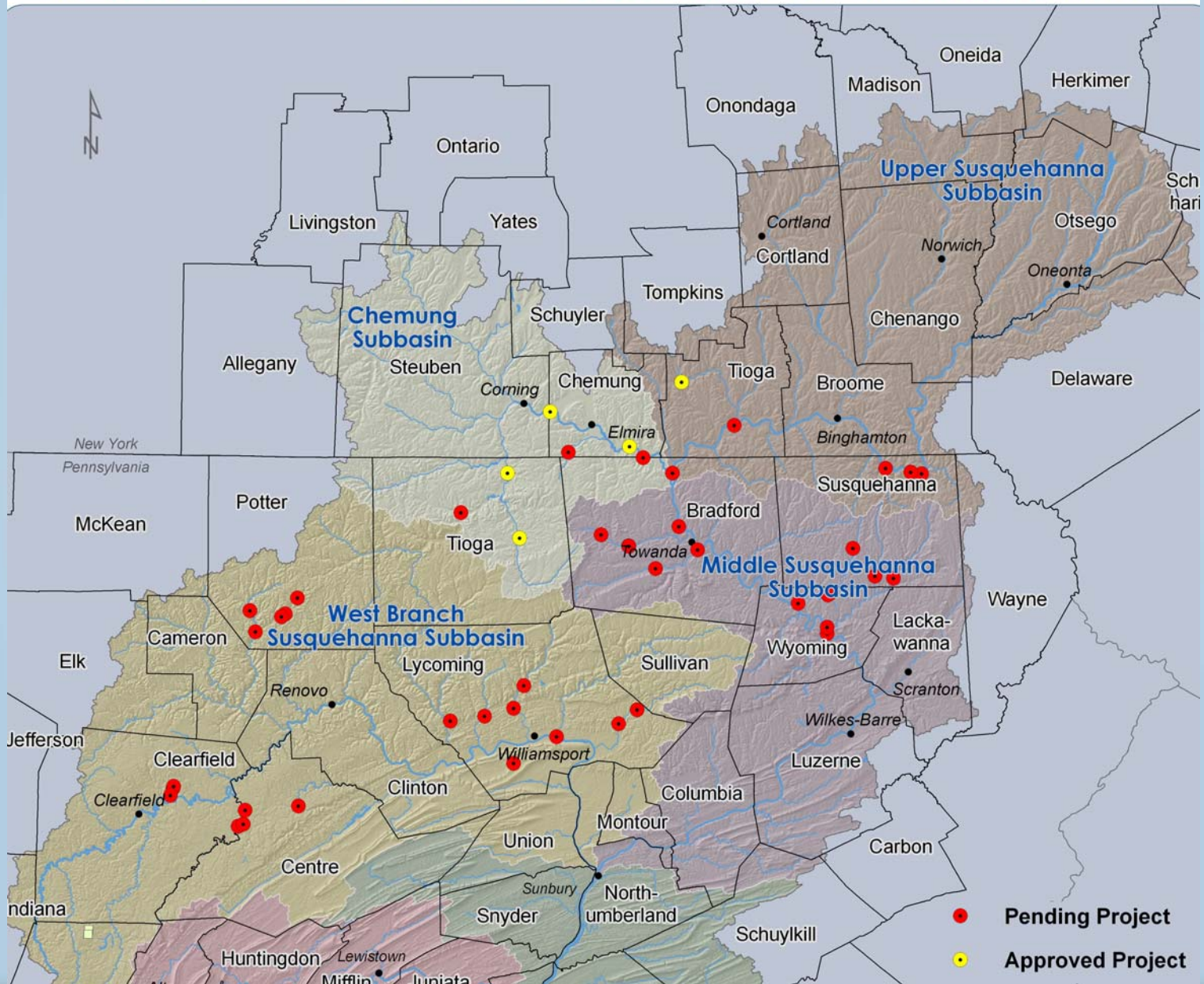
- Projects requiring review and approval
 - Consumptive water use §806.4(a)(1)
 - 20,000 gpd/30-day average (600,000 gallons)
 - Water withdrawals §806.4(a)(2)(iii)
 - 100,000 gpd/30-day average (3,000,000 gallons)
 - Any project which involves a withdrawal from a groundwater or surface water source and which is subject to the requirements of §806.4(a)(1) regarding consumptive use.

