

WATER MANAGEMENT PLAN FOR MARCELLUS SHALE GAS WELL DEVELOPMENT

Operator and Plan Coverage Information:

Well Operator Company	DEP ID#	Address
Contact Name/Title	Contract Phone	Contact E-mail
Area Covered (This Water Management Plan applies to wells located in the following counties: Armstrong, Allegheny, Beaver, Fayette, Greene, Indiana, Somerset, Washington, Westmoreland)		

Water Management Plans

General Water Source Information:

Section A. List of Water Sources

	Source Name	Location			Amount		Type of Source (check)			
		Municipality / County	Watershed Code	Major River Basin*	Average Daily Quantity (gpd)	Max Withdrawal Rate (gpm)	Surface Water	Groundwater	Wastewater, Mine Water, Cooling Water Discharge	Public Water Supply
1	Monongahela River	Washington	05020005	3	856,800	1,190	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Browns Creek	Greene	05020005	3	856,800	1,190	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Southwestern Pennsylvania Water Authority	Greene	05020005	3	856,800	1,190	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Two Lick Creek	Indiana	05010007	3	856,800	1,190	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Crooked Creek	Armstrong	05010006	3	856,800	1,190	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

➤ David B. Jostenski, P.E.
 ➤ Chief, Water Use Assessment Section
 ➤ PA DEP

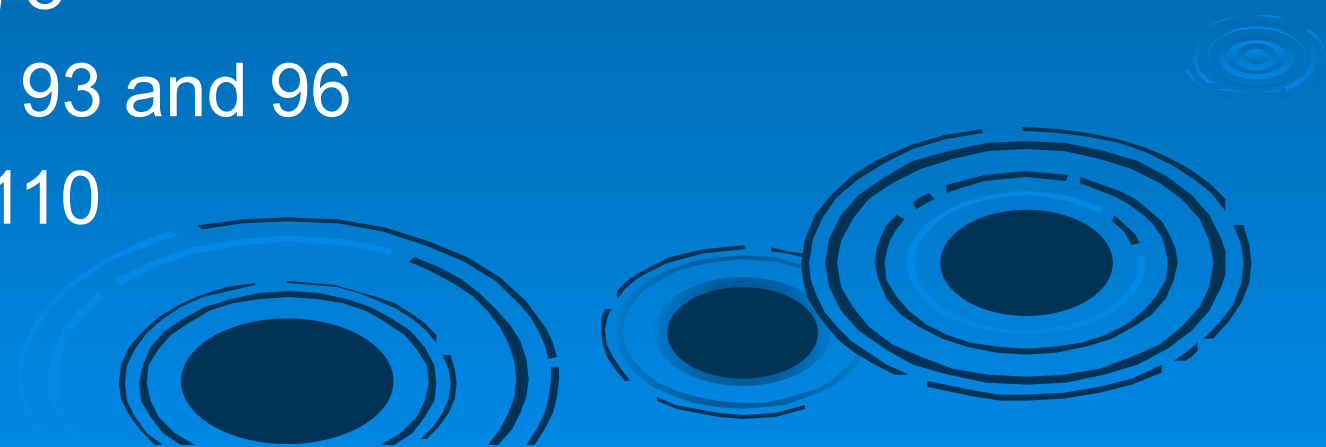
PA Laws and Regulations

➤ Laws

- Oil and Gas Act
- Clean Streams Law
- Water Resources Planning Act

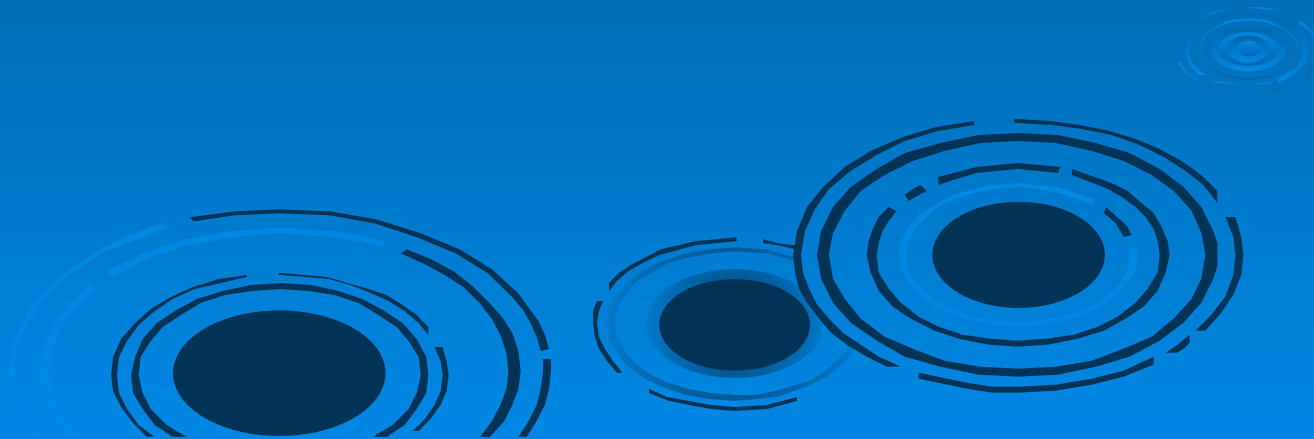
➤ Regulations

- Chapter 78
- Chapters 93 and 96
- Chapter 110



Oil and Gas Act

- The Department issues gas permits under the Oil and Gas Act which requires compliance with other laws administered by DEP



