

WELLHEAD PROTECTION PROGRAM

FOR

TELFORD BOROUGH AUTHORITY

MARCH 1998

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INTRODUCTION

The Safe Drinking Water Act (SDWA) was enacted in 1974 to ensure safe drinking water supplies. The SDWA requires the Environmental Protection Agency (EPA) to develop drinking water quality standards to protect the public health. In 1986, amendments were made to the SDWA strengthening provisions for the protection of underground sources of drinking water.

The SDWA Amendments of 1986 include Section 1428, the Wellhead Protection Program, thereby establishing a legal framework to protect existing wellhead areas of public water supply wells, wellfields, and springs from contamination.

A Wellhead Protection Area, or WHPA, is defined as the surface and subsurface area surrounding a water well or wellfield supplying a public water system through which contaminants are reasonably likely to move toward and reach the water well or wellfield.

A Wellhead Protection Program includes the following three components:

- Delineation of the extent of WHPAs;
- Identification of Potential Sources of Contamination within the WHPAs; and
- Development of procedures and management programs to protect the water supply from contaminants within WHPAs.

In addition, as of August 1996, President Clinton signed a major overhaul of the SDWA. One of the key provisions is directed toward enhanced protection of sources of water supply.

This document describes the Telford Borough Authority's Wellhead Protection Program.

1.0 GUIDELINES FOR WELLHEAD PROTECTION MANAGEMENT

The Pennsylvania Department of Environmental Protection (DEP) has developed the Commonwealth of Pennsylvania's Wellhead Protection Program to establish guidelines for local communities to assist in their wellhead protection planning. The following sections provide a summary of these guidelines as well as the related efforts of Montgomery and Bucks Counties.

1.1 Overview of Regulations and Requirements

The SDWA Amendments of 1986 and other federal regulations which govern wellhead protection do not establish specifically what should or should not be regulated as part of local programs. Rather, federal regulations seek to establish a partnership among local, state, and federal governments and public water suppliers.

State governments are assigned the responsibility to develop a "State-wide" wellhead protection program which must be approved by EPA (although Pennsylvania has developed a program, it does not currently have an EPA approved plan). The state-wide program must provide technical guidance for WHPA delineations and establish measures for contamination source controls and management. Some states (i.e., Maryland and New Jersey) are currently developing programs which will require mandatory wellhead protection for public water systems.

(On August 6, 1996, P.L. 104-182, known as the Safe Drinking Water Act Amendments of 1996, was enacted. These amendments serve to strengthen the federal government's interest in protecting surface and groundwater sources of drinking water. While the implementing regulations and guidance documents remain to be written, the 1996 amendments specifically include provisions for the states "for the development and implementation of a state program to ensure the coordinated and comprehensive protection of groundwater resources within the state". Also Section 132 provides for a source water assessment program of all sources of water for public water systems.)

1.2 Pennsylvania's Program

In the program that has been developed, DEP will not make wellhead protection mandatory for existing wells, but will provide technical guidance for municipalities interested in developing their own programs. The emphasis of the State's efforts has been on developing criteria and methods for delineation of WHPAs in different geological settings which are common throughout the State and on development of regulations.

DEP recommends three zones of protection within WHPAs. The following definitions are consistent with the Bucks County model ordinance:

Zone 1 is the protective zone immediately surrounding a well, spring, or infiltration gallery which shall be a radius of 400 feet.

Zone 2 represents the 10-Year Time-of-Travel Capture Zone - that area of the land surface which represents the 10-year time-of-travel capture zone associated with a protected public water supply well.

Zone 3 is - Zone of Contribution (ZOC) - that area of land surface which, through recharge or other means, provides water to sustain the yield of a protected public water supply well.

The Pennsylvania program can be summarized very briefly as follows:

New wells: Owners will be required, as a minimum, to own or tightly control the area that constitutes Zone 1.

Existing wells: Owners may develop a wellhead protection program and are encouraged to do so.

One of the incentives for developing a wellhead protection program is the potential to have DEP relax some of the water quality monitoring requirements under the Safe Drinking Water Act. To achieve this, however, it appears that a wellhead protection management plan will have to be implemented, including various elements as described in Section 4.0. With respect to Zone 2, DEP's position has been that the more rigorous the wellhead delineation analysis, then the more rigorous the management techniques that may be applied and the more likely monitoring waivers will be granted. This implies that concepts such as overlay zoning should be applied. In lieu of a rigorous wellhead delineation analysis, a water supplier/municipality may apply a one-half mile fixed radius for Zone 2, by definition, but then the management techniques would exhibit a lower emphasis, for example, public education might be the only management technique applied.

However, the primary reason for developing a plan is to help protect a community's public water supply.

DEP is also developing guidelines for management approaches in wellhead protection areas.

1.3 Bucks County and Montgomery County Wellhead Protection Planning

1.3.1 Bucks County

The Bucks County Planning Commission (BCPC) recently completed a draft report entitled " Bucks County Water Supply Plan and Model Wellhead Protection Study". The WHP portion of the study includes a description of WHP planning similar to this report and then develops wellhead protection case studies for seven municipalities in Bucks County. The wellhead protection process was applied to the following wells:

Bristol Borough Edgely Wellfield	Bristol Borough Water and Sewer Authority
Doylestown Borough Well #9	Doylestown Borough Water Department
Hilltown Township Well #1	Hilltown Township Water and Sewer Authority
Milford Township Well #1	Milford Township Water Authority
Riegelsville Borough Well #2	Riegelsville Borough Water Company
Solebury Township Well #S-1	Bucks County Water and Sewer Authority
Warrington Township Well #5	Warrington Township Water and Sewer Department

While these seven case studies were developed as specific Bucks County examples of how to define a WHPA, to identify the types of potential contamination sources that can be found in a WHPA, and to suggest possible management strategies, the basic recommendation of the study is to encourage municipalities to implement measures to protect groundwater resources through wellhead protection. While this is aimed primarily at new water supply wells (those developed after October 1995), the Telford Borough Authority is strongly concerned about protecting its existing well supplies as much as possible. The BCPC study also includes a model ordinance which may be used as a basis to develop a WHP program.

1.3.2. Montgomery County

Montgomery County is also interested in protecting both surface and groundwater sources, and anticipates developing a wellhead protection program once funding can be secured. The County has recently completed a regionalization study for small water systems in its western area. That study identified wellhead protection as a key issue to be considered in the overall development of water sources for this large area of the County.

1.4 Wellhead Protection Beneficiaries

While wellhead protection is typically considered to be a program to benefit users of community water systems, it is possible the greatest beneficiaries could be those residences and businesses which lie within the wellhead protection areas, but which rely on their own private wells. This is especially true where the water system to be "protected" lies in one municipality, but the area required to provide the protection lies in another municipality or municipalities. Very simply, if something does happen to a community water supply, e.g., contamination, those users have an organization (Borough Council, Township Supervisors, Authority Board) they can expect "to do something" to address the problem. Those people on their own private wells in the same area, however, often have no one to help them with the same problem. Therefore, as a result of a wellhead protection project these people may become the greatest beneficiaries of the project.

2.0 HYDROGEOLOGIC SETTING

2.1 Geology

The Borough of Telford lies entirely within the Triassic Lowland section of the Piedmont physiographic province of Pennsylvania. The Borough's production wells (Nos. 1, 3, 4, 5, and 6) are entirely located in areas underlain by the Brunswick Formation of Triassic age. This formation is described as typically consisting of reddish-brown shale and siltstone interbedded with sandstone and conglomerate. The Brunswick Formation has an estimated thickness of between 9,000 feet in Bucks county to 16,000 feet in western Montgomery County.

Throughout the study area, numerous tongues of the Lockatong Formation of Triassic age have also been mapped. This formation primarily consists of medium to dark-gray argillite interbedded with thin beds of gray to black shale and siltstone. The bedding of the formation is generally massive. The Lockatong Formation has a stratigraphic thickness ranging from approximately 4,000 feet to 1,500 feet. This formation is overlain conformably by the Brunswick Formation.

2.2 Regional Hydrogeology

The Brunswick Formation is the major aquifer in the Telford Borough Authority service area. Primary porosity in the formation is small, due to the abundance of very fine grained shale. In the rocks of the Brunswick Formation, the water bearing zones are almost entirely confined to secondary openings along bedding planes, faults, joints, and weathered zones. These zones also provide much of the porosity necessary for groundwater storage. The groundwater in the study area occurs under semi-confined conditions. Depending upon the size, number, and interconnection of water bearing zones penetrated by a well, the reported yields for the Brunswick Formation are highly variable and range between 3 gpm (577.3 ft³/day) to 750 gpm (144,320.7 ft³/day). In addition, the coefficients of transmissivity for the formation in the vicinity of the study area range from 3,500 gpd per foot (467 ft²/day) to 9,000 gpd per foot (1,203 ft²/day).

2.3 Precipitation

Precipitation is the source of all groundwater in the area. The average annual precipitation for Montgomery County ranges between 43 inches to 47 inches. Precipitation is rather uniformly distributed throughout the year, with slightly more in July and August. In addition to the groundwater in storage, the average precipitation is equivalent to approximately 2.02 million gallons of water per day (mgd) per square mile.

2.4 WELLHEAD PROTECTION AREA ZONES

2.4.1 Zone of Protection

As mentioned in Section 1.0 of this report, three (3) zones of wellhead protection must be identified to provide separate regulatory requirements for each zone, with the most rigorous contamination source controls for Zone 1 and less rigorous controls for Zone 2 and Zone 3, respectively. The criteria for delineation of each zone is as follows:

- Zone 1: A 400 foot radius for each wellhead
- Zone 2: 10-Year Time-of-Capture Zone
- Zone 3: The Zone of Contribution (ZOC)

2.4.2 WHPA Model

In order to delineate the Zone 2 area (ZOI), the Wellhead Protection Area Delineation Code (Version 2.11) developed by the Environmental Protection Agency was utilized. The WHPA program is a modular, semi-analytical groundwater flow model. The model consists of four (4) independent computational models (RESSQC, MWCAP, GPTRAC and MONTEC) used to delineate capture zones or the ZOI.

All of the modules contain semi-analytical capture zone solutions that are applicable to homogeneous aquifers which exhibit two-dimensional, steady-state groundwater flow in an areal plane.

2.4.3 Model Limitations

It should be recognized that the computational modules have been developed for ideal, infinite, isotropic and homogeneous aquifers. Since the groundwater flow in fractured rock aquifers, such as the Brunswick Formation, is not consistent with the above assumptions, the application of the model for delineation of WHPA is based on generally acceptable hydrogeologic principles and assumptions. These principles are limited to available hydrogeologic information including well locations, aquifer type, transmissivity, aquifer thickness, aquifer porosity, hydraulic gradient, angle of ambient flow, confining layer hydraulic conductivity, confining layer thickness, boundary conditions, well depth, casing depth, pump intake setting, well discharge and well radius. Regardless, it should be noted that a significant number of conservative, professional judgements are made so that the WHPA is of sufficient size to provide protection of the Telford Borough Authority's groundwater resources.

