# The North Carolina Source Water Protection Guidebook

## Developing a Local Surface Water Protection Program

**Developed by:**

**North Carolina Department of Environmental Quality**
**Division of Water Resources**
**Public Water Supply Section**
**Drinking Water Protection Program**
**Source Water Protection Program**

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# Table of Contents

# Introduction

Drinking water, which may be derived from ground water, surface water, or both, is vulnerable to contamination. If the drinking water source is not protected, contamination can cause a community significant expense and place the public's health in danger. Cleaning up contamination or finding a new source of drinking water is complicated, costly and sometimes impossible. Consequently, preventing contamination of the drinking water source makes sense from an economic as well as a public health and environmental standpoint.

Source water is untreated water from lakes, streams, reservoirs or ground water that is used as a drinking water supply. Source water quality can be threatened by everyday activities and land uses, ranging from industrial wastes to the chemicals applied to lawns. Source Water Protection (SWP) is the process of identifying and managing potential sources of contamination that may impact a drinking water supply. The ultimate goal of SWP is to prevent contaminants from entering a source of public drinking water.

The North Carolina Source Water Protection Program (SWPP) is a voluntary program designed to support local efforts to protect public drinking water sources. The SWPP is administered by the Public Water Supply Section (PWSS) of the N.C. Department of Environmental Quality (DEQ). A key feature of the SWPP is that each public water supply system develops its own local SWP plan based on local conditions and priorities. The SWPP affords public water supply systems a broad range of options for protecting their water supplies. The SWPP also provides information about funding and other resources available to support such local protection efforts.

The SWPP encompasses both surface water and ground water sources of drinking water. This guidebook is intended to assist public water supply systems in the development and implementation of a local SWP plan for surface water sources. Public water supply systems interested in developing a local SWP plan for ground water sources of drinking water should refer to "The North Carolina Wellhead Protection Guidebook" available on the PWSS' Website at NC Wellhead Protection Guidebook

# How to use this guidebook

Each chapter of this guidebook corresponds to a step in preparing a local SWP plan. When the steps are complete, the result should be a comprehensive SWP plan ready for submission to the PWSS for review and approval. It is recommended that each step be completed in order because information gathered during one step is used in subsequent steps. Below is a brief description of each step.

***This guidebook will lead you through the steps of developing a local SWP plan that addresses local needs and also meets State requirements for approval.***

Step 1. Obtain a copy of your Source Water Assessment Program (SWAP) report: This chapter guides the local public water supply system through the process of obtaining a copy of their SWAP report completed by the PWSS for their respective public water supply intakes. The SWAP reports contain basic information about potential contamination sources (PCSs) and the relative susceptibility of the public water supply systems intakes to these PCSs.

Step 2. Form a local Source Water Protection Team: This chapter gives suggestions for identifying those people and groups that should be included on the local SWP Team. This SWP Team will develop and implement the local SWP plan.

Step 3. Conduct a Potential Contaminant Source Inventory: This chapter will help the SWP Team identify PCSs that may threaten the surface water supply. Once the PCSs have been identified, the relative risk posed to the public water supply intake(s) can be assigned. In this way, the most serious concerns can be given priority.

Step 4. Develop management strategies: This chapter guides the SWP Team through the process of developing management strategies for managing the threat posed by the PCSs identified in Step 3. The goal of management is to minimize the potential for contamination to enter the drinking water supply. Management strategies may take the form of regulatory strategies (such as zoning or use permits) or non-regulatory strategies (such as education or household hazardous waste collection). The local SWP Team must decide what methods are appropriate for their public water supply system.

Step 5. Develop a contingency plan: This chapter gives suggestions for developing a contingency plan to respond to emergencies that might threaten the drinking water supply.

Step 6. Develop a schedule for implementing and updating the local SWP plan: This chapter guides the SWP Team through the process of developing an implementation and maintenance schedule for the local SWP plan.

Step 7. Submit the local SWP plan to the PWSS: This step includes instructions for submitting the completed local SWP plan to the PWSS for review and approval.

# Step 1: Obtain a copy of your Source Water Assessment Program (SWAP) report

The Federal Safe Drinking Water Act Amendments of 1996 required each state to develop a SWAP and to conduct source water assessments for all sources of a public water supply. A source water assessment is a qualitative evaluation of the potential of a drinking water source to become contaminated by PCSs occurring within a delineated assessment area.