Current Status

Consumptive water use §806.4 and Water withdrawals §806.4

- Consumptive water use applications
 - 11 APPLICATIONS HAVE BEEN RECEIVED (3 NY) (8 companies)
 - 3 HAVE BEEN ISSUED (June 12th) (2 NY)
- Surface water withdrawal applications
 - 47 APPLICATIONS HAVE BEEN RECEIVED (5 NY)
 - 5 HAVE BEEN ISSUED (June 12th) (3 NY)

APPROVED & PENDING GAS WELL SURFACE WATER WITHDRAWALS



Commission Regulation (cont'd)

Water withdrawals §806.4(a)(2)(iii)

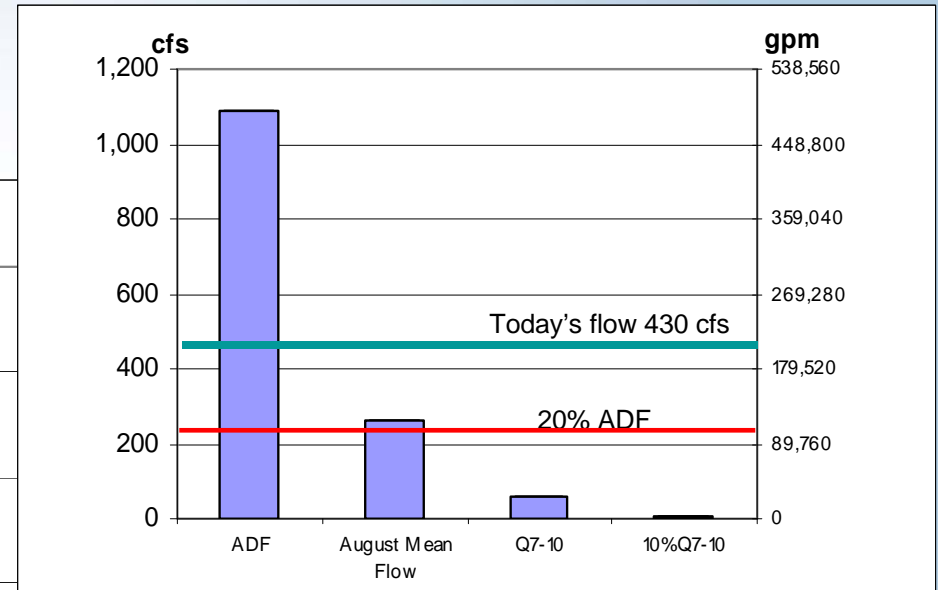
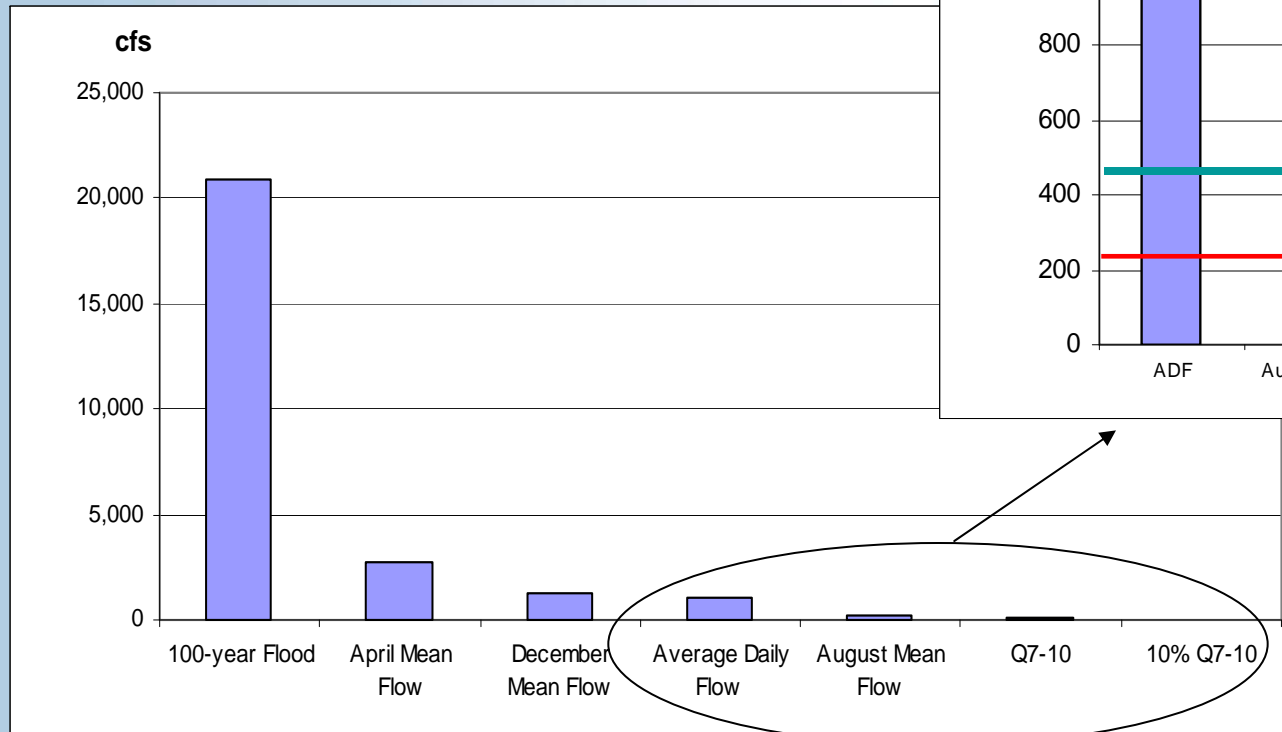
- (2) The Commission may deny an application, limit or condition an approval to ensure that the withdrawal will not cause significant adverse impacts to the water resources of the basin. The Commission may consider, without imitation, the following in its consideration of adverse impacts: Lowering of groundwater or stream flow levels; rendering competing supplies unreliable; **affecting other water uses**; causing water quality degradation that may be injurious to any existing or potential water use; **affecting fish, wildlife or other living resources or their habitat**; causing permanent loss of aquifer storage capacity; or **affecting low flow of perennial or intermittent streams**.