Clean Streams Law

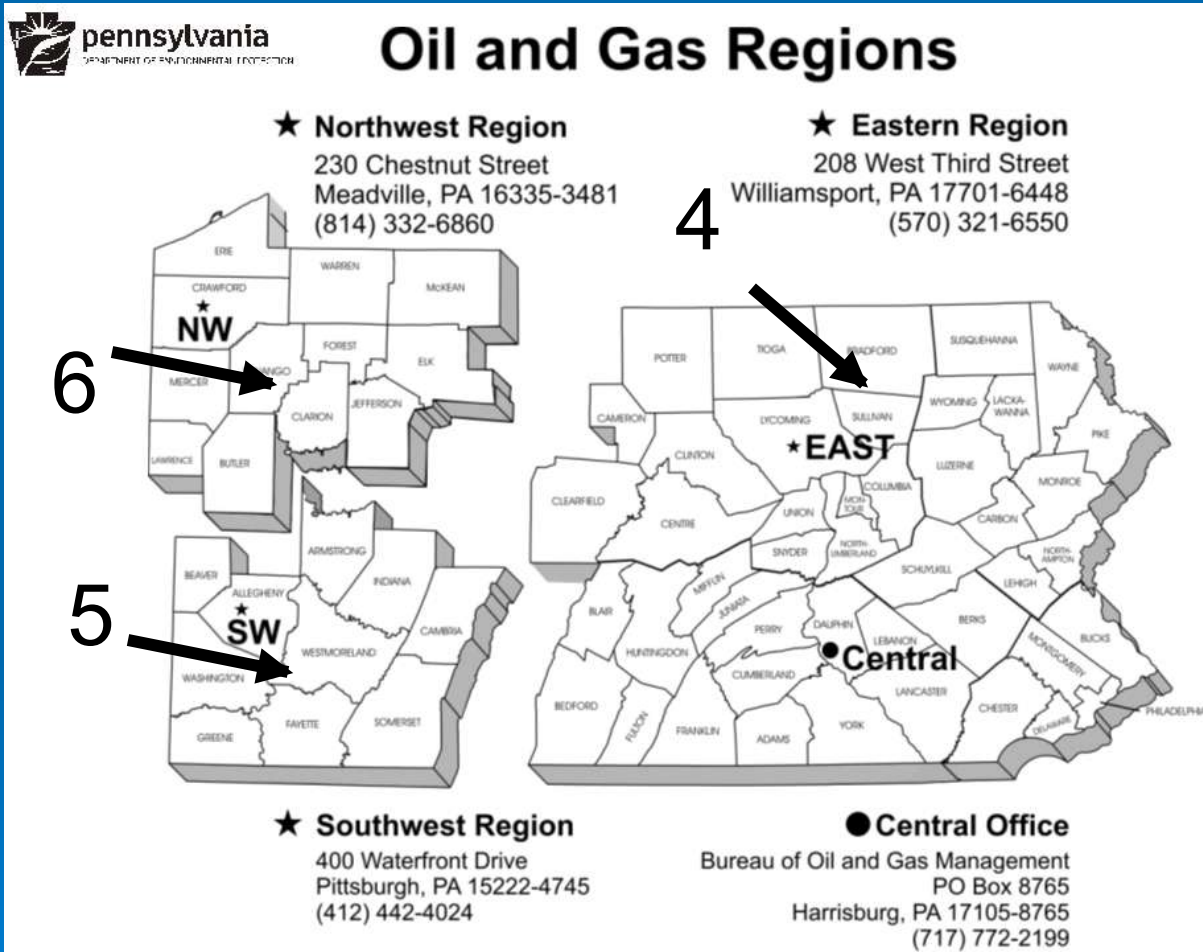
➤ The Department requires a demonstration, through the submission and approval of a Water Management Plan in connection with the gas well permit, that the gas well operator's withdrawal and use of water sources in the Commonwealth (in connection with natural gas well development) will not violate the Clean Streams Law's admonition against pollution.

