Huntingdon County
Infrastructure Investment Strategy & Water Supply Plan

June 2007

David Miller & Associates and
Huntingdon County Planning and Development Department

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

Completion of a project as complex as the Infrastructure Investment Strategy & Water Supply Plan involves a variety of disciplines and much time and effort by the participants. A number of people in addition to the planning consulting firm, have contributed to this volume. We would like to extend our acknowledgment and thanks to the following:

Huntingdon County Commissioners

R. Dean Fluke Roy E. Thomas Larry O. Sather

Huntingdon County Planning Commission

Ron Rabena, Chairperson	Larry Mutti, Vice-Chairperson	Virginia Gill, Secretary
Larry Pruss	Ann Kyper Reynolds	Bryan Yingling
Herb Cole	Carl Jaymes	Mildred Rockwell

Comprehensive Plan Advisory Committee

Susan Alexander	Dan Bickel	Palmer Brown	Kim Burket
Herb Cole	George Drobnock	Sen. John Eichelberger	Bert Einodshofer
Rep. Mike Fleck	Ann Foor	Ginny Gill	Debra Gregory
Ellis Griffith	Joseph Harding	Carl Jaymes	Jeff Krause
Mike Lehman	Melanie MacDonald	Mike Makufka	Yvonne Martin
Van Montague	Larry Mutti	Kenneth Parker	Andy Patterson
Eric Powell	Pam Prosser	Larry Pruss	Ron Rabena
Ann Kyper Reynolds	Mildred Rockwell	Lisa Roth	Gary Rutherford
Dick Scialabba	John Shafer	Jennifer Stahl	Glenn Stampfle
Ron Taverno	Foster Ulrich	George Vahoviak	Dan Varner
Steve Volgstadt	Sean Waddle	Bryan Yingling	Chuck Yohn

Project Funding

This project was funded in part with a Land Use Planning and Technical Assistance Program Grant (LUPTAP) from the Pennsylvania Department of Community and Economic Development and local funds from the Huntingdon County Commissioners.

Planning Consultants

David Miller/Associates Planning Group

Planning Consultants Project Staff

Jeff Butler, AICP, Project Manager Steve Dell, Planner

Special acknowledgments go to Richard Stahl, Planning Director, and the staff of the Huntingdon County Planning Commission for their data collection, analysis, and input throughout the completion of the Infrastructure Investment Strategy & Water Supply Plan.

Huntingdon County Planning Commission Staff

Richard Stahl, AICP, Planning Director	Brian Young, Planner/GIS Coordinator
Maureen Safko, Planner/Grant Administrator	Cinnamon Bair, Addressing Technician
Laurie Nearhood, Secretary	Peggy Wilson, Secretary/Bookkeeper

Geographic Information Systems

The Infrastructure Investment Strategy & Water Supply Plan report is based, in part, on data from the Huntingdon County Geographic Information System.

HUNTINGDON COUNTY
INFRASTRUCTURE INVESTMENT STRATEGY

INTRODUCTION

The Infrastructure Investment Strategy is being developed in order to implement the County Comprehensive Plan. This strategy is designed to help guide growth that is compatible with the land use element and to further economic growth. A prioritized list of infrastructure needs is being developed in conjunction with planning, community and economic development stakeholders.

Huntingdon County has developed an excellent dialogue between community and economic interests through the Partnership for Economic Progress, a consortium of community and economic development organizations, chaired by the County Commissioners.

While not a capital improvements plan, this ranking system and accompanying lists of projects provides an infrastructure investment strategy that can utilize limited funds to address community needs in accordance with local planning documents. The County Planning and Development Department is available to assist community leaders in the initial stages of planning for improvement projects before grant and loan applications are prepared and submitted.

The Infrastructure Investment Strategy builds on the description and analysis of Community Facilities and Public Infrastructure. This section proposes a strategy for decision making and prioritizing infrastructure investments and focuses on five (5) specific types of infrastructure: 1) water, 2) sewer, 3) storm sewer, 4) public buildings, and 5) parks and recreation facilities.

Included here is an Inventory of Infrastructure Needs, Investment Criteria, Long-Range Investment Strategy and Short-Range Investment Strategy.

The importance of infrastructure cannot be over rated. Infrastructure is the foundation of daily activities and the basis for overall quality of life. In a very real sense, the condition of a community's infrastructure defines its ability to meet its goals. Huntingdon County's infrastructure, like most communities, has deficiencies. The source of these deficiencies is four-fold:

1. Infrastructure is aging and deteriorating;
2. Funds are limited for each entity to properly manage and pro-actively maintain these facilities,
3. New state and federal regulations require additional capital investments,
4. Many communities have insufficient infrastructure to support community and economic development.

County government can play a lead role in assisting local municipalities in prioritizing infrastructure projects that make effective use of limited financial resources and which are in accord with county and local plans and ordinances.

The other role that county government can play is in providing grant management and administration services to local municipalities. In the short-term, this could be invaluable to the successful completion of any local grant program. In the long-term, the county can build local capacity to administer grant and loan programs.

This local capacity includes several attributes:

- Competent management of funding source requirements
- Good financial management
- Monetary reserves for local matching funds
- Seminars for management personnel in leadership training, and
- Forum for peer-to-peer training

The Huntingdon County Commissioners and County Planning staff has created an excellent dialogue between community and economic interests through the Partnership for Economic Progress (PEP). This Partnership is a consortium of community and economic development organizations, including Huntingdon County Business and Industry, Huntingdon County Chamber of Commerce, Huntingdon County Visitors Bureau, Juniata College and representatives of other organizations involved in community and economic development. PEP is chaired by the County Commissioners. In addition to the County Planning Commission, the Partnership has played a key role in developing this strategy.

One of the major problems facing public and private leaders in Huntingdon County is the wide range of infrastructure needs. These needs range from park and recreation to the need for potable water. The challenge is to prioritize these "apples and oranges" with a single, unifying investment ranking system. Following the inventory of needs, a ranking system is proposed. The report lists both long-range and short-range improvement projects.

Because the Strategy includes a project scoring system, community leaders know upfront the most important criteria for evaluating various needs. The other purpose of the Strategy is to leverage local matching funds with County funds and County development objectives, including the strengthening of Urban Growth Areas. This leveraging is particularly important because funding is so limited. In addition to leveraging, meeting these infrastructure needs will require innovation and creativity among the County, Local municipalities, rural community utilities and private financing sources.

INVENTORY OF INFRASTRUCTURE NEEDS

This section of the Infrastructure Investment Strategy contains an inventory of needs. These needs are based on the results of a survey questionnaire sent to the municipalities and authorities in Huntingdon County. The survey was conducted in 2006 and 2007. A copy is in the Appendix.

The survey results were tabulated and then augmented by the County Planning Staff based on their knowledge and with telephone follow-up calls to the appropriate consulting engineer. Infrastructure needs are shown for the following five (5) categories:

- water
- sewer
- storm water
- public buildings
- parks & recreation

These represent the primary areas within the county that require a specific strategy to address needs. Other infrastructure needs, e.g.transportation, have their own mechanism for prioritizing projects, such as the Transportation Improvement Program (TIP).

It is important that the list of infrastructure needs is updated at least once every five (5) years. The lists could be updated more frequently if staff resources permit or if student interns are available to assist in the update. The process for updating could be the same – with a mailed survey questionnaire to be completed and returned, supplemented with county planning staff follow-up.

Further, every time the infrastructure needs list is updated, each project should be scored and ranked by score.

Water Needs

A summary of current community water systems is provided in Table 1. These 23 systems provide water to approximately 7,050 residential customers and an additional 627 commercial and other customers. These systems have a combined average daily capacity to provide 3,837,233 gallons of water per day.

The Pennsylvania Department of Environmental Protection (PaDEP) regulates drinking water in the Commonwealth under the 1984 Safe Drinking Water Act.

The infrastructure survey identified 24 community water system needs. This may, in fact, represent only a fraction of the needs in the County due to failure to return surveys and needs which are as of yet unrecognized. Complete infrastructure survey results may be found in the Appendix. A summary of water needs is presented following Table 1.

TABLE 1. WATER TREATMENT PLANT SUMMARY

Name	Average Daily Consumption	Max. Daily Cons.	Customers	Storage	Short-Range Needs	Long-Range Needs
Alexandria Borough Water Authority	99,245 gpd	281,070 gpd	362	Reservoir - 3.5 mg, Tank 319,000 gal.	Installation of 6" pipe on Shelton Avenue	none
Broad Top City Borough Water Authority	32,911 gpd	56,000 gpd	181	tank - 127,000 gal.	Drill new well and connect to system, link with Dudley System	to "loop" system, rehabilitate water tank
Cherrytown Water Company	not given	not given	16	Reservoir - 10,000 gallon	none	none
Dudley, Carbon, Coalmont Joint Municipal Authority	19,437 gpd	83,500 gpd	132	not given	new meters	none
Greenwood Furnace State Park	3,414 gpd	4,365 gpd	3	134,600 gal. underground water tank	new hook-ups for water	none
Huntingdon Water Filtration Plant	1,465,000 gpd	2,000,000 gpd	2901	2 : 3 mg tanks, 1: 300,000 gal pipe	none	Replace distribution lines = $150,000/year indefinitely
Mapleton Municipal Authority	59,448 gpd	126,290 gpd	228	Reservoir 134,000 gal. & 160,000 gal.	install 8" water main/improvements to Dam & Settling pond	none
Mill Creek Area Municipal Authority	73,305 gpd	112,300 gpd	269	not given	none	none
Mount Union Borough	6000,000	750,000	2086	Tanks		none
Neelyton Water Co-Op	5,600 gpd	6,800 gpd	Res. Cust.	not given	none	none
Orbisonia/Rockhill Joint Municipal Authority	98,935 gpd	148,430 gpd	407	not given	New storage tank in Rockhill Borough, $250,000	none
Petersburg Borough Authority	48,140 gpd	72,000 gpd	266	1,000,000 in Reservoir; 313,000 gal. in tank	Pigging of main line, replacement of some of the main line	none
Rothrock Water Treatment Plant	120,000 gpd	360,000 gpd	258	not given	none	none
Saltillo Water Company	38,013 gpd	64,894 gpd	157	88,000 gal.	new well	none
SCI - Huntingdon	395,833	502,000	2	separate		none
Seven Points Water Treatment Plant	13,000 gpd	72,000 gpd	0	not given	none	none
Shirleysburg Municipal Authority	8,662 gpd	not given	69	not given	none	none
State Correctional Institution Huntingdon	500,000 gpd	650,000 gpd	0	not given	Currently Constructing Filtration plant & Chemical Treatment Facility	none
Three Springs Borough Water System	66,597 gpd	112,290 gpd	214	Reservoir - 75,000 gal, 2: 25,000 gal tanks	none	none
Trough Creek State Park	not given	not given	0	not given	new well @ newly constructed park office	none

Name	Average Daily Consumption	Max. Daily Cons.	Customers	Storage	Short-Range Needs	Long-Range Needs
Walker Township Water Treatment Plant	93,182 gpd	140,954 gpd	520	tank - 500,000 gal.	none	none
Warriors Mark General Authority	49,826 gpd	75,402 gpd	218	not given	locate & develop new well & replace 3000' of lines	none
Wood, Broad Top, Wells, Joint Municipal Authority	46,685 gpd	82,000 gpd	316	none	new system - waiting for FHA funds	none
			8328			
Source: Huntingdon County Planning Department						

Water Needs Summary

Alexandria Borough
- Complete replacement of 3.5-mile line from reservoir
- Build new water storage tank

Birmingham Borough
- Develop water plan to separate Grier School from borough

Broad Top City Borough
- Develop new water source, i.e. well
- Replace distribution system

Dudley, Carbon, Coalmont Authority
- Replace lines for entire system
- Repair/replace roof on treatment plant
- Repair/replace storage tank

Huntingdon Borough
- Replace 2 ten-inch lines along 5th Street
- Upgrade Crooked Creek & Fairgrounds Mutual lines
- Prepare Water Source Protection Plan

Mapleton Borough
- Replace and expand current water lines
- Increase storage capacity

Mill Creek Borough
- Identify and repair all line leaks

Mount Union Borough
- Place in service the Lemkelde Well
- Replace old lines in Cedar Crest and Silverford Heights
- Clean second lagoon at Singers Gap Treatment Plant
- Install radio-read meter transmitters
- Rehab Dark Hallow Dam
- Dredge Singers Gap Reservoir

Orbisonia Borough
- Install second storage tank at Rockhill
- Purchase and connect alternative well

Rockhill Furnace Borough
- Install new water tank

Wood-Broad Top-Wells Authority
- Install fencing around reservoir.

Of the five system needs identified in the 2000 Comprehensive Plan, four have been implemented: Alexandria Water Filtration System, Mapleton Water Filtration System, Mount Union Water Source Development and Wood-Broad Top-Wells Filtration and Storage.

The Planning and Development Department staff has observed a need to build management capacity in local utilities. Fiscal and management training are needed. Board and staff development in areas such as meeting management, project planning and grant management are needed. Few systems have a reserve account for internal financing of system improvements, which is needed in light of grant cutbacks at state and federal levels. Small systems have difficulty finding part-time certified plant operators.

Some regions have developed county or regional water authorities to more efficiently provide the professional level of operation and management required by a utility. This could take the form of circuit riding plant operators, a county water authority, consolidation of local water systems or management by a council of governments.

Sewer Needs

PaDEP regulates wastewater treatment through the Clean Streams Act and the Act 537 planning process.

A summary of current community sewer systems is provided in Table 2. These 21 systems provide water to approximately 8,818 total customers. These systems have a combined average daily capacity to treat 4,286,350 gallons of sewage per day.

The infrastructure survey identified 16 community sewer system needs. This may, in fact, represent only a fraction of the needs in the County due to failure to return surveys and needs which are as of yet unrecognized. Complete infrastructure survey results may be found in the Appendix. A summary of sewer needs is presented following Table 2.

TABLE 2. WASTEWATER TREATMENT PLANT SUMMARY

Name	Av. Daily Flow	Max. Daily Flow	Customers	Stormwater System	Act 537 Plan	Short-Range Needs	Long-Range Needs
Alexandria Borough - Porter Twp. Joint Sewer Auth.	105,000 gpd	240,000 gpd	340	separate	2003	Extend sewer line to Davis Way.	Extension of sewer to areas of Porter Twp indicated in the Act 537 Plan; improved sludge handling.
Broad Top City Wastewater Treatment Plant	40,000 gpd	65,000 gpd	153	separate	not given	none	none
Cassville Water & Sewer Authority	16,000 gpd	30,000 gpd	84	separate	1994	none	none
Dudley, Carbon, Coalmont Joint Municipal Authority	27000 gpd	70,000 gpd	300	separate	1995, 2002	none	none
Greenwood Furnace State Park	4,000 gpd	10,000 gpd	0	separate	n/a	Extend sewer lines	none
Hesston Wastewater System	6,000 gpd	15,000 gpd	57	separate	1989, amended in 1992 and 2006	Correct infiltration and inflow.	Connect collection system to Walker Twp system.
Huntingdon Waste Water Treatment Facility	3,000,000gpd	4,000,000 gpd	3,500	combined	1989, amended 1994 & 2007	$10,700,000 to meet Chesapeake Bay Stds	$15,000,000 to separate combined sewers
Mapleton Area Wastewater Treatment Facility	48,000 gpd	100,000 gpd	280	not given	1994	none	none
Marklesburg Borough	8000 gpd	12,000 gpd	77	separate	1993	none	none
Mill Creek Area Municipal Authority	72000 gpd	120,000 gpd	286	separate	1994	none	none
Mount Union Borough Sewer	357,000 gpd	604,000 gpd	1195 (2,044 EDU)	minimal combined	1995, amended in 1999	Disconnect interconnected storm sewers, identify and remedy I&I, minor upgrades.	Meet Chesapeake Bay Tributary Strategy

Name	Av. Daily Flow	Max. Daily Flow	Customers	Stormwater System	Act 537 Plan	Short-Range Needs	Long-Range Needs
Oneida Twp. Waste Water Collection System	20000 gpd	111,000 gpd	95	separate	1987	none	none
Orbisonia Rockhill Joint Municipal Authority	79,000 gpd	200,000 gpd	500	separate	not given	$1.65 million upgrade to 100,000/300,000 gpd capacity	none
Petersburg Sewer Department	80000 gpd	100,000 gpd	181	separate	1995	none	none
Rothrock Sewage Treatment Plant	18000 gpd	100,000 gpd	1	separate	n/a	none	none
Seven Points Recreation Area Sewer Treatment Plant	8000 gpd	60,000 gpd	1	separate	n/a	none	none
Shade Gap Area Joint Municipal Authority	30,000 gpd	65,000 gpd	123	separate	1988	none	none
Shirley Township Authority	127,000 gpd	500,000 gpd	343	separate	1996, amended 2001	Infiltration and inflow identification and repair	I & I reduction plan, pump station upgrade
Spring Creek Joint Sewer Authority	88,000 gpd	110,000 gpd	419	separate	not given	none	none
Walker Twp. Waste Water Collection System	98,350 gpd	108,350 gpd	560	n/a	1989	none	none
Wood, Broad Top, Wells Joint Municipal	55,000 gpd	84,000 gpd	322	not given	not given	none	none
			8817				
Source: Huntingdon County Planning Department							

Sewer Needs Summary

Huntingdon Borough
- Phosphorous and nitrogen removal

Logan Township
- Act 537 Plan Implementation

Marklesburg Borough
- Grinder Rings
- Aeration Boiler

Mill Creek Borough
- Solve infiltration and inflow problems

Mount Union Borough
- Mill Hollow and Liverpool Pumping Station
- Identify and solve infiltration and inflow problems
- Comply with requirements of the Chesapeake Bay Strategy

Oneida Township
- Comply with requirements of the Chesapeake Bay Strategy

Orbisonia Borough
- Identify and solve infiltration and inflow problems

Penn Township
- Construct conveyance lines to Huntingdon
- Update Act 537 Plan

Shirley Township
- Identify and solve infiltration and inflow problems

Three Springs Borough
- Upgrade treatment plant

Wood-Broad Top-Wells Authority
- Remove and replace old reeds and sub-base in reedbed
- Check lines for infiltration and inflow

Needs include connecting homes currently on failing septic systems to a municipal systems and separating storm water flow from sanitary sewer lines.

In addition, the Chesapeake Bay Strategy is placing new requirements on treatment plants to reduce phosphorus and nitrogen loading. An additional set of new regulations that will increase the financial burden on sewerage systems is the Low Flow Discharge Regulation.

Storm Water Needs

Storm Water run-off, if not properly controlled, can create a number of different problems. It can wash away prime agricultural soils, erode stream banks, add sediment in the Chesapeake Bay, pollute public water sources, over-load sewage treatment plants, and weaken (or destroy) building foundations.

Storm water run-off is regulated by PaDEP through the requirement of Act 167 – Storm Water Management. Act 167 requires the development of stormwater management plans for every watershed in Pennsylvania and establishes the principle of zero increase in post-development runoff.

In the Survey Questionnaires, municipalities noted some of their stormwater management needs. But an overview is needed and a starting point would be a county stormwater management plan for each watershed as required by Act 167.

Public Building Needs

The municipal building needs are shown in the Appendix, Municipal Building Survey Results. The survey indicates that 12 of the County's 48 municipalities do not have a municipal building. Meetings are held in personal residences, fire halls, community centers and local churches. Other needs include police departments located in separate, distant buildings, and maintenance departments in small and/or deteriorating structures. Older public buildings still have many barriers to the disabled and fail to meet Americans with Disabilities Act standards.

Growth in County government has resulted in a lack of office and records storage space. The public sector has a need to upgrade the telecommunications infrastructure of the County, connecting municipal buildings to broadband Internet and enhancing emergency radio communication.

Parks & Recreation Needs

The Appendix, shows the park and recreation needs throughout Huntingdon County. Consistent needs reflected in the Survey were funding for maintenance and up keep of existing recreation facilities. Again, area recreation needs were underreported in the survey. Smaller rural townships have traditionally relied on neighboring boroughs to provide parks. This has been changing in some of the larger and growing townships such as Smithfield and Walker. A complete park and recreation study is needed to adequately address this issue.

