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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bureau of Safe Drinking Water

Safe Drinking Water Program

Public Water System Permitting

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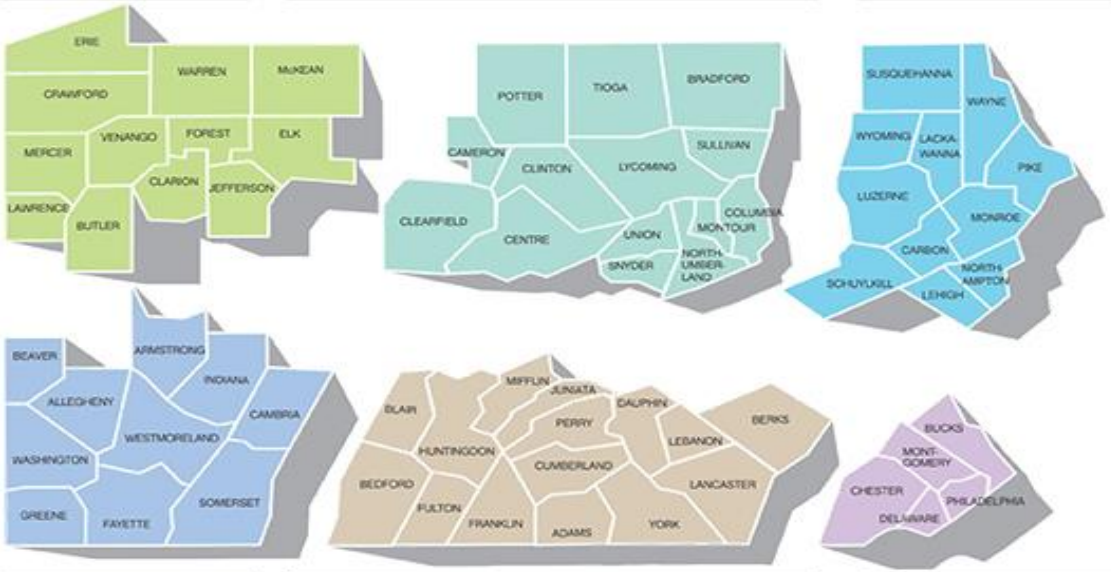

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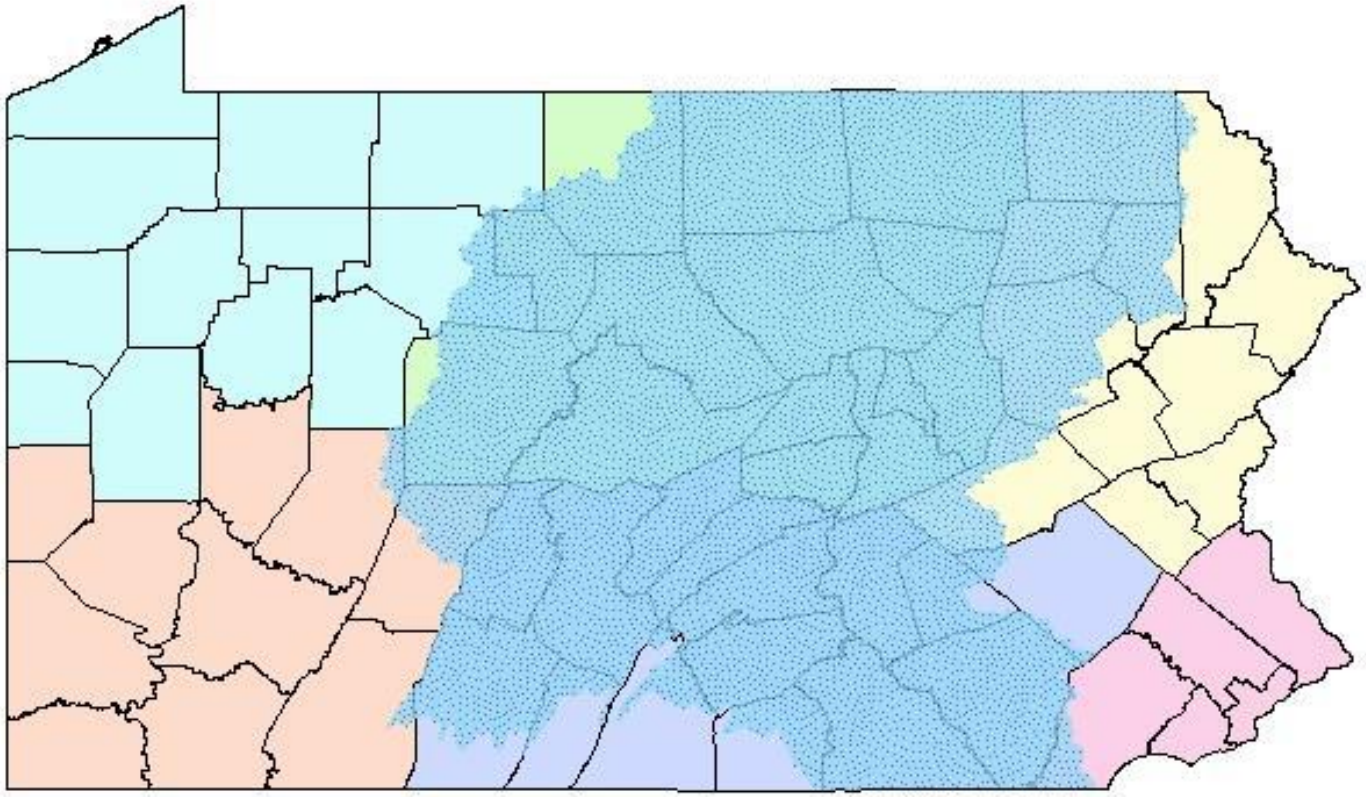
DEP Regions in Susquehanna Basin