Susquehanna River Basin

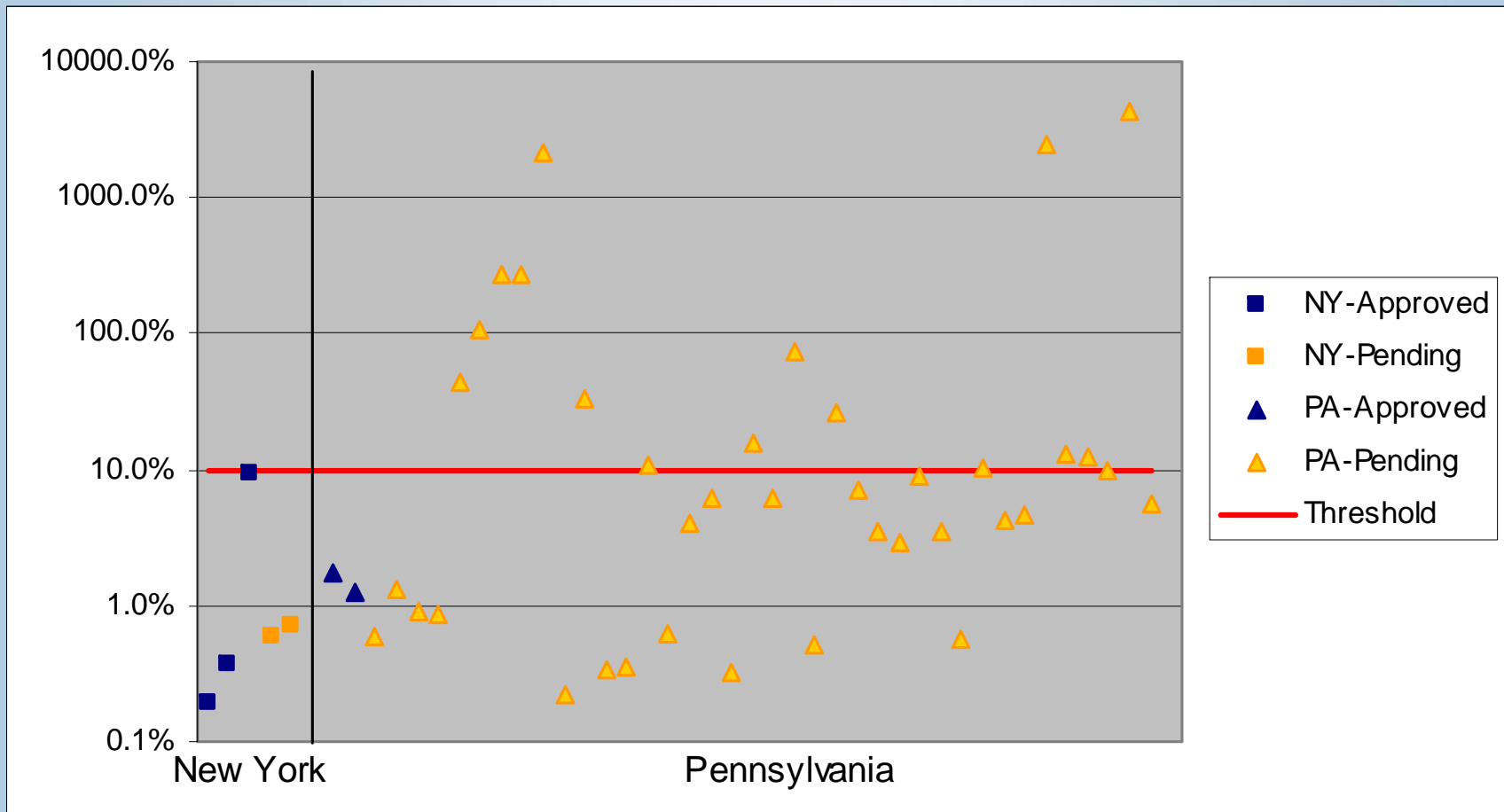
SUSQUEHANNA RIVER DRAINAGE AREAS AT ONEONTA, NY & UNADILLA, NY GAGE



Streamflow at Oneonta, NY



Gas Drilling Withdrawal Rate



Commission Regulation (cont'd)

Approval by rule for consumptive uses.

-Consumptive water use §806.22(e)

Any project whose **sole source of water for consumptive use is a public water supply** withdrawal, may be approved under this paragraph (e) in accordance with the following, unless the Commission determines that the project cannot be adequately regulated under this approval by rule.