TABLE 3. COMMUNITY PARKS

Municipality	Name	Region	Acreage	Ownership	Facilities
Broad Top City	Broad Top City Ballfield	9	1	Borough	Little League Ball Field
Broad Top City	Homecoming Grounds	9	8	Private	Fairgrounds, ball field
Carbon Township	Middletown Playground	9	31	Township	Pavillion, ball field, playground
Cassville Borough	Cassville Park	10	1	Borough	Community building, ball field
Dublin Township	Harper Memorial Park	10	52	Private	Fairgrounds, ball field
Dudley Borough	Dudley Ball Field	9	1	Private	Ball field
Dudley Borough	Dudley Historic Site	9	1	Private	Historic exhibit
Huntingdon Borough	Detweiler Memorial Field	4	6.8	Private	Picnic tables, horseshoe pits, softball field, soccer field, track, social building, kids playground area
Huntingdon Borough	Isett Memorial Pool	4	1	Borough	Swimming pool, bathhouse
Huntingdon Borough	Blair Park	4	2	Private	Picnic tables, gazebo, trail
Huntingdon Borough	Blairs Field	4	6	Borough	Ball field
Huntingdon Borough	Flag Pole Hill	4	164	Borough	Picnic area, trails
Huntingdon Borough	West End Playground	4	4	Borough	Ball field, playground, basketball court
Huntingdon Borough	The Cliffs	4	24	Borough	Scenic views, trail

Municipality	Name	Region	Acreage	Ownership	Facilities
Logan Township	Petersburg Ball Field	3	8	Borough	Ball field
Brady Township	Riverside Park	6	30	Borough	Ball field, boat ramp, pavillion
Mapleton Borough	Mapleton Swimming Pool	6	2	Borough	Swimming pool, bathhouse, playground
Mapleton Borough	Mapleton Courts	6	1	Borough	Tennis Court, Basketball
Mill Creek Borough	Mill Creek Playground	11	0.5	Borough	Picnic tables, baseball field, community building, playground equipment
Mount Union Borough	Diven Park	7	0.5	Borough	Playground, basketball court, tennis courts, splash fountain, athletic field
Mount Union Borough	Upper Municipal Park	7	6	Borough	Baseball fields, basketball court, tennis cout, playground
Mount Union Borough	Lower Municipal Park	7	1	Borough	Baseball fields, playground
Mount Union Borough	Catholic Hill Playground	7	1	Borough	Ball field, tennis court
Mount Union Borough	Riverside Park	7	8	Borough	Picnic pavillion, playground
Porter Township	Alexandria -Porter Park	3	2	Borough	Ball field
Shirleysburg Borough	Shirleysburg Park	7	0.4	Borough	Community building, ball field
Saltillo Borough	Saltillo Community Center	8	4	Borough	Basketball court, playground equipment, baseball field
Saltillo Borough	Jaycees Gym	8	0.5	Borough	Gymnasium, community meeting room
Smithfield Township	Riverside Park	4		Township	Pavillions, horse shoe pits, picnic tables, walking paths
Three Springs Borough	Three Spring Square	8		Borough	Passive sitting area
Three Springs Borough	Three Springs Park	8	8	Borough	Base ball,
Three Springs Borough	Municipal Pool	8	6	Borough	Swimming Pool
Walker Township	Bouquet Springs	4	0.2	Township	Artesian spring
Walker Township	Municipl Park	4		Township	Pavillion, ball field, playground
Warriors Mark Township	Warriors Mark Ball field	1	1	Township	Ball field
West Township	Shavers Creek Community Building	2	8	Private	Community Building
Wood Township	J.A. Carney Athletic Field	9	5	Township	Ball field, basketball court, playground
Wood Township	Huntingdon Square Playground	9	3.5	Private	Baseball field, concession stand, playground equipment, picnic pavilion
TOTAL		NA	399.4	NA	NA

Listed below is a summary of park and recreation needs in Huntingdon County.

Parks and Recreation Needs Summary

Alexandria Borough
- Remove/replace trees and sidewalks
- Improve park area behind Library

Broad Top City Borough
- Develop master plan for Little League field
- Develop master plan for Fireman's Grounds

Huntingdon Borough
- Continue development of Portstown Park
- Develop an amphitheater for performances

Mapleton Borough
- Swimming Pool
- Walkway to "Thousand Steps"

Mount Union Borough
- Finish installing lights at Teener Field
- Complete development of Riverside Park
- Install boat launch near Riverside Park
- Plan and install improvements to Lower Municipal Park
- Develop linear park along Pennsylvania Avenue

Porter Township
- Continue development of Juniata Valley Recreation Area

Smithfield Township
- Continue development of Riverside Park
- Develop railroad R-O-W as walking and biking trail

Walker Township
- Plan and construct storage building with public restrooms

Warriors Mark Township
- Develop park at former school site

INVESTMENT CRITERIA

One of the primary methods for implementing the Huntingdon County Comprehensive Plan is through infrastructure investment. This investment may be for either new or upgraded facilities. This investment will assist in guiding growth and economic development that is compatible with existing land use patterns and the Plan's Future Land Use Element.

Growth can follow infrastructure or infrastructure will have to follow growth in a random, unplanned way. Huntingdon County, its municipalities and authorities can actively manage investment in infrastructure or react to the demands created by the decisions of others. Guiding infrastructure can help provide predictability, affordability, and sustainability within the County.

In order to assist municipalities and authorities in planning and prioritizing infrastructure projects, the County Planning Commission presents the following Investment Criteria. Using this scoring system will promote infrastructure projects that insure the most cost-effective investments and will focus that investment on the implementation of the community development objectives of the County Comprehensive Plan, e.g. the Urban Growth Boundary strategy.

Investment Criteria

1. Projects must first meet the threshold of:
    - State and Federal Regulatory Requirements
    - Consistency with County Comprehensive Plan
2. Projects are then scored on a 100-point system using five different criteria – 20 points maximum for each criteria. The five criteria are:
    - Health, Safety & Welfare
    - Economic Development
    - Community Distress Rating
    - Leverage of Local Funding
    - Number of Persons Served

Health, Safety & Welfare

Infrastructure needs can range from a reliable source of potable water to a dedicated building for all municipal services to active recreation facilities for teenagers. One example of a numerical standard in this category would be the number of people or households affected by the project. Points in this category should be awarded as follows:

0 Points: No impact
5 Points: Minimal impact
10 Points: Average impact
15 Points: Above average impact
20 Points: Substantial impact

Economic Development

Projects that are necessary for job creation are rated as shown below. This can be measured by the total number of jobs to be created by a proposed project, or the number of jobs that could be created given the amount of vacant, zoned land to be served.

0 Points: No impact
5 Points: Minimal impact
10 Points: Average impact
15 Points: Above average impact
20 Points: Substantial impact

Community Distress Rating

The Huntingdon County Planning and Development Department has generated a Community Distress Rating for use in the CDBG ranking process. This rating utilizes the following:

1. Change in population
2. Percent below poverty
3. Percent unemployed
4. Housing greater than 50 years old.

Points from these criteria are totaled and a county ranking is assigned to each municipality from 48th (worst) to 1st (best). The highest number of points are awarded to those municipalities in the greatest distress. See the Appendix for a listing of these criteria.

In the infrastructure criteria this Distress Rating yields points as follows:

0 Points: Raking of 1st to 10th
5 Points: Ranking of 11th to 19th
10 Points: Ranking of 20th to 29th
15 Points: Ranking of 30th to 39th
20 Points: Ranking of 40th to 48th

Local Funding

The amount of money a municipality can bring to a project is another significant criterion i.e. the amount of financial leverage in the project. Points are assigned on the following scale:

0 Points: Less than 25% of a project cost
10 Points: 25% - 49% of project cost
20 Points: 50% or more of project cost

Population Served

The number of persons served by a project is the final criterion. Points are assigned on the following scale:

0 Points: No population served
5 Points: 0 – 100 persons served
10 Points: 100 – 200 persons served
15 Points: 200 – 300 persons served
20 Points: Greater than 300 persons served

SUMMARY

A primary mechanism for implementing the recommendations of the County Comprehensive Plan is infrastructure development. Therefore, this Infrastructure Investment Strategy was developed to prioritize infrastructure needs into a unified ranking order.

The needs were assembled from a survey questionnaire that was mailed to municipalities and authorities and then their responses were augmented by County Planning and Development staff through telephone calls. The Strategy focuses on water, sewer, storm water management, public buildings and park and recreation needs.

One of the major needs of the County is for a water/sewer service agency (or authority). This entity could provide professional operation and management of public water/sewer facilities.

The infrastructure investment criteria were developed in order to assist municipalities and authorities in prioritizing projects. First, all projects must meet state and Federal regulatory requirements and must be consistent with the County Comprehensive Plan. Each project is then scored in five (5) different categories:

- Health, Safety and Welfare
- Economic Development
- Community Distress Rating
- Leverage of Local Funding
- Number of Persons Served

By utilizing this scoring system, County and local officials, as well as authority personnel and board members, can: 1) Coordinate development with the County Comprehensive Plan, and 2) Leverage infrastructure investments that make the most effective use of limited financial resources.

WATER SUPPLY PLAN

INTRODUCTION

Soon after the Huntingdon County Comprehensive Plan was adopted, the Governor signed Act 67 and Act 68, amending the Pennsylvania Municipalities Planning Code (MPC). The amendments to the Code changed the responsibilities of the County Planning Commission, the status of the Comprehensive Plan, and the requirements of what a comprehensive plan must contain.

It should be noted, however, that though it predates the new law, Huntingdon County's Plan is valid. The MPC amendments considered all plans adopted between 1995 and September 2000 as legal plans for the purposes of the Act.

The relevant portion of the new MPC is contained in Section 301 (b) and reads as follows:

> The comprehensive plan shall include a plan for the reliable supply of water, considering current and future water resources availability, uses and limitations, including provisions adequate to protect water supply sources. Any such plan shall be generally consistent with the State Water Plan and any applicable water resources plan adopted by a river basin commission. It shall also contain a statement recognizing that:
> (1) Lawful activities such as extraction of minerals impact water supply sources and such activities are governed by statutes regulating mineral extraction that specify replacement and restoration of water supplies affected by such activities, and
> (2) Commercial agriculture production impacts water supply sources.

As stated above, one of the new requirements for a County Comprehensive Plan is a "plan for the reliable supply of water" -- hence, this portion of the Comprehensive Plan Update. This portion also serves as an extension and more detailed examination of the Infrastructure Investment Strategy, specifically for water supply needs.

This element is intended to assist municipalities and water providers in securing adequate supplies of potable water to meet projected needs. Projected future municipal water needs, as compared with existing water system capabilities are set forth, and anticipated system deficits noted. Potential threats to existing and future water supplies are also identified. The purpose of this chapter is to help municipalities and water providers overcome projected system shortfalls, planning conflicts and other potential threats by developing specific planning and solution strategies.

The role of the Huntingdon County Planning Commission in this process is to provide a framework and guide for local water planning efforts. While there are currently methods and models in place to guide community comprehensive planning and sewage facilities planning, guidance for water planning is notably lacking. The Water Supply element of the Huntingdon County Comprehensive Plan is intended to fill that gap by recognizing

the importance of water planning, by providing data on the water providers within the County, and by outlining a recommended process for undertaking water planning efforts at the local level.

While the County can facilitate local water planning efforts, the responsibility for the development of specific plans and strategies belongs to municipalities and water providers. These planning and solution strategies can best be developed where communities follow steps:

1. ***Identify future water needs and system capabilities;***
2. ***Evaluate existing and future threats to water supplies;***
3. ***Evaluate alternative solution strategies; and;***
4. ***Develop and implement a plan of action.***

These steps should be followed by all communities which anticipate public water supply deficits or which desire to safeguard public water supplies from potential threats. In addition, communities currently without public water services, but which have a growing demand for water and/or developed areas with contaminated groundwater, may wish to follow these steps.

Some preliminary planning is recommended before communities begin the water planning process. An initial public meeting can stimulate public interest and help identify key issues to be addressed, and be a source of potential community members qualified and willing to be part of the planning effort. Issues such as funding for consultants or data, mailings and advertising should be addressed. What needs to be done and who will do it should be addressed upfront. Such advance preparation will make the most efficient use of funding and the time given by volunteers involved in the process.

OVERVIEW OF COUNTY CONDITIONS

Water facilities, and the provision of clean and reliable water supply, are important aspects of the overall infrastructure needed to accommodate residential development and stimulate economic growth. In addition, new development can be directed into designated growth areas by coordinating the provision of public water facilities.

Public water purveyors are essential for maintaining a safe, reliable water supply. Public water facilities are particularly important in medium and high-density areas where wells would be located among multiple land uses. Multiple wells located in close proximity are more likely to interfere with each other, reducing reliability, and also provide more pathways for contaminants to reach and pollute groundwater. On the other hand, public water systems increase reliability by providing access to both ground and surface sources.

Groundwater Sources

The predominant rock type in Huntingdon County is a sequence of alternating shale sandstone, and limestone of Paleozoic Age. Water wells drilled into the rocks in this sequence can yield 20 to 1,000 gallons per minute, averaging 125 gallons per minute of

sift or very hard water. The limestones and dolomites are presently the most productive aquifers. Large springs, some producing several thousand gallons of hard water per minute, issue from the rocks. The sandstones are potentially good sources of water. Many of the wells that tap sandstone are used only for domestic purposes, as many municipalities are supplied by surface water, except where yields are 100 to 550 gallons per minute or more. The shales supply water that is generally high in iron and hydrogen sulfate. They do not ordinarily supply more than 75 gallons per minute per well.

Huntingdon County lies entirely within the Susquehanna River drainage basin. The Juniata River Basin, a major sub-basin of the Susquehanna River, includes all of Huntingdon County. Huntingdon County is part of two major sub-basins of the Juniata River Basin: The first is the Upper Juniata River sub-basin, including the western half of Huntingdon County, all of Blair County, the northern two-thirds of Bedford County, and small portions of Fulton, Centre, and Cambria Counties. The sub-basin encompasses 1,943 square miles with a total of approximately 2,430 steam miles. The sub-basin is made up of the Raystown and Frankstown Branches of the Juniata River and the Little Juniata River.

The second major sub-basin is the Lower Juniata sub-basin that drains 1,462 square miles encompassing approximately 1,782 steam miles. This sub-basin includes the southeastern third of Huntingdon County, all of Mifflin and Juniata Counties, the northern half of Perry County, and small parts of Snyder, Centre, Fulton, and Franklin Counties. The sub-basin is made up of the main stem of the Juniata River and its tributaries, including Aughwick Creek, Kishacoquillas Creek, and Tuscarora Creek.

Huntingdon County contains 9 major drainage basins. The steams contained in these basins are identified and detailed in the table below. The stream flows from the USGS Annual Hydrologic Data Report indicate that each day over 6 million gallons of surface water flow through Huntingdon County. This compares to a current average consumption of 3.8 million gallons per day.

TABLE 4.

Major Streams
Huntingdon County

Name	Tributary To …	Watershed at Mouth (Sq. Miles)	Juniata River Accumulative Drainage Area
Spruce Creek	Little Juniata	110	330
Little Juniata	Juniata River	340	340
Frankstown Branch	Juniata River	400	740
Shavers Creek	Juniata River	65	805
Standing Stone	Juniata River	135	955
Great Rough Creek	Raystown Branch	86	-
Raystown Branch	Juniata River	965	1,950
Aughwick Creek	Juniata River	325	2,390
Tuscarora Creek	Juniata River	60	-

Groundwater quality is at risk in localized areas of the County that have commercial, industrial and concentrated agricultural businesses. These types of businesses should be inventoried prior to public groundwater supply development activities to minimize the potential for contaminated sources. The EPA currently does not list any sites contaminated with hazardous waste in Huntingdon County on its Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database. The EPA does, however, list approximately 90 hazardous waste handlers within the County on its Resource Conservation and Recovery Information System (RCRIS) database.

Threats to water resources are related to industrial areas, sediment pollution and earth disturbance activities, excessive manure and sludge application, overuse of pesticides, urban and suburban runoff, and leaks, spills and dumps. Increasing population demands are considered yet another threat.

Other pollution sources of concern are concentrated animal feeding operations (CAFOs). These operations are defined by PaDEP as facilities with either more than one million pounds of live animal weight, or concentrated animal operations with 301,000 to 1,000,000 pounds of live animal weight that are located in "special protection watersheds" or have potential to discharge to surface waters. Concentrated animal operations (CAOs) are defined by PaDEP as an operation with 2,000 pounds of live animal weight per acre of land suitable for manure application and owned or managed by the farmer.

Farms with a high concentration of animals must have adequate storage facilities for the manure they generate. When the storage facilities are properly designated, constructed and managed, manure is an environmentally safe source of nutrients and organic matter necessary for the production of food, fiber and good soil health.

CAFOs must also develop Nutrient Management Plans and Erosion and Sediment Control Plans to help protect water quality and early detection of manure storage leaks. PaDEP requires proposed operations to obtain permits. The permit requirements are derived from the Federal Clean Water Act and PaDEP's National Pollution Discharge Elimination System (NPDES) Program regulations. Fortunately, public participation is required for all CAFO permits. Therefore, existing or potential groundwater supply sources can be protected via required public notification and subsequent public involvement.

As a general planning guideline, CAFOs and CAOs should not be located in close proximity to existing or proposed development, within special protection watersheds, near public water supply sources and areas that contribute flow to the sources, and in areas where future public water supply development is likely. It should be noted, however, that these guidelines do not give the local government the legal right to prohibit CAFOs and CAOs. But individual municipalities may regulate CAFOs and CAOs in conjunction of State law and case law -- which is still evolving.

On October 4, 1978, the Pennsylvania General Assembly approved the Storm Water Management Act, P.L. 846, No. 167. Act 167 was adopted based on the Statewide recognition of the adverse affects of inadequate management of excessive rates and volumes of storm water resulting from development. Act 167 required all Pennsylvania countries to prepare and adopt storm water management plans for each watershed located in the county. The plans are to provide for uniform standards and criteria throughout a watershed for the management of storm water flowing from development sites through implementation by local municipalities ordinances. An Act 167 Storm Water Management Plan has not been completed for Huntingdon County. It is recommended that County pursue funding from DEP for a storm water management plan.

WATER SYSTEM INVENTORY

There are 23 separate water systems in the County. At the time of the preparation of the County Comprehensive Plan, 8 systems were judged as having good capacity for expansion, 6 needed upgrades, and three were viewed as inadequate. Of these three, Mount Union has since drilled new wells; Alexandria has added a filtration plant and other extensive improvements; and Shirleysburg has drilled a new well.

In addition, eight (8) centers identified in the Comprehensive Plan now lacking public water, were encouraged to create water systems: Shade Gap, Coalmont, Cassville, Marklesburg, Hesston, McAlevys Fort, Birmingham and Spruce Creek. Since preparation of the previous plan, the governing bodies of Coalmont, Cassville, Marklesburg and Hesston have decided not to install public water systems in conjunction with a public sewer project – electing to continue using on-lot wells.

A countywide Source Water Assessment would be beneficial in developing plans for the protection and enhancement of municipal water supplies and may be helpful in identifying ground water sources that are overtaxed by private residential development and potential areas in need of public water service.

It becomes increasingly apparent that small municipal water authorities struggle to properly operate and maintain public utility systems due to a lack of certified operators. The small numbers of customers per system makes it difficult to pay for the services of certified operators. This lack of management results in excessive wear on equipment and loss of water. Additionally, improper operating procedures increase routine expenses, thus minimizing authority funds that are needed for regular system maintenance. A certified professional water treatment plan operator, with management skills, is needed to assist the small municipal authorities. There is no countywide supplier or county water service agency or authority in Huntingdon County. But such an organization, if created, could provide joint planning, billing, purchasing, management and certified operators. Individual water suppliers could then contract for any or all services from a menu of services.

Approximately 42% of Huntingdon County's households are served by public water suppliers. Private on-lot wells serve the remaining 58%. Total average daily water consumption for all uses in the County is approximately 4 million gallons per day.

Although these systems draw from both ground and surface waters, they are increasingly dependent on groundwater to meet growing public demand. To meet these increasing demands, water suppliers have completed system improvements, drilled new wells and extended service lines.

The water source and capacity for each water provider is listed on the Table 5 below.