2.5 Delineation of Wellhead Protection Areas

As shown on the attached map the WHP delineation for TBA's five active wells encompasses all or parts of six municipalities in Bucks and Montgomery Counties. This includes all of Telford Borough, some large areas of West Rockhill and Hilltown Townships, and a smaller area of Franconia Township. Only a small portion of Salford township falls within the WHP delineation, but this small portion includes part of Zones 1 and 2 for Well 5. A small portion of Souderton Borough falls within the Zone 3 delineation. Additional information concerning the development of Zones 1, 2 and 3 is discussed as follows. A map showing the three zone areas is located in the map pocket in the back of the report.

Zone 1

The Telford Borough Authority WHPA, Zone 1 protection area includes a four hundred (400) foot radius around each of the Borough's five (5) public water supply wells. Zone 1 areas occur in Telford Borough, Hilltown and West Rockhill Townships, and to a very small extent in Franconia and Salford Townships. These areas are illustrated on the attached map.

Zone 2

In order to delineate the Zone 2 protection area or Zone of Contribution (ZOC), the GPTRAC (General Particle Tracking) semi-analytical computational module was employed. The hydrogeologic principles and assumptions which were utilized in the delineation of the Zone 2 protection areas are listed in **Table 1**.

Several of the values in **Table 1** are based on the following assumptions:

- Well Discharge: Based on the capacity of the pumping equipment.
- Aquifer Thickness: Based on the depth at which groundwater is entering the water supply system from each well. This depth corresponds to the pump intake settings.
- Transmissivity: Based on the average of the individual well's calculated transmissivities and the median transmissivity of the Brunswick Formation.
- Confining Layer Hydraulic Conductivity: Based on dividing the average transmissivity by total aquifer thickness (12,500 ft).
- Confining Layer Thickness: Based on arbitrary assignment of value.
- Time Limit For Simulation: Based on 10 year time of travel.

- Time Value For Capture Zone: Based on 10 year time of travel.
- Aquifer Type: Semi-confined

The Zone 2 protection areas are illustrated on the attached map. As indicated on the map the general flow pattern of Zone 2 for each well is from northeast to southwest and Zone 2 areas are located in each of the municipalities except for Souderton.

Zone 3

The Telford Borough Authority WHPA, Zone 3 protection area or upland area, corresponding to the drainage area contributing to the overland flow to Zone 2 is illustrated on the attached map. This area was delineated based primarily on surface features and professional judgement.

The significance of Zone 3 should not be underestimated when considering wellhead protection. For example, the Kutztown Area (Berks County) wellhead protection project yielded verified accounts of a source of significant groundwater contamination occurring in one location in the Zone 3 planning area with evidence of the contamination also being identified several miles away.

2.6 Hydrogeologic Modeling and Analysis

The hydrogeologic modeling and analysis was prepared by Mr. Daniel Lewis, Registered Professional Geologist, of SSM/Spotts, Stevens and McCoy, Inc. The computer simulation was also reviewed by Leggette, Brashears & Graham, Inc., a professional groundwater service firm. The assumptions and resulting three zone map were also submitted to DEP's Central Office for a cursory review. (NOTE: In addition, both the Bucks County and Montgomery County Planning Commissions reviewed the overall draft WHP program.

**TABLE 1
WELL AND AQUIFER PARAMETERS**

Parameters	Well 1	Well 3	Well 4	Well 5	Well 6
Well Depth (ft.)	240	400	524	523	465
Well Radius (ft.)	0.4	0.4	0.4	0.4	0.3
Well Discharge (ft. ³ /d)	68311.8	42334.1	57728.3	53879.7	28864.1
Aquifer Thickness (ft.)	220	220	210	151	260
Transmissivity (ft. ² /d)	815.5	815.5	815.5	815.5	815.5
Aquifer Porosity (dimensionless)	0.2	0.2	0.2	0.2	0.2
Hydraulic Gradient (dimensionless)	0.01	0.01	0.01	0.01	0.01
Angle of Ambient Flow (degrees)	202	202	202	202	202
Confining Layer Hydraulic Conductivity (ft./d)	0.07	0.07	0.07	0.07	0.07
Confining Layer Thickness (ft.)	50	50	50	50	50
Time Limit for Simulation (days)	3650	3650	3650	3650	3650
Time Value For Capture Zones (days)	3650	3650	3650	3650	3650
Input Boundary condition	None	None	None	1 Stream	None
Aquifer	S.C.	S.C.	S.C.	S.C.	S.C.

3.0 SOURCES OF POTENTIAL CONTAMINATION

Land use activities can pose a wide range of pollution threats to the water supplies of the TBA area. Specific activities such as the use of hazardous substances, underground storage of petroleum (and other) products, municipal and industrial waste disposal, and agricultural practices are of particular concern. This section describes typical land uses and specific activities which pose significant threats to the communities' water supplies.

3.1 Overview of Contamination Sources

Table 2 provides an overview of land uses likely to be encountered within WHPAs and their relative risk to groundwater. The higher risks include activities which store or dispose of hazardous chemicals. There are lists of hundreds of chemicals and substances which are considered "hazardous" by federal and state governmental agencies. The most common hazardous materials include cleaning solvents, petroleum products (i.e., fuels and lubricants), paints, thinners, stripping agents, and industrial waste liquids or sludges. These chemicals are associated with the many light industries and commercial facilities located in the project area.

These materials enter groundwater through accidental spills, leaks from storage tanks, discharge into septic tanks or floor drains connected to a dry well, or illegally dumped in a waste area. Even when a high risk land use employs proper precautions, some of the hazardous materials can easily be accidentally spilled and enter the groundwater through surface runoff.

These high risk land uses are often referred to as "Point-Sources" of pollution because the pollution originates from a single source (i.e., storage tank, drain, discharge pipe, etc.) which can release a substantial amount of contamination to groundwater resources.

Land owner activities also have the potential to affect surface and groundwater resources. Areas of low risk land uses can still contaminate groundwater if the land owners are not aware of the potential impacts of their actions. The owner of a small lot dumping engine oil behind the garage, park maintenance people misapplying pesticides, and septic system on large lots with marginal soils can have a great affect on water quality, which is why public education is such an important and on-going requirement in wellhead protection.

TABLE 2

LAND USES AND THEIR RELATIVE RISK TO GROUNDWATER

LOW RISK	<ol style="list-style-type: none">1. Land surrounding a well or reservoir, owned by a municipality.2. Permanent open space dedicated to passive recreation.3. Federal, state, municipal, private parks and forests.4. Woodlands managed for forest products.5. Permanent open space dedicated to active recreation.6. Field Crops: Pasture, hay, grains, vegetables.7. Low Density Residential: Lots larger than 2 acres.8. Churches, municipal offices.
MEDIUM RISK	<ol style="list-style-type: none">1. Agricultural Production: Dairy, livestock, poultry, nurseries, orchards, berries.2. Golf course, quarries.3. Medium Density Residential: Lots from 1/2 to 1 acre.4. Institutional Uses: Schools, hospitals, nursing homes, prisons, garages, salt storage, sewage treatment facilities.5. High Density Housing: Lots smaller than 1/2 acre.6. Commercial Uses: Limited hazardous material storage.
HIGH RISK	<ol style="list-style-type: none">1. Retail Commercial: Gasoline, farm equipment, automotive, sales and service, dry cleaners, photo processors, medical arts, furniture strippers, machine shops, radiator repair, printers, fuel oil distributors.2. Industrial: All forms of manufacturing and processing, research facilities.3. Underground storage of chemicals, petroleum.4. Waste Disposal: Pits, ponds, lagoons, injection wells used for waste disposal, bulky waste and domestic garbage landfills, hazardous waste treatment, storage and disposal sites.

The low risk land uses include activities with potential to release small amounts of contamination over large areas and are often referred to as "Nonpoint Sources" because the pollution does not originate from a single source (i.e., agricultural practices, nonsewered areas, etc.). Nevertheless, nonpoint sources of contamination are a

concern to the communities because small amounts of contamination released over a long period of time can adversely impact groundwater resources. Common water quality concerns associated with nonpoint contamination sources include excessive nitrate levels, high levels of turbidity, and pollution associated with surface water contamination (i.e., road salts, bacteria, etc.).

3.2 Inventory of Potential Contamination Sources

The initial work for the development of an inventory of potential contamination sources¹ was limited to the data available from a commercial computer data base. These computer data bases provide an inventory of facilities and pollution incidents that are regulated or tracked by EPA and other environmental regulatory agencies. An area with a radius of one mile, with a center point located about one-quarter mile north of Telford, was searched for information from a number of data bases. The service providing the information was Environmental Risk Information and Imaging Services (ERIIS). The data bases searched, their acronyms, and a brief description of the subject of the data bases are listed in Table 3, Data Base Reference Guide. The computer data base information is only for a specific period of time and can become dated and may need to be verified on a periodic basis.

This information provided the starting point for such an inventory. The preliminary step in determining a more localized listing of potential sources of contamination was to compile a list of all commercial and industrial users in the TBA service area, plus the listing from ERIIS. These are included in Appendix 2 with potential sources highlighted in "blue". This list is being refined for applicability to wellhead protection by a detailed field survey.

As indicated, the final step in this process is to conduct a detailed field survey to identify potential contamination sources. This detailed survey is being performed by the Students Against Violating the Earth (SAVE). (Please see Section 4.2 for additional information on SAVE.) An inventory reporting sheet prepared for the detailed field survey is shown in Figure 1. Copies of the inventory reporting sheet, water and sewer maps, and guidelines for conducting the survey were distributed to SAVE for use in conducting the inventory, which is anticipated to be completed by mid-March 1998. SAVE organized survey teams, mapped routes, reviewed the work to be done, made team assignments, and conducted the survey which included visiting locations of potential sources of contamination. The Telford Borough Authority notified each municipality of the survey, provided identification for the SAVE members, and SAVE provided publicity through a news release to inform the general public of the survey (see following pages and Appendix 4).

¹ It should be noted that these are not necessarily locations of actual contamination. They are sources that in the event of a spill or accident, contamination of groundwater could possibly occur.