Water Management Plan

- Identifies various water sources proposed to be used for utilization in development of Marcellus Shale Natural Gas Wells within the covered area
- Includes mitigation efforts necessary to protect the resource, whether the source is located in the Ohio, the Susquehanna or the Delaware Basin

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6	Kitanning Suburban Water Authority Withdrawal	Armstrong/ Indiana	05010006	3	856,800	1,190	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
7	Clymer Borough Municipal Authority	Indiana	05010007	3	40,000	100	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
8	Upper Ten Mile Creek	Washington	05020005	3	856,800	1,190	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9	Connoquenessing Creek	Beaver	05030105	3	322,848	448.8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10	Marion Township Water Department	Beaver	05030105	3	200,000	277.8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
11	Deer Valley Lake	Somerset	05020006	3	1,713,600	1,190	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

WMP – by O&G Regions



Plan ID numbers = DEP Client ID # + Region #

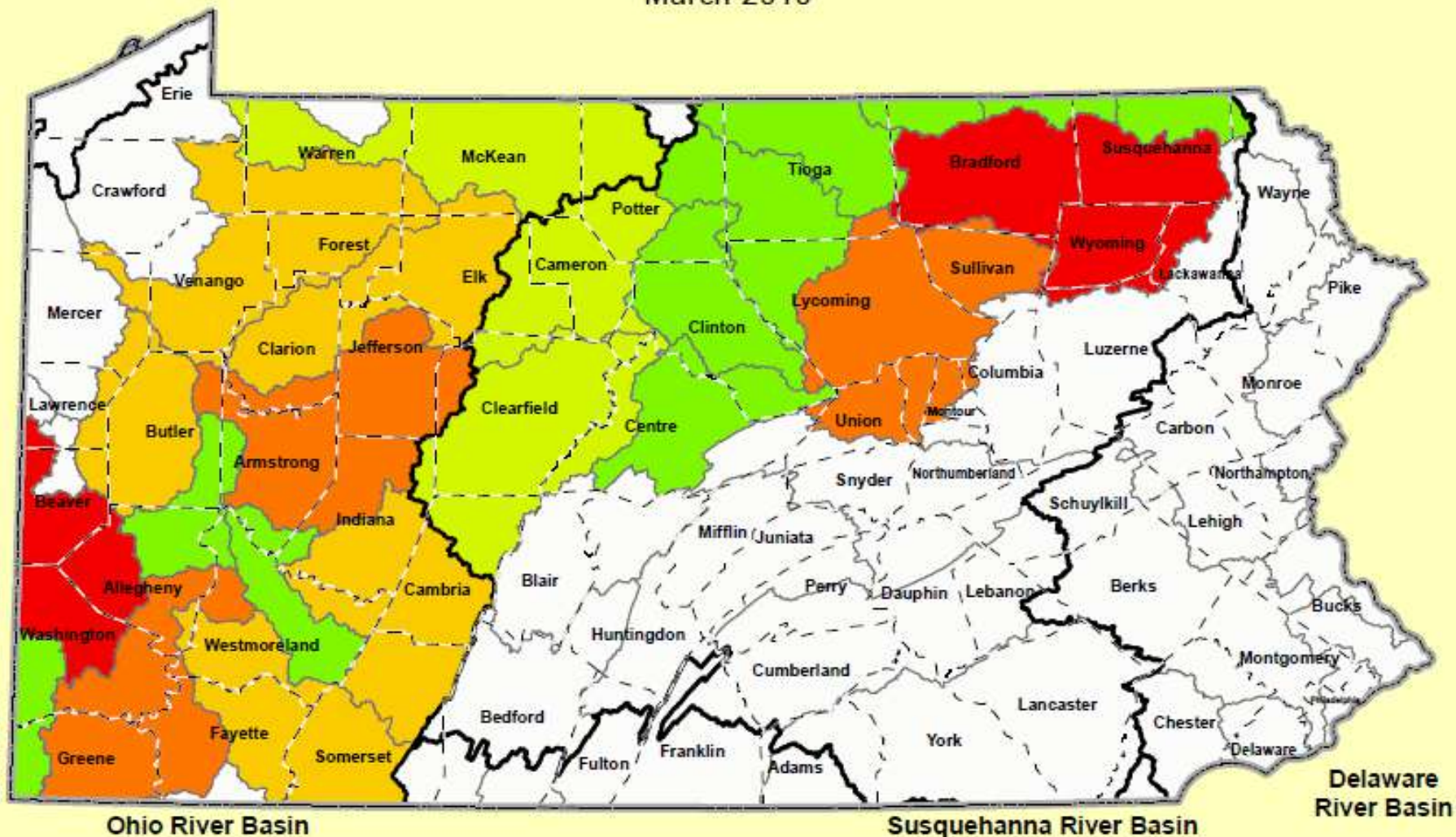
For example, WMP-12345-5

Marcellus Shale Natural Gas Well Development in Pennsylvania

Water Management Plans (WMPs)

