

EXECUTIVE SUMMARY

This Groundwater Management Plan has been prepared by the Susquehanna River Basin Commission (Commission) under the general oversight of its Water Resources Management Advisory Committee (WRMAC). A critical and long-term part of the Commission's mission, as reflected in the 1971 Susquehanna River Basin Compact (Compact), is the achievement of a balance among environmental, human, and economic needs in the management of the basin's water resources. The recommended water resource management actions in the plan were formulated with the goal of balancing economic development and environmental protection as a primary consideration. This was achieved by carefully considering: (1) sustainability of the resources for future generations; (2) protection of existing users; (3) adverse environmental impacts and actions to minimize the impacts; (4) protection of high quality water from degradation; (5) effective interagency coordination; and (6) public understanding of groundwater issues.

The plan also represents a comprehensive revision to the Commission's first Groundwater Management Plan, which was prepared in 1993. Appendix E of this report contains the list of the 1993 plan recommendations, which have either been implemented or are not relevant today. There were 37 additional recommendations identified in the 1993 plan that have not been implemented, and those served as an initial basis for the updated management plan.

This current, updated plan addresses existing and anticipated groundwater issues. To develop the plan, the Commission assessed groundwater problems and management issues, compiled groundwater management principles and tools, identified actions needed to address issues and problems, selected the management plan, and defined implementation aspects of the plan. All of these elements are presented in the plan. The information contained in this plan is based on available data, records, and past reports. No new data collection, analyses, or research efforts were undertaken. Based on professional judgment and experience, the available information was determined to be sufficient to develop a sound and effective management plan. Additional updates are contemplated in the future as new information is gathered and new management issues emerge.

Groundwater resource problems were assessed by reviewing issues and impacts that have developed in the last few decades. Many problems have been brought about by human activities, either directly related to increasing demands for groundwater or indirectly when development alters the natural flow regime in a non-beneficial manner. Other problems are related to water scarcity. Many water resource problems have been solved by human engineered solutions and, in some cases, fortuitously and unintentionally through human activity.

Of particular significance was the identification of several Potentially Stressed Areas (PSAs) in the basin where the utilization of groundwater resources is potentially approaching or has exceeded the sustainable limit of the resources, defined as the average annual base flow (recharge) available in the "local" watershed during a 1-in-10-year average annual drought. Using a series of criteria, Commission staff identified a number of PSAs. They include seven areas in Pennsylvania: the Manheim/Lititz/Ephrata Valley, the Fruit Belt (in York and Adams Counties), Hanover Area, Hershey Area (Spring Creek Basin), Fredericksburg Area, Roaring Spring Area, and State College Area; and the Corning area in New York State. Applications submitted to the Commission for review of projects located in PSAs receive a greater degree of scrutiny. The requests for groundwater withdrawals will be considered in relation to the availability of groundwater and they may be denied, approved for lower quantities than requested, or approved with conditions. Included in the PSAs are several low-yielding (low permeability) bedrock units in the southern Pennsylvania portion of the basin. These units will produce only limited amounts of groundwater to support water resource development, and, for this reason, are called Water Challenged Areas (WCAs). While the area-specific conditions in PSAs vary, all

of them share certain conditions, including well interference, exceedance of sustainable yield, and loss of recharge area. Section 2.1 contains more detailed information on PSAs and WCAs.

Several topics of particular interest were identified as management issues, including multi-agency coordination, changes to water resource utilization over time, regulatory changes, and the performance, accountability and updating of this plan. As an important adjunct, Commission co-leadership or support for actions by others to address certain groundwater issues and problems was identified. These areas of interest include: (1) protection of both specific groundwater sources of water supply and aquifers; (2) water use and availability information; and (3) well requirements such as construction standards, availability of well data, certification and training for well drillers, and improvements for the basinwide observation well network. The Commission also supports periodic assessments of state groundwater programs to identify needed improvements and plan for their implementation.

Using sound groundwater principles and available tools, the Commission identified actions to address all issues and problems. A series of 39 recommendations was then developed to encompass the actions to be taken by the Commission and others, including federal, state, and local governments, and the private sector. The goal of balancing economic development and environmental protection was a primary consideration in establishing the recommended actions. The current set of recommendations represent significant additions, deletions, and modifications to the 1993 recommendations. The recommendations constitute the majority of the Groundwater Management Plan and are summarized in the following list. Sections 2, 3, and 4 of the plan contain details on the issues and problems that are the basis for the recommendations. A summary list and detailed list of the issues, problems, and recommendations are contained in Tables 6.1 and E1 (Appendix E), respectively.