NPL

Date of Data: 09/15/1994
Release Date: 10/04/1994
US Environmental Protection Agency
Office Of Solid Waste And Emergency Response
703/603-8881

RCRIS TS

Date of Data: 03/01/1994
Release Date: 05/03/1994
US Environmental Protection Agency
Office Of Solid Waste And Emergency Response
202/260-2603

CERCLIS

Date of Data: 09/15/1994
Release Date: 10/04/1994
US Environmental Protection Agency
Office Of Solid Waste And Emergency Response
703/603-8730

RCRIS LG

Date of Data: 03/01/1994
Release Date: 05/03/1994
US Environmental Protection Agency
Office Of Solid Waste And Emergency Response
202/260-2603

RCRIS SG

Date of Data: 03/01/1994
Release Date: 05/03/1994
US Environmental Protection Agency
Office Of Solid Waste And Emergency Response
202/260-2603

ERNS

Date of Data: 07/01/1994
Release Date: 12/06/1994
US Environmental Protection Agency
Office Of Solid Waste And Emergency Response
202/260-2342

CR

Date of Data: 06/01/1994
Release Date: 08/03/1994
PA Dept. Of Environmental Resources
Bureau Of Water Quality Management
717/772-5599

UST

Date of Data: 06/01/1994
Release Date: 07/25/1994
PA Dept. Of Environmental Resources
Division Of Storage Tanks
717/772-5599

National Priorities List

The NPL Report, Also Known As The Superfund List, Is An EPA Listing Of Uncontrolled Or Abandoned Hazardous Waste Sites. The List Is Primarily Based Upon A Score Which The Site Receives From The EPA's Hazardous Ranking System. These Sites Are Targeted For Possible Long-Term Remedial Action Under The Superfund Act.

Resource Conservation And Recovery Information System - Treatment, Storage, And Disposal Facilities

The RCRIS TS Report Contains Information Pertaining To Facilities Which Either Treat, Store, Or Dispose Of Hazardous Waste. Information Pertaining To The Status Of Facilities Tracked By The RCRA Administrative Action Tracking System (RAATS 9/26/94) Is Included In The RCRIS TS Report.

Comprehensive Environmental Response, Compensation, And Liability Information System

The CERCLIS List Is A Compilation Of Known Or Suspected Uncontrolled Or Abandoned Hazardous Waste Sites. These Sites Have Either Been Investigated, Or Are Currently Under Investigation By The EPA For The Release, Or Threatened Release Of Hazardous Substances. Once A Site Is Placed In CERCLIS, It May Be Subjected To Several Levels Of Review And Evaluation And Ultimately Placed On The National Priorities List.

Resource Conservation And Recovery Information System - Large Quantity Generators

The RCRIS LG Report Contains Information Pertaining To Facilities Which Either Generate More Than 1000kg Of Hazardous Waste Per Month Or Meet Other Applicable Requirements Of The Resource Conservation And Recovery Act. Information Pertaining To The Status Of Facilities Tracked By The RCRA Administrative Action Tracking System (RAATS 9/26/94) Is Included In The RCRIS LG Report.

On Advice Of The US EPA, ERIIS Does Not Report So-Called "RCRA Protective Filers." Protective Filers Are Facilities That Have Completed RCRA Notification Paperwork, But Are Not, In Fact, Subject To RCRA Regulation. This Determination Is Made By The US EPA.

Resource Conservation And Recovery Information System - Small Quantity Generators

The RCRIS SG Report Contains Information Pertaining To Facilities Which Either Generate Between 100kg And 1000kg Of Hazardous Waste Per Month Or Meet Other Applicable Requirements Of The Resource Conservation And Recovery Act. Information Pertaining To The Status Of Facilities Tracked By The RCRA Administrative Action Tracking System (RAATS 9/26/94) Is Included In The RCRIS SG Report.

On Advice Of The US EPA, ERIIS Does Not Report So-Called "RCRA Protective Filers." Protective Filers Are Facilities That Have Completed RCRA Notification Paperwork, But Are Not, In Fact, Subject To RCRA Regulation. This Determination Is Made By The US EPA.

Emergency Response Notification System - 1994

ERNS Is A National Computer Database System That Is Used To Store Information On The Sudden And/Or Accidental Release Of Hazardous Substances, Including Petroleum, Into The Environment. The ERNS Reporting System Contains Preliminary Information On Specific Releases, Including The Spill Location, The Substance Released, And The Responsible Party. Please Note That The Information In The ERNS Report Pertains Only To Those Releases That Occured Between January 1, 1994 and June 30, 1994.

Pennsylvania List of Confirmed Releases

The Pennsylvania List Of Confirmed Releases Contains Information Pertaining To Reported Leaking Underground Storage Tanks, Spills, And Tank Overfills Located Within The Commonwealth Of Pennsylvania.

Pennsylvania Underground Storage Tank List

The Pennsylvania UST List Is A Comprehensive Listing Of All Registered Underground Storage Tanks Located In The Commonwealth Of Pennsylvania.

FIGURE 1

TELFORD AREA WELLHEAD PROTECTION PROGRAM
INVENTORY OF POTENTIAL CONTAMINANT SOURCES

SUGGESTED INVENTORY FORM

Inventory Person: _____
 A. Landowners Name: _____
 B. Address: _____
 C. Phone Number: _____
 D. City: _____ Zip Code: _____
 E. County: _____
 Description of Location: _____

Nature of Property

Residential _____ Commercial _____ Agricultural _____ Industrial _____
 City Gov't Site _____ State Gov't Site _____ Rental _____ Other _____

DIRECTIONS: Place an "X" next to each category that you identify in the wellhead protection area. Place the corresponding number on the map at the location of the source. If there is more than one source for a category, label each site with the number and a letter (e.g., multiple cemeteries would be 7A, 7B, 7C, etc.)

- | | |
|---|---------------------------------|
| 1. __ Abandoned Wells | 21. __ Landfill |
| 2. __ Aboveground Storage Tank | 22. __ Laboratories |
| 3. __ Airport | 23. __ Machine Shop |
| 4. __ Animal Feedlot/Waste Storage | 24. __ Mining(Quarry) |
| 5. __ Asphalt Plant | 25. __ Oil/Gas Pipelines |
| 6. __ Auto Repair/Body Shop/Salvage Washes | 26. __ Photo Processors |
| 7. __ Cemetery | 27. __ Printers |
| 8. __ Cesspool | 28. __ Railroad |
| 9. __ Chemical Production/Mixing/Storage | 29. __ Refinishing |
| 10. __ Dry Cleaners | 30. __ Road Salt Storage |
| 11. __ Electroplaters/Metal Finishers | 31. __ Septic Systems |
| 12. __ Farm/Private Dumps | 32. __ Service/Gas Stations |
| 13. __ Fertilizer/Pesticide Storage/Production Mixing | 33. __ Sewage Plant |
| 14. __ Golf Course | 34. __ Underground Storage Tank |
| 15. __ Grain Storage Bin | 35. __ Waste Piles |
| 16. __ Highway | 36. __ Water Well |
| 17. __ Holding Pond/Lagoon | 37. __ Wood Preserving |
| 18. __ Industrial (other-Identify): _____ | 38. __ Other (specify) _____ |
| _____ | _____ |
| 19. __ Injection Well | _____ |
| 20. __ Irrigation Practices | _____ |

The following sections provide an overview of existing and potential future contamination sources.

3.3 Point Sources

A mix of point sources which exist within the WHPAs include large and small Resource Conservation and Recovery Information System (RCRIS) Sites and underground storage tanks.

At this time, the most likely significant potential source of contamination from point sources throughout the general WHPA is hazardous material discharges from underground storage tanks as well as tank spills on roads or railroads.

3.4 Nonpoint Sources

The WHPA includes significant land areas outside of the developed area in and around Telford which primarily consist of undeveloped land and agricultural areas in Franconia, Salford, West Rockhill, and Hilltown Townships. Sources of potential contamination in these areas are referred to as nonpoint sources and include primarily contamination associated with agricultural operations and on-lot disposal of wastewater.

The most significant contamination associated with nonpoint sources are nitrates linked with excessive levels of manure and fertilizers, pesticides, and household hazardous waste (e.g., kitchen cleaners, soaps, detergents, and cosmetics) discharged from on-lot septic systems. Application of pesticides and fertilizers for residences close to a well site are also a cause for caution.

3.5 Transportation Routes

Transportation routes do not generally fit into either point or nonpoint sources, but these can be a source of contamination, especially in the event of an accidental spill. In addition to U.S. 309 and the SEPTA rail line, there are a number of secondary roads serving industrial, commercial and agricultural activities in the WHPA. Possibly the greatest threat could be to Wells 1 and 3 due to the proximity of the SEPTA rail line, and to Well 6, due to the proximity of U.S. 309. However, Wells 4 and 5 also lie very close to County Line Road and essentially lie at a lower surface elevation than the road.

3.6 Potential Future Sources

Undeveloped land areas represent a potential as future contamination sources. There are large undeveloped land areas within the WHPA. Based on the amount of undeveloped land areas in the WHPAs, the risk associated with future contamination sources is significant. This is especially true with the recent and potential residential, industrial and commercial growth in the general vicinity.



TELFORD BOROUGH AUTHORITY

Chartered July 16, 1954

Montgomery and Bucks Counties, Pennsylvania

P.O. Box 209, Borough Building, Telford, Pennsylvania 18969-0209

Phone (215) 723-5000
Fax (215) 723-5328

January 2, 1998

West Rockhill Township
Board of Supervisors
1028 Ridge Road
Sellersville, PA 18960

Dear Sirs;

As part of the Telford Borough Authority's Wellhead Protection Program environmental science students and student members of SAVE (Students Against Violating the Earth) from the Souderton Area High School will be canvassing your municipality soon to establish the validity of the list of business or industries which was previously prepared as part of the draft version of this program. Most of the activity will be confined to a drive-by verification of occupancies; however, some contact by interview may be made for sites that might be in question. Thank you for your cooperation.

Very truly yours,

Charles R. Feindler
Manager

CRF/jaw

cc: Mark E. Weand, Jr., Esq.
Dale Kratzer, SSM
Ken Hamilton, SAHS

TYPICAL OF 5 LETTERS



TELFORD BOROUGH AUTHORITY

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Montgomery and Bucks Counties, Pennsylvania

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Phone (215) 723-5000
Fax (215) 723-5328

January 2, 1998

RECEIVED

JAN - 6 1998

SPOTTS, STEVENS
and McCOY, Inc.

To Whom It May Concern:

The bearer of this letter is an environmental science student or a student member of SAVE (Students Against Violating the Earth) from the Souderton Area High School and is performing a survey on behalf of the Telford Borough Authority, as part of its Wellhead Protection Program and in cooperation with the following municipal governments: Franconia Township, Hilltown Township, Salford Township, Souderton Borough, Telford Borough and West Rockhill Township. Please afford every courtesy in responding to the questions you may be asked.