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PA Safe Drinking Water Program

- The Safe Drinking Water Program implements the 1984 Safe Drinking Water Act
- The Safe Drinking Water Act sets forth water quality, treatment and permitting requirements for safe, potable water

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Definition of Public Water System

What is a public water system?

According to the Safe Drinking Water Act: A system which provides water to the public for human consumption which has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year…

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Definition of Public Water System

Are there different kinds of public water systems?

- **Community (CWS)** – serves at least 15 service connections or 25 year-round residents
- **Nontransient, noncommunity (NTNC)** – serves at least 25 of the same persons over 6 months per year
- **Transient, noncommunity** – Not CWS or NTNC but regularly serves at least 25 persons
- **Bottled, vended, retail or bulk**

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Definition of Public Water System

Bottled

Community

Nontransient Noncommunity

Transient Noncommunity

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Regulation of Public Water Systems

PA SDWA Program elements include:

- Protection of source waters and aquifers
- Water quality standards
- Operational requirements
- Monitoring and reporting
- Design and treatment standards
- Permitting

- Emphasis on multiple barrier protection

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Regulation of Public Water Systems

Permitting is required of all community systems and any noncommunity system providing treatment to meet a Primary MCL

- DEP must review and approve any proposed changes before construction is started
- PA law requires the public water supply to use licensed Professional Engineers to design public water supplies and obtain SDWA permits
- DEP must also review constructed facilities and issue a SDWA permit authorizing use before any modified facilities may be used

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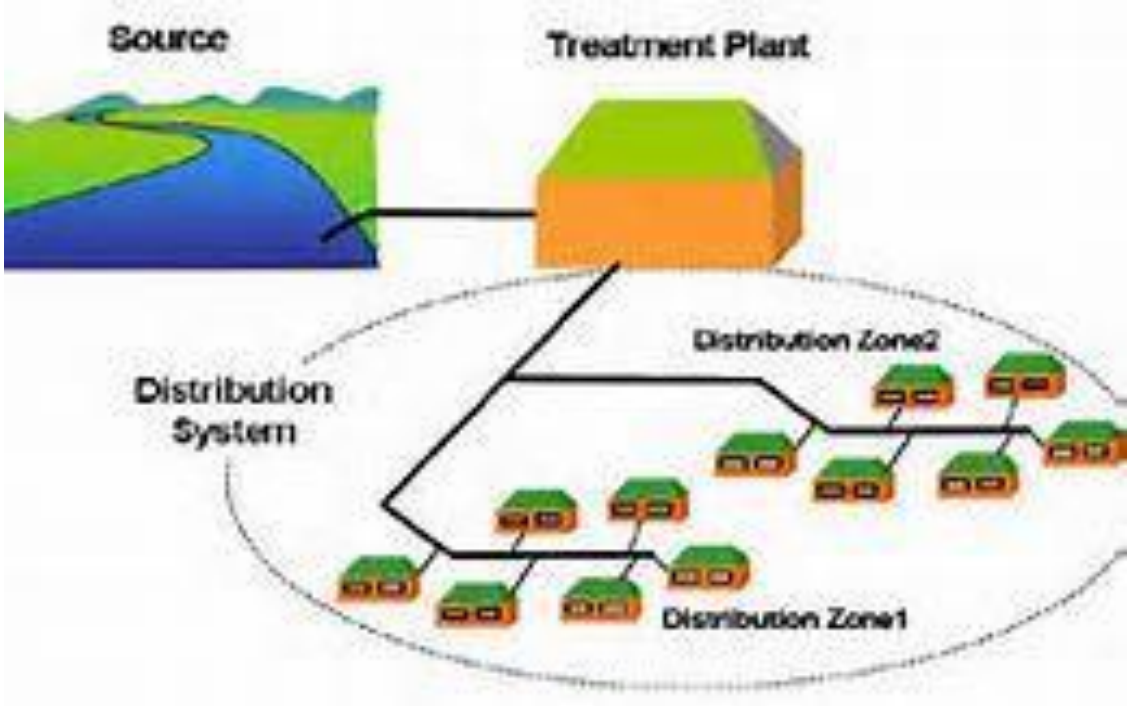
Regulation of Public Water Systems