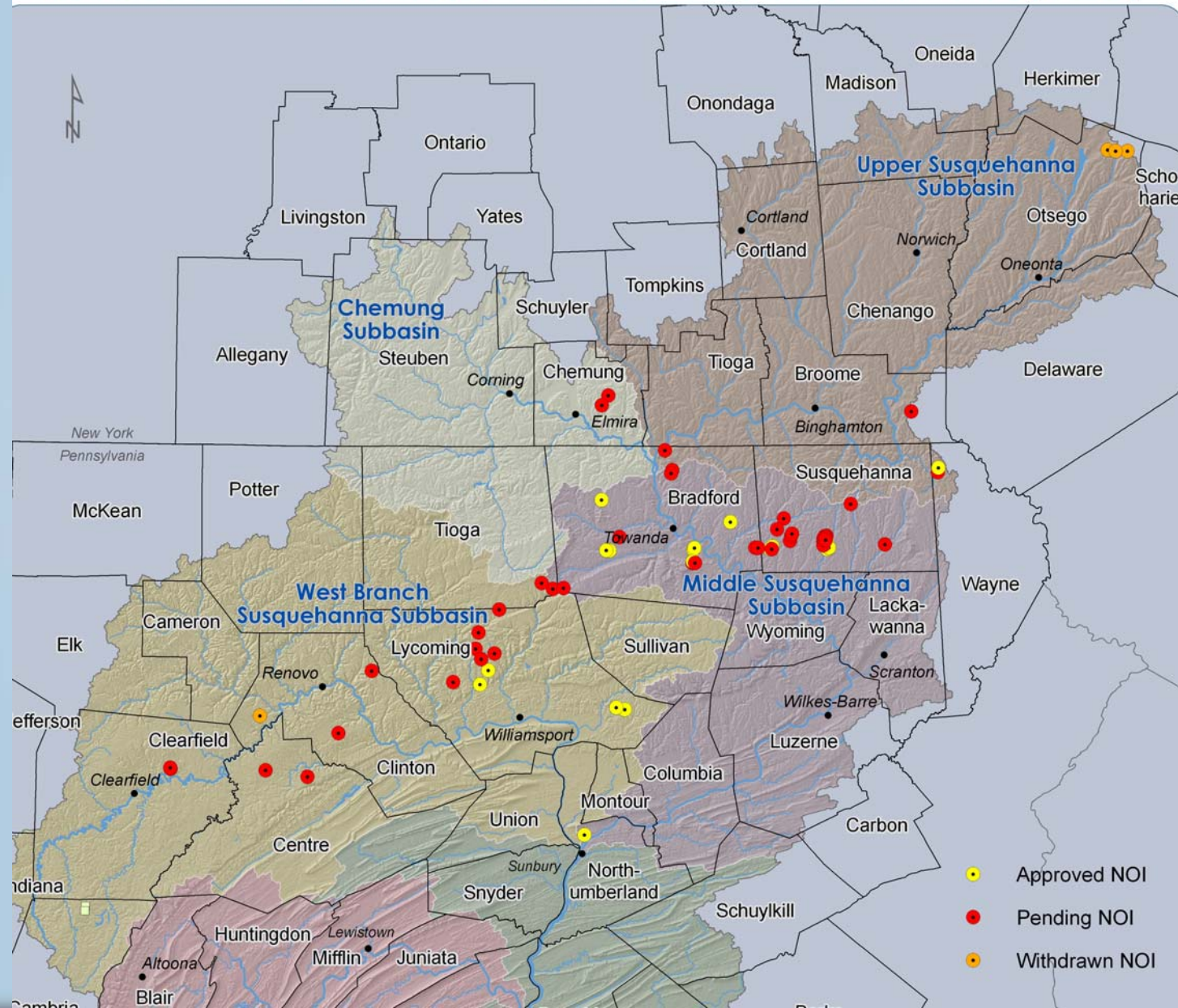
Current Status

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