Recommendations

A. Actions to Address Groundwater Resource Issues and Problems

1. Areas of Intense Growth and Development and Consequent Water Resource Development—
 - a. Use groundwater modeling and/or water level monitoring to evaluate potential well interference. Mitigation may be necessary.
 - b. Require groundwater availability analyses for new projects and for areas where the sustainable yield has been exceeded. Develop water budgets for all PSAs. Adjust withdrawal rates for sustainability, if needed.
 - c. Base sustainable yields for wells on post build-out conditions and encourage the use of best management practices (BMPs) to minimize loss of recharge.
2. Intensive Water Use in Small Basins—
 - a. Educate the public and local officials about the sustainability of headwater areas, and the need to properly manage them.
 - b. Evaluate headwater areas for the purpose of managing water quantity and quality.
3. Watershed “Transfers”—Educate professional groups about the options of maintaining groundwater withdrawals and post-use discharges in the same watershed.

4. Loss of “Clean” Water Input to Acid Mine Drainage (AMD)-Impacted Streams—Evaluate cumulative impacts from consumptive water uses to downstream water quality in AMD-impacted areas.
 5. Unknown and Unregulated Groundwater Use—
 - a. Collect information on unknown and unregulated withdrawals to improve evaluation for new projects.
 - b. Perform water budget and cumulative impact analyses, and manage groundwater withdrawals to address any adverse impacts.
 - c. Perform water budget analyses and consider options to address overdraw.
 6. Scarcity of Clean Water in Coal-Mined Areas—Manage quantity and quality in non-AMD-impacted watersheds recognizing that water resources are necessary for the economic growth of mining-affected regions; educate local officials and consultants; coordinate with state and federal agencies; and encourage grayfields initiatives.
 7. Drought Impact to Base Flow—Educate local jurisdictions about stormwater managements, critical aquifer recharge areas (CARAs), and other BMPs for development, and improve scientific basis for instream use protection.
 8. Impacts of Mining—
 - a. Encourage cooperative efforts to develop reliable water supplies related to mining operations.
 - b. Delineate the area of influence and capture area for the mine withdrawal and identify the impacts and method of impact mitigation, when needed.
 - c. Reduce impacts of mine pumpage through the grouting of water inflow points if economically and technically feasible.
 9. Flow Compensation for Consumptive Water Uses—Bring together key stakeholders to help promote use of groundwater stored in “artificial” aquifers to offset consumptive water uses and support instream flow needs.
- B. Actions to Address Management Issues
1. Multi-agency Coordination—Enhance the Commission's water resources procedures and project review coordination activities with involved agencies to avoid conflicting actions.
 2. Changes to Water Resource Utilization Over Time—
 - a. Assess water resource utilization periodically and make appropriate changes in policies, procedures, and project review process.
 - b. Strengthen water conservation requirements and encourage use of treated wastewater and conjunctive use.

3. **Regulatory Duplication**—Maintain close and effective coordination among the Commission, member jurisdictions, and key agencies to include possible formal arrangements such as memoranda of understanding.
4. **Increased Knowledge About Groundwater as a Resource**—
 - a. Capture and compile collected data for use by the Commission, agencies, and others.
 - b. Identify the constituency for an outreach and education program, and develop tools for their decision-making.
 - c. Encourage and assist local governments to include groundwater management concepts in planning and land use control.
 - d. Incorporate a variety of methods into a multifaceted outreach and education program.
5. **Plan Performance and Accountability**—Provide periodic reporting on implementation of the Groundwater Management Plan and new significant groundwater issues.
6. **Review and Update of the Plan**—Conduct comprehensive reviews and revisions of this plan at intervals not to exceed 10 years.
7. **Funding to Implement Plan**—Funding to implement the plan's recommended actions should be made available and/or proactively sought by the lead jurisdiction(s) for each action.