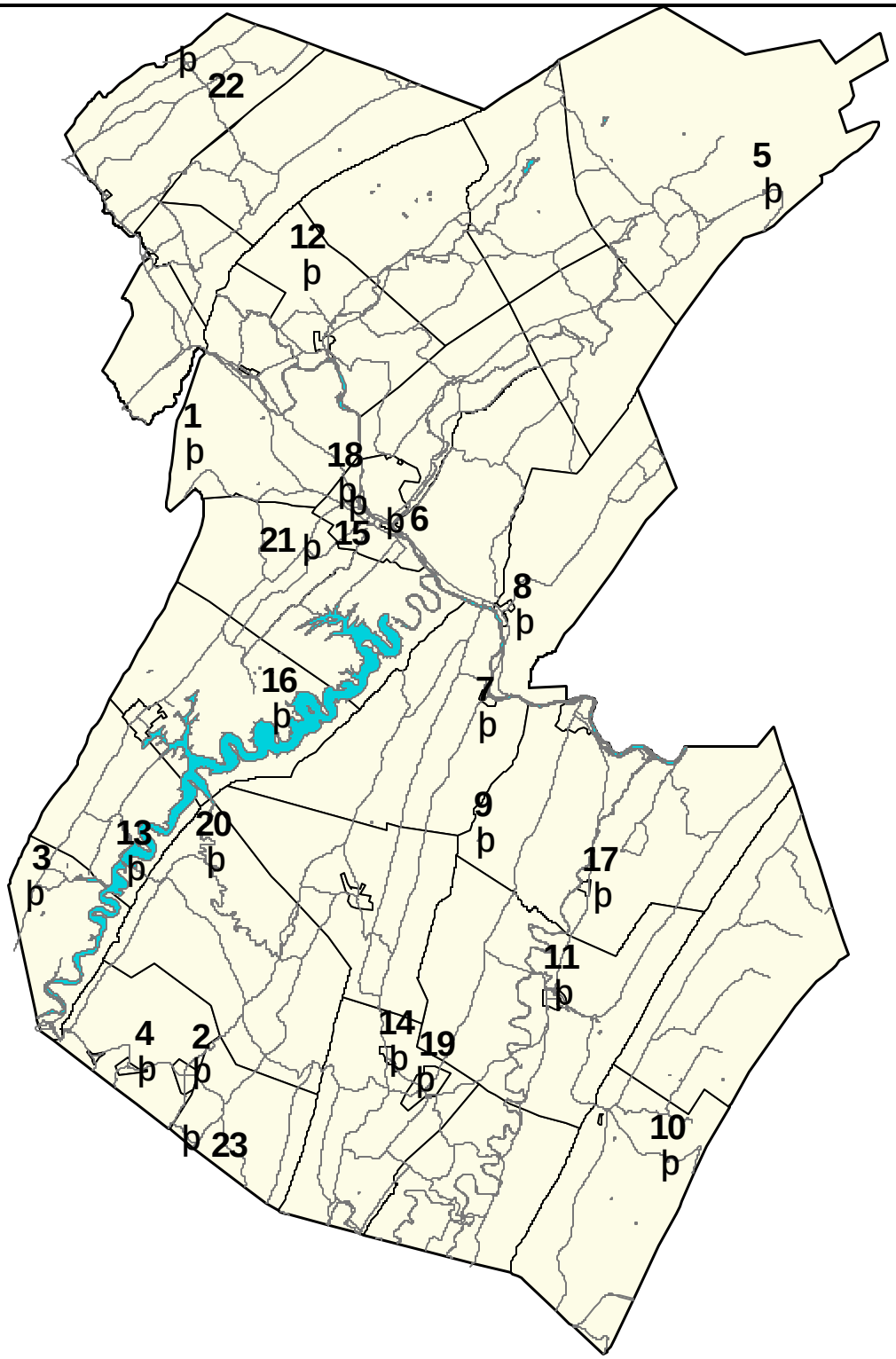
TABLE 5. WATER SOURCE

Name	GPD Capacity	Source
1. Alexandria Borough Water Authority	281,070*	Surface
2. Broad Top City Water Authority	56,000*	1 Well
3. Cherrytown Water Company	144,000	Shared Spring
4. Dudley, Carbon, Coalmont Joint Auth.	83,500*	Well & Spring
5. Greenwood Furnance State Park	4,365*	Well
6. Huntingdon Water Authority	4,000,000	Surface
7. Mapleton Municipal Authority	81,000	Surface
8. Mill Creek Area Municipal Authority	112,300*	Wells
9. Mount Union Borough	1,864,000	Wells & Surface
10. Neelyton Water Co-Op	12,000	Private Spring
11. Orbisonia/Rockhill Joint Authority	148,439*	Well
12. Petersburg Municipal Authority	72,000*	2 Wells
13. Rothrock	360,000*	Raystown Lake
14. Saltillo Water Company	132,480	Spring & Well
15. State Correctional Instit. – Huntingdon	502, 000	Spring & Interconnect w/ Huntingdon Boro
16. Seven Points Water Company	72,000*	Raystown Lake
17. Shirleysburg Municipal Authority	43,000	Well
18. State Correctional Instit: Huntingdon 2	650,000	Spring & Interconnect w/ Huntingdon Boro
19. Three Springs Borough Water System	112,290*	Well
20. Trough Creek State Park	not given	not given
21. Walker Township Water System	288,000	Well Field
22. Warriors Mark General Authority	144,000	Wells
23. Wood, Broad Top, Wells Joint Authority	136,800	Surface

*Maximum daily consumption when permitted capacity not available from DEP records.
Source: DEP website and public water supplier records.

The water suppliers are shown on Map 1 on the following page.

Another trend, illustrated by the Table, is the trend toward more wells as a source and away from surface sources. The primary reason for this is wells mean less expensive treatment.



HUNTINGDON COUNTY COMPREHENSIVE PLAN

2 0 2 4 Miles

HUNTINGDON COUNTY COMMUNITY WATER SYSTEMS

HUNTINGDON COUNTY PLANNING COMMISSION

HUNTINGDON COUNTY BOARD OF COMMISSIONERS

DM/A Planning Group
DAVID MILLER/ASSOCIATES, INC.

Private wells are the main source of water supply in rural areas of the County. Poor quality and low yields are frequent problems that may be caused by the type of rock formation in which the well is located, as well as the threats mentioned above.

The system of water providers is fragmented in most areas of Huntingdon County. The trend throughout the State has been toward the consolidation of water providers. This is partially the result of increased Federal regulatory standards.

Objectives

The Huntingdon County Comprehensive Plan identified public sewer and water services as the most influential community facilities relative to future development. These services helped to guide the Plan's "centers" concept of emphasizing development around existing communities that have essential sewer and water systems in place. By encouraging development of these areas, there is no need to build new water plants. Even if new plans are needed, the existence of a current population base helps make such expensive services more affordable. But, even more important, the Centers philosophy encourages new development to focus on nodes, rather than promoting endless low-density sprawl development. Public water and sewerage services can also greatly reduce the amount of land that is consumed by new development, lessening the pressure on the rural landscape.

The Plan's overall goal from the Community Services and Facilities Plan Element of the County Comprehensive Plan is as follows:

"It is our vision that future development is focused on existing borough and villages to take advantage of existing public investment in utilities and services."

A major foundation of the County Comprehensive Plan is the support, maintenance, and upgrade of existing water systems and the development of a network of new ones in designated centers.

WATER SYSTEMS EVALUATION

Each water authority was contacted to complete an initial "Water Facilities Report". The information requested included such items as: water allocation and supply permits, system map and facility drawings, customer and demand data, engineering reports, supply data and source protection plans, financial reports, water rate schedule, operation and maintenance manual, etc.

This section includes a water system summary sheet for each of the 23 community water suppliers, which provide information on each system's service area, water supply, current system demand, and reported issues with the system. The important consideration is not merely the size of the system, but its current condition and capacity for expansion.

Results of the survey are shown on Table 1, Water Treatment Plant Summary, and discussed below.

Alexandria Water Authority

The water utility serves customers in both Alexandria Borough and Porter Township. The water source is surface (Robinson Run Reservoir). There are approximately 362 customers. Average water use is 99,245 GPD.

Pressing Issues:

- Sustaining revenue for operation and maintenance
- Replacement of approximately 3 miles of water main from storage tank to town and distribution system looping
- Installation of 6" pipe on Shelton Avenue.

Broad Top City Water Authority

This utility provides services to the Borough of Broad Top City. The water source is 1 well. There are approximately 1,000 customers. Its average water usage is 32,911 GPD. The capacity of the filtration plant is over three times the average daily use.

Recent Improvements:
2001 – Project extension to a 10-acre industrial site
2004 – Investigation of new well development

Pressing Issues:

- Link with Dudley System
- Water source development – drill new well
- Replacement of aging equipment
- Water quality and quantity improvements
- Creation of backup supply
- Need for certified operators
- Facilities for handling backwash water
- Loop system
- Rehabilitate water tanks

Dudley, Carbon, Coalmont Joint Municipal Authority

This system has total of approximately 132 total users located in Dudley Borough and portions of Carbon Township. Water source is spring and well. Current average daily use is reported at 19,437 gallons, but filtration plant capacity is over twice that amount.

Recent Projects:
2001 – CDBG Project
2004 – Dudley area well development

Pressing Issues:

- New meters
- Water sharing and potential merging with the Broad Top City Borough system

- Water Storage Tank
- Pressure Reducer Station
- Backflow prevention valves
- Roof replacement on water plant
- New/extension lines/blow-off valves
- Deteriorating lines (age of system)

Huntingdon Borough Water and Sewer Authority

Water source for the system is Standing Stone Creek. The Borough has a large system and reports water production of up to 2 million GPD with 4 million GPD permitted. There are approximately 3,000 customers served by the system. The Authority serves portions of Smithfield Township as well. According to Borough Engineer the system has capacity for 2,000 additional homes.

Pressing Issues:
- Vulnerable water source (Stone Creek)
- Age of system and cost to replace distribution system.

Mapleton Municipal Authority

This system has a peak demand of 126,000 GPD but average consumption is 60,000 GPD. The system serves Mapleton Borough and a small portion of Union Township. Source is surface water. There are a total of approximately 240 customers served by the system. The system is sensitive to drought and has extensive line problems. A significant line replacement project has been completed to reduce system leaks.

Recent Projects:
Proposed 2008 – Water line replacement along Reservoir Street and Bankstown Road.

Pressing Issues:
- Install 8" water main
- Improvements to reservoir dam
- Line breakage due to antiquated system
- High water pressure contributes to water line breaks throughout the system

Mill Creek Area Municipal Authority

This system is relatively new and serves Mill Creek Borough and adjacent areas of Brady and Henderson Townships. Wells serve as the water source for the system. There are approximately 270 customers served by the system. Average daily consumption is 73,300 GPD, while the peak is 112,200 GPD.

Mount Union Municipal Authority

The Mount Union Municipal Authority supplies water to Mount Union Borough and portions of Shirley Township, as well as three Mifflin County Municipalities (Newton-

Hamilton Borough, Kistler Borough and Wayne Township). Surface water (Singer's Gap Reservoir) and 2 wells serve as water sources. A third well, located in Mifflin County is currently under development. Included in the service area is the Riverview Business Center. There are approximately 2,100 customers served by the system. The peak usage is 750,000 GPD; current average daily usage is 600,000 GPD.

Pressing Issues:

- Wellhead protection efforts are underway
- Completion of third well in Wayne Township, Mifflin County
- Replacement and upgrade of old mains in areas of Wayne and Shirley Townships
- Clean 2nd lagoon at Singer's Gap water treatment plant
- Upgrade technology with installation of radio-read meter transmitters

Orbisonia-Rockhill Joint Water Authority

The Authority uses a well for its water source and, on average, pumps 98,900 gallons per day. The service area includes Orbisonia Borough, Rockhill Borough and portions of Cromwell Township. There are approximately 405 customers served by the system.

Recent Projects:
Proposed 2007 – Water tank construction in the Borough of Rockhill to provide approximately three days of water supply.

Pressing Issues:

- Connection of existing test well to water system for additional water source
- Construction of two water storage tanks
- Construction of booster station
- Leak repairs (plant processing 2-times what customers used)
- Water line replacement
- Water storage for Rockhill side of system (single line crossing creek)
- Second water source

Petersburg Borough Authority

The system is supplied from 2 wells. The Petersburg system includes 260 customers. The majority of the customers are located in Petersburg Borough, with the balance located in Logan Township. The average daily water use is 48,100 GPD, but the system is in excess of that amount.

Pressing Issues:

- Water line replacements
- Water source development

Saltillo Water Company

System supplied by well and a spring. There are approximately 155 customers and the average water use is 38,000 GPD.

Pressing Issues:

- New well
- Water storage improvements
- Water source protection

Shirleysburg Borough Water Authority

This small system serves approximately 70 customers. The system pumps about 8,700 GPD on average. The system includes a primary and backup well.

Pressing Issues:

- Delinquent customers

Three Springs Borough Water Company

A well serves as water source for the system. Three Springs has approximately 215 users and pumps an average of 66,6000 GPD.

Pressing Issues:

- Maintaining adequate supply of water

Walker Township Municipal Authority

System is supplied by wells. It currently serves approximately 520 customers in Walker Township, which has growth potential. This system pumps an average of 93,200 GPD.

Warriors Mark General Authority

Supplied by wells, this system serves approximately 220 customers and pumps approximately 50,000 GPD. It serves the Villages of Warriors Mark and Spring Mount in a high growth area.

Wood, Broad Top, Wells Joint Authority

System is supplied by surface reservoir. This system serves the Villages of Woodvale and Robertsdale in Wood Township. Service also extends into Bedford and Fulton Counties (Woodvale). Approximately 315 customers use an average of 46,700 GPD.

Pressing Issues:

- Need fence surrounding reservoir.

In summary, most of the water systems in Huntingdon County are extremely small, averaging 560 customers each, including the 2,900 customers in Huntingdon system and the 2,100 customers in the Mount Union system. Without those systems, the average would be 257 customers. And while most of these systems have pressing maintenance and capital needs, at least many of them have extra capacity for future growth.

WATER DEMANDS

The County population continues to grow. From 1990 to 2000 the County gained 1422 additional persons. By 2030, it's projected that the population will grow by an additional 7% or 3,266 people. Additional people mean more demands for water. Increased building and development can have an adverse impact on surface waters and groundwater of the County. These resources serve as the source for the County potable water supply.

Guiding future development into the designated growth areas of the County will provide opportunities to develop water management efforts to protect water quality and quantity. Guiding development into the designated growth areas will continue to provide an abundant amount of open space and agricultural land in the County. Forests, parks, wetlands, and agricultural lands enable large amount of precipitation to filter into and recharge our local groundwater supplies.

The water supply planning policies take into account the two statements from the Municipalities Planning Code listed below:

1. Lawful activities such as extraction of minerals impact water supply sources and such activities are governed by statutes regulating mineral extraction and specify replacement and restoration of water supplies affected by such activities.
2. Commercial agriculture production may impact water supply sources.

Secondly, the Water Supply Plan Policies are consistent with state policies, as listed in "Keystone Principles and Criteria for Growth, Investment and Resource Conservation," adopted by the Economic Development Cabinet May 31, 2005. These are summarized below:

- Redevelop first
- Provide efficient infrastructure
- Concentrate development
- Increase job opportunities
- Foster sustainable businesses
- Restore and enhance the environment
- Enhance recreational and heritage resources
- Expand housing opportunities
- Plan regionally; implement locally
- Be fair

Finally, the policies also aim to: protect existing and potential sources of water and assure adequate future supply.

WATER SUPPLY POLICIES

1. Direct new development to areas that currently have public water and some level of excess capacity, or to areas that can expand for additional capacity.

2. Connect areas with contaminated water supplies to existing public water, where economically and physically possible.
3. Protect water quality by creating wellhead or similar source protection areas and prohibiting incompatible uses near surface water. The County will encourage the Penn State Extension Service and the Huntingdon County Conservation District to work with farms in the vicinity of water sources to develop nutrient management and other plans that minimize nitrates and other contaminants.
4. Protect riparian areas upstream from water sources with land purchases and riparian easements, for example.
5. Water systems should encourage water conservation by using an incremental fee schedule that rewards those who use less water.
6. Protect water quantity by maintaining water lines and promoting water conservation. Water systems should institute a small surcharge that would allow for major repairs to be completed to the system in accordance with a detailed maintenance plan that includes the updating of service line maps. Many systems only repair facilities that break and do not have the necessary funds needed to complete general maintenance of their existing facilities that would prevent interruption of services and cut down on water loss due to leaks.
7. Areas that are being connected to public sewer should also connect to a public water system. Municipalities should complete a water study of areas that have been identified for future sewer due to on-lot septic malfunctions. This study should address where the contamination is coming from and ways to fix, treat, or eliminate it.
8. Areas that consider adoption of zoning regulations should take into consideration the availability of water, septic and other environmental issues and then determine the appropriate lot size necessary throughout the rural and agricultural areas of the County.
9. The County Planning Commission should provide leadership for a water system cooperative program that would include some of the following responsibilities:
    - Provide a clearinghouse to exchange information; maintain a list of resources (goods and services) typically used by small water systems; coordinate educational programs; and work with other agencies and local governments on land use planning that protects water supplies;
    - Develop a mutual aid network throughout the water systems. This network could keep an inventory of equipment and major material (valves) and maintain a list of certified operators and resources available in an emergency;
    - Support a mentoring program to help small systems complete the Pennsylvania Water System Self-Assessment Guide. Follow up with a similar program to encourage existing small water systems to develop a Business Plan based on DEP's or PaDEP's guidelines;

- Assist with cooperative purchasing to save on administrative costs, material costs, bid on similar services, and develop standard designs for projects;
- Organize and coordinate an investment plan for future infrastructure rehabilitation or replacement in which the water systems in the County would participate.

10. The County will encourage small water systems to interconnect with larger systems where possible, and help them to secure funding. The County will also encourage them to increase their reliability by adding wells or storage tanks and to complete SWIP (Surface Water Infiltration Protocol) testing on all of their water sources.
11. Investigate potential for County water service agency or authority.
12. New privately owned small water companies, serving only a new development or small geographic area, are not recommended.
13. The permitting of facilities used for the extraction of water, where the water is to be bottles for sale off-site, should only be allowed after the following criteria are met:
    - The extraction will not negatively affect the reliable supply of water for that community.
    - The extraction does not lower the nearby surface water levels especially in the case of exceptional quality steams;
    - Develop an approved drought protection plan, which will include the supply of emergency water to local municipalities during drought events.
14. Investigate funding for a County-wide Sewer Management Plan
15. Investigate funding for a source water assessment plan.
16. Encourage water providers to enhance security at their critical facilities.

PLAN IMPLEMENTATION

There are two sections under Plan Implementation: General Implementation Strategies and then a specific example of an implementation strategy, i.e. a Well-Head Protection Plan. An example of a Well-Head Protection Plan is contained in the Appendix and is from the Lancaster County, Pennsylvania Well-Head Protection Plan. The Mount Union Authority in conjunction with Shirley Township is currently implementing its own Well-Head Protection Plan.

Under general implementation the suggested next step in the process is the evaluation of alternative solution strategies to ensure an adequate supply of water for the future. A wide range of alternatives exist to meet present and future water needs within the County. These may be termed "structural," "management" and "municipal" solutions and are identified below.

Structural Solutions - Structural solutions include physical improvements to water systems necessitated by projected water or system deficits. These include system upgrades, new source development and new interconnection with other systems. Structural solutions are usually the most costly of all potential solutions. They may be found in some instances to be necessary when management and municipal solutions, discussed below, are inadequate or inappropriate to provide sufficient water to meet projected future needs. Structural solutions that are encouraged include leakage repair and new interconnections as they promote system efficiency and regional water provision, including emergency preparedness.

· ***System Upgrades*** - Where existing water systems have significant surplus water availability and sizable projected growth, and where filtration plants already exist and groundwater can be protected, it makes sense to invest in system upgrades. Factors favoring major system upgrades include the following:

· *Existing filter plant*

· *Adequate future water availability*

· *Significant projected growth*

· *Ability and commitment to protect groundwater*

Good candidates for more minor system upgrades include those systems that are deficient in a single aspect, such as insufficient treated storage capacity or inadequate pumps. An active leak detection control program is recommended for all systems with 20%+ leakage rates. Leakage rates can be approximated by using the "unaccounted for" water use reported in the annual water supply reports, less water used for firefighting purposes.

Generally, new filter plants only become cost effective where there are no reasonable alternative means of supplying a community with water, whether through an existing or new interconnection with a nearby system or the drilling of a new well or wells that are not surface water-influenced.

· ***New Source Development*** - For systems in which safe yields are unknown, meaning that future water availability cannot be determined, and the intention is to continue to utilize their groundwater resources, a determination of safe yield is a critical first step. Systems which should consider finding and developing new water sources include those which:

· *Have a system with excess treatment and treated storage capacity;*

· *Cannot reasonably connect with a nearby supplier with surplus water;*

· *Have access to surface water with allocation potential or are located in a high-yield, high-quality aquifer which can be protected; and/or*

· *Project significant growth.*

In addition to existing systems needing to supplement current water sources, there may a few communities without water systems but with degraded groundwater that will consider locating a source of community water and developing a water system.

The selection of new well sites in Huntingdon County should give close consideration to the following general siting criteria:

· *Proximity to the end user - This will reduce piping costs and in some cases keep the source within the political control of the users.*

· *Distance from other wells - Excellent sites can be over-exploited, resulting in interfering cones of depression, decreasing yields and increasing the risk of contamination.*

· *Surface water influence - Unless a community has or plans to have a water filter plant, surface water-influenced sources should be avoided.*

· *Lack of contamination sources - It is easier to maintain water quality than to clean up an aquifer.*

· *Potential for maintaining the integrity of the public water supply and system into the future*

Table 6.

ALTERNATIVE WATER SUPPLY SOLUTION STRATEGIES			
Structural Solutions	**Applicability**	**Pros**	**Cons**
· System Upgrades ·			
Higher-capacity pumps	Where existing pumps are inadequate to withdraw safe yield	Maximizes existing water availability	Cost
Increase treatment capacity	Where existing filter plant has inadequate capacity to treat permitted allocation or safe yield	Maximizes treated water availability	Cost
New filtration plants	Where surface water use is proposed or where groundwater source is surface-water influenced.	Provides treated water	Cost; environmental impacts of discharge
Increased treated storage capacity	Where inadequate treated storage capacity exists for peak & emergency needs.	Maximizes treated water availability & reduces peak withdrawal & treatment	Cost
Leakage repair	Where systems with 20%+ leakage rates exist.	Increases supply, cost savings	Cost
New public water lines	Where public sewer lines are planned & low groundwater yields exist/where old water lines need replacement	Assures sufficient water availability/ reduces water leakage	Cost; coordination
· New Source Development ·			
Determine safe yield	Where safe yield is unknown	Provides certainty	None

		of water availability	
Deeper wells	Where geology permits deeper drilling	Increases available water	Possible introduction of pollutants from deeper aquifer and/or change in water chemistry; cost
New wells	Where high-yield, high-quality aquifers exist	Increases available water	Can affect yields of existing wells; cost
New surface water sources	Where access to surface water sources with allocation availability exists	Increases water availability	Requires treatment
Reservoirs	Where access to surface water exists	Increases water availability	Cost; environmental impacts
New interconnections	Where there is proximity between two systems & bulk water purchase/sales are desired	Facilitates redistribution of water based on need & availability	Cost
Management Solutions	**Applicability**	**Pros**	**Cons**
· Coordination With Others ·			
Bulk purchase of water	Where interconnection to another system with excess water exists	Redistributes water based on need	Long-term lack of control
Direct service by other supplier	Where other supplier currently serves or has proximity to area requiring water	Usually cost-effective	May require regulation by PUC; lack of control
Joint service areas/consolidation of suppliers	Where two or more systems are able to combine system components to provide regionalized facilities for a larger area	Achieves greater efficiency & cost savings by reducing replication	Reduces local autonomy
Sale of system/abandonment of water sources	Where poor existing water sources cannot be reasonably augmented & where there is proximity to another system with excess water	Eliminates inefficient & inadequate systems; cost savings	Reduces local autonomy
Reservation of capacity in a system	Where future capacity in a system serving more than one municipality is desired	Provides assurance of future water availability	Cost
Contingency planning	All water systems	Assures provision of water in emergency situation	None; must be mutually agreeable
Designated Growth	Where inconsistencies, conflicts	Achieves	None

Areas and water service area coordination	exist	coordination between development and water supply	
· Reduction of Water Use ·			
Conservation practices	Residential, commercial, industrial, institutional, & agricultural use	Reduces the demand for water; cost savings	Inconvenience & effort
Revised water pricing	All water systems	Promotes conservation; generates funding for needed improvements	Controversial
Limits on withdrawals near public wells	New major users (bottlers, industrial, etc.)	Protects public water supplies	Controversial
Municipal Solutions	**Applicability**	**Pros**	**Cons**
Regenerative storm water management controls	All municipalities	Increases groundwater recharge	Cost
Protection of wetlands, floodplains, woodlands	All municipalities	Increases groundwater recharge	Controversial
Agricultural or conservation zoning	Lands with agricultural and conservation resources	Reduces water demand & increases recharge	Controversial
Wellhead protection program	Delineated wellhead protection areas	Protects against contamination	Controversial; Administration

New interconnections are most likely to be initiated by municipalities or water providers who need to supplement or replace the water supplied to their communities. Depending on the size and resources of these communities, interconnections are most cost-effective for systems that lie within 10,000 feet of each other. Greater distances involve not only higher costs, but also raise concerns regarding the extension of lines through large land areas that may not be suitable and planned for development. Where such extensions are found to be necessary, no intervening connections should be permitted, with the possible exception of providing remedial water where degraded groundwater is a health hazard.