If you wish verification or a fuller explanation please feel free to contact this office at 723-5000.

Very truly yours,

Charles R. Feindler,
Manager

CRF/jaw

cc: Mark E. Weand, Jr., Esq.
Dale Kratzer, SSM
Ken Hamilton, SAHS

4.0 WELLHEAD PROTECTION AREA STEERING COMMITTEE

When the concept of WHP was first discussed by the Telford Borough Authority, it was decided that it would be desirable to first have some basic data to show to other potentially involved municipalities before asking them to participate in a WHP program. As a result, the draft WHPA delineations were prepared and some very preliminary work on identifying potential sources of contamination was completed. With this information in hand each of the six municipalities identified in the potential wellhead protection area was contacted and requested to send an elected official to a meeting to discuss TBA's findings. This meeting was held January 24, 1996. At this meeting, there was consensus that groundwater sources transcended municipal boundaries and that protection of this resource was a desirable goal of intermunicipal cooperation. As a result a steering committee was established, with appointed broad representation requested from each of the six municipalities, to review, discuss and identify the various tools and techniques available to manage a wellhead protection area. The Steering Committee Members and Elected Official contacts are identified on the acknowledgements page of this report. Other Steering Committee members were added as the wellhead protection program developed. The initial Steering Committee chairman was C. Richard Feindler, Telford Borough Authority Manager (215-723-5000), who has since retired. The current chairman is Mr. Mark Fornier, present Telford Borough Authority Manager, also at 215-723-5000.

The Steering Committee subsequently met several times to discuss wellhead protection and the associated management tools. The meetings entailed a review of wellhead protection planning in general, a review of TBA's specific wellhead protection situation, a tour of TBA's well sites, a presentation of the Bucks County model wellhead protection study, and review, discussion and recommendation of the wellhead protection tools most likely to be accepted and implemented by the municipalities falling within the delineation area, and recommended adoption of the plan by TBA.

The Steering Committee meeting dates and key topics were:

- June 10, 1996 Introduction to Wellhead Protection and TBA WHP Areas; introduction of Management Tools, review potential sources of contamination
- June 27, 1996 Discuss Management Tools
- July 18, 1996 Tour proposed wellhead protection area and wells; presentation on wellhead protection by Bucks County Planning Commission; finalize management tools to be used
- August 22, 1996 Review "Draft Wellhead Protection Program", and review presentation for elected officials in each municipality

All meetings were public meetings and were held at the meeting room of the Telford borough Authority (and the Telford Borough Council. The initial meeting for the elected officials was held at the Franconia Township Municipal Building.

One key activity of the Steering Committee was to review the various management tools that have been identified as being suitable for wellhead protection. There are a number of such tools and a table summarizing these, taken from EPA's "Wellhead Protection: A Guide For Small Communities", is located in the Appendix.

Based on this review, the consensus of the Steering Committee was that the following management tools would be suitable for application to this wellhead protection program:

- Overlay zoning for wellhead protection
- Prohibition of certain land uses
- Special permitting
- Cluster/PUD design
- Toxic and hazardous materials handling provisions
- Private well protection
- Purchase, or donation, of land and easements
- Groundwater monitoring
- Storm water drainage requirements
- Regulation of underground storage tanks
- Prohibit small private sewage treatment plants
- Ban certain septic tank cleaners
- Septic system upgrades
- Support household hazardous waste collection events
- Encourage the preservation of open space
- Public education

Obviously, it is not likely that every one of these protection tools will be applicable in every municipality. However, a series of these tools being used collectively will be a significant step toward protecting the groundwater resources that are common to all people within the WHP delineation area.

Overlay zoning, along with other tools that can be readily incorporated with this approach, appears to offer a very pragmatic and practical approach to wellhead protection without being overly burdensome on the property owners within the protection area. Overlay zoning involves taking an existing zoned area and overlaying additionally defined zones for environmental or other special purposes. Overlay zones are added on top of and provide additional regulations to the already-in-place base zoning. Overlay zones need not conform to the boundaries of existing zones. Overlay zoning typically is administered by plotting an opaque map that delineates existing zones (e.g., residential, commercial, industrial) and then using transparent maps to delineate the overlay zone itself (e.g., a wellhead protection area). The most common type of overlay zoning district in Bucks and Montgomery Counties is a floodplain district.

Overlay zoning and related tools to protect local water resources can only be achieved through municipal implementation.

The following excerpt from the draft Bucks County water supply and wellhead protection study presents a very good, and succinct discussion of the correlation between land use decisions and protection of community water supplies.

"There is a direct correlation between local land use decisions and the availability and potability of community water supplies. Various water supply protective measures have been adopted throughout the nation including overlay zoning to protect sensitive aquifers, sensitive areas, and land surrounding water supply reservoirs. Another common approach is to prohibit certain land uses, physical facilities or activities in proximity to aquifers, groundwater wells and other drinking water sources. Both approaches have been applied to watersheds and at county and municipal levels. The approach varies based on the enabling legislation, the state government structure, and the selected management technique(s).

In Pennsylvania, most land use decisions are made at the municipal level and in conformance with the Pennsylvania Municipal Planning Code (MPC). The MPC provides the opportunity for direct municipal implementation of regulations designed to improve the viability of community water supply sources. The following water supply planning and regulatory tools are provided to municipalities through the MPC:

- The municipal comprehensive plan may include a water supply plan. The plan may consider present and future water resource availability, limitations and methods to protect the water supply (MPC: Article III, "Preparation of a Comprehensive Plan", Section 301.b.).
- The subdivision and land development plan may include ways to ensure that new developments provide reliable water supplies to support intended development. The intended supply should be within the "capacity of available resources" (MPC: Article V, "Subdivision and Land Development", Section 503.10).
- The zoning ordinance may include provisions (siting, density, design) which regulate all types of development, and the water supply should support the intended use. The zoning ordinance provision should "promote, protect and facilitate the provision of safe, reliable and adequate water supply for all uses as well

as the preservation of the aquifer (MPC: Article VI, "Zoning", Sections 603.C.6.d, 604.1).¹²

The following section includes a summary of existing zoning and planning in the respective municipalities that may be relevant to wellhead protection.

4.1 Summary of Existing Conditions Relative to Wellhead Protection

This section provides a summary of existing conditions relative to wellhead protection within those portions of each municipality that lie within the proposed wellhead protection delineation area. This summary is based on a review of readily available documents such as zoning and subdivision ordinances, ACT 537 studies, and comprehensive plans. This summary may not necessarily include every item that is relevant, but is intended to highlight at least some issues. This summary is as follows:

Borough of Telford

1. All of Zone 1 for TBA Wells Nos. 1 and 3 lies within Telford Borough as does virtually all of the associated Zone 2. The remainder of the Borough is encompassed by Zone 3.
2. A number of land uses of concern to wellhead protection are allowed by the current zoning ordinance. A variety of potential contamination sources already exist within Telford, including underground storage tanks, and other commercial and industrial land uses. Current zoning of primary concern with respect to wellhead protection within Telford includes all residential, commercial, limited industrial, and institutional classifications.
3. While appropriate at the time it was prepared Telford Zoning Ordinance, Part 8, LI - Limited Industrial Districts; Sections 804, 807, 811, 812, 813, and 814 touch on dust, dirt, fly ash; toxic gases; outdoor storage and waste disposal; electric, diesel, gas or other power; industrial waste or sewage; and provision of water, but by today's standards, lack the stringency to provide more effective management of a wellhead protection area.
4. Part 8 also already lists a variety of specific uses that shall not be permitted, including a number of uses that would be desirable to exclude from a wellhead protection area.
5. The comprehensive plan includes references in several of the development objectives (Chapter VII) that are supportive of wellhead protection. For

² Bucks County Water Supply and Model Wellhead Protection Study, Volume II - Technical Report, PA DEP Review Draft; February 1996, Bucks County Planning Commission

example:

- "New industrial development....and be nonpolluting in nature". (Land Use Objective No. 4);
- "The Borough should cooperate with surrounding communities to cope with social and physical problems which transcend municipal boundaries". (Intergovernmental Cooperation and Implementation Objective No. 1)
- The Borough should become actively involved in county and regional planning bodies, whose plans may have an effect on the Borough in the future". (Intergovernmental Cooperation and Implementation Objective No. 2)

Franconia Township

1. TBA Wells Nos. 4 and 5 lie just northeast of County Line Road in West Rockhill Township, in Bucks County. The property containing these wells is owned by the TBA.
2. A very small portion of the Zone 1 area of Well No. 4 extends into Franconia Township. Also, a small area of Zone 2 for both wells also extends into Franconia Township. Generally, the major portion of the proposed wellhead delineation area in Franconia Township is comprised of the Zone 3 area. This amounts to approximately 460 acres, which lie generally southwest of County Line Road or adjacent to Telford.
3. The land uses encompassed by the proposed wellhead protection area are primarily residential, with some smaller institutional and recreational areas included. Current zoning of primary concern with respect to wellhead protection within this area is Residential R-175, R-130 and R-100. The R-175 and R-130 areas both allow agriculture as a permitted use while research laboratories and golf courses are also allowed in R-175 areas.
4. There appear to be minimal commercial activities located within the Franconia portion of the proposed wellhead protection area. The TBA wastewater treatment plant is located in the area.
5. While the overall land use goals of the 1987 Comprehensive Plan update are generally supportive of the goals of wellhead protection, these are two specific goals that are relevant. Under the Environmental category, the goal is to "Preserve sensitive environmental areas". The objective refers to traditionally sensitive areas such as woodlands, steep slopes, and flood plains and wetlands.

Also the Inter-Governmental Cooperation goal refers to cooperating with "surrounding communities in coping with social and physical problems that transcend municipal boundaries".

6. Although there are no Limited Industrial or Industrial Areas in the proposed protection area, the Zoning Ordinance, particularly in Articles XIV - Limited Industrial District, and Article XV - Industrial District, includes various references that would be consistent with the intent of a wellhead protection program. For example, Section 145-74 includes a subsection dealing with protection of valuable and sensitive natural features and Section 145-76 deals with performance standards for certain environmental items.