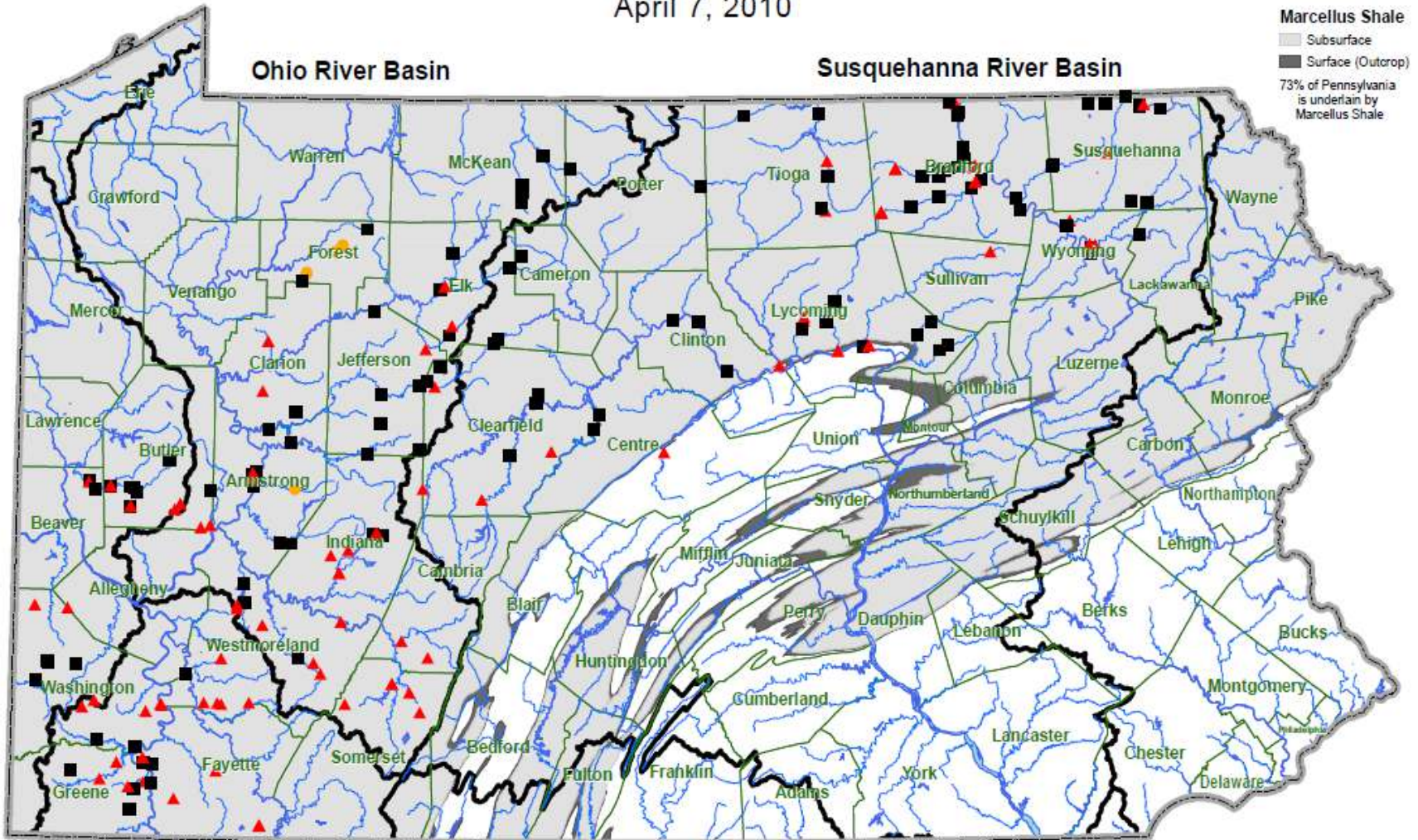
Distribution of Sources by Sub-basin

March 2010



Marcellus Shale Natural Gas Well Development in Pennsylvania Water Management Plans (WMPs)

April 7, 2010



Marcellus Shale
 ■ Subsurface
 ■ Surface (Outcrop)
 73% of Pennsylvania is underlain by Marcellus Shale

WMP Summary for State and River Basins

Number of Gas Operators	Individual Sources			Approved Daily Maximum Use, mgal/d			Reported Water Use			
	Type	Susquehanna	Ohio	State	Susquehanna	Ohio	State	Susquehanna	Ohio	State
34	Surface water	61	56	117	57.4	81.8	139.2			
	Ground water	0	10	10						
	Purchase	31	55	86						
	Total	92	121	213						
	%	43%	57%							