The Broad Top City and the Dudley-Carbon-Coalmont water systems are currently implementing an interconnection project.

When considering structural alternatives, an examination of management solutions should also be explored. Municipalities and water providers with surplus water and system capacity are encouraged to consider the water needs of their neighbors and the possibility of a mutually-beneficial relationship including a water interconnection. New interconnections for contingency planning purposes alone can provide a valuable benefit

for all participating parties by assuring access to a backup water supply in the event of an emergency.

Management Solutions - Management solutions to water supply planning consist of various methods of managing and operating water systems to maximize efficiency, predictability, conservation and contingency planning, and to minimize cost. Such solutions are administrative and are typically undertaken by the water provider. A number are oriented toward the potential of regional water provision and directing surplus water toward meeting the needs of designated growth areas that may extend beyond municipal boundaries. Management solutions address coordination with others, contingency planning, Growth Area/water service area coordination, and the reduction of water use.

· ***Coordination With Others*** - Water providers that should consider coordination with others include those with existing interconnections or the potential for new interconnections, and which exhibit some combination of the following characteristics:

· *Projected water deficit*

· *No filter plant*

· *Surface water-influenced or poor water quality*

· *Wellhead area built or difficult to protect*

Public water providers with systems characterized by all of the above features should consider the abandonment of their water source(s) in favor of service by an adjacent supplier, if possible. This service might be through bulk purchase or direct service by the other supplier with a change to the supplier's service boundary.

Those providers with systems which can continue to produce adequate quality but insufficient quantities of water may wish to supplement their supplies using bulk purchase or direct service by another supplier, or through joint service areas, or the consolidation with another supplier. Where systems have adequate projected water and treatment capabilities, but providers no longer wish or can afford to manage those systems, they may be sold or managed as satellites to other systems.

The foregoing management solutions can be implemented by means of inter-municipal agreements, memorandums of understanding, resolutions, and contracts between providers and municipalities. Providers with surplus water availability and system capacity that are, or feasibly might be, interconnected with municipalities with projected water deficits are strongly encouraged to consider providing needed water to their neighbors.

· ***Contingency Planning*** - An important facet of water contingency planning is ensuring that adequate alternative sources of water will be available should a community's water supply become contaminated or a prolonged drought occur. Even a rigorous water source protection program cannot always guarantee the protection against contamination and drought. While municipalities are responsible for contingency planning related to the containment of released contaminants, should those contaminants reach the water source

and put a community's system out of service, it then becomes the responsibility of the water supplier to find alternate water sources for the community. Water suppliers must, therefore, by law, implement necessary measures to have alternative water sources available in the event of emergency water shortfalls. The most effective way to do this is to plan for these contingencies. For systems entirely dependent on groundwater sources, the State Water Plan recommends that systems be able to supply projected water needs with the best source of water out of service. To determine whether a single contamination incident would impact a grouping of water sources, a professional delineation of each of their respective wellhead protection areas, including areas of overlap, should be undertaken. In addition, water suppliers should be evaluated for their ability to compensate for shortfalls through existing interconnections with adjacent suppliers or surface supplies.

Water systems with groundwater sources grouped together, and without interconnection to another system or access to surface supplies, are the most vulnerable to potential groundwater contaminants and prolonged drought. These systems are the best candidates for wellhead protection efforts undertaken by municipalities. All potential options for emergency water availability should be explored, including inter-municipal agreements with other water suppliers where there are interconnections or the potential for interconnections, increased treated storage capacity, increased use of other municipal sources, use of inactive wells or surface water sources, additional treatment, aquifer remediation, mandated reductions in water use, tank trucks and bottled water. The viability of particular options may depend on the nature of the contaminant. In addition, municipalities should establish priorities for water rationing where needed, with priorities going to essential uses, such as domestic water use, medical care and other businesses for which water use is a critical component. Such businesses should also consider developing their own contingency plans for emergency water availability.

Contingency planning is best undertaken as a cooperative effort between the water provider and municipality, as part of a water supply/wellhead protection program. Coordination is especially important where a single municipality is served by more than one water supplier, or where water suppliers serve more than one municipality.

· ***Grow Area/Water Service Area Coordination*** - Where existing and planned future service areas differ from designated growth areas, water planning efforts may be headed down two different tracks. Such inconsistencies arise when water authorities and municipalities plan independently for the future. Inconsistent water authority and municipal planning can lead to:

· *Inadequate water availability, treatment capacity or treated storage capabilities;*

· *Inadequately sized water lines in areas designated as Growth Areas;*

· *System upgrades in areas not planned for future growth; and,*

· *Wellhead recharge areas being located in areas planned for development.*

These problems create unnecessary costs and inefficiencies. Coordination of planning efforts in the future will increase predictability, cost-effectiveness and efficiency for the water authority. Such coordination will require water authorities to change from a

historic, reactive short-term outlook to a more proactive long-term outlook. Generally, water authorities should feel confident in using areas designated for growth either in the County or local Comprehensive Plan, together with population projections as guides indicating areas that the provision of water services is appropriate. Conversely, water authorities should be assured that areas outside these designated growth areas are not intended to receive water service.

The most prevalent existing conflict between water authorities and municipalities in the County is the fact that very few water authorities have any planned future service areas at all. Those that do typically have very short-term, small-scale service areas in anticipation of immediate growth. While a handful of municipalities have comprehensive plans that delineate future water service areas, there is no indication whether the local water authorities concur with these service areas or are even aware of them. In other instances, communities lack a current comprehensive plan designating areas planned future growth and appropriate for public water service.

· ***Reduction of Water Use*** - All community water suppliers should adopt internal management practices to conserve water, as well as promote conservation practices among water system users. Public water suppliers should adopt specific conservation goals. The value of education in encouraging conservation is discussed in detail later in this chapter, as are a variety of techniques and resources that can be used to achieve conservation goals. Ideally, water suppliers and municipalities should work together to achieve maximum effectiveness. Some of the ways in which water can be conserved toward which supplier and municipal efforts might be directed include:

Table 7.

HOW TO CONSERVE WATER RESOURCES	
Home & Business	**Yard & Garden**
· install low-flow toilets, faucets & shower heads	· don't over water
· repair faucet leaks	· water lawn & garden during early morning
· check toilet tanks for leaks	· buy a hose nozzle that shuts off water flow as needed
· locate & label master water supply valve	· compost yard wastes
· run dishwasher & washing machine only when full	· mulch soils
Home & Business	**Yard & Garden**
· take shorter showers	· use native plants
· don't leave water running	· keep lawns 2" to 3" high

· keep water use during pea, k hours down · recycle grey water from baths & laundry **<u>Outdoors</u>** · sweep, rather than hose down outdoor areas · use buckets when washing car · locate & label master water supply valve	· consider other landscaping as alternative to lawns

An important method of reducing water use is the revision of water pricing policies to charge more, not less, for higher increments of water use. Historically, water systems charge less for higher increments of water use than they do for lower increments, or may charge the same rate for all increments. Such water pricing policy may promote water use and wastage. Systems operating close to their limits of water availability and treatment and storage capacity, in particular, should be conscious of the impact water pricing may have on water use. Water suppliers should reevaluate their water pricing policies in light of their community's water consumption and conservation goals, and revise them where appropriate.

<u>Municipal Solutions</u> - Municipal solutions are those enacted by municipalities rather than the water provider. They consist of a wide variety of tools and techniques, such as planning, zoning, subdivision review, and growth management. Municipal solutions primarily address existing or potential groundwater problems related to growth and development and changing water use. These include measures to protect both groundwater quantity and quality. It is vital for municipalities planning to rely on groundwater as a major source of the community's water supply to adopt municipal solutions to water supply planning. While water providers can do much to assure an adequate future supply of water to communities, where the primary water source is groundwater, municipalities must take the lead in assuring the continued quality of local water.

DEVELOP AND IMPLEMENT A PLAN OF ACTION

After carefully reviewing all of the foregoing alternative solution strategies and their applicability to differing circumstances, a plan of action should be developed. This plan may incorporate a mixture of structural, management and municipal solution strategies to secure and protect an adequate future water supply. The water planning effort will want to consider the initial recommendations made by this Plan in the municipal water supplier data sheets. These recommendations, which are regionally oriented are intended as a beginning point for local discussion only and are not meant to substitute for each community's chosen solutions to its water issues.

In choosing an appropriate mix of solution strategies to secure and protect an adequate future water supply, the agency(s) preparing the plan will want to select from among the choices those which best fit the particular needs and circumstances of their communities.

Factors to Consider - In weighing the applicability and pros and cons of the various approaches to securing and protecting an adequate future water supply, the following factors should be considered:

· ***The Magnitude of the Projected Water or System Deficit.*** Very large water or system deficits may necessitate major system upgrades, new source development or interconnections. Smaller deficits allow greater flexibility in choice of solutions that both increase water supply and reduce water use.

· ***The Nature and Magnitude of Threats to Water Supply.*** Where existing or potential threats to water supply are substantial, the potential for source development and/or interconnections should be explored. Where these threats are more minor, again, there is greater flexibility in the choice of solutions that both maximize water availability and protect against threats.

· ***Projected Costs of System Upgrades vs. Interconnections.*** The construction of new filter plants or major system upgrades should not be undertaken prior to a cost/benefit analysis comparing it to interconnecting with a nearby water provider.

· ***Availability and Costs of Securing Alternative Sources of Water.*** Alternative sources of water include new or deeper wells, surface water, reservoirs, and new, or use of existing, interconnections. Unless a filter plant exists or is planned, new water sources should not be surface water-influenced.

· ***A Balanced Approach to Protecting Water Supplies.*** In many cases, the use of a number of different solution strategies-structural, management and municipal-can maximize water availability by increasing supply, reducing use, improving recharge, and protecting quality.

· ***Coordination Among Neighboring Municipalities.*** Regional water solution strategies can increase cost savings, promote efficiency, provide a greater choice in new source development locations, facilitate wellhead protection efforts, offer contingency backup preparedness, and permit other reciprocal, mutually-beneficial arrangements.

A Strategy for Implementation - After choosing an appropriate mix of solution strategies to secure an adequate future water supply, an implementation strategy should be developed.

· ***A Workable Time-Line.*** A workable time-line for developing, adopting and implementing the various components of its water supply program should be developed. Not every aspect of the proposed program needs to be undertaken at once or at the same time. Tasks that are recommended to receive initial attention are those that are simple or urgent or further the education of the public. Tasks that require significant analysis or resources may be undertaken or completed somewhat later. Major system upgrades, new source development and contingency planning for emergency water supplies are

examples of program components that will take more time and effort, and which may also need to be incorporated into local capital improvement planning and funding efforts.

· ***Responsibilities and Resources*** - The various members working for the completion of the plan could be responsible for developing different components of the water supply program. Responsibilities and roles should be clearly stated to maximize the effectiveness of participants and to avoid overextending a limited number of individuals.

Evaluation and Update - The community's water supply program should be periodically evaluated and updated to assure a continued adequate supply of water into the future. Such updates might be tied to area municipal comprehensive plan preparation, amendment or updates, which identify population projections and planned growth areas, both essential pieces of information for effective water planning. Where municipal comprehensive plans have not been prepared, or are out-of-date, water supply plans should be evaluated and updated at least every ten years, using population projections and other pertinent information from the Huntingdon County Planning Commission.

SUMMARY

The Water Supply Plan updates the County Comprehensive Plan to comply with the amended Municipalities Planning Code, which requires "a plan for the reliable supply of water."

The Plan provides an:

- overview of County water supply conditions
- water system inventory
- water system evaluation
- future water demands
- water supply policies
- plan implementation procedures, including a recommended Well-Head Protection Plan.

The major recommendations of the Plan are to: 1) direct new development to urban growth areas already served by public water, 2) connect areas with contaminated well water supplies to existing public water systems, 3) protect water quality by creating well-head protection areas, 4) create a county water service agency (or authority), 5) investigate funding for both a county storm water management plan and a source water assessment plan, and 6) enhance security at critical water facilities.

APPENDICIES

Community Distress Ratings

Infrastructure Inventory

Well-Head Protection

CDBG PROJECT RATING POINT SYSTEM

Community Development projects are rated by Huntingdon County Planning and Development Department staff on a 1,000-point scale based on the following criteria. The maximum number of points to be assigned for each category is listed below along with a description of the manner in which the number of points to be awarded is determined.

200 Community Distress Rating

Points are awarded based on the ranking of the project service area considering U.S. Census data including change in population, percent unemployed, percent below poverty, and age of housing stock.

150 Appropriateness of Solution

Points are assigned to rate how effectively the proposed project addresses the stated problem. Staff must ask if the problem is completely or only partially solved by the project.

150 Proven Need for the Project

The seriousness of the project is rated in comparison to other proposed projects considering concerns such as safety, loss of economic and natural resources, number of people impacted, etc.

100 Level of Activity Planning

The amount of preparation made for the project is rated in comparison to other proposed activities. Planning efforts include conducting an income survey, having detailed cost estimates and/or specifications prepared by a contractor or other knowledgeable professional, letters of support, previous applications for same project, evidence of discussions regarding project. This factor also addresses the readiness of the project to proceed once funding is received.

100	detailed drawings and specifications
90	feasibility study completed
80	activity is recommended by other planning documents
60	quote from contractor
50	income survey complete
0	no planning activities

100 Low and Moderate Benefit

Points are assigned based on the actual percent of the population that meets low and moderate income guidelines. Unless an income survey has been conducted, U.S. Census figures are used to determine these points.

County Comprehensive Plan Implementation

If an activity is compliant with the goals established by the Comprehensive Plan the activity receives 100 points. If the activity is non-compliant with the Plan no points are awarded. No fraction of points will be awarded in this category.

100 Three Year Community Development Plan Priority

Following are the community development needs priorities and rating points assigned for Huntingdon County as contained in the Three Year Community Development Plan

1. Economic Development (100 points)
   a. Commercial CBD and Economic Development
   b. More and greater variety of jobs
   c. Comprehensive Development Plan Update
2. Public/Community Facilties (90 points)
   a. Surface Drainage
   b. Water Service
   c. Sewage Collection and Treatment
   d. Solid Waste Disposal
   e. Recreation Facilities
3. Housing (80 points)
   a. Rehabilitation
   b. Choice of Type
4. Public Service (70 points)
   a. Human Services Coordination
   b. Handicapped and Elderly Accessibility
   c. Domestic Violence
5. Transportation (60 points)
   a. Local Roads and Streets
   b. Sidewalks
6. Other (50 points)
   a. Historic Preservation
   b. Proper Land Use Development to Prevent Future Slums and Blight
   c. Agricultural Preservation

50 Previous Grant – 3 Years

Projects which have received CDBG funds in the previous 3 years receive 0 points. Those which have not receive 50 points. A fraction of the points are not awarded.

50 Leverage

Points are assigned by first calculating the percent of the total project cost that comes from another funding source. This percentage is multiplied by 50 to determine the number of points awarded.

For example: total project cost is $100,000, $20,000 is provided from another source (20,000 / 100,000 = .20 or 20%), 20% of the 50 points are awarded (50 X .20 = 10 points).

HUNTINGDON COUNTY
MUNICIPAL DISTRESS RATING

Municipality	Change in Pop	% Below Poverty	% Unemployed	Housing > 50 yrs	TOTAL	RANK
Alexandria	31	13	45	48	137	41
Barree	18	2	35	20	75	16
Birmingham	48	1	1	47	97	24
Brady	34	44	36	4	118	36
Broad Top City	6	47	41	17	111	34
Carbon	39	34	38	25	136	40
Cass	16	7	8	5	36	1
Cassville	40	26	2	43	111	33
Clay	30	22	33	14	99	27
Coalmont	3	15	7	34	59	9
Cromwell	13	24	12	8	57	7
Dublin	9	21	30	18	78	17
Dudley	41	5	3	36	85	19
Franklin	42	9	22	40	113	35
Henderson	24	18	19	9	70	13
Hopewell	12	30	42	6	90	21
Huntingdon	28	40	20	41	129	38
Jackson	14	4	26	23	67	12
Juniata	2	41	27	1	71	14
Lincoln	37	25	23	15	100	28
Logan	20	19	37	22	98	26
Mapleton	44	43	34	45	166	46
Marklesburg	1	6	10	35	52	4
Mill Creek	38	46	31	38	153	44
Miller	19	10	9	7	45	3
Morris	25	35	28	19	107	30
Mount Union	46	48	43	31	168	47
Oneida	22	17	6	10	55	6
Orbisionia	45	31	25	39	140	42
Penn	11	36	11	2	60	10
Petersburg	36	8	21	46	111	32
Porter	32	29	13	16	90	20
Rockhill	17	39	46	32	134	39
Saltillo	23	16	16	37	92	22
Shade Gap	47	45	48	44	184	48
Shirley	26	37	18	13	94	23
Shirleysburg	33	38	39	42	152	43
Smithfield	15	12	4	24	55	5
Springfield	5	28	14	11	58	8
Spruce Creek	43	23	32	30	128	37
Tell	7	20	47	29	103	29
Three Springs	21	32	17	28	98	25
Todd	10	27	40	3	80	18
Union	27	33	29	21	110	31
Walker	8	3	15	12	38	2
Warriors Mark	4	11	24	26	65	11
West	29	14	5	27	75	15
Wood	35	42	44	33	154	45
Huntingdon County	23	33	24	25	105	30
Source: 2000 Census of Population and Housing						

Huntingdon County
Infrastructure Needs Survey
2007

MUNICIPALITY	FACILITY/NAME	DESCRIPTION	COST	SHORT TERM GOALS	LONG TERM GOALS
Alexandria Boro	*Water:*				
	1st Priority: Replacement of distribution line	Complete replacement of the 3.5 mile distribution line from the reservoir to the Boro of Alexandria	$1.5 million to $3 million	Yes	None
	2nd Priority: Raw water storage tank	A new raw water storage tank at the treatment facility to increase capacity and reduce turbidity especially during periods of drought	$300,000 to $500,000	Yes	None
	Stormwater:	Flood Hazard Mitigation Study	$100,000	Yes	None
	1st Priority:	Repair and maintenance - to determine exact locations	To Be Determined	Yes	None
	Parks and Recreation:				
	1st Priority:	Removal and replacement of trees and sidewalks	To Be Determined	Yes	None
	2nd Priority:	Improve park area behind Library	To Be Determined	None	Yes
Barree Twp	*None*				
Birmingham Boro	*Water:*	Develop a municipal water plan to separate Grier School from town residents		Underway	None
	Public Building:	Develop a municipal building		None	Yes
Broad Top City	*Water:*	Develop new water source (well); replace distribution system	To Be Determined	Yes	None
	Parks and Recreation: 1st Priority	Little League Field: develop a Master Site Plan, new playground and paths.	To Be Determined	Yes	None
	2nd Priority:	Fireman's Grounds: Master Site Plan, install restrooms, and do electrical upgrades	To Be Determined	None	Yes

Huntingdon County
Infrastructure Needs Survey
2007

MUNICIPALITY	FACILITY/NAME	DESCRIPTION	COST	SHORT TERM GOALS	LONG TERM GOALS
	3rd Priority: Community Building:	Expand with restrooms and concession stand	To Be Determined	None	Yes
	Public Building:	Develop a municipal building		None	Yes
Cass Twp	*Public Building:*	Develop a municipal building		None	Yes
Carbon Twp	*None*				
Coalmont Boro	*Water:*				
	1st Priority: Coal Bank Run	Flood protection being done by Corps of Engineers	$500,000	Completed: Fall 2006	None
Cassville Boro	None				
Dublin Twp	*Public Building:*	Develop a municipal building		None	Yes
DCCJMA	*Water:*				
	1st Priority: Replace Lines	Replace lines for entire system	$500,000	Yes	None
	2nd Priority: Roof at Plant	Leaks, damaging equipment	$20,000	Yes	None
	3rd Priority:Water Tank	Repair/Replace storage tank	$200,000	None	Yes
Franklin Twp	*Public Building:*	Develop a municipal building		None	Yes
Henderson Twp	*None*				
Hopewell Twp	*Public Building:*	Develop a municipal building		None	Yes

