

Integrated Water Resource Management

Introduction - Water Management in Pennsylvania

For the commonwealth, nothing could be more important than ensuring that there is an adequate supply of clean water for all Pennsylvanians with a sufficient quantity and quality to supply its many needs and uses. Fortunately, the commonwealth is rich in water resources, with about 85,500 miles of streams, nearly 4,000 lakes, reservoirs, and ponds, 80 trillion gallons of groundwater and 404,000 acres of wetlands. In addition, the commonwealth has 56 miles of coast along the Delaware Estuary and 77 miles along Lake Erie.

Water is essential to virtually all aspects of our economy and life, and an equally essential foundation to Pennsylvania's environment. In addition to residential drinking water for its 13 million people, water in the commonwealth is used for thermoelectric power generation, agriculture, industries, mining, and recreation.

Under the Pennsylvania Clean Streams Law, 35 P.S. §691.1¹, the commonwealth's official policy is to recognize that "clean, unpolluted streams are absolutely essential if Pennsylvania is to attract new manufacturing industries and to develop Pennsylvania's full share of the tourist industry," and the Pennsylvania Department of Environmental Protection (DEP) has the primary responsibility to "prevent further pollution of the waters of the commonwealth, but also to reclaim and restore to a clean, unpolluted condition every stream in Pennsylvania that is presently polluted." Concurrently, Act 220 of 2002, 27 Pa. C.S. §§3101-3136², provides for water planning that considers both quality and quantity, the assessment and projection of current and future uses, consideration of stormwater and floodplain management issues, and other important aspects of water management.

Within DEP, the Office of Water Programs coordinates policies, procedures, and regulations which influence public water supply withdrawals and quantity, sewage facilities planning, point source municipal and industrial discharges, encroachments upon waterways and wetlands, dam safety, earth disturbance activities, and control of stormwater and nonpoint source pollution. In addition, the Office of Water Programs coordinates the planning, design and construction of flood protection and stream improvement projects.

Pennsylvania is a party to the Delaware River Basin Compact, Susquehanna River Basin Compact, Interstate Commission on the Potomac River Basin Compact, Ohio River Valley Water Sanitation Compact, and the Great Lakes – St. Lawrence River Basin Water Resources Compact; interstate agreements that share the responsibility for the management of Pennsylvania's water resources in parts of the state. Within DEP, the Office of Compacts and Commissions coordinates with the interstate commissions, state governments, and interstate organizations in advancing partnerships and promoting multi-state cooperation to address shared issues.

¹ Pennsylvania General Assembly, Clean Streams Law, 1937 Act 394
<https://www.legis.state.pa.us/cfdocs/Legis/LI/uconsCheck.cfm?txtType=HTM&yr=1937&sessInd=0&smthLwInd=0&act=0394>.

² Pennsylvania General Assembly, 2002 Act 220
<https://www.legis.state.pa.us/cfdocs/legis/li/uconsCheck.cfm?yr=2002&sessInd=0&act=220>

Linkage of Land Use to Water Management

At the same time, how land is used, developed, redeveloped, or conserved also has a great effect on the availability and quality of the water in the commonwealth's creeks, rivers, lakes, ponds, and groundwater for all of water's uses in Pennsylvania. Under the Pennsylvania Municipalities Planning Code, 53 P.S. §10101³, (MPC), most issues involved in regulating land use and development are delegated to Pennsylvania's more than 2,500 local governments (cities, townships, and boroughs), and counties. While the MPC requires local zoning as well as subdivision and land development ordinances to consider the availability of water for various uses and access to water, integrating land use planning and water resource management would be beneficial to both managing the commonwealth's water resources while enhancing efforts aimed to support wise land use and smart development.

As one example, the regulation, design, operation, and management of proposed stormwater management systems can have a dramatic effect on the quantity and quality of the water in nearby waterways and groundwater and as well as impact downstream neighbors. Similarly, the planning, siting, and functioning of sewage facilities to serve existing or new development can significantly impact both water quality in surface and groundwaters, and the way water is returned to streams or recharged to aquifers. An integrated approach brings surface water, groundwater, stormwater, wastewater and water supply issues into the land planning process and decision-making.

Importance of Coordination

Water resources management becomes incredibly complex when basins, watersheds, and geographic regions of interest are often overlapped by multiple municipal, county, or state boundaries each having varying governance and priorities. The multivariate nature of this problem means that success of a project could correlate directly with the level of coordination between involved parties. This becomes especially evident when work is done on a watershed scale in comparison with an individual permit site or small stream segment. Coordination is a commitment to bring different stakeholders together to work effectively.