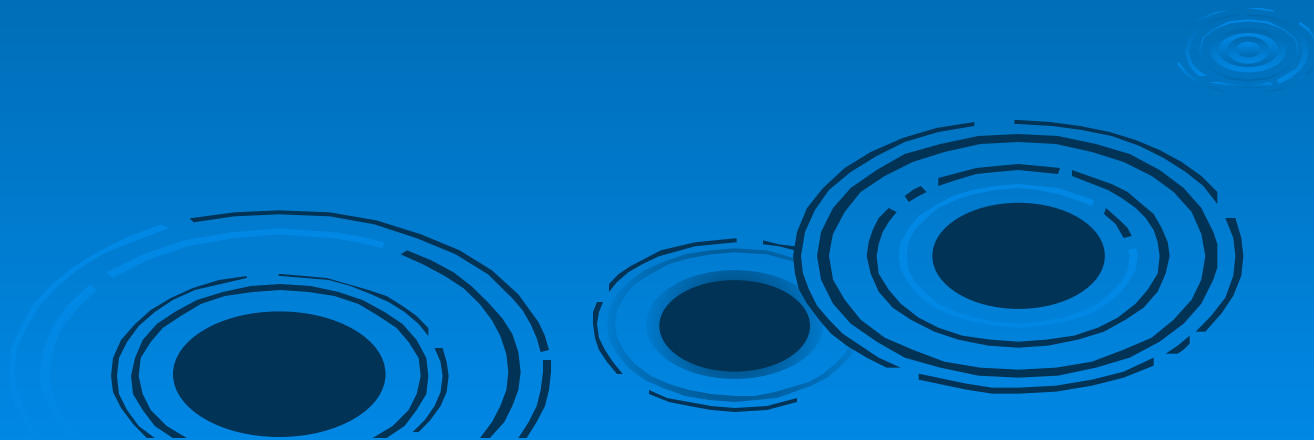
WMP Withdrawal Sources
 Source Type
 ● Ground water
 ■ Surface water
 ▲ Purchase



Disclaimer: Intended as general information and may not include all WMP information submitted to DEP for the period stated.

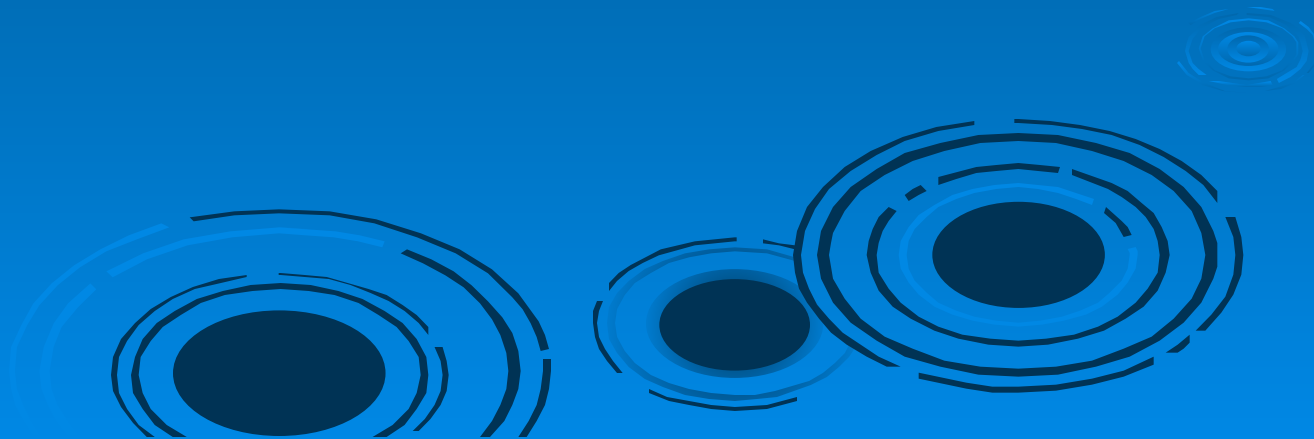
Statewide Implementation

- WMP process to provide framework for statewide consistency
- All sources must be captured in a WMP
- DEP using the SRBC Passby Flow Guidelines statewide (sources in the Ohio Basin receive same level of protection as sources located in Susquehanna or Delaware Basins)




River Basin Commission Interaction

- To reduce duplication, if a water source is subject to approval by SRBC or DRBC, the River Basin Commission approvals will be captured in a Water Management Plan and submitted to DEP.