Huntingdon County
Infrastructure Needs Survey
2007

MUNICIPALITY	FACILITY/NAME	DESCRIPTION	COST	SHORT TERM GOALS	LONG TERM GOALS
Huntingdon Boro	*Water:*				
	1st Priority: 5th Street	Replace two old 10 inch lines	$200,000	Yes	None
	2nd Priority:	Crooked Creek and Fairgrounds Mutual line upgrades	$150,000	None	Yes
	3rd Priority:Water Source Project	Prepare a Water Source Protection Plan	$50,000	None	Yes
	Sewer:				
	1st Priority:	Phosphorous and nitrogen removal	$5 to $8 million	None	Yes
	Stormwater:				
	1st Priority: Stone Ridge Detention	Create a detention area	$150,000	Yes	None
	2nd Priority: Combined Sewer Separation	Separate stormwater and sewer	$12 to $13 million	None	Yes
	Public Buildings:				
	1st Priority:	New public works building to house equipment and salt	$150,000	Yes	None
	Parks and Recreation:				
	1st Priority: Portstown	Continued development of the Portstown Park	$250,000	None	Yes
	2nd Priority: Flag Pole	Develop an Amphitheater for performances	$250,000	None	Yes
Jackson Twp	*Public Building:*	Develop a municipal building		None	Yes
Juniata Twp	None				
Lincoln Twp	*None*				
Logan Twp	*Water:*				
	1st Priority:	Presently re-building and up-grading reservoir (Dam Breast)		Completed	None
	Sewer:				
	1st Priority: Act 537	Currently in the process of conducting 537 plan per DEP	$500,000	Yes	None

Huntingdon County
Infrastructure Needs Survey
2007

MUNICIPALITY	FACILITY/NAME	DESCRIPTION	COST	SHORT TERM GOALS	LONG TERM GOALS
	2nd Priority:	Implement Act 537 Plan recommendations	To Be Determined	None	Yes
	Public Building:	Develop a municipal building		None	Yes
Mapleton Boro	*Water:*				
	1st Priority:	Replace current infrastructure	To Be Determined	Yes	None
	2nd Priority:	Expand distribution area, increase storage capacity	To Be Determined	None	Yes
	Parks and Recreation:				
	1st Priority: Swimming Pool		$200,000	Yes	None
	2nd Priority: Walkway to Thousand Steps	Camping area, boat dock, walkway from Riverside Park to Thousand Steps	To Be Determined	None	Yes
Marklesburg Boro	*Sewer:*				
	1st Priority: Grinder Rings	Two grinder pumps are needed	$10,000 for two	Yes	None
	2nd Priority: Aeration Boiler	A new one is needed	$3,000	Yes	None
Mill Creek Boro	*Water:*				
	1st Priority:	Find all leaks, if any, and repair them	To Be Determined	Yes	None
	Sewer:				
	1st Priority:	To solve all infiltration problems	To Be Determined	Yes	None
Miller Twp	*Public Building:*	Develop a municipal building		None	Yes
Mount Union Boro	*Public Buildings:*				
	1st Priority:	First floor: install ramp and accessible restrooms	$100,000	Yes	None
	2nd Priority:	Install elevator and 2nd floor accessibility improvements	$200,000	None	Yes

Huntingdon County
Infrastructure Needs Survey
2007

MUNICIPALITY	FACILITY/NAME	DESCRIPTION	COST	SHORT TERM GOALS	LONG TERM GOALS
	3rd Priority:	Remodel & reconfigure space to include Police Dept, Library & Tax Collector	To Be Determined	None	Yes
	4th Priority:	Electrical upgrade	To Be Determined	None	Yes
	5th Priority:	Equipment Shed: need more indoor space	To Be Determined	None	Yes
	Parks and Recreation:				
	1st Priority: Teener Baseball Field	Complete installation of lights	To Be Determined	Yes	None
	2nd Priority: Riverside Park	Complete development of Park	To Be Determined	Yes	None
	3rd Priority:	Install boat launch at site adjacent to Riverside Park	To Be Determined	None	Yes
	4th Priority: Lower Municipal Park	Plan & install improvements	To Be Determined	None	Yes
	5th Priority: Dark Hollow Dam	Develop linear park along Pennsylvania Ave.	To Be Determined	None	Yes
	Water:				
	1st Priority: Lemkelde Well	Complete development & place in service	To Be Determined	None	Yes
	2nd Priority: Old water mains	Replace in Cedar Crest & Silverford Hts and along Extract Rd	To Be Determined	None	Yes
	3rd Priority: Singers Gap Treatment Plant	Clean 2nd lagoon	To Be Determined	None	Yes
	4th Priority:	Install radio-read meter transmitters	To Be Determined	None	Yes
	5th Priority: Dark Hollow Dam	Rehab for passive recreation	To Be Determined	None	Yes
	6th Priority: Singers Gap Reservoir	Dredge	To Be Determined	None	Yes
	Sewer:				
	1st Priority: Mill Hollow & Liverpool Pumping Stations	Complete Upgrades		To be completed in 2007	None
	2nd Priority: Infiltration & Inflow	Eliminate	To Be Determined	None	Yes
	3rd Priority: Treatment Plant	Chesapeake Bay Strategy Compliance	To Be Determined	None	Yes
Oneida Twp	*Sewer:*				

Huntingdon County
Infrastructure Needs Survey
2007

MUNICIPALITY	FACILITY/NAME	DESCRIPTION	COST	SHORT TERM GOALS	LONG TERM GOALS
	1st Priority:	Chesapeake Bay Strategy Compliance	To Be Determined	None	Yes
	Public Buildings:				
	1st Priority: Exterior Beautification	Replacement of R.R. ties used in landscaping with landscaping brick	$2,500	Yes	None
Orbisonia Boro	*Water:*				
	1st Priority: Water Storage	Install a 2nd water storage tank in Rockhill to provide continuous water service to Boro	$200,000	Yes	None
	2nd Priority: Alternate water source	Purchase and connect well located on Brown property north of Sandy Ridge	$100,000	Yes	None
	Sewer:				
	1st Priority: I/I	Investigate sources and repair I/I in sewers	$90,000	Yes	None
	2nd Priority: Treatment Facility Upgrade	Upgrade portions of treatment facility	$1 million	None	Yes
Penn Twp	*Sewer:*				
	1st Priority:	Construct conveyance lines to Huntingdon	$1.3 million	Yes	None
	2nd Priority:	Update Act 537 plan for the township	To Be Determined	None	Yes
	3rd Priority:	Control infiltration and inflow		Yes	None
	Stormwater:				
	1st Priority:	Prepare a stormwater management plan	To Be Determined	Yes	None
	Public Building:				
	1st Priority:	Construct a salt storage facility	To Be Determined	Yes	None
	2nd Priority:	Public Building			
Porter Twp	*Parks and Recreation:* Juniata Valley Recreation Area	Develop walking paths, additional play equipment and other improvements	To Be Determined	None	Yes
Rockhill Furnace	*Stormwater:*	Replace existing storm sewers	$100,000	Yes	None
	Water:	Install new water tank	$300,000	Yes	None

Huntingdon County
Infrastructure Needs Survey
2007

MUNICIPALITY	FACILITY/NAME	DESCRIPTION	COST	SHORT TERM GOALS	LONG TERM GOALS
Saltillo Boro	*Water:*				
	1st Priority:	Having a spare pump on hand	Pump is on order	Yes	None
	Stormwater:				
	1st Priority:	Replacing all tile on Utley Street	$10,000	None	Yes
Shade Gap Boro	None				
Shirley Twp	*Sewer:*				
	1st Priority:	Identify areas of infiltration	To Be Determined	None	Yes
	2nd Priority:	Remedy problems to system	To Be Determined	None	Yes
	Stormwater:	Implement storm water plan	To Be Determined	None	Yes
Shirleysburg Boro	*Public Building:*	Develop handicapped access and rehabilitate the borough building		None	Yes
Smithfield Twp	*Stormwater:*				
	1st Priority: South 5th St.	Install drains coming out of base of hill and run it to an exisiting culvert	To Be Determined	Yes	None
	2nd Priority: 838 Pa. Ave.	Install catch box and pipe and run to another drain for water runoff	To Be Determined	Yes	None
	Parks and Recreation:				
	1st Priority:	Construct third pavilion in Riverside Park as well as additional parking and walking paths	$150,000	None	Yes
	2nd Priority:	Acquire railroad trestle and rehabilitate for pedestrian and bicycle use.	To Be Determined	None	Yes
Springfield Twp	*Public Building:*	Develop a meeting room and office area.		None	Yes
Spruce Creek Twp	*Public Building:*	Develop a municipal building		None	Yes
Tell Twp	None				

Huntingdon County
Infrastructure Needs Survey
2007

MUNICIPALITY	FACILITY/NAME	DESCRIPTION	COST	SHORT TERM GOALS	LONG TERM GOALS
Three Springs Boro	*Sewer:*				
	1st Priority: Act 537	Upgrade wastewater treatment plant	$2,000,000	Yes	None
	Public Building:	Develop a municipal building		None	Yes
Walker Twp	*Parks and Recreation:*				
	1st Priority: Park Equip. Shed	Building constructed on park property to house equipment used at park and a bathroom	$40,000	Yes	None
Warriors Mark Twp	*Parks and Recreation:*	Develop park at former school site	To Be Determined	Yes	None
	Public Building:	Develop a municipal building		None	Yes
West Twp	*Public Building:*	Develop a municipal building		None	Yes
Wood Twp	*None*				
Wood-Broad Top Wells JMA	*Water:*				
	1st Priority: Fencing	Need to protect sources from unauthorized swimming. Keep large animals out.	$50,000	None	Yes
	Sewer:				
	1st Priority: Replace Reeds in Reedbed	Remove and replace old reeds and sub-base	$20,000	Yes	None
	2nd Priority: Infiltration	Check system for infiltration	$15,000	Yes	None
Huntingdon County	*Public Buildings:*				
	1st Priority:	Purchase & renovate former Elks Building and renovate existing courthouse	$4mill.	Yes	None
	2nd Priority:	Security upgrades and fiber-optic network	$300,000	Yes	None

Huntingdon County
Infrastructure Needs Survey
2007

MUNICIPALITY	FACILITY/NAME	DESCRIPTION	COST	SHORT TERM GOALS	LONG TERM GOALS
	County Library:				
	Phase I	Rehabilitate the McMurtrie Building, moving offices to the third floor, meeting space on the second floor	$1.1 million	Yes	None
	Phase II	Install a new elevator and stair tower	$500,000	Yes	None
	Phase III	Renovate the 1968 Building adding a new third floor.	$1.6 million	None	Yes

WELLHEAD PROTECTION PROGRAM

PLANNING AND SOLUTION STRATEGIES

Municipalities planning to rely on groundwater resources to meet municipal water needs in the future should take action now to protect groundwater resources from potential contamination. Wellhead protection offers community leaders a far more effective and less expensive approach to assuring continued clean water than cleaning up after contamination occurs. Estimates are that the cleanup of a contaminated groundwater source can be 30 to 40 times more costly than preventing it in the first place.[1]

Not every public groundwater source warrants protection. It is up to each community to determine whether its groundwater sources are worth protecting. Factors that should be used to help make this decision include the following:

· *Can the wellhead recharge area be protected from existing and potential contaminants?*

· *Is the source surface water influenced?*

· *Is there an existing filtration plant?*

· *Is there potential for interconnection with and purchase of water from another system?*

· *Is the source from a designated sole source aquifer?*

A sole source aquifer is an aquifer that is the sole or principal source (50% or more) of drinking water for the people who live in the area. Sole source aquifers are Federally designated and are protected from Federally financed projects that might contaminate the aquifer. Communities that choose to protect their groundwater resources should also request sole source aquifer status.

Generally speaking, communities utilizing sole source aquifers and which have little potential for interconnections with other systems should protect their recharge areas, particularly if the source is not surface water influenced or if there is an existing filtration plant. The existence of a filtration plant, while a help, is not a substitute for a wellhead protection program. While a filtration plant can treat water for many (not all) contaminants, a much less costly alternative is a wellhead protection program that can prevent contaminants from entering the groundwater.

The five steps to wellhead protection are:

1) Form a Water Planning Team.

2) Define the land area to be protected.

3) Identify potential sources of contamination.

4) Evaluate alternative tools and techniques.

5) Develop and implement a plan of action.

The process for protecting groundwater includes a proposed project schedule, a discussion of roles and responsibilities and materials needed. Some preliminary planning is recommended before communities begin the water planning process. An initial public forum or meeting can stimulate public interest, help identify key issues to be addressed, and be a source of potential Water Planning Team members. After the public forum, issues such as funding for consultants or data, mailings and advertising should be resolved. Any professional delineation of the wellhead protection area or gathering of other desired information to be used in the water planning process should also be done at the outset. Finally, what needs to be done and who will do it, need to be resolved up front. Such advance preparation will allow the Water Planning Team to make the most efficient use of its time.

1. FORM A WATER PLANNING TEAM

If a Water Planning Team has not already been formed, such a Team should be created. Where communities have more than adequate water availability and system capacity, where interconnections are not needed, and where groundwater sources are utilized, wellhead protection planning may suffice.

2. DEFINE THE LAND AREA TO BE PROTECTED

Under the Safe Drinking Water Act, a wellhead protection area is defined as "the surface and subsurface area surrounding a water well, well field, spring or infiltration gallery, supplying a public water system, through which contaminants are reasonably likely to move toward and reach the water source." The method by which a wellhead protection area is defined may differ from one community to the next. Typically, wellhead protection areas (WHPAs) are considered to include three zones of protection as follows:

· Zone 1 is the protective area immediately surrounding a well, spring or infiltration gallery which shall be a 100-to-400 foot radius depending on site-specific source and aquifer characteristics.

· Zone 2 is the area encompassing the portion of the aquifer through which water is diverted to a well or flows to a spring or infiltration gallery. Zone 2 shall be a 1/2 mile radius around the source unless a more detailed delineation is approved. Because springs are not pumped, Zone 2 for a spring is equivalent to Zone 3.

· Zone 3 is the area beyond Zone 2 that contributes surface water and groundwater to Zones 1 and 2.

The delineation of a wellhead protection area (WHP) in the complicated geology of Lancaster County requires the help of a professional geologist or engineer. Due to several historic periods of deformation and extensive carbonate deposits, Lancaster County's

water wells often draw from irregularly shaped areas rather than geometric zones. While Zones 1 and 3 are easily determined, a delineation of Zone 2 can require extensive work.

A comprehensive discussion of wellhead delineation may be found in Risser and Barton[2]. Hydrogeologic mapping, modeling, pumping tests, geochemistry, geophysics, water budget analysis, aquifer testing, and tracer testing are some of the many approaches to gaining the needed information for delineating WHPAs. In this study, REWEI's analysis for the four pilot projects was somewhat constrained by available data, budget and weather considerations. Although there are many ways to determine the Zone 2 area, the most common aquifer test used was a 72-hour pumping test, where several monitoring wells were observed. When a well is first constructed, the initial a pumping test typically does not include observing surrounding monitoring wells. While such tests are relatively expensive, it is this information that allows a professional geologist to make estimates of the size and shape of the area of drawdown.

From aquifer testing or a water budget analysis, and assuming a hydrologic constant for water migration through specific rock types, it is possible to determine the subsurface area needed to supply the well. Additional geologic information, such as orientations of fractures and joints, may be used to refine the orientation of a drawdown ellipse. Likewise, topography may constrain the shape of the drawdown cone, resulting in an irregular shape.

Springs require different strategies for protecting the groundwater quality of the spring. A 400-foot radius is used as the Zone 1 WHPA for springs, which provides greater protection of the shallow groundwater in the vicinity of the spring than the 100-foot radius that is used at a well would provide. Because springs are not pumped, the Zone 2 for a spring well be the same as the Zone 3, and might not be separately delineated. Whenever Zone 3 is as vulnereable to contamination as Zone 2, the protection of the Zone 3 area should be as rigorous as in a Zone 2 WHPA.

The professional delineation of WHPAs removes a potential basis for legal challenge to arbitrary or fixed-area delineations. Based on professional delineations of wellhead protection areas and a determination that area wellheads warrant protection and can be protected, municipalities are strongly encouraged to identify potential sources of contamination, evaluate alternative tools and techniques, and choose a plan of action to protect groundwater quality.

3. IDENTIFY POTENTIAL SOURCES OF CONTAMINATION

Degraded water quality occurs when contaminants enter surface or groundwater. The most serious documented and identified point source contaminant threats in the County have been digitized into a Lancaster County Geographic Information System coverage as part of Phase One of the Water Resources Plan. These include:

Table V-1

EXISTING MAJOR POTENTIAL SOURCES OF CONTAMINATION	
· Underground and Above-ground Storage Tanks	· Surface Impoundments
· Pesticide Storage Sites	· National Pollution Discharge Elimination System (NPDES) Permitted Discharges
· On-Lot Sewage Disposal Systems	· Junk and Scrap Yards
· Hazardous Waste Sites	· Cemeteries
· Hazardous Waste Generators	· Recycling Centers
· Biosolids (Sludge) Application Sites	· Sinkholes and Closed Depressions
· Solid Waste Disposal Sites	

These coverages will be available to municipalities to supplement local information used to identify potential contaminant threats. In addition to keeping these coverages up-to-date, the Lancaster County Planning Commission also intends to complete the digitization of a number of other contaminant threat inventories, including karst features. In some cases, an exchange of information may provide more accurate information to both municipalities and the County. Documented point source contaminant threats are of particular significance for municipalities and water providers with water supplies in close proximity to these sites. However, other threats may exist as well. The water system summary sheets from Chapter IV identify the existing major potential sources of contamination from Table V-1 that are located within a one-half mile radius of municipal wellheads. Other, more generalized potential water quality threats apparent from existing land use mapping are noted on these summary sheets as well. Additional municipal sources for water quality problem areas are local Act 537 Official Sewage Facilities Plans that often have data on extensive well water testing, and the DEP data on sinkhole locations.

The Water Planning Team should note which of the following potential threats to water quality exist, or has the potential to exist in the study area. A map should specifically identify the location of all inventoried threats, and a brief description accompany each.

Identified potential sources of contamination should be prioritized by degree of threat to the groundwater resource, considering proximity to the wellhead. Threats to water quality can be identified as those which are generated by growth and development, those which are due to water supplier practices, and those which are a result of various land management practices, as described in Table V-2:

Table V-2

Potential Threats to Water Quality
· Growth and Development Impacts ·
Population Growth - Projected population growth to the year 2010 will increase the generation of human, animal and industrial waste products, as well as result in increased utilization of chemicals and disturbance to soils. Excess nutrients, chemicals and sedimentation find their way into ground and surface water sources, where they degrade water quality.
Urban and Suburban Runoff - Urban and suburban runoff occurs when storm waters wash contaminants off roads and lanes into streams and storm sewer systems. Such runoff is not treated by local wastewater plants except where combined wastewater/storm sewer systems exist. Even in such instances, system overflows caused by storm events often result in inadequate treatment of both runoff and wastewater.
Lack of Earth Disturbance Controls - Development, as well as the harvesting of timber, mining and agriculture all involve earth disturbance and the potential loss of soils and sedimentation of surface waters through runoff during storm events. Some municipalities lack adequate earth disturbance controls or fail to enforce controls so as to minimize such runoff.
Filling of Wetlands - Wetlands purify water by filtering, assimilating and recycling pollutants. The filling of wetlands reduces this purifying function.
Rural Development With On-Lot Sewage Disposal Systems - Rural development utilizing on-lot sewage disposal systems, particularly such development in carbonate geology, is a significant source of nitrogen nitrate, phosphorous, fecal coliform and fecal staphococcus bacterial contamination of groundwater, even where such systems are properly sited and maintained.
Lack of Maintenance of On-Lot Sewage Disposal Systems - Many households currently fail to maintain their on-lot sewage disposal systems in proper working order. Yet few municipalities require the regular pumping out of on-lot sewage disposal systems. Malfunction of these systems is another significant source of nitrogen nitrate, phosphorous, fecal coliform and fecal staphococcus bacterial contaminations of groundwater.

Sewage Treatment Plants/Large Community and Package Sewage Disposal Systems - These large systems discharge to streams or in the ground. Malfunctions in systems that are privately maintained can go unnoticed for long periods, while nitrates are released into the environment.

Improper Use, Storage, Transport, and Disposal - The improper use, storage, transport, or disposal of contaminants can result in spills or leaks and the release and leaching of pollutants into area surface and groundwater supplies.

· Water Supplier Practices ·

Overpumping of Wells - The overpumping of wells can alter groundwater flow and cause polluted water from one aquifer to flow into another aquifer, impairing its water quality. In addition, the drilling of deep wells into new aquifers fed by larger watersheds can yield deteriorated water quality where these waters have been contaminated, and can introduce contamination from shallow aquifers into deeper ones.

Lack of Monitoring - Facilities which generate, use or store hazardous substances have the potential to contaminate area groundwater. Those with a significant potential to do so, and particularly those within WHPAs, should be monitored with test wells that are checked on a regular basis. Such monitoring wells serve as an early warning system, and may facilitate interception and possible remediation of contaminants before they reach area drinking wells.

Lack of Local Contingency Planning - Local contingency planning for water emergencies assures that hazardous substance spills and leaks, should they occur, will be reported, contained and cleaned up as rapidly and efficiently as possible. Lack of a current, coordinated contingency plan and reporting methods can hamper such efforts and, where spills or leaks occur within a WHPA or near surface water bodies, can jeopardize the water quality of public water sources.