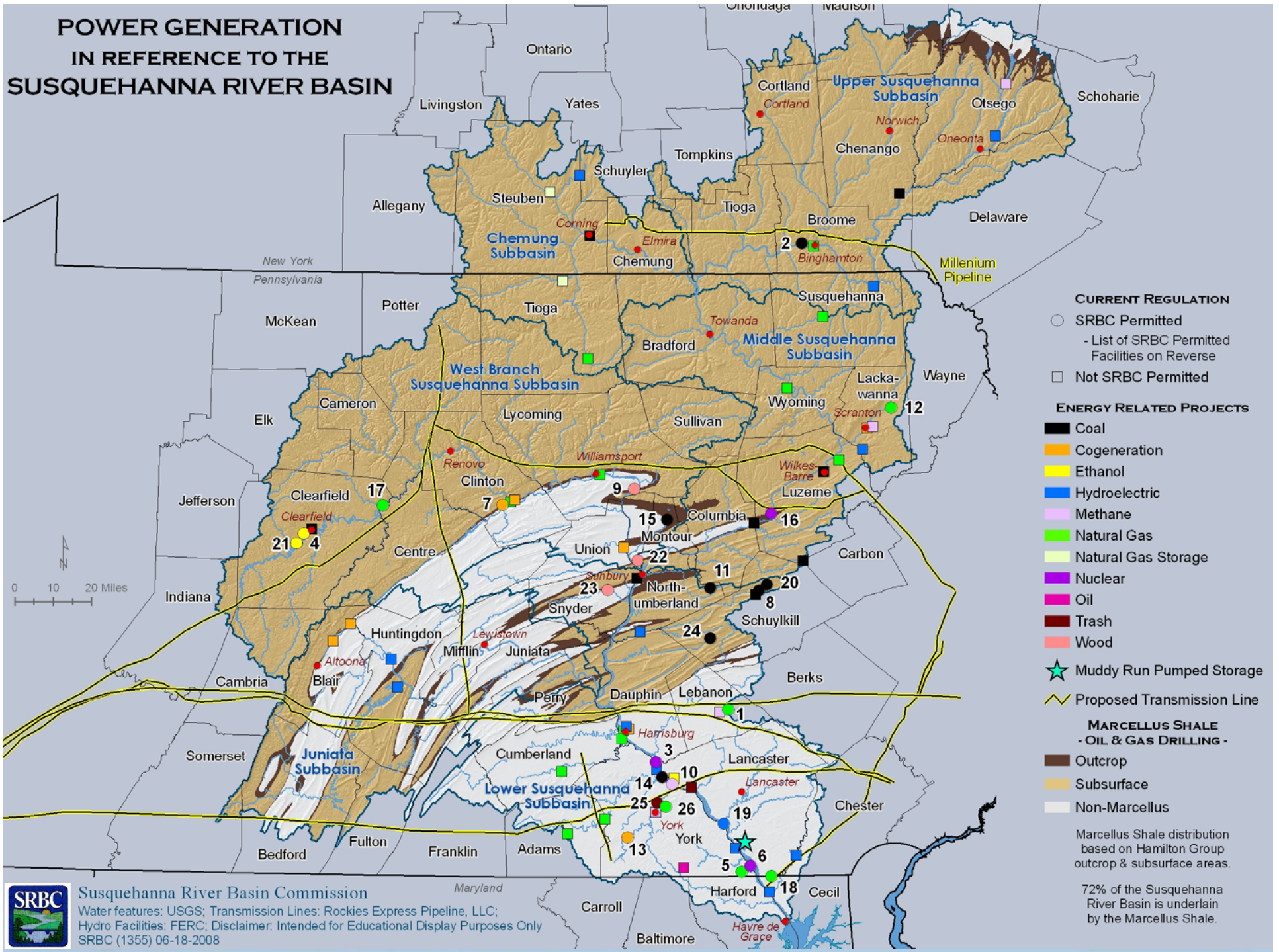
-Consumptive water use §806.22(e)