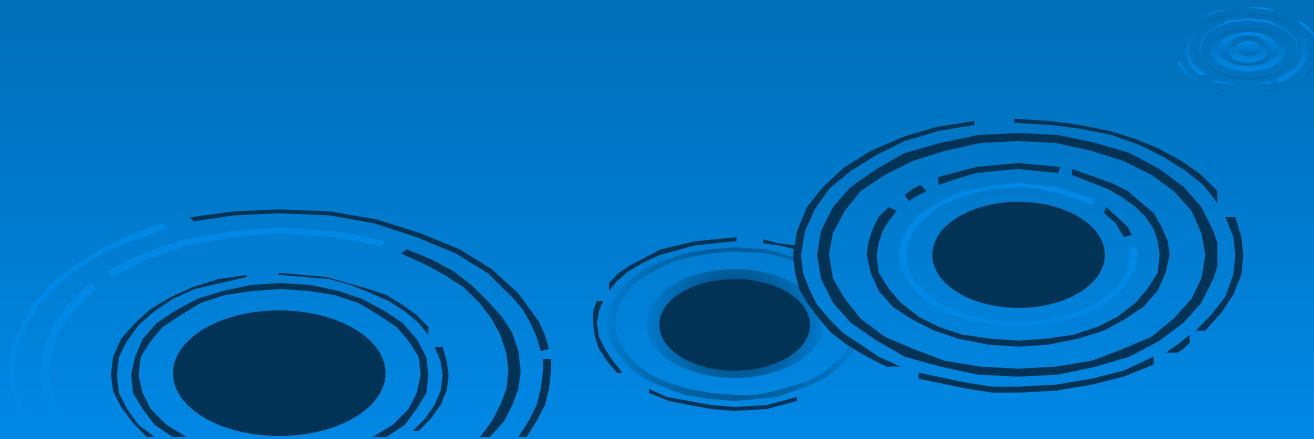


WMP Content

- Municipal and county notification
 - Identification of sources
 - Water Source and Use Monitoring Plan
 - Registration and Reporting
 - 48-hour source initiation notice prior to first withdrawal
 - Assessment of impact to environment
 - Low flow analysis
 - PNDI
 - Identification of PWSAs
- 

WATER SOURCES

- Public Water Supplies
- Surface Water or Groundwater
- Wastewater, Mine Water, Cooling Water Discharge
- Reuse of flowback



Water Source and Use Monitoring Plan

- Accurate monitoring of the amount of water withdrawn on a daily basis
- Daily recording and maintenance of data
- Water withdrawal data to be maintained for five years and be available to DEP for review upon request.
- Passby Flow Monitoring if required



Registration and Reporting

- All sources must be registered
 - Purchase from Public water supply
 - Purchase from 3rd parties (only in Susq. Basin)
 - Ground, surface water withdrawals
- Quarterly submittal of Sub Facility Reports using the DEP Greenport
- Reports to SRBC if withdrawal is in Susquehanna Basin
- Annual submittal of Primary Facility Reports using DEP Greenport- still on hold

Registration

www.pawaterplan.dep.state.pa.us

pennsylvania PA

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ONLINE SERVICES

Edward G. Rendell, Governor | John Hanger, Secretary | DEP Home



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION

state water plan

State Water Plan Home

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Water Use Registration and Reporting

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Water Related Partners

State Water Plan Committees

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What's New:

Last updated:

2/22/2010

[View News...](#)

Welcome to the Pennsylvania State Water Plan Web Site, the gateway to the vision, goals and recommendations for Pennsylvania in meeting the challenges of sustainable water use into the future. [Learn More!](#)

Regional Water Resource Planning Areas

click an area to view more information contained in the

Digital Water Atlas



Water Plan Documents

[State Water Plan Principles](#)

State Water Plan Principles highlights the State Water Plan Priorities and Recommendations for Action, key components of the Plan that will carry us into the next five years and lay the groundwork for future versions of the Plan.

[Executive Summary](#)

[Pennsylvania Water Atlas](#)

The Water Atlas represents a fundamental component of the Plan, as it lays out the landscape of Pennsylvania's water and land resources and how they are managed.

[Touchstone Document](#)

Shared Resource... Shared Responsibility: Booklet Summarizing State Water Plan



Reporting on DEP Greenport

pennsylvania PA PA STATE AGENCIES ONLINE SERVICES

Commonwealth of Pennsylvania DEP Home | About DEP

 Department of Environmental Protection

DEP GreenPort

Contact DEP GreenPort

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Can't remember your password? [Click here](#)
Having problems? [DEP Greenport FAQ](#)

For most DEP electronic applications users have completed a Request for Security Access form and DEP has provided a username and password to access the DEP GreenPort. However, DEP has some electronic applications that allow users to self-register.

[See the current list of self-register applications](#)