Education, outreach, and data sharing with the local government regarding land use planning and land use decisions are coordination elements. These elements more effectively integrate water resource management into land use planning and decision-making but will require local acceptance by local governments.

An important example of coordination would be DEP continuing to lead in coordinating regular updates, and addenda to the *Pennsylvania Stormwater Best Management Practices Manual*⁴ to reflect changes to computational methodologies\processes, design\construction practices, proprietary products, maintenance needs, and the best available and current technologies. This technical design guidance should include, but not be limited to, design criteria for resilient structural practices to accommodate changing precipitation patterns within the commonwealth, special guidance on certain projects with potentially significant impacts, such as large-scale energy projects, and brownfields redevelopment.

³ Pennsylvania General Assembly, Municipalities Planning Code
<https://www.legis.state.pa.us/WU01/LI/LI/US/HTM/1968/0/0247..HTM>

⁴ Department of Environmental Protection, Pennsylvania Stormwater Best Management Practices Manual 363-0300-002
<http://www.depgreenport.state.pa.us/elibrary/GetFolder?FolderID=4673>

Local governments should be encouraged to consider and adopt these guidelines in local land use ordinances.

With state incentives, technical resources, and encouragement, the commonwealth can lead the way by aligning its regulatory responsibilities within state agencies and then by working together with local governments and planning commissions to integrate water resource planning and projects into land use planning and decisions.

Strategic Direction

Integrated water resources management is a holistic, coordinated approach to managing water, land, and related resources that offers a framework to identify and understand water related challenges and obligations and the opportunities to address those challenges efficiently and in consideration of watershed needs. Integration helps make practical and science-based decisions while considering water availability data, water resiliency (including considerations related to climate change), and water quality in the context of land use decisions.

Essential strategies for Pennsylvania may include but are not limited to:

- Looking for opportunities to improve coordination on water resources management within DEP.
- Improving coordination and data sharing across state agencies and throughout the federal, interstate, state, and local government hierarchy, including but not limited to Pennsylvania Emergency Management Agency (PEMA) and Federal Emergency Management Agency (FEMA).
- Solidifying the connection between land use and water resources management by looking for more opportunities to actively involve local governments, county planning commissions, conservancies and watershed groups, private companies, and citizens within the watershed in integrated water resource planning education, and land planning projects and decisions.

Comprehensive planning at all levels should consider the entirety of the river basin as well as more granular watershed level management including regional planning, water quality regulation and enforcement, water allocation, low flow protection, drought preparedness, water use planning and regulation, flood mitigation and stormwater management, groundwater recharge, consumptive use management and mitigation, monitoring and data management (baseline and impact assessment), addressing climate change impacts, mining, land use/land cover issues (including supporting the protection of existing forest cover and appropriate use of floodplains/active river areas), education and outreach, and the development of tools, including model ordinances, county and regional plans, funding, and incentives. Environmentally effective and cost efficient planning is best done on a watershed basis.

DEP should continue to administer its water resources management, watershed restoration and protection, and water quality management programs in a consolidated and coordinated fashion, seeking opportunities for improvement both when performing planning and during the process of reviewing individual development projects. The strong relationships among these programs should continue to be encouraged and used in guiding DEP's strategic policy choices and daily decision-making.

DEP should continually strive to improve coordination among state agencies, as well as throughout the hierarchy of governance in Pennsylvania. State agencies have an obligation to work toward common

objectives so that statutes, regulations, and policies are mutually supportive, efficiencies are gained, and conflict and duplication are avoided. A great example is DEP's coordination on floodplain management and planning in cooperation with FEMA and PEMA.

DEP and PEMA should engage with Pennsylvania Fish and Boat Commission (PFBC) and Pennsylvania Department of Transportation (PennDOT) to establish technical design guidance for new encroachments and obstructions including Aquatic Organism Passage (AOP) design standards, construction materials and standards for design storm sizing. Such guidance for incorporation into local land use ordinances should include recommendations for PennDOT and municipal road crossings, along with stream simulation design standards and other items deemed necessary for resilient safe conveyance of flood waters.

Similarly, DEP should further collaborate with federal, state, interstate, international, and local governments within a watershed to align their collective efforts to ensure consistency among water resources management initiatives and to take advantage of their combined wisdom, data, and capital. This will entail outreach and education to the private sector and non-profit organizations to build awareness and support for following a united course.