In accordance with the requirements of these amendments, the PWSS completed a source water assessment for approximately 10,000 drinking water sources in North Carolina. This included delineating an assessment area around each drinking water source, conducting an inventory of PCSs occurring within these assessment areas, and assigning a susceptibility rating to each drinking water source. The results of these assessments are contained in SWAP reports available to all public water supply systems in North Carolina. Each of these SWAP reports contains the following key information about the public water supply systems intakes:

- a map showing the delineated assessment areas,
- an inventory of known and potential contaminant sources occurring within the assessment areas, and
- an assessment of the relative susceptibility of each drinking water source to the identified potential contaminants.

A detailed description of the procedure used by North Carolina to complete the assessments is found in Section 6 of each SWAP report. Public water supply systems may download a copy of their SWAP report by accessing the PWSS's Source Water Assessment and Protection Website at http://www.ncwater.org/pws/swap/. These SWAP reports are an extremely valuable starting point for public water supply systems interested in developing a local SWP plan. Information contained in the report will allow systems to identify local drinking water sources, identify PCSs within the delineated assessment areas, understand the inherent vulnerability to contamination of the watershed, understand the relative susceptibility of the source to potential contaminants and prioritize areas requiring protection. Questions regarding the SWAP report should be directed to the PWSS at 919-707-9070 or by e-mail to swap@ncdenr.gov.

# Step 2: Form a SWP Team

The greatest means of protecting water is at the local level where most land-use decisions are made and where potential pollution sources must ultimately be managed. The local SWP Team will guide the development of the SWP Plan from beginning to end. Once approved, the SWP Team will be responsible for implementation of the plan.

## 2.1 Who should be on the SWP Team

It is important to represent a wide range of stakeholders on your SWP Team. The word "stakeholder" is used to describe anyone who has a stake in or has some interest in, protecting local sources of drinking water. If the support of different stakeholders is not obtained in the planning stage, the SWP Team may encounter resistance when implementing the recommended protection strategies.

The public water supply system should take the lead in identifying the appropriate members of the local SWP Team. Many agencies, organizations and individuals are already involved to some degree in water quality protection, public health and public safety. In addition to the public water supply system staff, the SWP Team may also include locally elected officials, local business leaders, educators, farmers, N.C. PWSS regional office staff, extension service staff, non-profit environmental groups, land conservation groups and citizens. The SWP Team can share the workload, delegate tasks among members according to their skills and access resources needed to evaluate the watershed.

***The greatest means of protecting water is at the local level, where most land-use decisions are made, where potential pollution sources must ultimately be managed, and where water resources can benefit from community vigilance and stewardship. At the local level, individuals can easily get involved and make a difference.***


Local Government
- Planning department or board
- Elected officials
- Emergency response planner
- Fire department
- Budget and/or Finance Office
- Economic Development Office or Commission
- Public Information Officer

Water Supply Providers
- City manager
- County manager
- Water systems manager
- Other public works employees who will be involved in implementing the plan

Economic Interests
- Developers
- Realtors
- Bankers
- Chamber of Commerce
- Agricultural representatives
- Industry representatives

Expert Advisors
- Water quality expert, such as NCRWA consultant
- Legal counsel
- Health/Environmental Health Department
- State agencies (DEQ, DWR, DEMLR)
- Medical representatives
- Agricultural Extension Service
- Environmental Educators

Community Groups
- Residential water users
- Land Conservation groups
- Landowner groups
- River Basin associations
- Service organizations
- Civic, ethnic or religious leader
- Environmental Groups
- Students & Parent Teacher Associations

Other
- Media
- Representatives from neighboring local jurisdictions
- Councils of Government
- Small community water supply owners

**Community Roles—people to consider for the SWP planning team.**

One of the SWP Team's first tasks will be to determine what protection efforts are currently being conducted in the community and identify strategies to build upon these efforts. Gathering the appropriate information will give the local SWP Team the information needed to begin delineating and prioritizing the sub-areas within the watershed to be protected. Depending on the information gathered and the watershed classification, the SWP Team may decide to define the protection area as the entire watershed. This would be appropriate for a small WS-I watershed. However, in a larger, WS-III or WS-IV, delineating the entire watershed could be a daunting prospect. Therefore, the SWP Team may elect to target only the critical or protected areas for local assessment and protection. The decision is one that the SWP Team should make based on local priorities, stakeholder input and community values.

When forming a SWP Team, it is also important to look beyond your service area. In some cases, the public water supply system does not have legal authority over the area that needs to be protected. For example, watersheds often comprise a number of communities, municipalities, counties or even states. In these cases, representatives of the relevant governing bodies should be invited to serve on the SWP Team.