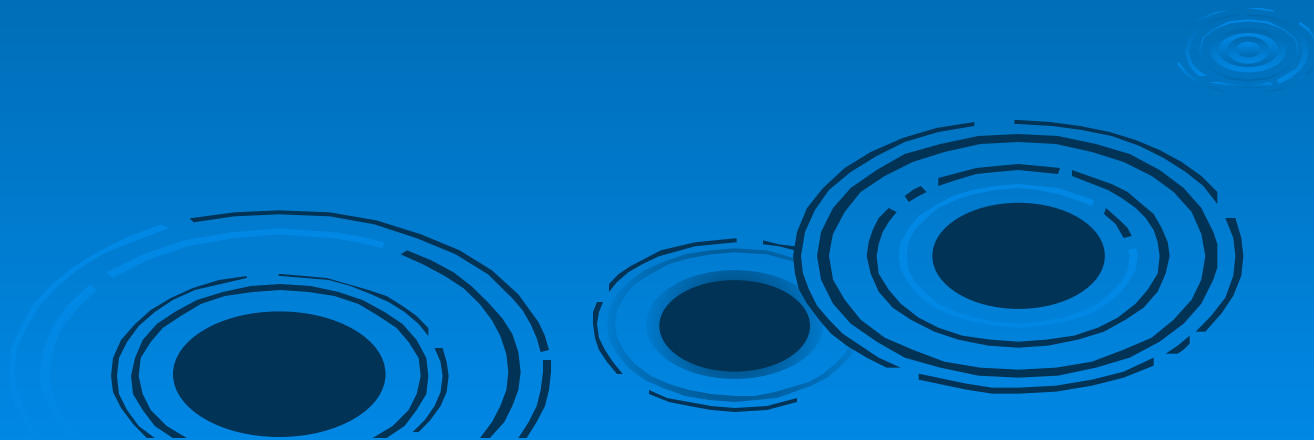
[Click here to self-register](#)

After completing the self-registration form, users will be provided with a username and password. Please note that this username and password will only grant access to those electronic applications that are associated with self-registration.

Need help?
Call our Application Support Help Desk at (717)705-3768
or e-mail us at depgreenporthehelpdesk@state.pa.us

Surface Water

- Rivers, streams, lakes
- Stream Classification- Special Protection Water (High Quality or Exceptional Value)
- Cumulative assessment performed under low flow conditions (Q7-10)

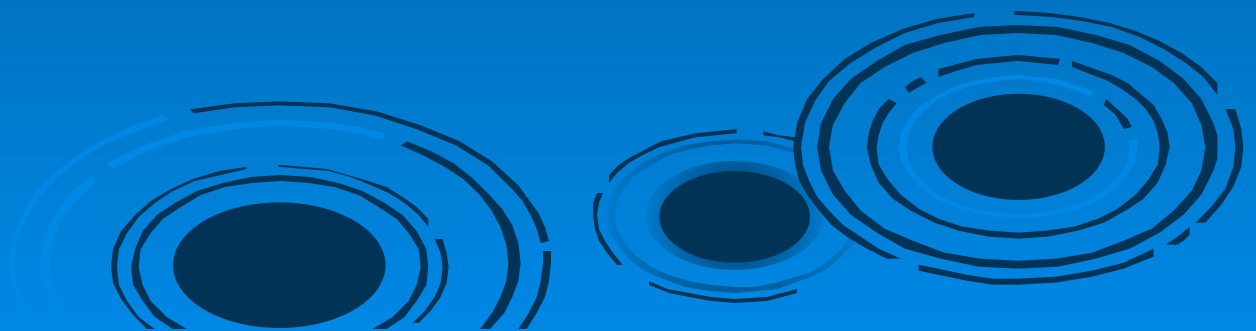


Q 7-10

- Low Flow Condition
- At a specific location on the stream, the flow rate that occurs for 7 consecutive days during a 10-year period (Q7-10)
- Proposed water withdrawal amount is compared to Q7-10 value

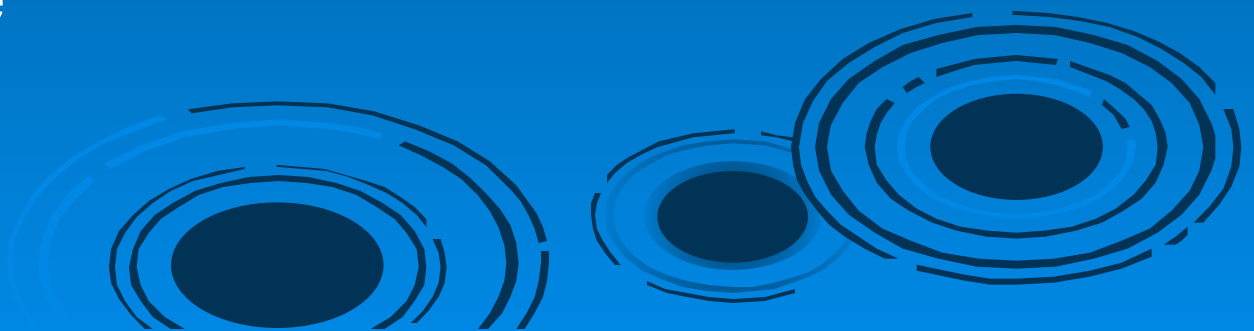
Pass by Flow

- SRBC Passby Flow Guidelines used Statewide
- PA/MD IFIM where applicable
- If proposed withdrawal greater than 10% Q7-10 or cumulatively greater than 10% Q7-10, a passby flow condition is imposed
- Passby flow may be imposed on withdrawal amounts less than 10% Q7-10 and will depend upon site specifics