· Land Management Practices ·

Overuse of Nutrients - When manure, sludge and fertilizers are applied to farmland, lawns and golf courses in greater quantities than can be absorbed by crops, excess nutrients may find their way to area groundwater, creating health hazards for humans and livestock.

Chemical Applications - Excessive applications of pesticides, insecticides, herbicides, and fungicides applied to farmland, lawns and golf courses, infiltrate into surface and groundwater sources, posing potential health threats.

Unrestricted Livestock Access - Unrestricted livestock access along many of the County's small streams denudes streambanks of vegetation which filters pollutants, erodes streambanks themselves, creating soil loss and sedimentation of surface waters, and contributes animal wastes

directly into these waters. Polluted surface waters in this County add greatly to public water supplier treatment costs and are a significant contributor to pollution in the Chesapeake Bay.
Barnyard Runoff - Barnyard runoff can introduce animal wastes into surface waters where there are no mechanisms to divert it.
Poor Management Practices - Poor management practices can result in increased erosion and sedimentation of surface waters. Overgrazing, high animal traffic areas, the plowing of steep slopes, the repeated growing of corn at the same locations, and certain other cultivation techniques demonstrate a lack of implementation of best management practices.
Monoculture - Nationwide, there has been an increasing tendency toward monoculture in agriculture_the growing of single large crops. Monoculture increases soil loss through erosion and requires greater amounts of pesticides to control insects and weeds.

Growth and development by their very nature involve earth disturbance activities, produce storm water runoff, and yield waste products that may be improperly disposed. Various water supplier practices may also put water quality at risk. Finally, certain land management practices by farmers, homeowners and others can contribute to water contamination and sedimentation.

Chapter I of this Plan provides an in-depth discussion of all of the foregoing land use and other practices which have the potential to degrade surface and groundwater quality. Another way of looking at the same issue is to identify potential contaminant sources by actual types, rather than practices, as Table V-3 on page 7 does.

The identification of both land use practices and types of concern allows Water Planning Teams to recognize existing water quality problems as well as anticipate potential future problems implicit in certain types of development.

Table V-3

Potential Sources of Contamination	
Commercial · Airport · Medical institutions · Auto repair shops · Paint shops · Boat yards · Photography establishments/printers · Car washes	· Pipelines (e.g., oil, gas) · Septage lagoons and sludge · Storage tanks (i.e., above-ground, underground) · Toxic and hazardous spills · Wells - operating and abandoned (e.g., water supply, injection, monitoring) · Wood preserving facilities

· Railroad tracks and yards/maintenance · Cemeteries · Research laboratories · Construction areas · Road de-icing operations (e.g., road salt storage) · Dry cleaning establishments · Scrap and junkyards · Gas stations · Storage tanks and pipes (i.e., above-ground, below-ground, underground) · Golf courses (chemical application) · Jewelry and metal plating · Laundromats **Industrial** · Abandoned properties · Asphalt plants · Chemical manufacture, warehousing and distribution activities · Electrical and electronic products and manufacturing · Electroplaters and metal fabricators · Foundries · Fire training facilities · Machine and metal working shops · Manufacturing and distribution sites for cleaning supplies · Quarries · Petroleum products production, storage and distribution centers	**Residential** · Fuel storage systems · Septic systems, cesspools, water softeners · Furniture and wood strippers and refinishers · Sewer lines · Household hazardous products · Residential lawns (chemical application) **Waste Management** · Hazardous waste management units (e.g., landfills, land treatment areas, surface impoundments, waste piles, incinerators, treatment tanks) · Municipal incinerators · Municipal landfills · Municipal wastewater and sewer lines · Open burning sites · Recycling and reduction facilities · Storm water drains, retention basins, transfer stations **Agricultural** · Animal burial areas · Irrigation · Animal feedlots · Manure storage areas · Pesticide and herbicide storage areas · Farm dumps

4. EVALUATE ALTERNATIVE TOOLS AND TECHNIQUES

Many tools and techniques exist to protect groundwater quality within the County. These may be termed regulatory and non-regulatory. **Regulatory** tools and techniques include those that are locally mandated, and apply to property owners and residents, including zoning, subdivision and health regulations. Where regulatory techniques are used, municipalities need to make a commitment to enforce regulations and cite violators. Enforcement might involve site inspections and/or recordkeeping, and will occasionally require legal remedies. **Non-regulatory** tools and techniques are those that the municipality, water provider, civic organizations, and individuals choose to undertake, and which are non-binding. Such tools and techniques include those relating to emergency preparedness, land acquisition, education, planning, and volunteer efforts. Regulatory and non-regulatory tools and techniques, their applicability, land use practice, and legal and administrative considerations are set out in the table on the following pages. It is recommended that Water Planning Teams carefully consider each potential tool and technique so as not to preclude any options.

Zoning - Zoning regulations establish permissible uses and appropriate approval standards for those uses within wellhead protection areas. Zoning regulations also establish minimum lot sizes, maximum lot coverage and other standards related to the use of land. Zoning regulations normally apply to proposed new land uses and not existing ones, with the exception of certain land use activities, or accessory uses intended to be phased out over time.

· ***Wellhead Protection Overlay Zoning*** is the single-most comprehensive approach to protecting the quality and quantity of groundwater resources. Overlay zoning can include many different components that function in different ways to provide this protection. For instance, an Overlay Zone can ***prohibit*** certain land uses and establish special ***permitting standards*** for others. Alternatively, it could use ***performance standards*** to review proposed land uses, although such standards can be complex to understand and administer. A summary of the major features of this Zone is found on page 10. The Model Wellhead Protection Overlay Zone also includes a variety of reporting requirements and design standards, described in the sections that follow.

Overlay zones can offer a variety of approaches to groundwater protection that can be viewed as a "menu" from which Water Planning Teams can select those that best fit the particular characteristics and needs of their area. Some components will not pertain to particular areas or may be unnecessary. Zone standards may be modified as necessary to meet particular needs.

MODEL WELLHEAD PROTECTION OVERLAY ZONE FEATURES

The following explains the purpose of each of the Model Wellhead Protection Overlay Zone's sections, and offers guidance in selecting the provisions that will best meet local needs.

· **Purpose** - This section sets forth the intent of the zone and should be fully and clearly stated. The specific type of groundwater source being protected (municipal well or spring) should be specified. Any special circumstances that are of particular importance to the community should be noted. For instance, area wells or springs might be the only source of public drinking water for the community. The presence of carbonate geology within a wellhead protection area should also be noted because of its special vulnerability.

· **Objectives** - This section includes a listing of specific zone objectives. These objectives summarize the substantive content of the overlay zone. For instance, one objective might be to regulate land uses and activities with the potential to pollute groundwater. Another objective might be to provide for storm water management that minimizes adverse impacts on carbonate geology.

· **Statutory Authority** - This section identifies the enabling legislation that permits municipalities to regulate land uses and activities so as to protect groundwater resources. The Municipalities Planning Code provides the authority for zoning and subdivision-related standards, and various borough and township codes provide the authority for other health and safety-related standards.

· **Definitions** - A listing of definitions of terms used in the overlay zone improves its understandability and enforceability. While commonly understood or easily determined terms need not be defined, less well-known or used terms should be defined.

· **Applicability** - The overlay zone applies only to those areas of the municipality that are located within the wellhead protection area. It functions as an overlay on top of the underlying zone or zones. While the underlying zone prescribes certain requirements, the overlay zone imposes additional requirements that, should they be more restrictive than underlying zoning requirements, take precedence. The applicability section defines wellhead protection areas 1, 2 and 3, and establishes specific exemptions from the zone's provisions. In some municipalities, wellhead protection area zones 2 and 3 have been delineated to be one and the same. In such cases, land uses and activities in these areas should be treated as if they were in zone 2.

· **Reporting Requirements** - This section requires that facilities which generate, use, store, or transport hazardous substances within the municipality and which are required to submit certain forms, plans and reports to the Federal

or State government, also submit copies of these forms to the municipality and/or water authority. Such a reporting requirement assists in determining the location of facilities with hazardous substances which might otherwise remain unknown or which should be, but are not, reporting to Federal and State officials. These may include certain rural or farm occupations that might not normally be thought of as industries (e.g., furniture production or refinishing). Finally, reporting requirements familiarize the municipality with the types and amounts of hazardous substances at various facilities. Such knowledge is critical for maximizing local emergency response to hazardous substance spills and leaks, particularly those for which the Lancaster County Emergency Management Agency and Haz-Mat Team are not responsible (see Contingency Planning Discussion). Reporting requirements necessitate a certain amount of administrative recordkeeping and coordination with local and County emergency management planning.

· **Regulated Land Uses and Activities** - This section may be viewed as the heart of the overlay zone. It identifies those land uses and activities that are deemed to be inappropriate in one or more wellhead protection area zones, because it is felt that they represent serious potential threats to groundwater quality or quantity. Also identified are those land uses and activities that may be permitted in one or more wellhead protection area zones, subject to specified criteria, based on the belief that potential groundwater threats can be adequately mitigated or avoided through proper planning and construction techniques.

Municipalities may wish to modify this listing by adding or deleting land uses and activities, or by expanding or limiting the wellhead protection area zones within which these land uses and activities are permitted. While approval criteria may also be modified, most are based on recognized State standards or guidelines; for this reason, it is not recommended that they be substantively changed.

· **Design Standards** - These standards are meant to minimize the adverse impacts to area groundwater generated by land uses and activities permitted in the wellhead protection area. They are geared primarily to promoting groundwater recharge and reducing surface water runoff by minimizing earth disturbance. A variety of criteria are offered, among which municipalities may choose those that best fit their circumstances and needs. These include standards related to:

- Siting - Storm Water Management

- Lot Coverage - Wetlands

- Ground Cover and Landscaping - Woodlands

- Setbacks and Buffers - Steep Slopes

- Erosion and Sedimentation Road Construction

· **Repealer and Severability** - These sections assure that, should any provision of the overlay zone be invalidated by a court of law, the remaining provisions shall remain in effect. Should the overlay zone be codified into a zoning ordinance that already has these sections, they would no longer be needed in the text of this zone.

Municipalities are strongly urged to adopt wellhead protection overlay zoning in coordination with area water suppliers and affected neighboring communities. While a single wellhead protection area extending across municipal lines can be protected using different overlay zones, maximizing the consistency between these zones will help in inter-municipal coordination, cooperation and enforcement.

Municipalities are also urged to use the services of the Lancaster Conservation District and Penn State Cooperative Extension Service in devising and administering standards that apply to the agricultural community. This will assure that such standards are reasonable and are not a nuisance for farmers.

· ***Amortization of Land Uses*** - Certain existing uses that have the potential to contaminate surface or groundwaters may be able to be phased out over time, or amortized. These might include improperly abandoned wells, underground storage tanks, junked materials, farm dumps, and other similar uses that are prohibited as new uses in an overlay or other zone. Amortization provisions would need to be adopted in a stand-alone ordinance because they apply to existing uses, rather than proposed new uses, which are regulated under zoning provisions. Current legal precedents do not appear to permit the amortization of principal uses. It may be possible, however, to amortize accessory uses (see Appendix G for model ordinance).

· ***Agricultural or Conservation Zoning*** - Lancaster County is fortunate to have large land areas in agricultural production that are protected by effective agricultural zoning. Lands within wellhead protection areas that are not appropriate for effective agricultural zoning, such as woodlands or low-yield water areas, should be considered for other appropriate conservation zoning.

· ***Lot Coverage*** - These standards promote maximum groundwater recharge and minimize storm water runoff by limiting impervious cover. While lower coverage requirements are reasonable for agricultural and rural areas, areas planned for more intensive land uses should have somewhat higher lot coverage requirements. Impervious surface coverage can have a dramatic impact on infiltration rates and maximum permitted percentages should be as low as can be justified. The lot coverage requirements of underlying zones may be used if adequate.

· ***Transfer of Development Rights*** - If significant development is planned within a potential WHPA, the potential for increased sources of pollutants and reduced levels of groundwater recharge conflict with the protection of the water supply. If it is determined that the water supply is worth saving, and alternative approaches, such as agricultural or

conservation zoning are unrealistic, transfer of development rights may provide a solution. A TDR program, however, is complex to administer.

· ***Urban and Village Growth Boundaries*** throughout the County identify areas planned for future growth and development. Such planned growth areas should be directed away from wellhead protection areas wherever possible, both to maximize groundwater recharge and to minimize the potential threats to water quality from intensive development. Future comprehensive plan updates should address wellhead protection planning and identify any delineated wellhead protection area.

Design Standards - Design standards are meant to minimize the adverse impacts to area groundwater generated by land uses and activities permitted in the wellhead protection area. They may be included within an overlay zone or be stand-alone provisions that apply to the wellhead protection area or just subdivisions and land developments within it.

· ***Siting Criteria*** - These standards have the effect of directing proposed land uses and activities to the portions of properties furthest from municipal wellheads, in order to minimize the impact of development on area groundwater. This technique is most useful in areas zoned primarily for agricultural use or that have open space requirements, such that areas that are not to be developed can be sited closer in to the wellhead, while areas that are to be developed can be sited further out. This technique is also especially applicable in areas where a number of landholdings are split by the boundaries of wellhead protection areas 1, 2 or 3. Siting criteria in more developed areas with access to public water and sewer could take the form of cluster developments or planned unit developments (PUDs).

· ***Setback and Buffer Criteria*** - These standards maintain existing vegetation around water areas, reducing soil loss and siltation, and provide a setback for permitted land uses and activities from water areas, reducing the potential for water pollution. These standards can be written to apply to all permitted land uses and activities, specifically including or excluding agriculture. If agriculture were included, no application of nutrients or pesticides would be permitted to be applied within a specified number of feet of the edge of a stream, water body or spring.

· ***Disturbance Standards*** - Erosion and sedimentation standards are required by the Commonwealth of Pennsylvania to minimize erosion and sedimentation. Ground cover and landscaping standards can maximize groundwater recharge and minimize surface water runoff by stabilizing soils. Woodlands protection maximizes recharge and minimizes runoff. Steep slopes standards minimize runoff of storm water and soil loss, and can provide for a down slope vegetative buffer. Wetlands standards are required by the Commonwealth of Pennsylvania. Replacement wetlands may be required to be located within the wellhead protection area. Finally, road construction standards minimize runoff of storm water by limiting impervious cover.

· ***Storm Water Management*** - These standards are intended to minimize storm water runoff, maximize recharge, and promote the use of best management practices (BMPs)

examples. One set of standards might apply to all development and land use activities within wellhead protection areas, while another set of standards might apply only to development and land use activities proposed in areas underlain by carbonate geology. Because of the tremendous vulnerability of this geology, such standards should be more exacting and require the applicant to engage the services of a geologist. Storm water management is an especially important component of a groundwater protection strategy in developing areas.

Table V-4

ALTERNATIVE REGULATORY GROUNDWATER PROTECTION SOLUTION STRATEGIES				
Regulatory Solutions	**Applicability**	**Land Use Practice**	**Legal Considerations**	**Admin Considerations**
Zoning:				
Overlay GW Protection Districts	Used to protect wellhead protection areas (WHPAs). Provides for identification of sensitive areas for protection. Used in conjunction with other tools that follow.	Municipality has WHPAs professionally delineated and adopts regulations to protect groundwater within those areas.	Well-accepted method of identifying sensitive areas. May face legal challenges if WHPA boundaries are based solely on arbitrary delineation.	Requires staff to administer. Inherent nature of zoning provides "grandfather" protection to pre-existing uses and structures.
Prohibition of Various Land Uses	Used within mapped WHPAs to prohibit groundwater contaminants and uses that generate contaminants.	Municipality adopts prohibited uses list within their zoning ordinance.	Well-accepted function of zoning where appropriate techniques to protect natural resources from contamination are used.	Requires amendment to zoning ordinance. Requires enforcement by both visual inspection and on-site investigation.
Special Permitting	Used to regulate uses within WHPAs that may cause groundwater contamination if left unregulated.	Municipality adopts special permit "thresholds" for various uses and structures within WHPAs.	Well-accepted method of segregating land uses within critical resource areas, such as WHPAs.	Requires detailed understanding of WHPA sensitivity by local permit granting authority. Requires enforcement and on-site investigations.
Performance Standards	Used to regulate development within WHPAs by enforcing	Municipality identifies WHPAs and establishes "thresholds" for water quality.	Adoption of specific WHPA performance standards requires sound technical support. Performance	Complex administrative requirements to evaluate impacts of land development

	predetermined standards for water quality. Allows for aggressive protection of WHPAs by limiting development within WHPAs to an accepted level.		standards must be enforced on a case-by-case basis.	within WHPAs.
Amortization of Various Land Uses	Used to phase out land uses that may cause groundwater contamination.	Municipality identifies uses to be phased out.	Cannot apply to principal uses that are "grandfathered" but only to accessory uses or activities.	Requires enforcement and on-site investigations.
Agricultural or Conservation Zoning	Used to protect lands with important natural resource attributes.	Municipality establishes very large minimum lot requirements and related standards.	Well-recognized prerogative of local government. Requires rational connection between minimum lot size selected and resource protection goals.	Requires amendment to zoning ordinance.
Lot Coverage Requirements	Used to limit impervious surface cover.	Municipality sets maximum lot coverage standards.	Well-accepted land use tool.	Requires administrative review of proposals.
Transfer of Development Rights	Used to transfer development from WHPAs to locations outside WHPAs.	Municipality permits development rights on properties within the WHPA to be transferred to properties outside the WHPA.	Accepted land use planning tool.	Cumbersome administrative requirements. Not well suited for small municipalities without significant administrative resources or slow-growing communities.
Growth Controls/Timing	Used to locate and time the occurrence of development within WHPAs. Allows municipalities the opportunity to plan for wellhead delineation and protection.	Municipality imposes growth controls in the form of growth boundaries, zoning, subdivision phasing, or other limitation tied to planning.	Well-accepted option for communities facing development pressures within sensitive resource areas. Growth controls may be challenged if they are imposed without a rational connection to the resource being protected.	Generally complicated administrative process. Requries administrative staff to issue permits and enforce growth control ordinances.

Design Standards:				
Siting Criteria	Used to guide residential development outside of WHPAs.	Municipality offers siting criteria that could include cluster/PUD as development option within zoning/subdivision ordinance.	Well-accepted option for residential land development.	Slightly more complicated to administer than traditional subdivision.
Setback/Buffer Criteria	Used to site development in least detrimental locations within WHPAs.	Municipality adopts specific siting/setback criteria for vulnerable areas within WHPAs.	Accepted land use planning tool.	Enforcement / inspection requirements are similar to traditional subdivision.
Disturbance Regulations	Used to guide grading, tree removal and other practices that can degrade water quality within WHPAs.	Municipality adopts specific zoning/subdivision ordinance standards for earth disturbance activities.	Well-accepted land use tool.	Requires administrative support and on-site inspection.
Storm Water Requirements	Used to ensure that storm water drainage is directed outside of WHPAs.	Municipality adopts stringent zoning/subdivision rules and regulations to regulate drainage/runoff within WHPAs.	Well-accepted purpose of subdivision control.	Requires moderate level of inspection and enforcement by administrative staff.
Conservation Plans	Used to reduce soil loss; used on farms.	May alter farming practices.	1973 Clean Streams Law requires it.	Conservation District develops plan.
Health and Other:				
Toxic and Hazardous Materials Handling Regulations	Used to ensure proper handling and disposal of toxic materials waste.	Municipality adopts health/zoning ordinance requiring reporting, registration and/or inspection of all businesses within WHPA using toxic/hazardous materials above certain quantities.	Well-accepted as within purview of government to ensure protection of groundwater.	Requires administrative support and on-site inspections.

Underground Fuel Storage Tank Regulations	Used to prohibit or regulate underground fuel storage tanks (USTs) within WHPAs.	Municipality adopts health/zoning ordinance prohibiting or regulating USTs within WHPAs.	Well-accepted regulatory option for local government.	Prohibition of USTs require little administrative support. Regulating USTs requires moderate amounts of administrative support for inspection follow-up and enforcement.
Private Well and Geothermal Exchange Systems Protection	Used to protect groundwater where private on-site water supply wells or geothermal exchange systems are used.	Municipality adopts health/zoning ordinance to require permits for new private wells and/or geothermal exchange systems, and to ensure appropriate well-to-septic-systems setbacks. Could also require pump and water quality testing.	Well-accepted as within purview of government to ensure protection of groundwater.	Requires administrative support and review of applications.
Septic System Maintenance	Used to require periodic maintenance and upgrading of septic systems.	Municipality adopts health/zoning ordinance requiring pumping and, if necessary, upgrading of septic systems on a time basis (e.g., every 3 years).	Well-accepted purview of government to ensure protection of groundwater.	Significant administrative resources required for this option.
Act 537 Official Sewage Facilities Plan	Used to plan for public sewage needs and service areas.	Municipality adopts plan, which may lead to changes in areas planned and zoned for development.	Required by DEP.	Prepared by a consultant with municipal input; must be approved by DEP.
Nutrient Management Plan	Balances nutrient application with crop uptake on farms with over 2,000 lbs. animal weight per acre.	Requires planning by a certified nutrient management technician.	Enforced by State.	Education. To be administered by Conservation District.
Nutrient Balance Plan	Balances nutrient application with crop uptake on farms with less	Requires planning by a certified nutrient management technician.	New concept; advisable to make available cost-free to farmer.	Education. Conservation District develops plan.

	than 2,000 lbs. animal weight per acre.			
Integrated Pest Management Plan	Minimizes pesticide use through best management practices.	May involve crop rotation, change in farming practices.	Advisable to make available cost-free to farmer. License needed to apply restricted pesticides.	Education. To be administered by Penn State Extension.