West Rockhill Township

1. TBA Wells Nos. 4 and 5 lie just northeast of County Line Road in West Rockhill Township. The property containing these wells is owned by the TBA.
2. Almost all of the Zone 1 and Zone 2 areas of both wells are located in West Rockhill. Similarly, a small portion of Zone 2 of Well No. 3, located in Telford, extends into West Rockhill. Much of the remainder of the southern portion of West Rockhill falls within the Zone 3 delineation.
3. The existing or planned land uses encompassed by the proposed wellhead protection area are primarily residential, agricultural, commercial and industrial in nature. Some land use is also devoted to a mobile home park, an extraction industry and institutional use. Current zoning of primary concern with respect to wellhead protection within this area is RA - Rural Agricultural, SR - Suburban Residential, PC - Planned Commercial, PI - Planned Industrial, MHP - Mobile Home Park, and EXT - Extraction.
4. The West Rockhill Township Zoning Ordinance includes at least two district classifications that would appear to be very compatible with the intent of wellhead protection. These are: RC - Residential Conservation and RA - Residential Agriculture.
5. Zoning Ordinance Article V, Natural Resource Standards, Site Capacity Calculations, Open space Standards, and Buffers, of the Zoning Ordinance as well as Article VI - Nuisance Standard; Section 607 - Storage and Waste Disposal are also consistent with wellhead protection.
6. The North Penn Area Comprehensive Plan, which includes West Rockhill Township, addresses a variety of environmental issues; including water resources, and does mention groundwater protection in conjunction with the objective for Lakes and Ponds and Their Shorelines. The policies associated

with the objective under Land Development are very relevant to wellhead protection:

"Objective: Guide land development to maintain and enhance the value of natural features.

Policies:

- Support land development compatible with natural resource protection policies and sensitive to natural site limitations.
- Support urban in-fill development and redevelopment to reduce continued urban sprawl and unnecessary extension of infrastructure.
- Encourage flexible and innovative approaches to site development that enhance environmental features of the site and minimize impacts on natural resources."

Hilltown Township

1. TBA Well No. 6 lies just northeast of U.S. 309 in Hilltown Township. The property containing well No. 6 is owned by the TBA.
2. All of Zones 1 and 2 for Well No. 6 are located in Hilltown Township. A large portion of the township, roughly triangular in shape, falls within the Zone 3 delineation.
3. The existing or planned land uses encompassed by the proposed wellhead protection are primarily residential, rural, industrial and commercial in nature. Current zoning of primary concern with respect to wellhead protection within this area is CR-1 - Country Residential 1; CR-2- Country Residential II; MHP - Mobile Home Park; RR - Rural Residential; PC-1 -Planned Commercial 1; LI - Light Industrial; and HI -Heavy Industrial.
4. The ordinance includes several classifications that would appear to be very compatible with the intent of wellhead protection. There are the Country Residential Districts (CR-1 and CR-2) and RR - Rural Residential.
5. Zoning Ordinance Article V, Performance Standards, includes several provisions that are consistent with wellhead protection. These include Sections 504 (Environmental Performance Standards), 505 (Sewage Treatment and Disposal, Private), 506 (Sewage Treatment, Public), 508 (New Development Water Systems), 519 (Storage and Waste Disposal), and 521 (Floodplain Performance Standards). Article XI, Floodplain Standards, is also another

example of an overlay zoning approach.

6. The Hilltown Township Comprehensive Plan addresses a variety of environmental and conservation issues, including groundwater hydrology. Several goals and proposals included in the Utility Plan Element and the Conservation Plan Element of the Comprehensive Plan are very relevant to wellhead protection. These include:

Utility Plan Element

Water Supply

"Goal I:

To protect groundwater resources by using the recommendations of the Groundwater Study in developing land use policies.

Proposals:

The major conclusions and specific land use recommendation of the Groundwater Resources Report are as follows:

1. Not included
2. Not included
3. Land use policies should be established towards protecting aquifer recharge zones to counteract the loss of groundwater recharge that results from high intensity development with high impervious surface ratios.
4. Minimum isolation distances (100+ feet) should be maintained between on-lot septic systems and water supply wells to avoid well water contamination. For parcels containing both a well and a septic system, a minimum lot area of at least three acres is recommended by the Study.

It is recommended that provisions for water supply be coordinated with land use policies so that:

1. Land use policies and recommended densities take into account the needs for recharge of the groundwater supply, as expressed in the Groundwater Resources Study;
2. Public water service should be provided where possible within the Township.
3. Not included

4. Not included
5. Not included
6. Due to problems with potable water within some of the Villages, efforts should be made to provide these areas of the Township with public water.

Wastewater Disposal

Goal I:

1. To discourage the use of stream discharge and spray irrigation systems without adequate controls to protect the environment and the health and safety of Township residents.
2. Not included
3. To rely on individual and community land disposal systems for development outside of the Development District where conditions are acceptable.
4. To educate homeowners as to the proper care of on-lot sewage disposal systems to ensure the longevity of the system.

Implementation

1. Enact adequate regulations to manage and control use of alternative wastewater disposal systems.
2. Not included
3. Use the Township Newsletter to inform homeowners about proper on-lot septic system maintenance.

Goal II:

To plan for and coordinate land use planning and future growth with water and sewage facilities planning which can be accommodated without exceeding the supply and quality of available groundwater.

Proposal:

1. Not included
2. Utilize the information in the Township's groundwater study regarding available groundwater in setting densities permitted under Township zoning.

Conservation Plan Element

Goal I:

To identify the natural and scenic resources and evaluate the environmental impact of all planning, zoning, and development decisions, making every effort to minimize adverse environmental impacts through sound design and planning policies.

Proposal:

Continue to require the mapping and protection of natural features as part of the development application and review process. Update environmental protection standards as needed to be consistent with county, state, and federal guidelines regarding environmental protection.

Goal II:

The Conservation Plan Element should ensure the preservation of critical natural features.

Proposal:

1. Establish minimum standards of encroachment based upon the capacity of various natural features to withstand the effects of clearing and grading;
 2. Limit or prohibit development in critical or sensitive environmental areas;"
7. The Hilltown Township Subdivision and Land Development Ordinance also makes provisions for sewage facilities (Section 407), a water resources impact study (Section 408), and storm water management requirements (Section 516); all of which are important elements in the context of wellhead protection.

Salford Township

1. TBA Well No. 5 lies just northeast of County Line Road, in West Rockhill

Township, but just across the road from Salford Township. The property containing the well is owned by the TBA.

2. A small portion of Zone 1 and some of Zones 2 and 3 extend into Salford Township. Generally, the major portion of the proposed wellhead delineation area in Salford Township is comprised of the Zone 3 area. The entire proposed protection area in Salford Township amounts to approximately 145 acres.
3. The land uses encompassed by the proposed wellhead protection area are residential and agricultural. The current zoning of primary concern with respect to wellhead protection within this area is RA-3, 3-acre Residential/Agricultural District.
4. Article V, Section 500, Use Regulations, of the Salford Township Zoning Ordinance, includes provisions for several uses that are consistent with wellhead protection. In particular, Item C:

"Natural Open Spaces primarily of a passive nature and conducted out-of-doors, including wildlife sanctuary; forest preserve; nature center; arboretum; outdoor education center; and similar uses."

Other similar compatible uses include residential; game farm, fish hatchery, etc., park and recreation areas, and agricultural activities.
5. Although there is no Limited Industrial Area in the proposed protection area, the Zoning Ordinance, particularly in Article XI - Limited Industrial District, include various references that would be consistent with the intent of a wellhead protection program. These include Sections 1103 - Performance Standards; 1108 - Outdoor Storage and Waste Disposal; 1109 - Electric, Diesel, Gas, or Other Power; and 1110 - Industrial Waste or Sewage.
6. Article XIV, Section 1400, Village Transitions Overlay, for the Tylersport Area, incorporates the overlay zoning concept, as do Articles XII - FPC - Floodplain Conservation District, and XIII - SSC - Steep Slope Conservation District, which is the basic approach recommended for the wellhead protection program.
7. The Salford Township Subdivision and Land Development Ordinance also includes provisions relevant to wellhead protection. These include Article IV - Plan Requirements and Processing Procedures; Section 404 - Preliminary Plans - Plan Requirements; Item A - Map; No. 12; which requires mapping of watercourses, marshes, rock outcrops, wooded areas, and areas subject to flooding; and Article V - Design Standards and Required Improvements, Section 510 - Storm Drains and Surface Drainage is also important.

8. The summary of the final draft of the Salford Township Comprehensive Plan Update (dated January 31, 1996) states that "..the main issues that will be addressed after the plan is completed pertain to sewer and water facilities along with recreation. The Township intends to do the following:
 1. Not included
 2. Not included
 3. Establish Township sewer management districts and on-lot management programs
 4. Not included
 5. Not included
 6. Assure that all planning efforts subscribe to the Township principle of preserving rural character and natural resources within the community."

9. The Township's 1995 Open Space and Environmental Resource Protection Plan includes numerous items that are relevant to wellhead protection. This includes at least three key goals:
 - Maintain and protect the municipality's rural character.
 - Coordinate environmental preservation strategies with surrounding municipalities that expands or enhances existing natural areas.
 - Identify and preserve the Township's vulnerable ecological resources.

In particular, however, Chapter Eleven's Natural Resource Protection Ordinances section, Item C. Groundwater, addresses wellhead protection. This section indicates that Salford will further investigate wellhead protection options.

Borough of Souderton

1. Approximately 330 acres of the northern portion of Souderton, which are adjacent to Telford and part of Franconia Township, lie in Zone 3 of the proposed wellhead protection area.

2. A number of land uses of concern to wellhead protection are allowed by the current zoning ordinance. Current zoning of primary concern with respect to wellhead protection within Souderton includes all residential, commercial, and

limited industrial classifications.

3. While appropriate at the time it was prepared, Souderton Zoning Ordinance, Article X, LI - Limited Industrial Districts; Sections 1003, 1008, and 1009 touch on dust, dirt, fly ash, toxic gases, outdoor storage, and waste disposal; and electric, diesel, gas, or other power; but by today's standards, lack the stringency to provide more effective management of a wellhead protection area.
4. Article X also already lists a variety of specific uses that shall not be permitted, including a number of uses that would be desirable to exclude from a wellhead protection area.
5. The Comprehensive Plan includes references in several of the community development goals (Chapter VII) that are supportive of wellhead protection. For example:
 - "4. That Souderton seek to preserve and increase recreational and open space amenities wherever and whenever possible, protect stream valleys and floodplains from encroachment by buildings, fill, and other obstructions
 5. That the Borough cooperate with planning agencies and governing bodies of adjoining municipalities in solving common problems".

Chapter XI - Implementation further discusses the importance of intergovernmental cooperation with regard to deriving mutual benefits.

Montgomery County

Montgomery County's open space preservation program can also be a useful tool. Open space can be purchased through this program that will protect wellhead areas. Municipal parks can be developed on land purchased as protection areas. The open space program provides funding for outright purchase as well as easements, and both of these can be used in wellhead protection.

Bucks County

Bucks county is currently in the process of developing an open space program and may consider tying open space areas to wellhead protection.

Conclusion

Within this context a recommended wellhead protection program was developed and is presented in Section 5.