The development of a SWP plan does not require the involvement of an engineer or other consultant; however, because many communities do not have experience with this kind of project, the SWP Team may find it helpful to talk with a professional consultant. Additionally, the North Carolina Rural Water Association (NCRWA) provides consultants experienced in developing SWP plans at no charge to public water supply systems.

## 2.2 Set initial goals and priorities

The SWP Team should determine its initial protection goals and priorities. For example, is the goal only to maintain the quality of the existing water supply or, is it to improve the water quality of the source water and thereby reducing treatment costs? Each community is unique. If the SWP Team agrees on an overall protection philosophy and specific protection goals early in the process, it will help guide later decisions, priorities, and commitments. Other goals will not be determined until later, when the SWP Team has acquired more information about the watershed.

## 2.3 Establish a timeframe for the planning process

The time each activity takes will depend on the nature of the water supply system and the goals the SWP Team establishes. Researching the properties and PCSs in the delineated assessment area and related source water protection area (SWPA) generally occurs at the beginning of the process. Other activities, such as public education, take place throughout the planning process, and continue into the future. It may seem difficult to set deadlines at this point, but a schedule helps people complete tasks in a timely manner and keeps the process moving.

## 2.4 Public education and involvement

From the beginning of the planning process through implementation of the final plan, public education and involvement are two important elements of a successful local SWP program.

Protection efforts are more successful when citizens are aware of the critical links between their actions to protect their drinking water sources and the health of their families and community. Activities such as applying pesticides, fertilizing lawns or improperly disposing of oil are individual actions that seem to have relatively small impacts on water quality. However, the cumulative impacts on our land and water are significant.

## 2.5 Monitor the SWP Team's progress

Opportunities to evaluate the SWP Team's progress should be included in your goals and timetable. Take stock of the different activities involved in the planning process and ensure they are all moving forward. Let the public know about the SWP Team's accomplishments. Source water protection is a long-term commitment; developing a lasting relationship between the stakeholders in your community and surrounding communities can be an important part of the SWP Team's education and protection efforts.

## 2.6 Products that should result from Step 2 and be included with the final plan

When this step is finished, the following items should be complete:

1. A core group will assemble, select a team leader and begin the team-building process.
2. The core group will select and invite stakeholders to form a SWP planning team.
3. The Team will meet to review the SWAP report results and gather the required information to prepare subsequent portions of the SWP plan.

Plan components that should result from this step include:

- Introduction,
- The planning team roster,
- Roles and responsibilities of the Team members,
- Statement of initial goals and objectives,
- Schedule for preparing plan (dates can be filled in prior to submission),
- Schedule of planning team meetings (dates can be filled in prior to submission), and
- Actions taken or planned for involving the public.

The introduction should include a description of the surface water system, how many people it serves, how many connections, the capacity, the type of system, the watershed classification, the intake location, the SWAP results and other pertinent watershed or river basin information.

# Step 3: Conduct a Potential Contaminant Source (PCS) Inventory

The next step in developing your SWP plan is to conduct a PCS inventory. A PCS is any substance or activity that could adversely affect the quality of your drinking water supply. The PCS inventory is a complete listing, including mapped locations, of past and present land use activities within the watershed that threaten drinking water quality. The PCS inventory also includes a determination of the relative risk posed to the public water supply intake by the identified PCSs. By assigning a relative risk to each identified PCS, the most serious concerns can be given priority.

Your goal is to protect your drinking water supply by protecting the land area surrounding the public water supply intake. Gathering the appropriate information will give the local SWP Team the information needed to begin delineating and prioritizing sub-areas within the watershed. Depending on the information gathered and the watershed classification, the SWP Team may decide to define the entire watershed as the SWPA. This would be appropriate for small watersheds. However, for larger watersheds; however, delineating the entire watershed as the SWPA could be a daunting prospect. Therefore, the SWP Team may elect to designate a sub-area of the watershed as the SWPA. The decision is one the SWP Team should make based on specific, actual and potential threats as well as on local priorities, stakeholder input and community values.

## 3.1 Procedure

Completing a PCS inventory is a process that cannot be completed in a single step. General information will lead to a search for specific details, and new questions may arise that need further investigation and verification. You will have to use a combination of methods to locate and identify all PCSs located within the watershed. Many contaminants are associated with particular land uses, so you will need to collect agricultural, commercial, industrial, residential, and other types of data to help locate and identify land use activities associated with potential contaminants. Because certain types of contamination can be very long lasting, it is critical to identify not just current conditions but also historical land uses, old waste disposal sites, and past uses of chemicals that might be hazardous to drinking water. Businesses that closed long ago may have left underground storage tanks or other buried chemicals that are still a potential threat to your water supply.