- PADEP permits Public Water Systems: source, treatment, storage, pump stations and distribution system components
- PADEP does not permit individual sources



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Regulation of Public Water Systems

Activities which require a PWS permit include construction, operation and substantial modification of a PWS:

- **Major Modifications**: New sources, Additions or deletions of treatment techniques, Pumping Stations and Storage Reservoirs.
- **Minor Modifications**: Changes in treatment chemicals, Replacement of storage tank or reservoir linings, Covering of reservoirs, Construction for prefabricated storage tanks, Transmission mains, Interconnections and Permit Transfers.

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Public Water System Permitting

Two-part PWS permitting process:

- PWS Construction Permit: The applicant must obtain a PWS construction permit issued by DEP prior to initiation of construction activities
- PWS Operation Permit: The applicant must obtain a PWS operation permit issued by DEP prior to initiation of operation of PWS facilities approved under the PWS construction permit
- PWS permits are subject to DEP's Permit Review Process (PRP) and Permit Decision Guarantee (PDG)

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Public Water System Permitting

Permit Review Process for PWS Permits:

- PWS Construction Permit: New PWS system construction permits and major amendments for construction: 120 business days
- Minor permit amendments for construction: 60 business days
- Transfer of ownership: 60 business days
- PWS Operation Permit: New and amended operation permits: 20 business days

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Public Water System Permitting

Public Water Supply Operation Permits

- Issued with a instantaneous maximum rate
- Not Renewable
- Valid until conditions in the permit change
- Examples:
  - Additional treatment needed
  - PWS wants to increase the yield of the well

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Public Water System Permitting

A water supply shall engage the services of a licensed professional engineer who is legally qualified to practice in Pennsylvania, and who is competent in the design and construction of water supply facilities. When the proposed source is a groundwater source, the party shall also engage the services of a licensed professional geologist who is legally qualified to practice in Pennsylvania. The geologist shall be competent in groundwater source siting and hydrogeologic investigations.

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Hydrogeologic Requirements

- Preliminary Conference
- Site Survey
- Pre-drill Plan Approval
- Aquifer Test Monitoring Plan Approval
- Pre-application Meeting (Recommended)
- Submission of Application – Planning Modules, Engineer's Report, Geologist's Report, Detailed Plans and Specifications and New Source Sample Results

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Site Survey

- Purpose of project including quantity needed
- Best Source Available
- Review of proposed well locations
- Zone I Wellhead Protection Area Requirements
- Discussion of Surface Water Identification Protocol
- Review of Potential Sources of Contamination
- Preliminary review of geologic/drilling conditions
- Preliminary identification/discussion of adjacent water resources and users
- Discuss aquifer test monitoring locations
- Pennsylvania Conservation Explorer (Pennsylvania Natural Diversity Index)

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Zone I Wellhead Protection Area

The Zone I WHPA is defined as a 100-400 ft radius around the source.

- Must own or control the Zone I WHPA
- Prohibit activities that may have a potential adverse impact on the source's quantity or quality
- Only chemicals and materials used in the production or treatment or both of drinking water are allowed.

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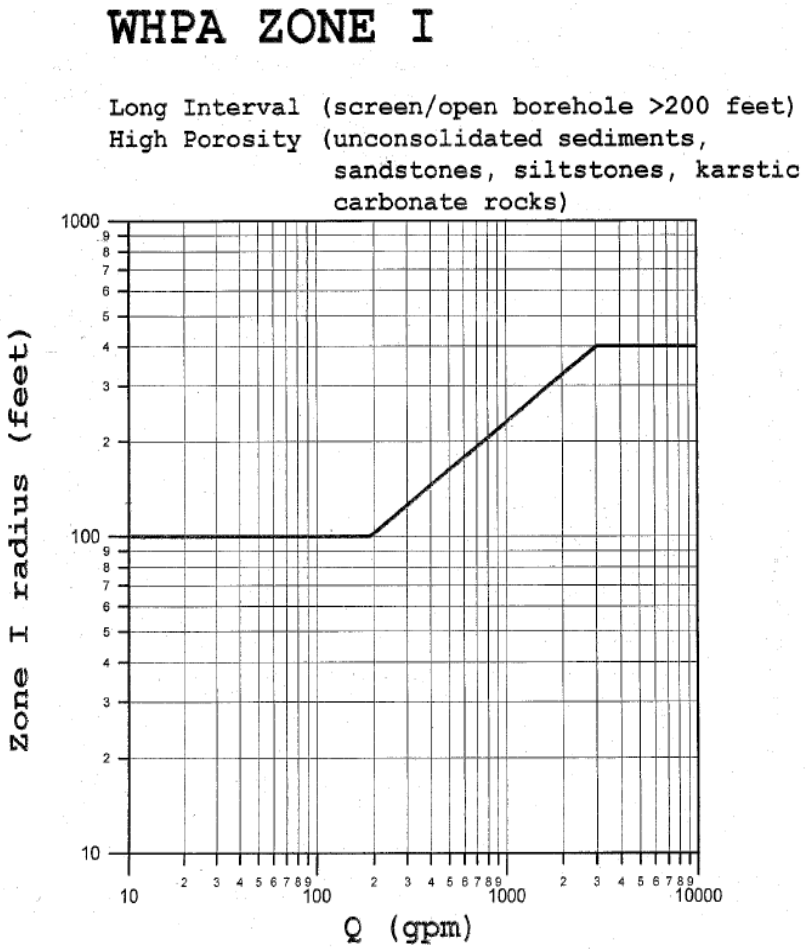
Zone I Wellhead Protection Area