4.2 Public Participation and Education

Although no members of the "public" as such attended any of the Steering Committee meetings, the Steering Committee had (and continues to have) broad based representation from those municipalities choosing to participate, including municipal, business, and educational representatives. Once a "Draft Wellhead Protection Program" was agreed to, it was submitted to the Telford Borough Authority for review and comment. This draft program was approved at the regularly scheduled September 12, 1996 meeting of the Authority. Approval was also granted to contact each of the municipalities included in the designated WHP area to discuss the program with those municipalities; to give them copies of the draft plan; and to request that their planning commissions and municipal government review and support the WHP program.

Subsequently, a team consisting of the Telford Borough Authority Chairman, the Steering Committee Chairman, the TBA Consultant (for technical questions), and the TBA solicitor (for legal questions) attended a regularly scheduled meeting of each municipality to present the draft WHP program and to request support for the plan. The presentations took place as follows:

Telford Borough (Montgomery and Bucks Counties)	September 16, 1996
Souderton Borough (Montgomery County)	September 23, 1996
Franconia Township (Montgomery County)	October 14, 1996
Hilltown Township (Bucks County)	October 21, 1996
Salford Township (Montgomery County)	October 31, 1996
West Rockhill Township (Bucks County)	November 26, 1996

A presentation was also made to the North Penn Water Authority on September 25, 1996.

Each presentation included an overview of the draft WHP program by the TBA Chairman, Mr. Timothy Hagey, or the Steering Committee Chairman, with support from the other presentation members. A variety of questions were asked and addressed.

Other public education and participation activities have included:

- Providing a speaker to discuss TBA's draft program at the Bucks County Water Supply and Wellhead Protection Seminar (September 26, 1996; Bucks County Planning Commission).
- Providing speakers and exhibit materials for the Bucks County site of the March 1997 "National Teleconference on Groundwater Protection" sponsored by the League of Women Voters and the U.S. Environmental Protection Agency.
- Application to "The Groundwater Foundation" for designation as a Groundwater Guardian Community.

There have also been several newspaper articles concerning the project. Copies of these are included in Appendix 4.

One key consideration of this program has been to pace the level of public education commensurate with the level of support and participation by the six municipal governments. As of November 1997, four municipalities had indicated a very favorable response to supporting the draft WHP program and it was decided to proceed with additional WHP work related to further defining potential sources of contamination and public education.

To assist with this, a local student environmental organization, Students Against Violating the Earth (SAVE) at the Souderton Area High School, was contacted to determine if SAVE would be interested in working with the TBA on these two issues. SAVE has received regional and national recognition for some of its other environmental activities and agreed to participate in TBA's WHP program. SAVE is presently conducting a more detailed inventory of potential sources of contamination and will subsequently assist in education programs targeted to specific potential sources of contamination and the general public.

Public education is anticipated to be an on-going program with key participation by the SAVE organization in developing and presenting this information. Overall direction of the public information and education program will remain with the TBA. The TBA and its staff will coordinate and review all activities related to public education.

As materials are developed or activities occur, they will be recorded and integrated as part of the wellhead protection program.

5.0 RECOMMENDED PLAN

As shown on the Wellhead Protection Area Map, the communities potentially involved in this program hold different geographical positions within the WHPA. Likewise, each of the communities contains a different set of potential contaminants and has varying zoning plans. Each of the municipalities has a mixture of existing activities and land uses including industrial, commercial, and residential, and agricultural, which dominates the area in terms of land uses. Consequently, each municipality potentially involved in this Wellhead Protection Program is likely to have its own management agenda, depending upon its location within the WHPA, potential contamination sources, and future development plans. The purpose of this section is to provide guidance for each municipality with respect to participation in the Wellhead Protection Program (WHPP).

When considering a wellhead protection program, there is a range of options or aggressiveness, that a municipality can consider. The range of options begins at "Do Nothing" and carries up through extremely aggressive activities at the other end. The "Do Nothing" alternative means no changes are made with respect to protecting water supplies. A very aggressive program could prevent any additional development in a Zone 2 wellhead area and possibly severely limit it in Zone 3. In between these extremes are other options which are likely to be more acceptable to a municipality and its citizens and therefore more implementable and yet provide a good measure of groundwater protection. It is within this context that this wellhead protection program was developed. As a starting point, however, the potential impact for a "Do Nothing" alternative will be considered as a point of reference from which to proceed to a wellhead protection program.

5.1 Do Nothing Alternative

As already stated, the "Do Nothing" alternative means no changes are made with respect to protecting water supplies. There would be no land use controls in critical areas or local control of potential contamination threats. Existing residential, industrial, commercial, and agricultural activities and new development will continue. The threats of groundwater contamination, in general, will continue and may not always be readily identifiable. While certain commercial and industrial activities may be subject to state or federal regulation, many other activities that could be groundwater threats are not so regulated and under either state or federal jurisdiction would not be responsible to local control. If groundwater contamination occurs, it may be very costly to clean-up and, if clean-up is prohibitive, alternate water supply sources may have to be found which could also be very costly and difficult to implement.

5.2 **Regional Cooperation**

While an individual municipality has the authority to implement a wellhead protection program only within its jurisdiction, the wellhead delineation map indicates that groundwater flow and potential contamination problems in the study area will not respect municipal boundaries, and regional cooperation will contribute greatly to protecting groundwater resources for everyone. In many cases, not only are the wells located in more than one municipality, much or all of Zone 2 may be in one or two other municipalities. Similarly, Zone 3 extends across all six municipalities.

Given the nature of the area's geology a problem at one location in Zone 3 could quite possibly affect not only TBA's wells, but any of the private water systems. To be truly effective, wellhead protection planning will require the cooperation of all the municipalities.

In addition to those persons served by the TBA water system, every residence, farm, business, or industry with a private well within the potential wellhead protection area will benefit from a protection program; and, as noted earlier, perhaps even more than those on the TBA system. For example, if a municipal source were to be contaminated, it would be TBA's responsibility to deal with the issue. If an individual's well is contaminated, he or she will likely have to deal with the problem without assistance from government.

In summary, these communities do actually rely upon one another to maintain a clean water supply even if it is not readily obvious. Communities can also benefit from comparing programs and coordinating their efforts, particularly in education, emergency and contingency planning, and land-use planning. By keeping in mind that groundwater knows no political boundaries and by planning for this unavoidable fact, the municipalities involved in this program will be able to develop more efficient and effective wellhead protection programs.

5.3 **Wellhead Protection Program Components**

The Steering Committee recognized that with six municipalities located in two counties, a successful wellhead protection program would have to allow for a "menu" of activities so that the municipalities could select a program that would be compatible with their individual goals and needs while still supporting groundwater protection. The following wellhead management tools were identified as those most likely to be acceptable, individually or collectively, to the municipalities.

Overlay Zoning

The primary and possibly the most effective recommended wellhead protection program for the six potential municipalities that could participate is based on an overlay zoning approach. This approach would incorporate key provisions for control of certain land uses and special permitting of others, provisions for control of toxic and hazardous materials, and provisions for land development and subdivisions.

Land Use, or Source, Restrictions: As discussed in Section 1.2, Pennsylvania's guidelines for WHPA delineations recommend three zones of protection as the basis of regulatory controls. Source prohibitions simply reduce the concentration of hazardous materials within the WHPA by restricting or prohibiting certain activities within each of these zones. The most strict regulations apply to Zone 1 because of its proximity to the well itself and decreasingly strict regulations apply to Zones 2 and 3 respectively because of their lesser influence on the groundwater supply.

The recommended management approach to source restrictions include both land uses which are prohibited and land uses which are permitted only if a special permit is granted through a specific application process.

A model wellhead protection overlay zoning ordinance has been prepared for consideration by the six municipalities which are entirely or partially included in the proposed wellhead protection area. This may be used by municipal officials as a starting point to protect local groundwater resources both for community and individual water supply systems and may be modified as necessary to reflect local concerns. (Note: An alternate model ordinance is the one prepared by the Bucks County Planning commission.)

While the entire model ordinance is included in the Appendix, Exhibit 1 is an outline of the various sections in the ordinance and the following text reviews some of the key points in the ordinance.

Sections 3, 4, 5, and 6 are the heart of the ordinance and are summarized as follows.

Section 3: Regulated Land Uses, establishes that certain particular regulated land uses will be prohibited or permitted only by Special Permit, within Zones 1, 2, or 3, as applicable, as set forth in a schedule of these regulated land uses, which is incorporated in the ordinance.

Section 4: Reporting Requirements, provides that for each lot or tract of land within the overlay district, upon which is conducted a regulated land use, that certain reports or information must be submitted to the municipal Code Enforcement or Zoning Officer.

Section 5: Administration, provides that uses of land in existence on the date of

EXHIBIT 1

- SECTION 1 Purpose and Intent; Authority. Sets forth the purpose of the Ordinance, as well as the legal authority for its adoption.
- SECTION 2 Establishment and Delineation of Wellhead Protection Overlay District and Wellhead Protection zones. Defines and delineates the Wellhead Protection Overlay District ("District") and Zones 1, 2, and 3 therein.
- SECTION 3 Regulated Land Uses. Identifies the land uses and activities which are to be regulated in the District.
- SECTION 4 Reporting Requirements. Sets forth the reporting requirements for Regulated Land Uses within the District.
- SECTION 5 Administration. Describes the procedures to be applicable to the administration of the Ordinance, including the granting of Special Permits, nonconforming uses, and appeals.
- SECTION 6 Subdivision and Land Development Review. Required consideration of compliance with this Ordinance as well as additional planning requirements (if they do not already exist) as part of subdivision and land development review.
- SECTION 7 General Exceptions. Provides exceptions to the application of the Ordinance for transit and residential use within the District.
- SECTION 8 Preventive and Enforcement Remedies. Contains provisions for enforcement through civil actions, summary criminal actions, cease and desist orders and enforcement orders.
- SECTION 9 Fees. Provides for the establishment of a schedule of fees by the resolution of (Borough Council) (Township Supervisors).
- SECTION 10 Miscellaneous. Contains provisions regarding conflicts, severability, a savings clause, and an effective date.

enactment of the ordinance are deemed to be "nonconforming uses" and may be continued by the present or any subsequent owners with certain provisions. Some of these provisions are that it be in compliance with all laws and regulations; that the nonconforming use is not discontinued for twelve consecutive months; and provides that the nonconforming use is not materially altered, changed, or expanded. This section also provides that a regulated land use is deemed to be new or materially altered, changed, or expanded under certain conditions. Some of these include the production and/or storage capacity of the regulated land use is increased; the types of any substances which give rise to the regulated land use are changed; and the quantity of any substance which gives rise to the regulated land use is materially increased.