ALTERNATIVE NON-REGULATORY GROUNDWATER PROTECTION SOLUTION STRATEGIES				
Non-Regulatory Solutions	**Applicability**	**Land Use Practice**	**Legal Considerations**	**Admin Considerations**
Emergency Preparedness:				
Contingency Planning	Used to ensure appropriate response in cases of contaminant release or other emergencies within WHPA.	Municipality prepares a contingency plan involving wide range of municipal/county officials.	Possible if municipalities become involved in containment activities.	Requires significant up-front planning to anticipate and be prepared for emergencies.
WHPA Signage	Used to alert the public to contaminant spills within WHPAs.	Municipality purchases and erects signs along roads at boundaries of WHPAs indicating presence of WHPA and emergency response number.	None.	Requires limited expenditure.
Monitoring	Used to monitor ground water to quality within WHPAs.	Municipality or developers within WHPAs monitor groundwater quality downgradient from their development.	Accepted method of ensuring groundwater quality.	Requires moderate administrative staffing to ensure routine sampling and response if sampling indicates contamination.
Remediation	Used to clean up groundwater contamination.	Municipality or business/industry can develop programs to remediate groundwater	DEP requires if threat to municipal water supply.	DEP should administer. Municipality should obtain copies of sampling reports.

		contamination.		
Land Acquisition:				
Sale/Donation	Land acquired by a community within WHPAs, either by purchase or donation. Provides broad protection to the groundwater supply.	As non-regulatory technique, municipalities can work in partnership with nonprofit land conservation organizations or can purchase land for park. Right-of-first refusal is an option.	There are some legal consequences of accepting land for donation or sale from the private sector, mostly involving liability.	There are few administrative requirements involved in accepting donations or sales of land from the private sector. Administrative requirements for maintenance of land may be substantial, particularly if the community does not have a program for open space management.
Easements	Can be used to limit development or application of nutrients or pesticides within WHPAs.	Similar to sales/donations, conservation easements are generally obtained with the assistance of nonprofit land conservation organizations.	Same as above.	Same as above.
Land Banking	Used to acquire and protect land within WHPAs.	Land banks are usually accomplished with a transfer tax established by State government empowering local government to impose a tax on the transfer of land from one party to another.	Land banks can be subject to legal challenge as an unjust tax, but have been accepted as a legitimate method of raising revenue for resource protection.	Land banks require significant administrative support if they are to function effectively.
Planning:				
Comprehensive Planning	Used to support and justify wellhead protection measures.	Municipality establishes WHPA plan designation on Future Land Use Map.	Accepted land use planning tool.	Should reflect professional delineation.
Regional WHPA Planning	Used to protect regional aquifers that often transcend existing municipal boundaries.	Requires inter-municipal agreements to create a new authority, or informal cooperation to coordinate	Well-accepted method of protecting regional groundwater resources.	Administrative requirements will vary depending on the goal of the regional district.

		between authorities and municipalities.		
Watershed Plans	Used to guide local storm water drainage runoff and other regulations.	County undertakes for multi-municipality watersheds.	State mandate with accompanying partial funding.	Requires appropriate revisions to local storm, water management standards.
Voluntary and Municipal:				
Public Education	Used to inform community residents of the connection between land use within WHPAs and drinking water quality.	Municipality can employ a variety of public education techniques, ranging from brochures detailing their WHPA program to seminars, to involvement in events such as hazardous waste collection days.	None.	Requires some degree of administrative support for programs, such as brochure mailing to more intensive support for seminars and hazardous waste collection days.
Environmental Advisory Councils	Used to provide local expertise in developing and implementing WHPA planning and programs.	Appointed and assigned tasks by municipality.	None.	Requires some degree of administrative support.
Street Sweeping	Used in urban and suburban areas.	Municpality undertakes.	None.	Minimal; vehicle purchase and maintenance.
Household and Yard Hazardous Waste Collection	Used to reduce accumulation of hazardous materials within WHPAs and the community at large.	Lancaster County Solid Waste Authority has Household Hazardous Waste Collection Program; municipality can also sponsor a "hazardous waste collection day" annually.	There are several legal issues raised by the collection, transport and disposal of hazardous waste.	Hazardous waste collection programs are generally sponsored by government agencies, but administered by a private collector.
Storm Drain Painting	Used to alert residents against waste	Civic organizations sponsor painting	None.	Minimal.

	disposal.	of "Chesapeake Bay Drainage" on storm drains.		
Sinkhole Cleanup	Used to remove waste from sinkhole.	Water provider undertakes.	Need to secure permission of landowners on any private lands.	Requires location of sinkholes and justification of landowners.
Streambank Cleanup	Used to reduce accumulation of pollutants along stream.	Municipality, in cooperation with civic organizations, sponsors "streambank cleanup day" annually.	Need to secure permission of landowners on any private lands.	Organizational.
Streambank Fencing and Stabilization	Used to reduce sedimentation and contamination of streams.	Various programs assist farmers in fencing and stabilizing streambanks.	None.	Various County, State and Federal programs available to farmers.

*May be implemented through either zoning or subdivision requirements.
Source: Modified, 1996, by Gehringer-Roth Associates from Environmental Protection Agency's

Wellhead Protection: A Guide for Small Communities. Original source: Horsley and Witten, 1989.)

· ***Conservation Plan*** - An approved Conservation Plan utilizing BMPs for managing storm water has been a requirement for all farms since 1973, when the Federal Clean Streams Law was passed. It is estimated that only about half of the County's farms, however, currently have such a plan, and enforcement generally occurs only when complaints are received from neighbors. The Lancaster Conservation District is the approving body for such plans. The Water Planning Team should work closely with the Conservation District to target the District's efforts to developing conservation plans for each and every farm within delineated WHPAs. This may involve setting priorities, such as working first with farms in WHPA area 1, then 2, then 3. Particularly in the area of addressing barnyard runoff into streams, the County's Conservation District has great potential together with participating farms to benefit area groundwater quality through Conservation Plans.

Health and Other - These standards deal directly with the handling of storage and disposal of wastes that could pose health problems. Such standards can either be incorporated into an overlay zone or can stand alone in ordinances that may apply within the wellhead protection area or to the municipality as a whole. Private well protection and septic system maintenance standards are examples of health regulations recommended to

be applied municipality-wide, as such standards protect private individual water sources, as well as public supplies.

· ***Toxic and Hazardous Materials Handling Regulations*** - Because the handling of toxic and hazardous materials is already regulated by Federal and State laws, municipalities need only ensure that all facilities that handle such materials, particularly within WHPAs, are, in fact, reporting to the DEP. A local requirement that all such facilities submit duplicate copies of required State and Federal permits will alert municipalities to non-compliant facilities.

Salt storage and handling is a concern in many municipalities whether State or local storage exists. The Pennsylvania Department of Transportation has standards for salt storage and handling by which its facilities abide. These same standards can be used by municipalities for their facilities (see Appendix H).

In addition, municipalities should take the time to review their floodplain ordinances to ensure that the generation, use, storage, and disposal of certain hazardous materials (see Appendix I) are prohibited within floodplains. This will ensure compliance with new Federal requirements and protect surface and surface water-influenced sources from these contaminants.

· ***Underground Fuel Storage Tank Regulations*** - Leaking underground storage tanks (USTs) are a major source of groundwater contamination. Congress responded to this problem in 1984 by adding Subtitle I to the Resource Conservation and Recovery Act (RCRA), which directed the U. S. EPA to develop regulations to protect groundwater quality. All new and existing USTs not exempted by EPA, as well as certain above-ground tanks, are to be registered with the DEP and inspected according to an adopted timetable for leaks, corrosion and spill/overfill prevention. Any problems caused by leaks or corrosion are to be corrected by the tank owner.

Municipalities may want to ensure that all regulated storage tanks within their boundaries, and especially within WHPAs, are registered and inspected. Because Federal and State regulations were not specifically designed for vulnerable WHPAs, municipalities may want to go further by limiting or prohibiting new USTs within WHPAs. (See Appendix J for further information.)

· ***Private Well and Geothermal Exchange Systems Protection*** - All municipalities should give serious consideration to adopting well construction requirements that will help protect private water supplies from contamination. Such requirements, which would involve grouting and the placement of a sanitary seal on all at-or-below grade well openings, as well as abandonment standards, would also prevent wells from becoming conduits for contaminants to enter groundwater that may be used for public purposes. Such requirements are commonplace in many states, as well as in many of the developing counties in Pennsylvania. Similar requirements to protect groundwater from contaminants should be considered in areas where geothermal exchange systems are being utilized. (See Appendices E, G, K, and M for sample ordinances and other standards.)

· ***Septic System Maintenance*** - Municipalities with sizable numbers of residences utilizing on-lot sewage disposal systems should adopt regulations requiring the periodic pumping of septic tanks, as recommended by the DEP. Such action will help protect private and public water supplies from nitrate contamination, and is particularly critical in areas with carbonate geology. Municipalities that adopt such regulations may avoid the need to extend public water and public sewer into rural areas in the future, thereby incurring substantial cost savings. Appendix N provides a sample on-lot disposal system (OLDS) ordinance that may be applied municipality-wide or adapted to apply only to WHPAs. Other sample OLDS ordinances may be requested from the Lancaster County Planning Commission. The adoption of an OLDS ordinance should be coordinated with any applicable Act 537 Plan (see below).

· ***Act 537 Planning*** - Municipalities with public sewage systems or a need therefore are periodically required by the DEP to prepare Act 537 Official Sewage Facilities Plans intended to guide future public sewage planning efforts. Such plans should follow and be coordinated with comprehensive plan updates, as well as with any delineated WHPA, to assure that only those areas determined to be appropriate for growth are planned for development.

· ***Nutrient Management Plan*** - The 1993 State Legislature passed the Nutrient Management Act, which established standards for the use of manure generated on farms with more than 2,000 pounds per acre of animal weight. The Lancaster Conservation District will work with the agricultural community to ensure that a nutrient management plan is developed for each applicable farm. This Act should significantly reduce any excess application of manure to County cropland. To help dispose of excess manure, the Conservation District should develop a program to redistribute the excess to farms in need of the addition of nutrients.

· ***Nutrient Balance Plan*** - Municipalities concerned about the possible excess application of manure to farms with 2,000 pounds or less of animal weight per acre within WHPAs may want to consider requiring or encouraging a nutrient balance plan, a simpler version of a Nutrient Management Plan that the Lancaster Conservation District has committed to prepare for farmers at no cost.

· ***Integrated Pest Management Plan*** - IPM permits a reduction in the amount of pesticide used and frequency of application. It promotes field preparation, planting, cultivation and rotation, which reduce the need for pesticides, and encourages the use of beneficial insects and fowl to rid farms of destructive insects. IPM recommends that pesticides be reserved to combat, rather than prevent, insect infestation. The Penn State Cooperative Extension Service should be encouraged to work with farmers within WHPAs to develop IPM Plans to reduce the use of pesticides in these areas.

Water providers should take the initiative to encourage golf courses within WHPAs to use IPM, as well as make them aware, if they are not already, of a number of recent initiatives undertaken by the U.S. Golf Association to reduce the use of, and impacts from, pesticides on golf courses. These include:

· *Adoption of a set of principles to guide siting for new golf courses to avoid environmentally sensitive areas.*

· *Creation of Audubon Sanctuary Program to, among other things, improve water quality and promote water conservation.*

· *Research to develop turf grass which best filters pesticides.*

Increasingly, golf courses are becoming less manicured, featuring more natural vegetation and requiring less upkeep; this trend should be promoted.

Emergency Preparedness - Emergency preparedness includes contingency planning, monitoring and remediation of release contaminants, the responsibility for which lies primarily with the water authority. It includes activities intended to contain, identify the presence of and cleanup contaminants that could, or already have, entered the groundwater.

· ***Contingency Planning***, as it applies to groundwater, is the identification of potential threats to a community's groundwater supplies and the development of procedures to be followed when such threats materialize. Specifically, contingency planning involves both the timely containment and cleanup of hazardous substances that might infiltrate into area groundwater, and, where necessary, the location of alternate drinking water supplies. The location of alternate drinking water supplies is discussed in Chapter IV. Municipalities are required by Federal and Commonwealth law to prepare a contingency plan to guide decision-making during emergencies. Each municipality has an Emergency Operations Plan (EOP) that is updated on a regular basis. A Groundwater Contingency Plan could be incorporated into the EOP. This would make all of the information and resources already in the municipal EOP available to the response team coordinator and would eliminate the need to maintain two different plans that are designed to handle similar incidents.

A Groundwater Contingency Plan prescribes what to do, when to take action, who would do it, with what tools and materials, and how it would be done. Such plans, where they exist, differ significantly from municipality to municipality. As of 1996, there was no model emergency response plan or procedures available for responding to hazardous materials incidents in wellhead protection areas. The provision of such a model to municipalities and water providers would be a valuable service. There is a 1995 DEP publication entitled *Guidelines for the Development and Implementation of Environmental Emergency Response Plans*, (see Appendix O), which provides general, non-wellhead specific guidance.

The more information that is available on a water system's components and use, as well as area geology and hydrology, the more likely municipal contingency planning will be successful. Such background information allows contingency plans to be tailored to meet the special needs and circumstances of municipalities. WHPA regulations and other provisions, where they are adopted, will further minimize the likelihood of contingency plans actually needing to be implemented, by regulating new potential contaminant sources, and remediating existing hazards.

Coordination among the various parties involved at the local, County and State levels is essential. Currently, all facilities which produce or utilize extremely hazardous substances above a threshold quantity are required to have plans on file outlining the procedures they will take to evacuate areas where spills or leaks occur and notify and coordinate with authorities. Copies of these plans are kept by the Lancaster County Emergency Management Agency (LCEMA). When there is a spill or leak involving such a substance, either from a stationary site or a vehicle in transit, those responsible are required to notify the DEP, as well as the LCEMA; if a waterway is involved, the PA Fish and Boat Commission must be notified as well. Lancaster County has a certified Haz-Mat Team trained to control and contain these spills and leaks; some larger facilities have their own teams.

Spills and leaks involving other than extremely hazardous substances must be reported to the DEP and LCEMA by the responsible party. However, LCEMA does not respond to these spills and leaks. For this reason, it is important that municipalities be aware of the location of facilities within their boundaries which generate, use, store, or dispose of hazardous substances that do not have emergency response plans on file with LCEMA. The easiest way to do this is for municipalities to require copies of certain reporting forms from such facilities that are required to be submitted to Federal, State and County officials. Such information will familiarize local officials not only with the locations of these facilities, but with the types and amounts of hazardous substances on site. Sometimes spills and leaks occur which go unreported and become known only after a hazardous substance is detected in the water supply. Those responsible for water supply contingency planning should consider such an eventuality.

All Emergency Management Coordinators must be State-certified. Four levels of training exist for personnel involved in hazardous substances containment. Employers _ generally municipalities or local emergency service authorities _ must certify that employees involved in hazardous materials containment have received the appropriate level of training. While standardized training for local emergency management personnel is available through the State Fire Academy, there is currently no centralized training location, and most training in Lancaster County is provided by volunteers or instructors of the State Fire Academy. Current training practice does not address groundwater concerns in many localities.

Actual cleanup of all contaminated sites is the responsibility of the industry or, in the case of a vehicle in transit, primarily the responsibility of the transporter, and secondarily the responsibility of the shipper. Cleanup responsibilities of the spiller are set forth in PA Act 165-90. Notification, containment and cleanup are to occur immediately where there is imminent or environmental danger; however, "immediately" is not defined. Otherwise, notification is to be within 24 hours and cleanup as soon as possible. In some cases, cleanup can take more than a year. Potential liability may motivate a more rapid response in identified wellhead protection areas as pollution of ground or surface waters is a violation of State and Federal Law. Where spills occur and the responsible party is unknown, the DEP or EPA may suggest cleanup funding sources.

A contingency plan has the following components:

· *Inventory of Threats*

· *Design of Response*

· *Assignment of Responsibilities*

· *Identification of Resources*

These components are discussed in detail in the "Contingency Planning Components" inset. Municipalities can improve emergency response by:

· *Making maps of WHPAs, where they have been delineated, available to LCEMA for the Haz-Mat Team's use in response to emergencies, and to the DEP to encourage a timely, thorough cleanup by the responsible party. This can be done by providing a digital copy on the County's base map to the Lancaster County Planning Commission for inclusion in the County's Geographic Information System.*

· *Coordinating with and making local contingency plans available to the LCEMA and the DEP.*

· *Requiring reporting by facilities generating, using, storing, or disposing of hazardous substances.*

· *Obtaining professional training for local emergency response personnel in containing spills and leaks in WHPAs.*

· *Committing to strictly enforce speed limits.*

· *Encouraging public reporting of spills and leaks.*

CONTINGENCY PLANNING COMPONENTS

Inventory of Threats - Potential threats differ among municipalities and will affect the particular response that is chosen. Such threats generally involve leaks or spills. The Water Planning Team may already have identified potential sources of contamination as part of the wellhead protection process. A potential contaminant source that is proposed to be regulated under a municipality's zoning (especially non-point source pollutants) is not, however, necessarily a potential threat from a contingency planning perspective. The Lancaster County Planning Commission's Wellhead Protection Workbook includes a listing of potential sources of groundwater contamination that could be used as a starting point. Threats may be evaluated by probability of occurring and/or level of hazard, or an overall weighting factor combining the level of probability and hazard can be applied. Primary threats should receive the most urgent attention in the planning response. Threats may be primarily rural or urban in nature, or a

combination of both. The presence of major roads creates the potential for road spills of unknown substances. Certain geologic formations, such as carbonate, may in themselves pose a threat, in their vulnerability to groundwater contamination.

Design of Response - This part of the plan should clearly state what conditions will initiate a response and what the response will be. The response should be designed to prevent or minimize well or spring contamination. To do this, a knowledge of the toxicity and transport properties of all potential contaminants inventoried as threats is necessary. Case histories of similar known contamination events or plans developed for other areas are good sources of responses that could be used in the development of an appropriate response. Such information should be evaluated in the context of the particular hydrology of the municipality's WHPA. Thorough advance planning should be designed to assure that containment and cleanup will occur as rapidly as possible within the WHPA. Because a large proportion of spills occur in the transport of hazardous substances by trucks, part of the municipality's response should be a commitment to strictly enforce local speeding laws.

Assignment of Responsibilities - This part of the plan identifies the response team and response team coordinator, and contains a list of names, agencies, telephone numbers, FAX numbers, and addresses. A flow chart showing who has responsibility for each phase of the response is a desirable feature of the plan. Because speed of response is essential, the chain-of-command must be determined prior to an emergency. One person should have overall responsibility for response coordination; suggestions for response team coordinator could be the Fire Chief, Emergency Management Coordinator or an elected official.

A copy of the municipality's contingency plan, including on-site reporting forms, should be made available to all facilities using or storing hazardous substances, and should be promptly provided to any transporter with spilled hazardous substances. The municipality should take steps to encourage and facilitate the prompt reporting of spills and leaks by the public, police and fire personnel, facility management, and employees. Call-in reporting forms should be prepared in advance to assure the most complete gathering of information possible. A clear and prompt process for notifying the public, including public facilities, services, utilities, and institutions should be set forth, as well as a plan for emergency evacuation where necessary.

Identification of Resources - This part of the plan describes the logistics of implementing the response plan, and identifies where needed materials and equipment, as well as technical expertise and training, can be obtained. This should include a listing of agencies, departments and consultants, their telephone numbers, FAX numbers and addresses, and their scope of services. Prior to inclusion on the listing, it should be ascertained that these contacts would be able to provide the rapid response needed by the municipality. The municipality may

want to have certain types of supplies, such as absorbent materials actually on hand, to reduce response time. This part of the plan can be particularly useful to transporters with spills who may be unfamiliar with available resources in the area. Municipalities desiring to contain spills and leaks to which the Haz-Mat Team will not respond need to coordinate with the LCEMA on professional training and the use of cleanup materials. For further information, obtain *Guide to Ground-Water Supply Contingency Planning for Local and State Governments - Technical Assistance Document*, U.S. Environmental Protection Agency, Office of Ground-Water Protection, Washington, D.C.

As of 1996, a County emergency training facility is in the planning stages in Manheim Township. This facility would provide a central training location for emergency management personnel. Intended to be a state-of-the-art operation, the center would include facilities to simulate fires and hazardous materials spills and would provide standardized, certifiable emergency training.

· ***WHPA Signage*** - WHPA signage is an important tool for notifying the public of the location of wellhead protection areas and inviting their participation in reporting any spills or releases to authorities. WHPA signage along State roads must be arranged through the Pennsylvania Department of Transportation and generally costs between $300 and $800 per sign installed depending on sign size. These signs typically read:

WATER SUPPLY
PROTECTION AREA
NEXT 5 MILES
SPILL RESPONSE
911

Signs along municipal roads may be arranged through private contractors.

· ***Monitoring*** is an important technique that can be used to prevent groundwater contamination from reaching municipal wells. Municipalities with industrial, commercial or institutional uses that generate, use, store, or transport hazardous substances on a significant scale are good candidates for monitoring wells. Other land uses for which monitoring wells would be appropriate include landfills, junkyards, hazardous waste disposal sites, and similar uses. Many such uses already have monitoring wells at one or more locations both on- and off-site, some equipped with remediation mechanisms to mitigate existing contaminants. Monitoring wells may be tested periodically by either the facility, the DEP or the water supplier. Their function is to provide an early warning system for the leaching of contaminants into groundwater before they become a serious hazard and while site cleanup and remediation can still be effective. A number of municipalities have forged positive, mutually beneficial monitoring relationships with potentially polluting businesses mindful of their liability.