Calculating the Zone I WHPA

- The Zone I WHPA radius is dependent on site-specific source and aquifer characteristics
- Can be calculated using the volumetric flow equation or using DEP's Compliance Assistance Document *Recommended Wellhead Protection Area Zone I Delineation Methodology*

$$r = \sqrt{(Qt/\pi n H)} \qquad \text{(Equation 1)}$$

where Q = pumping rate of well (ft^3/day)
t = time of pumping (days)
π = pi (~3.1415926)
n = porosity (dimensionless; percentage expressed as a decimal)
H = saturated thickness (feet; typically open interval or length of well screen).



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Well Construction Standards

- Shall be constructed to be watertight and meet minimum protected depths
  - In consolidated rock formations casing shall be equipped with a drive shoe and seated into competent bedrock
  - In unconsolidated rock formations the permanent casing and grout shall extend at least 50 ft below original or final ground elevation
- Well Casing Material must meet AWWA's Standard A100 for Water Wells for minimum weights and thickness
- Well Screens should have sufficient diameter to provide adequate specific capacity and low aperture velocity
- All permanent well casings shall be surrounded by a minimum of 1.5 inches of grout the entire length of the casing
- Upper Terminal Well Construction
  - Shall extend 18 inches above final grade
  - At least 3 feet above highest know flood elevation
  - Sanitary seal
  - Shall not be constructed in pits

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Pre-Drill Plan

Submitted by PG for DEP review and approval prior to drilling

- Purpose of project including quantity needed
- Pennsylvania Conservation Explorer Search Results
- Geologic Description
- Expected depth, anticipated yield and water quality
- Well construction - Drilling technique, casing, grouting and drive shoe
- Proper Erosion and Sedimentation controls for the drilling of the well
- Well logging procedure
- Well development procedure

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Aquifer Testing Plan

Submitted by PG for DEP review and approval prior to testing

Minimum 72-hour Constant Rate Aquifer Test

Four components:

- Step Test
- Background Test
- Constant Rate Test
- Recovery Test

Timing –

- Avoid heavy rain events or rapid changes in water table elevation
- Conduct during a period of recession when local stream flow conditions are at or below seasonal averages

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New Source Sampling

Conducted at the end of 72-hour Constant Rate Test

- Primary Maximum Contaminant Levels (PMCLs)
  - based upon health protection
  - Ex. arsenic, barium
- Secondary Maximum Contaminant Levels (SMCLs)
  - based upon aesthetics
  - Ex. iron, sulfate
- Need for Microscopic Particulate Analysis (MPA) based on Hydrogeologic Risk Assessment

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Hydrogeologic Report

- Part of permit application
- Signed and sealed by a professional geologist
- Submit within 2 years of data collection

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Hydrogeologic Report

Components of Hydrogeologic Report

- Conceptual model
- Stratigraphic log for well
- As-built cross section for well
- Aquifer test data and results
- Aquifer characteristics
- Safe yield with justification
- Proof of the supplier's ability to control the Zone I wellhead protection area
- New Source Sample Results
- Description of potential impacts that use of the new source will or could have on adjacent surface and subsurface water features

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Summary

- PADEP permits systems not individual sources
- PADEP permits are nonrenewable and valid until conditions in permit change
- PADEP focuses on water quality and quantity issues

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Summary

In Susquehanna Basin PADEP coordinates with the SRBC for permitting. Some components of the permitting process for each agency are the same but there are differences. Not all PADEP requirements fulfill SRBC requirements and vice versa.

- Well Construction Standards
- Zone I
- New Source Sampling
- Surface Water Identification Protocol

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