Generally, the reports and information required include copies of all federal, state, and county permits and similar documents pertaining to a variety of environmental laws and regulations. Similarly, copies of all notices, orders, enforcement actions, and similar documentation received by the record owner in connection with these various environmental laws and regulations must be provided to the municipality. In the event any contaminants and/or regulated substances are released on or from any lot or tract of land within the overlay district, this section also requires the owner to notify the municipality as well as any other agencies that are required to be notified.

Section 6: Subdivision and Land Development Review, prohibits storm water retention basins, but allows storm water detention basins with an impermeable liner. If subsurface sewage disposal is proposed, adequate primary and secondary absorption areas are required on each lot. Also additional investigations, mapping and testing may be required to protect water resources.

Other Wellhead Protection Plan Components

Cluster/PUD Design: Where possible, it is recommended that the municipalities encourage the cluster or PUD* development for residential development within the WHPA. The goal is to increase density at selected areas while maximizing open space.

* PUD = Planned Unit Development

Inspection and Monitoring Programs: Groundwater inspection and monitoring programs include direct observation of those contamination sources allowed to remain or be constructed within WHPAs. Municipalities use these programs to keep a watchful eye on specific contamination sources such as large industrial facilities, landfills, and junk yards.

Inspection programs require industries to allow community officials to review the operations of the facility on a regular basis and to require preventive or corrective measures to be taken to reduce the possibility of a spill. Some inspection programs are coordinated with efforts to implement community right-to-know requirements. Fire companies are often involved in such programs so that fire fighting plans can be

developed which evaluate potential groundwater contamination.

Monitoring programs have been developed which require new facilities constructed within WHPAs to install their own monitoring wells and pay for the costs of their sampling and water testing.

Purchase or Donation, of Property: Some communities have purchased property to protect wellhead areas. Acquisition of land is probably the surest method for a community to control land use and is one of the reasons why many states encourage municipal ownership of land in Zone 1 protection areas.

Typically, municipalities will build parks and recreation areas in lands acquired for water supply protection purposes.

In situations where purchasing the Zone 1 property has not been a realizable option, some communities have acquired partial interests in properties. Acquisition of partial interests typically involves conservation easements or development rights which prevent landowners from specified actions on the property covered by the easement, yet allows landowners to continue many other productive uses of their land.

An easement for wellhead protection would include prohibitions on certain activities such as hazardous materials storage, junk yards, etc. Easements apply to all subsequent landowners for the full term of the easement, which may be a finite number of years or perpetual.

Public Education: Public education programs aimed at groundwater protection issues are an integral and absolutely necessary as part of any Wellhead Protection Program.

These education programs are used to build understanding and support for regulatory programs, such as zoning and land use controls, and to raise awareness concerning individual efforts that can be made to promote water supply protection.

In addition to literature, communities can establish educational programs which help citizens, businesses, and industries to best comply with wellhead protection regulations and prevent contamination of their water supply. Some suggested programs are holding Best Available Technology (BAT) seminars or distributing pamphlets concerning subjects such as above and underground storage tanks and Integrated Pest Management Programs. Communities can benefit from utilizing local knowledge as well as draw on resources from outside the community such as university extension programs and conservation districts.

Residential development can represent a significant amount of potential contamination when the extent and variety of pesticides, fertilizers and other applications for lawns and gardens are considered. A program to raise the awareness and cooperation of

homeowners about the potential for groundwater contamination by the products they use should be a basic element of a public education program.

Working with the local school district provides a very desirable vehicle for involving students at all levels in learning about the importance of water and the need to protect it through activities such as special projects, lectures, art or slogan contests, essays, field trips, and similar activities.

Environmental Management Programs: There are many local environmental management programs which have been developed to address specific pollution concerns. These include used oil collection and recycling programs, household hazardous waste pick-up days, septic system management programs, and manure/nutrient management. These programs are highly successful and can address a wide-range of contamination sources in the WHPAs. Such programs often require substantial amounts of public education and community involvement.

The disposal of household hazardous wastes (i.e., cleaning solvents, paint thinners, etc.) in homes relying on septic systems can be a serious threat to water supplies in the Telford area. Many communities have developed programs aimed at encouraging homeowners to properly dispose of their household hazardous wastes. Typically, these programs include public education and community sponsored household hazardous waste pick-up days. Both Bucks and Montgomery Counties provide this service.

The recommended program is to include information about the proper disposal of household hazardous waste as part of public education efforts and the role this plays in protecting everyone's water resources.

Steering Committee

The Steering Committee should continue to meet on an annual basis to review activities in the wellhead protection area, to discuss and advise the TBA about possible changes in the WHP program, and to report back to their respective municipalities on the status of the wellhead protection program.

5.4 Implementation Status/WHP Area Management and Commitment

The overall development, on-going monitoring and guidance, public education, and related activities are the responsibility of the Telford borough Authority. However, the basic designation of wellhead protection areas and certain aspects of implementation; e.g., overlay zoning, are the responsibility of the six identified municipal government bodies.

The TBA has sponsored the development of the wellhead protection plan; provided presentations and information to the six municipalities; will provide administrative

assistance to these municipalities; has enlisted the services of SAVE to assist with potential source inventories and public education; and, will provide for overall monitoring of the wellhead protection area.

Funding for the wellhead protection program is supported by the revenues of the TBA. In-kind services are provided by the student volunteer members of SAVE for the inventory and public education activities. Other in-kind services are provided by the Steering Committee and TBA members as well as some time being provided by the technical and legal advisors.

The implementation status of wellhead protection in the six municipalities is as follows:

Telford Borough, Montgomery and Bucks Counties

Telford Borough has adopted a wellhead protection overlay zoning ordinance based on the model ordinance included in this Appendix. A reduced copy of the overlay zoning map is shown on the following page).

West Rockhill Township, Bucks County

The West Rockhill Township Planning Commission has recommended that the Township Supervisors adopt a wellhead protection overlay zoning ordinance. The draft of this material is prepared. However, the Township is considering other zoning changes as well and plans to act on all changes as a "package" rather than piece-meal changes. Adoption of these revisions is expected to occur no later than June 1998.

Hilltown Township, Bucks County

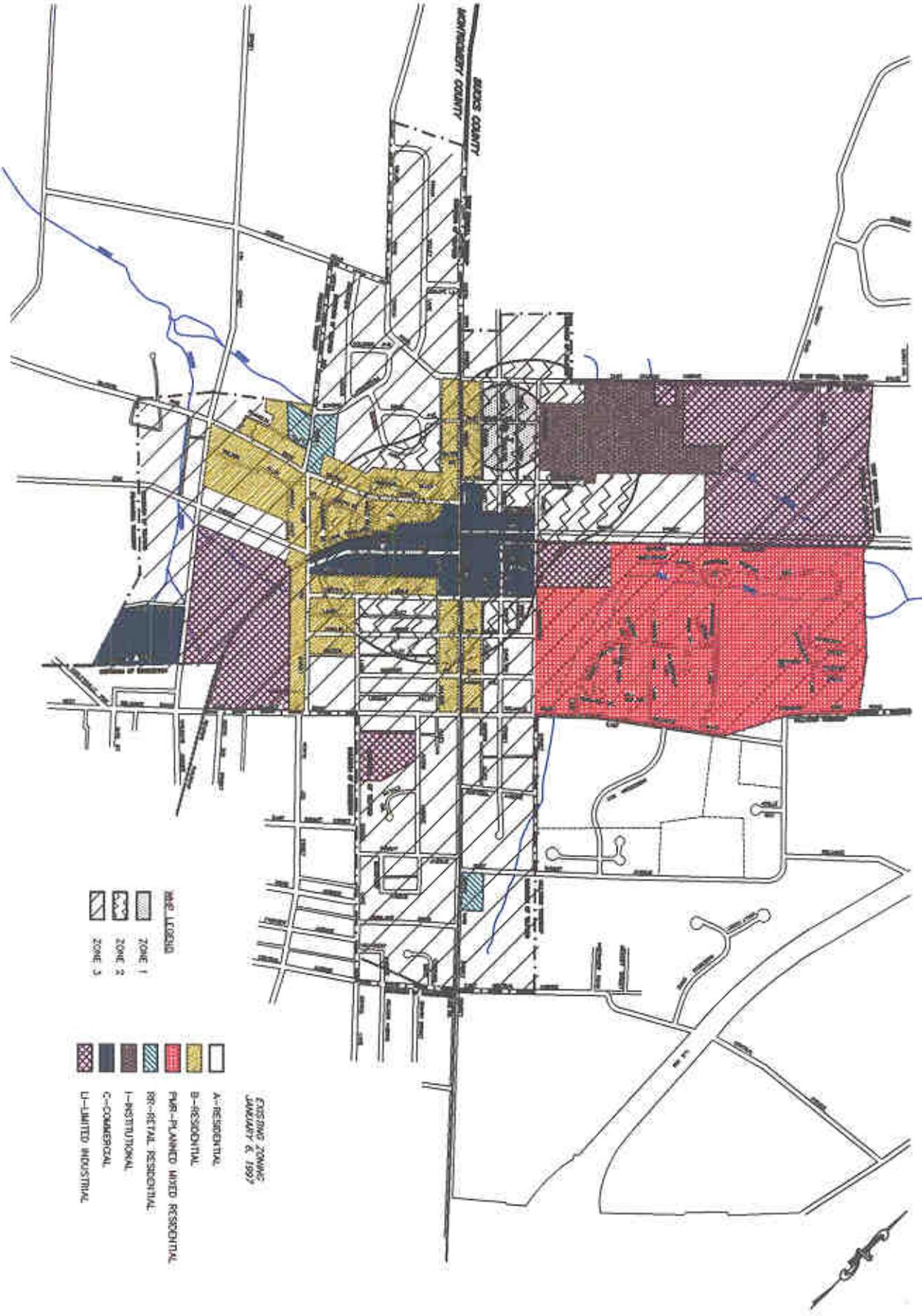
No action as of this date of this report; it is anticipated that public education will be the program for this area.

Salford Township, Montgomery County

The Township Supervisors have indicated support for wellhead protection. However, since only 145 acres of the Township are included in the wellhead protection area, the Supervisors plan to modify an existing ordinance rather than create an entirely new one for such a small area. The Township requested and has been provided with electronic and paper copies of the model ordinance in the appendix.