Land use has a profound influence on water resources planning and management. While federal, interstate, and state governments have broad mandates to manage and regulate water resources, Pennsylvania municipalities have authority to adopt comprehensive plans, zoning regulations, and subdivision and land development ordinances. Local land use decisions should integrate water resources management objectives in their watershed to sustain economic growth while also achieving environmental protection and water resource management goals. To the extent that local governments lack the resources to integrate their land use decisions with current science and available data, and up to date water resource planning and development, the commonwealth, through grant incentives and support to county planning agencies and conservation districts can encourage the development of model land use ordinances and offer the technical assistance that help them accomplish this.

Recommendations

Set Agency Groundwork for IWRM

1. **Perform a baseline assessment.** DEP, with assistance from the Statewide Water Resources Committee (statewide committee), should develop a baseline assessment of what IWRM means under the current commonwealth governance and formulate a roadmap that establishes the roles that DEP and other agencies may have in IWRM. Applicable bureaus and offices within DEP include: Clean Water, Safe Drinking Water, Waterways Engineering and Wetlands, Chesapeake Bay, Compacts and Commissions, Mining Programs, and Abandoned Mine Reclamation. The scope will include, but not be limited to:
 - a. Facilitate discussions to educate statewide committee members on program functions and current coordination among DEP programs and agencies. This will help provide a better understanding of current coordination that will lead to more defined and

applicable IWRM concepts for statewide committee recommendation to DEP and partnering agencies.

- b. Identify specific current or emerging issues, opportunities for improved coordination and problems that may be addressed by IWRM. This can include areas where lack of coordination is leading to missed opportunities for existing programs or newer programs that address emerging environmental concerns and initiatives.
- c. Explore case studies and assessments of projects that are IWRM related.

2. **Establish an actionable workplan.**

With the baseline assessment completed, DEP, with assistance from the statewide committee, should then begin to establish and take discrete, actionable steps that:

- a. Identify potential programmatic, policy or regulatory options along with their impacts and benefits.
- b. Assess options in developing specific implementable management actions that would reflect the linkage of land use to water resources management.

Improve Coordination

1. **Inter-agency coordination.** Consideration should be given to making the state water plan section of DEP the single point of contact (SPOC) in DEP's Central Office charged with championing consistent planning, operations, and application of regulations and policies across programs and coordination across state agencies including DEP, DCNR, the Pennsylvania Infrastructure Investment Authority (PENNVEST), Department of Transportation (PennDOT), Pennsylvania Energy Management Agency (PEMA) and the Public Utility Commission (PUC), as well as the Game Commission, Fish and Boat Commission, Department of Agriculture and county conservation districts. Under this, DEP should evaluate existing interagency teams established under National Environmental Policy Act (NEPA)⁵ requirements as to whether these requirements may be used for other planning/implementation issues.
2. **Inter-basin coordination.** DEP should continue to support basin commissions leading coordination efforts on issues affecting basin-wide water planning and management, understanding that land use management lies largely at the local level. Existing basin commission committees are very helpful tools. In parts of the commonwealth without a basin commission or other authorized agency, DEP should continue to be actively involved.
3. **State-federal coordination.** A concentrated effort should be taken by DEP to maintain and strengthen the relationships with key federal agencies. These include the United States Geological Survey (USGS), FEMA, United States Army Corps of Engineers, United States Environmental Protection Agency, United States Fish and Wildlife Service (USFWS), United

⁵ The Council on Environmental Quality, NEPA.gov
<https://ceq.doe.gov/index.html>

States Forest Service, Natural Resources Conservation Service, and Office of Surface Mining Reclamation and Enforcement.

4. **Local government coordination.** Where the need and opportunities exist, DEP is encouraged to coordinate IWRM planning and education/outreach efforts with local governmental resources such as the Pennsylvania State Association of Township Supervisors (PSATS), Pennsylvania State Association of Boroughs, Pennsylvania Municipal League, professional organizations including the Pennsylvania Planning Association and Consulting Engineers Council, and local organizations including county conservation districts, planning departments, and watershed associations.

Initiate County IWRM Plans

1. Efforts should be made by DEP to identify and assess completed countywide, online integrated water resource plans which serve developers by allowing them to classify their projects and determine which permits or state resources are applicable to their project. These specific plans could be assessed for effectiveness by the state water plan section and proliferated using existing tools.
2. DEP should update current county integrated water resource plan templates as necessary for voluntary implementation and explore providing outreach and assistance to encourage widespread implementation of county wide plans.