Groundwater

- Hydrogeologist input recommended
- Impact to surface waters and wetlands considered
- Impact to potable water supply sources considered
- Groundwater Characterization
 - Recommend using SRBC Aquifer Testing Guidance



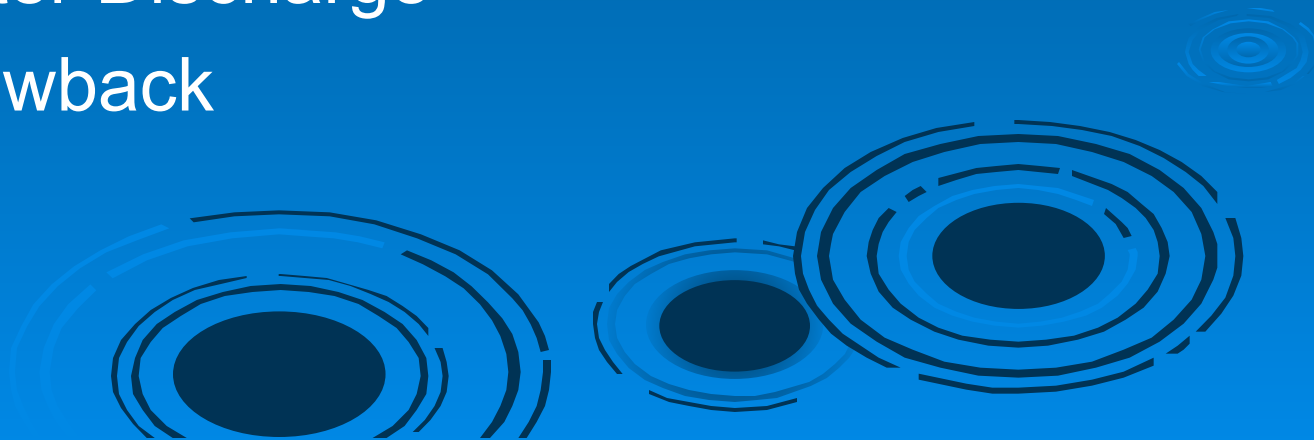
Public Water Supply Agencies (PWSAs)

- For purchases of water from a PWSA, consideration will be given to the capability of the PWSA to sell water to the gas operator without jeopardizing its' ability to deliver drinking water to the public.
- In addition, consideration will be given to the PWSA's own compliance with applicable laws, such as the Safe Drinking Water Act, the Water Rights Act and the Water Resources Planning Act.



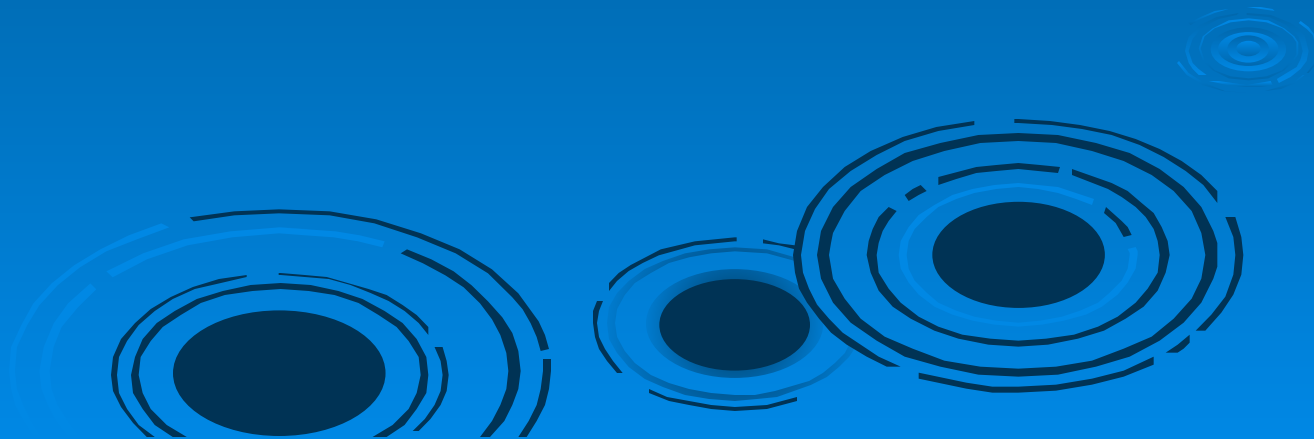
Other Water Sources

- Wastewater
 - Leachate from Landfill
 - POTW Effluent
- Mine Water
 - AMD
- Cooling Water Discharge
- Reuse of flowback



Emerging Issues

- Working with USACE to define “area of influence” around USACE reservoirs
- Management of Aquatic Invasive Species
- Revision to DEP Well Record and Completion Report underway to capture similar information to SRBC Post-Hydrofracture Stimulation Report



Questions?

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