Franconia Township, Montgomery County

Franconia Township has adopted a resolution supporting the TBA wellhead protection program (see resolution on the following page). As a result of the TBA work, Franconia Township has asked North Penn Water Authority, which also has wells and



- MAP LEGEND**
- ZONE 1
 - ZONE 2
 - ZONE 3
-
- A--RESIDENTIAL
 - B--RESIDENTIAL
 - PUR--PLANNED UNID RESIDENTIAL
 - RR--RETAIL RESIDENTIAL
 - I--INSTITUTIONAL
 - C--COMMERCIAL
 - LI--LIMITED INDUSTRIAL

EXISTING ZONING
 JANUARY 6, 1997

<p>BOROUGH OF TELFORD BOUND AND UNINCORPORATED TOWNSHIP - PENNSYLVANIA Telford Planning Dept.</p>	 SSM LAND SURVEYING & ENGINEERING 1000 W. 10TH ST. SUITE 100 TOWNSHIP OF TOWNSHIP, PA 17067 PHONE: 717-839-1111 FAX: 717-839-1112	<p>DATE BY: _____ CHECK BY: _____ APPROVED: _____ PROJECT NUMBER: _____</p>	<p>DATE BY: _____ CHECK BY: _____ APPROVED: _____ PROJECT NUMBER: _____</p>	<p>DATE BY: _____ CHECK BY: _____ APPROVED: _____ PROJECT NUMBER: _____</p>	<p>DATE BY: _____ CHECK BY: _____ APPROVED: _____ PROJECT NUMBER: _____</p>
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customers in Franconia, if North Penn would be interested in developing a similar WHP plan for its wells and the Township would then support both programs. At this time, the Franconia Township Planning Commission, the North Penn Water Authority, and the Montgomery County Planning Commission are working out the details for North Penn to proceed with a WHP program for the Authority's wells in the Township.

Souderton Borough, Montgomery County

No action as of the date of this report; it is anticipated that public education will be the program for this area.

5.5 **Contingency and Emergency Response Planning**

Although the goal of wellhead protection is to prevent contamination events from occurring, no wellhead protection program can guarantee that such events will not happen. Therefore, effective wellhead protection planning includes a contingency plan to direct a coordinated and timely clean-up strategy for hazardous material spills to ensure a continued supply of potable water. It is recommended that communities jointly develop this plan as spill clean-up can require the efforts of many individuals such as fire companies and knowledgeable hazardous materials handlers.

Telford Borough presently has an Emergency Management Agency Disaster Operations Plan. This plan was completed in February 1992, and updated in December 1996. The current Emergency Management Coordinator is Joseph F. Rausch. This plan provides adequate assistance in outlining the responsibilities and functions of any disaster incident within the Borough and can serve as the basis for initial and follow-up activities by the TBA for emergency situations that would potentially affect the wells. With regard to wellhead protection, the major issues of concern would be spills or accidents that would involve release of hazardous materials into the groundwater supply to TBA's wells. The following list details the location within the Emergency Management Plan of the relevant information.

1. Highway Accidents Involving Tank Trucks or Spills

Page 16 of the Emergency Management Plan outlines the contacts for any emergencies related to spill or tank truck accidents. Highway spills likely represent the greatest threat to any drinking water well in the TBA system.

2. Conrail/SEPTA



Township of Franconia

Box 128, 671 Allentown Road
Franconia, Pennsylvania 18924

Tel. (215) 723-1137

Fax (215) 723-4167

November 19, 1997

Mr. Charles R. Feindler, Manager
Telford Borough
122 Penn Avenue
Telford, PA 18969

RECEIVED

NOV 24 1997

SPOTTS, STEVENS
AND MCCOY, INC.

Dear Dick:

I am pleased to inform you that at their November 10, 1997 Regular Meeting, the Franconia Township Board of Supervisors adopted Resolution No. 97-37-10-11 supporting the concept of the Wellhead Protection Program as outlined in a report as prepared by Spotts, Stevens and McCoy, Inc., consulting engineers for the Telford Borough Authority. A copy of the Resolution is enclosed for your information.

Further study of how the concepts delineated in the report might be incorporated into the Franconia Township Zoning Ordinance is needed. The recommendations of the report are being reviewed by the Franconia Township Planning Commission and the Board of Supervisors.

I hope the above referenced Resolution is of assistance to the Borough Authority. Franconia Township will continue to keep you informed of our progress.

Sincerely,

TOWNSHIP OF FRANCONIA

Anne D. Williams
Assistant Township Manager

Enclosure

- c: Board of Supervisors
- Planning Commission
- J. Delton Plank - Township Manager

Page 24 lists the emergency phone contacts for Conrail and SEPTA.

3. Texas Eastern Gas Pipeline

A gas line rupture can pose a serious threat to groundwater. Page 25 of the plan lists all contacts for the Texas Eastern Companies.

4. County Emergency Preparedness

Page 20 of the plan identified the Bucks County and Montgomery County contacts should there be a disaster occurrence. The phone number for Bucks county is: 215-348-7518; the Montgomery County phone number is: 610-631-6530.

The aforementioned items are only mentioned due to their relevance to wellhead protection planning. The complete Emergency Management Plan is attached as an appendix to this Wellhead Protection Plan. All emergency response questions should be referred to the Emergency Management Plan. Any questions that arise that are not found in this document should be directed to the Telford Borough Emergency Management Agency, attention Joseph F. Rausch.

Interconnections

Two interconnections presently exist between the TBA system and two other water systems. These other water systems are the North Penn Water Authority and the Hilltown Township Water and Sewer Authority. The interconnection with North Penn is an 8-inch connection and is located near the intersection of School Lane and East Summit Street.

The interconnection with Hilltown is an 12-inch connection and is located on Schoolhouse Road, just west of Keystone Drive.

The interconnections, which allow for mutual assistance, are normally closed and are only used in cases of emergency for either party.

As a result, the TBA system has immediate access to alternate sources of supply in the event of serious contamination to one or more of TBA's wells. A third potential interconnection with the Sellersville system has been discussed, but is not yet a reality.

5.6 New Sources

The TBA planning for the future includes provision for additional wells. The Authority is currently considering acquisition of an existing well which will allow greater resting periods for the current wells and which should provide for the Authority's needs well into the future.

The TBA intends to acquire an existing well on the property of the North American Dräger Company for public water supply. The well is located at the approximate coordinates of 40° 20' 15.36" north latitude and 75° 19' 36.09" west longitude, on the 7.5 minute U.S. Geological Survey (USGS) Telford, PA, quadrangle. The site is situated within the Lower Delaware River Basin (Subbasin E).

A sanitary survey conducted on November 13, 1997 took into account both natural and man-made factors which might affect the quality and quantity of the groundwater. The well site is not located within 200 feet of a stream. Thus, the Surface Water Identification Protocol does not apply. We measured 173 feet to the property line of the nearest domicile and 340 feet to the nearest building. An active quarry is located northwest of the site and the impact of this quarry will be considered. A public sewer main is located southeast of the site but is not anticipated to be a problem as sewage is conveyed off-site.

Available information indicates the well is drilled in Brunswick Shale to a depth of about 500 feet. If the anticipated yield is 400 gallons per minute (gpm), then the Zone I wellhead protection area (WHPA) radius is 250 feet. A WHPA of this size would overlap the adjacent property of the domicile. Pumping the well at a rate other than 400 gpm will change the Zone I WHPA radius.

The inspection did not reveal any other apparent potential or existing contaminant sources in proximity to the well site. DEP has found this site to be acceptable for the development of a public water supply well. As a result, the TBA is continuing to pursue the acquisition and upgrading of this well.

6.0 OTHER WELLHEAD OR GROUNDWATER PROTECTION PROGRAMS

Although wellhead protection is a relatively new strategy to protect drinking water systems that rely on groundwater, a significant amount of activity has already occurred throughout the United States and within Pennsylvania.

The following is a brief summary of other wellhead or related groundwater protection programs being undertaken in Pennsylvania.

- Borough of Kutztown: Adopted wellhead protection overlay zoning ordinance.
- Borough of Topton: Adopted wellhead protection overlay zoning ordinance.
- Borough of East Stroudsburg: Adopted wellhead protection overlay zoning ordinance.
- West Whiteland Township: Adopted ordinance relative to protection of carbonate geology areas.
- Upper Mount Bethel Township: Adopted wellhead protection overlay zoning ordinance.
- Cranberry Township: Considering adoption of wellhead protection overlay ordinance.
- Center County: Developing extensive groundwater protection programs.
- Allegheny County: Developing zoning and subdivision provisions for groundwater protection including overlay zoning.
- Maxatawny Township: As part of overall rezoning, considering down-zoning as a groundwater protection measure.
- Mount Joy Township, Mount Joy Borough, East and West Donegal Townships, and Elizabethtown Borough: Developed cooperative efforts for a defined wellhead protection area.
- Complanter Township (for Rouseville Borough): Adopted wellhead protection overlay zoning ordinance.

SUMMARY OF PROPOSED WELLHEAD PROTECTION PROGRAM

Purpose: Protect public health, safety, and welfare through preservation of the area's groundwater resources.

There are numerous examples of groundwater sources becoming contaminated from a variety of pollutants. These situations have resulted in either expenditures of large sums of money to treat the water, or forced the development of alternative, and often expensive, secondary sources of supply.

The Telford Borough Authority is undertaking a pro-active approach to minimizing the possible contamination of our common water resources.

Background: The Federal and Pennsylvania Safe Drinking Water Acts provide for wellhead protection and in August 1996 major amendments to the federal law were signed. One key provision of those amendments deals with enhanced protection of drinking water sources.

Bucks County has prepared a draft water supply and model wellhead protection study. Montgomery County is working toward preparation of a wellhead protection study/plan

Beneficiaries: Users of both community water systems and private individual wells.

Summary of Project:

- Delineated 3-zone wellhead area to be protected
 - 6 municipalities fall in the delineation area: Telford and Souderton Boroughs; West Rockhill, Hilltown, Franconia and Salford Townships
 - Requested participation of these municipalities on a steering committee
 - Preliminarily identified sources of potential pollution
 - Steering Committee reviewed various management tools
 - Reviewed each municipality's zoning or subdivision ordinances, comprehensive plan or similar documents finding they already contain certain elements relevant to wellhead protection

Recommended Plan:

- Key Component: Overlay Wellhead Protection District Ordinance. Please see

summary on Exhibit 1.

- Other Components:
 - Public education
 - Groundwater monitoring
 - Encourage cluster/PUD development
 - Encourage purchase, or donation, of land or easements
 - Support environmental programs such a recycling and collection of household hazardous wastes

WELLHEAD PROTECTION IMPLEMENTATION PLAN

1. Review proposed program with Steering Committee.
2. Meet with Telford Borough Authority.
3. Provide copies of report, etc. to Bucks and Montgomery County Planning Commissions and request their support.
4. Submit copy to PA DEP
5. Meet with Borough Councils of Telford and Souderton and Boards of Supervisors of Franconia, Salford, Hilltown and West Rockhill Townships.
6. Meet with Planning Commissions of above municipalities, if requested to do so.
7. Finalize wellhead protection plan, develop GES map, and refine list of potential sources of contamination.