- 82 APPLICATIONS HAVE BEEN RECEIVED (6 NY)
- 13 HAVE BEEN WITHDRAWN (3 NY)
- 23 HAVE BEEN ISSUED (0 NY)

APPROVED & PENDING GAS WELL NOTICES OF INTENTION (NOI's)



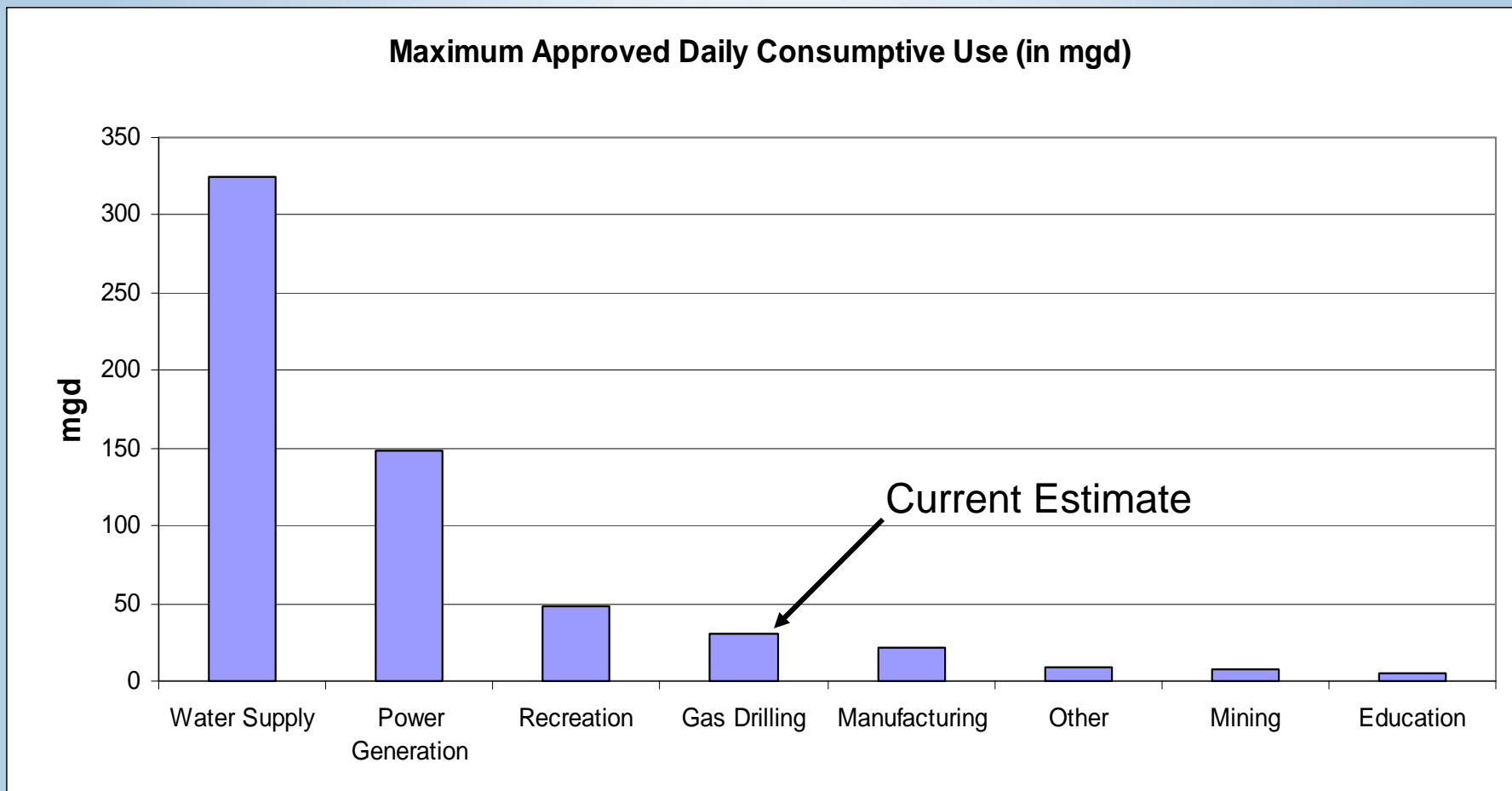
POWER GENERATION IN REFERENCE TO THE SUSQUEHANNA RIVER BASIN



Susquehanna River Basin Commission

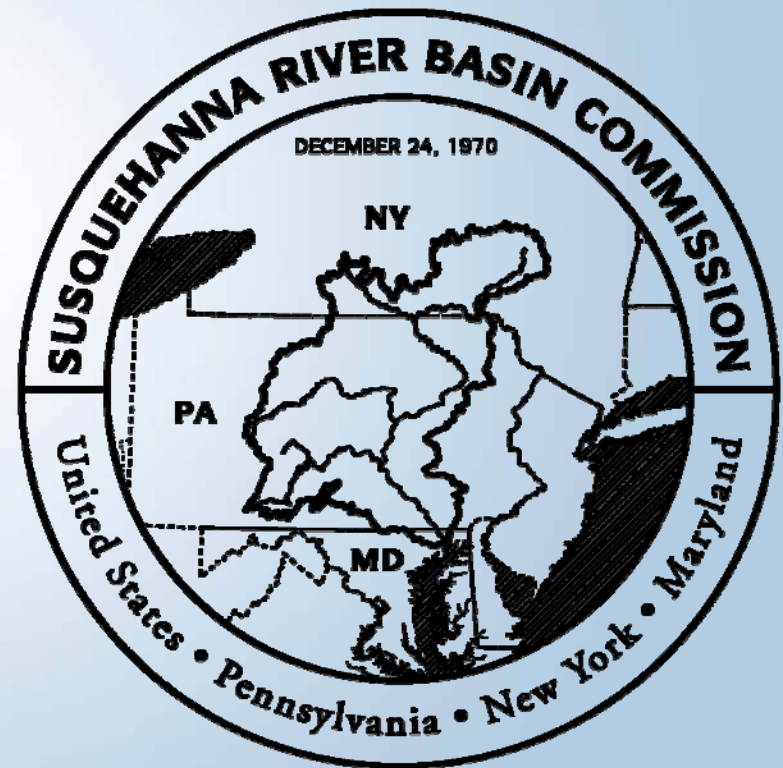
Water features: USGS; Transmission Lines: Rockies Express Pipeline, LLC;
Hydro Facilities: FERC; Disclaimer: Intended for Educational Display Purposes Only
SRBC (1355) 06-18-2008

Maximum Approved Daily Consumptive Use



Gas Well Development and Regulatory Requirements of the Susquehanna River Basin

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Presented August 6, 2008 in Oneonta, New York