Water suppliers interested in monitoring should first identify which facilities are currently monitored by the DEP or the facilities themselves, and request to be notified

regularly of monitoring results. Next, water suppliers should review potential contaminant sources as identified by the Water Planning Team for possible additional monitoring candidates. Any local monitoring program should be designed to complement the existing State program, and may involve inter-jurisdictional cooperation where a groundwater aquifer extends across a municipal line. In determining the location, depth, number, and type of monitoring wells necessary, a familiarity with area geology is essential.

Monitoring can also be used to measure the effectiveness of the groundwater protection program over time. Such monitoring is done at the wellhead itself and is similar to the water testing currently done to demonstrate compliance with State and Federal water quality standards.

· ***Remediation*** - Remediation is the withdrawal of pollutants from or the detoxification of contaminants within the aquifer. Such action may be needed where contaminant efforts have failed and where monitoring reveals that contaminants have reached the groundwater. Remediation may be possible where contamination is highly localized and from a specific source, but it is not always possible, and it is very expensive. Contaminants are first isolated or limited in their movement through containment measures, then withdrawn and treated through pumping, de-watering or drainage. Not all contaminants can be adequately contained and treated.

Land Acquisition - The smart method for a community to control land uses and activities on property that might degrade groundwater quality is through acquisition of that property. Ownership of land can be thought of as a "bundle of rights," including surface use rights, mineral rights, air rights, and access rights. In seeking to acquire land, communities may target the entire bundle of rights ("fee simple" title) or a more limited set of rights. The choice depends on practical factors, such as the land use activities the community wishes to control, and local financial resources.

Local governments have two means of acquiring land:

· *Undertake negotiations with a willing seller; or*

· *Exercise the right of eminent domain and condemn the property.*

Voluntary negotiations avoid the time, legal expense and controversy associated with condemnation proceedings. Donations and bargain sales of interests should be pursued. Where the current landowner is unwilling to sell a property, he may still be agreeable to extending a Right-of-First-Refusal, meaning that should the property ever be offered for sale, the water supplier (or municipality) would be provided the first opportunity to buy.

· ***Fee Simple Ownership*** - Outright ownership provides communities with the fullest measure of control over land uses. For this reason, it is strongly recommended that communities undertaking groundwater protection own all, or as much as possible, of the lands within Zone 1 of each wellhead protection area. Zone 1 represents the land area which is most vulnerable to groundwater contamination and which, ideally, should not be

developed or used for any purpose other than as a municipal wellhead. High priority areas within Zone 2 should also be identified in anticipation that an opportunity might arise for acquisition of land in this area. Land acquisition can provide a double benefit for communities where used for parkland, recreation facilities or other similar land uses. The potential availability of County and/or State funding for parkland purchase makes this an even more desirable option. Additionally, various local conservation organizations may be contacted to determine their interest in purchasing lands within wellhead protection areas.

· ***Easements and Covenants*** - Acquisition of partial interest in land is usually in the form of conservation easements (sometimes referred to as "purchase of development rights") and restrictive covenants. While partial interests do not convey total control over land, there are certain advantages over fee simple interest:

· *The community is not burdened with maintaining the property;*

· *The property remains on the tax rolls; and,*

· *Lower costs allow the community to obtain interest in more parcels.*

Easements used for wellhead protection must be carefully crafted to control land uses that would threaten groundwater resources. Easements apply to all subsequent land uses for either a finite number of years or forever. Easements can be used to regulate land uses or activities which communities are either not willing or not legally permitted to prohibit or limit. The greatest potential for the use of easements in Lancaster County may be in conjunction with certain agricultural practices in Zones 1 and 2 in wellhead protection areas. This is because the regulation of farm practices can otherwise be construed to be "nuisance regulations" that unreasonably interfere with farming operations. Easements voluntarily entered into in such areas could achieve greater control over the land application of nutrients and pesticides than might otherwise be possible. Municipalities may also acquire a parcel outright, place an easement on it, and sell the easement-restricted property back to a private landowner.

It is important to note here that the current County purchase of development rights program administered through the Agricultural Preserve Board acquires easements on farms which permanently preserve the farm use of properties, but do not affect farm practices, except those relating to storm water runoff as set forth in the required Conservation Plan. Thus, while the permanent preservation of farms assures continued groundwater recharge, it does not address the application of nutrients or pesticides to land. If such farm practices are a concern, a separate type of easement would need to be pursued.

Similar to easements, restrictive covenants attach to the property and apply to subsequent landowners. Whereas easements are held by another party who can enforce their restrictions, restrictive covenants can only be enforced by other property owners similarly restricted. Restrictive covenants can be used to prohibit specific land uses, densities or

threatening activities in wellhead protection areas. A restrictive covenant, unlike an easement, involves no outlay of public funds, but is more limited in its applicability.

Planning - There is a great deal of potential for the coordination of local groundwater protection planning with municipal comprehensive planning and other planning efforts in neighboring municipalities and Lancaster County. Such coordinated planning can minimize the adverse impact growth and development can have on both groundwater quality and quantity.

· ***Comprehensive planning*** can include much of the rationale and factual base that supports various wellhead protection implementing measures. In particular, the Future Land Use Map, which can be used to guide zoning, should include a "Wellhead Protection Area" plan designation reflecting any delineated WHPA. Even if not followed through with a protective zone, this designation will serve to notify the public, developers and lending institutions of the significance of this land area. The designation will also remind municipal officials of the vulnerability of this area as they review proposals for subdivisions, land developments and zone changes. Where regional comprehensive plans exist and there is a regional WHPA, this designation should also be reflected on the Future Land Use Map. A WHPA plan designation could be an amendment to an existing comprehensive plan, or could be part of a comprehensive plan update.

· ***Regional WHPA planning*** consists of municipalities working with neighboring communities to protect groundwater. The four pilot projects that are part of this Water Resources Plan all utilized such coordinated cooperative planning.

· ***Watershed planning*** is currently being undertaken by the Lancaster County Engineer's Department for the watersheds in the County. As each watershed plan is completed, Water Planning Teams will want to review and evaluate its recommendations as they pertain to storm water management in their municipalities and make any desired changes to wellhead protection or water supply plans.

Voluntary and Municipal - Voluntary and municipal efforts include public education, street sweeping, household and yard hazardous waste collection, storm drain painting, sinkhole cleanup, streambank cleanup, and streambank fencing and stabilization. In addition, they can include the creation of an Environmental Advisory Council to provide expertise and interest in developing and implementing local water plans and programs.

· ***Public Education*** is a vital first and ongoing step in communicating to the public the value of clean and plentiful water and the essential role the public plays in maintaining continued water quality and quantity. An effective public education effort will promote voluntary protection efforts as well as build support for regulatory efforts. Public education is well received by the public and is relatively low-cost. It is essential that the public know:

· what types of practices threaten water quality and quantity;

· what alternatives to these practices exist;

· how to obtain further information or assistance regarding alternatives; and,

· whom to alert if contamination occurs or is suspected.

Table V-5 lists a wide variety of ways in which the public can be encouraged to protect area water quality.

· ***Street Sweeping*** - Municipal street sweeping programs can reduce the level of contaminants in urban and suburban storm water runoff. Where sanitary and storm sewer systems are combined, this can reduce treatment costs. Where sanitary and storm sewer systems are separate, this can reduce pollution levels in streams and leaching of contaminants into groundwater.

Table V-5

HOW TO PROTECT WATER QUALITY

Home and Business

. reduce use of hazardous household products

. read and follow product labels

. use more environmentally-friendly household products

. use pump sprays rather than aerosols

. avoid chemical air fresheners

. reuse paint thinner

. use latex and water-based paints

. do not dispose of hazardous household products down the sink, toilet, storm drain or onto the ground

. bring toxic household products to the Lancaster County Hazardous Waste Facility

. do not use septic system cleaners or additives

. use a plunger or hand-snake for unclogging toilets and drains

. check underground home heating oil tank for leaks

. recycle batteries

. use least toxic alternatives in cottage industries and rural occupations

Outdoors

. have septic system pumped every three years

. recycle used motor oil

. repair leaky crankcase or transmission

. keep storm drains cleared

. de-ice with sand instead of salt and chemicals

. clean up pet waste

. fence animals away from wells, steams and other water bodies

. test quality of wellwater

. check unused wells for proper capping and sealing

Yard and Garden

. minimize use of lawn and garden chemicals

. use alternatives to pesticides

. avoid "weed 'n feed" applications

. encourage insect-eating birds and insects

. do not apply pesticides near streams, wells or water bodies

. do not dispose of hazardous garden products down the sink, toilet, storm drain or onto the ground

. bring hazardous garden products to the Lancaster County Hazardous Waste Facility

. landscape with trees and shrubs

. avoid landscaping plastic

. provide vegetation along streams

· ***Household and Yard Hazardous Waste Collection*** - As noted, the Lancaster County Solid Waste Authority operates the only Household Hazardous Waste Collection Facility in the Commonwealth, and accepts all such wastes from County households free of charge. In addition, all residents may dispose of used batteries as part of municipal trash hauling and recycling programs. However, many County residents live at considerable distance from the Lancaster City facility and these County residents are less likely to make the trip into Lancaster City to dispose of household hazardous wastes than those living closer in. Even homeowners in and around the facility may be disposing of hazardous wastes in regular trash pick-ups or into storm sewers, sanitary sewers or septic systems. These wastes may also be discarded in illegal on-site landfills or roadside trash dumps.

A PUBLIC EDUCATION STRATEGY

Getting Started - The first step in undertaking a public education program is to establish a broadly representative committee for that purpose, as a subcommittee to the Water Planning Team. This group should gather and familiarize itself with as much information as possible about the water system's components and use, area geology and hydrology, and potential threats to area ground and surface water quality and quantity. Once familiar with this information, it should hold an educational workshop for all public officials and employees to familiarize them with the issues and enable everyone to respond to questions and inquiries that are likely to be posed by the public.

The first public outreach effort should be a well-advertised and attended kick-off directed to the public at large. Such an effort could be a:

· Meeting· Conference

· Workshop· Forum or rally

This effort should be widely advertised using a combination of the following:

· Press releases· Fliers

· Press conferences· Posters

· Newsletters· Radio and TV public service announcements

The goals of the first effort should be to promote public interest, communicate issues and encourage participation. The committee should:

· Use visuals to communicate. A demonstration model showing how contaminants can infiltrate into aquifers is a very useful tool, as are slides, videos and other visual aids, including the LCPC "Power to Protect" video;

· Identify the sources of the community's water, current quality and quantity and anticipated future water needs;

· Describe potential threats to existing water quality and quantity and how these can affect public health;

· Explain the significance of individual actions which can affect water quality and quantity and the important role the public plays in maintaining clean and plentiful water;

· *Describe the commitment the community has made to provide the public with information, alternatives and resources that will allow them to assist in the protection of water resources;*

· *Explain the need for any proposed or adopted regulations; and,*

· *Allow for questions, comments and suggestions.*

Following Through - There is a wide variety of approaches the committee can take in its public education program, including:

· *Developing or providing brochures on water protection to include in water or tax bills.*

· *Providing a regular column in a municipal newsletter to address water protection.*

· *Providing speakers to schools and local groups.*

The most effective public education efforts appear to use a broad range of outreach techniques designed for a variety of specific audiences. Efforts should be directed to groups whose activities pose special groundwater pollution threats: homeowners with on-lot septic systems, homeowners, farmers, automotive businesses, golf courses, and other uses. In many cases, collaborative efforts can be undertaken with agencies and organizations that regularly work with these groups, such as sewage enforcement officers, garden clubs, the Lancaster Conservation District, Penn State Cooperative Extension Service, the Chamber of Commerce, League of Women Voters of Lancaster County, and others. Fliers, brochures and handbooks exist or can be created that are directed to all of the above and other groups.

Efforts should also be directed to area schools, where students can learn environmental habits that will last a lifetime, bringing them home to put them to use. The potential exists for a wide variety of hands-on educational techniques to be used in a school setting. Teachers might be involved on Water Planning Teams. Teacher workshops could be held, special curriculum materials provided, poster and other contests held and awards given. Student research projects and presentations could be coordinated with ongoing community efforts to protect area water resources.

Special assistance programs could be developed with the help of or involving local civic organizations, churches and schools, including local pick-up of household and yard hazardous wastes, streambank cleanups, informational fairs, Earth Day participation, tours of springs, etc.

Further sources of information and assistance in establishing a public education program include the Pennsylvania Rural Water Association, Lancaster County Planning Commission, League of Women Voters, Pennsylvania Environmental Council, Pennsylvania Department of Environmental Protection, Susquehanna River Basin Commission, Chesapeake Bay Foundation, Alliance for the Chesapeake Bay, Trout Unlimited, the Conestoga Valley Association, the Lancaster Greens, and other local environmental groups.

Municipalities might want to take advantage of the unusual opportunity County residents have to dispose of household and yard hazardous wastes free of charge, by promoting the use of the County's facility. Another innovative method that numerous communities have used to alleviate the threat of contamination of water from hazardous substance disposal has been to hold annual hazardous waste collection days. On a specified and well-publicized day, a municipality could receive hazardous wastes from homeowners at a central location, disposing of the wastes via a licensed hazardous waste hauler to the County's hazardous waste collection facility or elsewhere. While the County would not likely be able to transport collected hazardous wastes to its facility itself, it would be available to advise municipal officials on alternative methods of disposing of collected wastes.

· ***Storm Drain Painting*** - Many people dump used paint and other toxic substances into storm drains, believing that these drains flow into community sewage facilities where treatment is provided. In most cases, storm and sanitary systems are, in fact, separate. In such cases, municipalities may want to encourage civic organizations to sponsor storm drain painting efforts, alerting residents that storm drainage often flows directly to streams and is not treated.

· ***Sinkhole Cleanup*** - In areas of the County with carbonate geology, landowners have, in the past, disposed of wastes in sinkholes, creating considerable potential for contamination of groundwater resources. In public wellhead recharge areas, this is a particular hazard. Where this is a concern, water providers should develop a voluntary program to clean up such sinkholes free of charge and prescribe protective measures to minimize the likelihood of future contaminants entering the groundwater. These measures might include:

· *Buffer areas covered with grass or other appropriate vegetation;*
· *Installation of diversion methods or structures; and,*
· *Installation of concrete or plastic liners.*

· ***Streambank Cleanup*** - This is a popular, hands-on way to familiarize the public with water quality issues while involving them in a task helpful to the community. Streambank cleanups are sponsored by municipalities, civic organizations, conservation groups, church groups, scouts, and others. Whole families frequently participate. Streambank cleanups might be coordinated with Rivers Month (June) or Earth Day (April) celebrations. Typically, specific river segments are chosen; these may be coordinated with segments chosen by other groups.

· ***Streambank Fencing and Stabilization*** - Various County, State and Federal streambank fencing and stabilization programs are available to farmers through the Lancaster Conservation District. Some programs are cost-shared with farmers while others are completely subsidized. Although interest is high, funding is limited. This is an area in which there may be great potential to use the volunteer services and skills of local conservation groups, civic organizations, scouts, and others.

5. DEVELOP AND IMPLEMENT A PLAN OF ACTION

In choosing a particular package of tools and techniques to protect groundwater quality, Water Planning Teams will want to select from among the choices presented in this chapter those which best fit the particular needs and circumstances of their communities. To learn more about the many approaches that exist, it is strongly recommended that Water Planning Teams gather as much material as possible about existing programs. Three excellent sources on wellhead protection planning include *Local Groundwater Protection* by Martin Jaffe and Frank Dinovo, American Planning Association, 1987; *A Guide to Wellhead Protection* by Jon Witten and Scott Horsley, American Planning Association, 1995; and *Wellhead Protection Programs: Tools for Local Governments*, U. S. Environmental Protection Agency, 1989.

Factors to Consider - In weighing the applicability and other considerations of the many approaches to protecting groundwater quality, the Water Planning Team should consider the following factors:

· ***The Importance of the Groundwater Resource.*** Communities which rely entirely or primarily on their groundwater supplies and which are not now interconnected with, nor reasonably could interconnect with, another system with surplus water, should provide the highest level of protection to their groundwater resources.

· ***The Geology of the Area and Its Vulnerability to Groundwater Contamination.*** Carbonate geology, particularly that exhibiting karst features, provides direct conduits to area groundwater. Such areas require rigorous protection standards and remedial actions.

· ***The Nature and Magnitude of Threats to Area Groundwater.*** The types of existing and potential future land uses and activities that characterize the area around the wellheads should determine the types of land uses and activities protection efforts will be geared toward. In rural communities the focus may be on agricultural practices and on-lot sewage disposal systems. Developing areas may direct their attention to design standards that maximize recharge or to prohibiting certain industrial activities or underground storage tanks.

· ***A Balanced Approach to Protecting Groundwater Resources.*** Both regulatory and non-regulatory approaches have their own unique advantages and applicability to different circumstances. The ideal program will incorporate elements of each approach. While educational and voluntary programs are indispensable in raising public awareness, understanding and acceptance of a groundwater protection program relying exclusively on this approach will likely expose community water supplies to significant risk.

· ***Existing Protection.*** Many communities may already have certain mechanisms in place that provide a limited amount of protection to groundwater resources. These include: urban and village growth boundaries, effective agricultural zoning, agricultural security areas, preserved farms, water supplier ownership of lands around wellheads, storm water management regulations, disturbance standards, setback criteria, septic system maintenance, contingency planning, and street sweeping. These existing techniques should be "fine-tuned" in light of the Water Planning Team's findings.

· ***Coordination Among Neighboring Municipalities.*** Where a wellhead protection area underlies more than one municipality, there will be a need to coordinate with and seek the active participation of neighboring municipalities. While municipal approaches may differ in the protection of a single aquifer, implementation will be facilitated where approaches are as consistent as possible.

· ***Cost, Legal and Administrative Concerns.*** Water Planning Teams should evaluate their communities' financial and staffing resources, and their willingness to take any legal risks that may accompany some of the desired approaches. Any available funding from the DEP to assist local wellhead protection efforts should be pursued.

A Strategy for Implementation - After choosing an appropriate mix of tools and techniques to protect groundwater quality, an implementation strategy should be developed.

· ***A Workable Time-Line*** - The Water Planning Team should construct a workable time-line for developing, adopting and implementing the various components of its proposed wellhead protection program. It is advised that Water Planning Teams not attempt to take on every aspect of the proposed program at once. Tasks that are recommended to receive the Teams' initial attention are those that are simple or urgent or further educate the public. Tasks that require significant analysis or resources may be undertaken or completed as time permits. Ordinances with detailed regulatory standards, for instance, may take more time to develop, as well as be understood and accepted by the public. Similarly, plans to acquire land or develop new municipal programs may take more time and effort.

One way to develop a time-line is to assign a time frame within which each task should be implemented. Tasks that are recommended for immediate action are those that can be readily undertaken now. Those that are earmarked short-term should be implemented within the next year; those with a mid-term status completed within two to three years, and those planned for long-term implementation within five years. Ongoing tasks, such as education, should also be noted.

· ***Responsibilities and Resources*** - The various members of the Water Planning Team could be responsible for developing different components of the wellhead protection program, depending on interest and expertise. Subcommittees might be useful in this regard. Other individuals and organizations might also be called on for involvement, both in the development, and the adoption and implementation stages of the program.

Responsibilities and roles should be clearly stated to maximize the effectiveness of participants and to avoid overextending the same individuals.

As soon as a workable time-line and appropriate responsibilities have been determined, this information could be presented in a table, with tasks (or program components) placed in order of priority. This table might also include a column identifying the resources anticipated to be required to develop, adopt and implement each task. Such a table could be presented to governing body officials for their approval. A hypothetical example of a portion of such a table might look like this:

WELLHEAD PROTECTION PROGRAM IMPLEMENTATION STRATEGY			
Program Component	**Responsible Parties**	**Resources Required**	**Time-Line**
1. Education Program	Civic Groups and Water Planning Team	Coordination, printing	Short-term
2. Update Water Quality Contingency Plan	Local and County Emergency Management Personnel	LCEMA Model Contingency Plan	Mid-term
3. WHPA Overlay Zone	Water Planning Team	Ordinances from other municipalities	Mid-term

If governing body officials or Water Planning Teams determine later that certain tasks need quicker attention, the order of the tasks may be revised.

Evaluation and Update - The community's wellhead protection program should be periodically evaluated and updated to assure that it is providing the desired amount of protection to groundwater resources. The success of voluntary measures might be measured by the degree of public understanding, support for and participation in voluntary programs to protect groundwater quality. The success of regulatory measure, s might be gauged by public understanding, support for and compliance with regulatory programs to protect groundwater quality. Where participation with voluntary programs and compliance with regulatory programs is low, education efforts should be enhanced. Where compliance with regulatory programs is low because of unpopular specific requirements, it may be necessary to amend these regulations or pursue fee simple or easement acquisition of critical properties. Monitoring of groundwater quality for the public wellhead over time will determine ultimate success of the program, but this knowledge may come too late for some programs. Where wellhead or other monitoring indicates that groundwater is becoming progressively more degraded, the public needs to be alerted and the wellhead protection program needs to be immediately made more rigorous. At this point, remediation may also be necessary.

BIBLIOGRAPHY

Plans & Studies

Continuity Through Conservation II, Phase I, Background Studies, Huntingdon County (PA) Planning Commission, 1997.

Lancaster County Water Resources Plan: Water Supply Plan & Wellhead Protection Programs, Lancaster County (PA) Planning Commission, 1996.