C. **Groundwater Management Support Programs**

1. **Protection of Groundwater Sources of Supply and Aquifers**—
 - a. Encourage states and local jurisdictions to develop regulations and programs to protect critical aquifers from contamination.
 - b. Continue and expand monitoring and research in cooperation with states related to nonpoint source contamination, and support the assessment and implementation of such actions, including total maximum daily loads (TMDLs), the United States Environmental Protection Agency's (USEPA's) 319 Nonpoint Source Program, and United States Department of Agriculture/Natural Resource Conservation Service (USDA/NRCS) water programs.
 - c. Support member jurisdictions in their efforts to consider the effect of wastewater discharges on groundwater, including sensitive recharge areas, when issuing National Pollutant Discharge Elimination System (NPDES) or State Pollutant Discharge Elimination System (SPDES) permits.
 - d. Assist communities with groundwater source protection by utilizing existing source water assessment data and aquifer test data to provide educational and technical assistance in formulation of protection plans.

2. Water Use and Availability Information—
 - a. Require large volume groundwater users (>10,000 gallons per day [gpd]) to register (document) their use and to re-register (update documentation) periodically. Coordinate with member states and others to maintain a vibrant data set.
 - b. Maintain a centralized database containing information on large users, and make this data available to planners and managers throughout the basin, subject to security considerations.
 - c. Maintain a centralized database containing well location information, and make the data available to planners and managers throughout the basin, subject to security considerations.
 - d. The Commission should partner with appropriate agencies to develop groundwater availability and yield information and make it available on-line.
3. Well Requirements—
 - a. Support state and local programs for well construction and abandonment standards, and improved controls to prevent pollution.
 - b. Support legislation that works toward the development of a well driller's certification program in Pennsylvania and support the improvement of programs that provide training and licensing/certification for all well drillers in the basin's states.
 - c. Provide effective maintenance and work toward improvements for the basinwide observation well network with a goal of having real-time monitoring capability in each county in the basin.
4. Assessment of State/Federal Groundwater Programs and Program Coordination—The Commission's member jurisdictions should continue periodic assessments of their groundwater programs to identify needed improvements and plan for their implementation.

This plan has been prepared to provide a framework that will allow the Commission, within the scope of the Commission's mission, powers, and duties, to effectively manage groundwater resources in the basin, in cooperation with member jurisdictions and other organizations. Within this framework, the plan sets forth actions to address a variety of groundwater issues and problems. The plan is broad-based, and is not meant to be a detailed implementation document for all recommendations. However, there are a number of actions that can be taken in the near term. Twelve continuing actions (of the total of 39 recommended actions) are identified in Section 6.2 and are defined to be those actions that should be initiated and/or implemented relatively easily and quickly under existing programs, although full implementation of some initiated actions may take years. The remaining actions are defined to be short-term (initiate within two years) or long-term (two to five years), and will require implementation measures such as development of new guidelines or regulations, provision of adequate resources, and interagency coordination.

The management plan is fairly evenly balanced among regulatory, planning, public outreach/education, and management actions. Of the 39 recommended actions included in the plan, 13 are regulatory in nature, 11 are related to planning, and 15 involve outreach/education and management.

The Commission, its four member jurisdictions (New York, Pennsylvania, Maryland, and the federal government), local jurisdictions, and the private sector are called upon to implement the plan. Each party's role and responsibilities are presented as part of plan implementation, and each party is responsible for allocating the resources necessary to implement its element of the plan, using a prioritized and phased approach, as needed. A rating system for prioritizing actions and assigning schedules was developed for the management plan to enhance implementation. This resulted in 10 actions being rated as top priority, 20 as high priority, and 9 as priority. In terms of scheduling, 12 actions were determined to be continuing, 16 short-term, and 11 long-term efforts. Section 6 of the plan contains details on plan implementation.

Prior to finalizing this plan, the Commission provided for a 90-day public review and comment period to a draft plan from June to September 2004. The Commission's objective was to receive constructive input and comments as a result of public review to produce a high quality Groundwater Management Plan. Three public workshops were held in July 2004, to present the draft plan and provide an opportunity for the approximately 175 attendees to make oral comments. Written comments were also received from 21 interested parties during the review period. More than 400 comments were received from the workshops and written submittals. Appendix F includes a summary of the most significant comments received, organized by major topics, and a summary response for each topic. The final plan has incorporated additional or revised information, as needed, to reflect changes made in response to the comments.

The Commission has approved this management plan to effectively address major groundwater resource issues in the basin that are within the Commission's purview. The Commission will monitor plan implementation and periodically review and update the plan.

In addition to this complete management plan, a short summary of the plan has been prepared for general distribution. The full plan will be most useful to those having a need for or interest in the details of the plan, particularly the recommended actions and their implementation. The summary version presents an overview of the full plan and is intended to provide a basic understanding of the plan's development and results.