### 3.1.1 Collect physical information

The SWP Team should gather information, including mapped locations, of past and present land use activities within the watershed that threaten drinking water quality. A PCS data sheet should also be completed for each PCS identified within the watershed. The information provided on the PCS data sheet should contain a description of the PCS, including any existing contamination incidents and a description of the current status, location, volume of material involved and references to any permits. Each PCS identified should be assigned a unique PCS identity code by the SWP Team. This code, which should be written on the appropriate PCS data sheet, will be used to plot the location of the PCS on the PCS map.

### 3.1.2 Search existing information

There are many sources of PCS information available to the SWP Team. Some of the information needed to complete the PCS data sheets will result from searches of various databases and records. The SWAP reports contain PCS data gathered from 16, statewide databases. It is important to understand that the PCS inventory contained in the SWAP report includes only those PCSs located on statewide databases. The data is intended to be only a starting point. It does not include local PCSs such as septic tanks, cemeteries, dry cleaning facilities, or other local activities that may have the potential to impact local drinking water supplies. Other sources of existing information include:

Electronic Databases: Federal government agencies and the State of North Carolina maintain records relevant to drinking water contamination in electronic form that can be searched using a computer. A few of such sources are given here:

Databases and Software | Science & Technology | US EPA
Drinking Water Contaminants | US EPA
NC Drinking Water Watch

Hard copy files: Local, county and state governments may have information on the location and type of PCSs such as septic tank permit records, cemeteries, landfills and other land uses that may lead to drinking water contamination.

Aerial photos: If aerial photos or other remote images exist, they can be used to learn about inaccessible areas or to measure the size of a large PCS such as a landfill or waste dump. Orthophotoquads, which are black and white images in map format, may be available for your area. Annual crop compliance slides from your county's Farm Service Agency office may also be a useful source of information. The North Carolina Geological Survey has a collection of aerial photographs as well. The N.C. Department of Transportation's Photogrammetry unit also has a collection of aerial photos. Digital orthophotoquad quarter quadrangles are available from the DOT and the United States Geological Survey at a scale of 1:12,000.

Other published information: For compliance with emergency planning and right-to-know regulations, industries are required to notify emergency planning committees and fire departments of the use and storage of certain materials. Information from the N.C. Department of Revenue, Sales Tax Division, may provide information on retail sales of PCSs. The yellow pages of the local phone book and the directory of local businesses supplied by the Chamber of Commerce are also sources of information.

### 3.1.3 Locate PCSs on a preliminary map

After gathering preliminary data from existing records, it is a good idea to plot the PCSs that have been identified on a map or aerial photo. This map does not have to be complex or highly technical; often paper copies of city street maps, plat maps or USGS topographic maps will work well. Large-scale aerial photos in the range of 1:3,000 to 1:12,000 are usually the most suitable for mapping. If no aerial photos or orthophotos are available, the information can be transferred to a USGS quadrangle or county road map. The USGS mapping center sells 1:24,000 scale topographic maps.

Documenting the locations of known PCSs will help guide site visits to confirm these sources and may suggest land use patterns or situations that need additional investigation. Identification of several contamination sites close together, for example, may suggest that a common historical source might exist.

### 3.1.4 Identify additional PCSs and characterize each PCS

PCSs not identified from existing databases and information will need to be identified and documented. In addition, information on PCSs already identified in the initial search needs to be verified and possibly updated.

To collect up-to-date information about sources already identified, it may be necessary to conduct surveys of cooperating PCS owners or operators. The surveys should concentrate on gathering information for the PCS data sheets, such as the amount and type of potential contaminants stored, produced or disposed of at each site. Each sheet must also be labeled with the appropriate PCS identity code. This same code will be used on the final map of PCSs and on the inventory of PCSs described below.

To find additional unrecorded sources, it will be necessary to do some detective work in the watershed where community sources of information may be as important as government records. Information from members of the community and visual surveys of the watershed will be the primary ways to identify these sources.

Past PCSs are important to document and may not appear in current official records. Personal interviews with community residents can be extremely valuable sources of such information. Knowledge that a service station once stood on what is now a home site may lead to the discovery of an old underground storage tank. Retired facility operators, public officials such as firefighters, road commissioners, planning and zoning officials, building inspectors, health

inspectors and long-term residents can give an historical perspective, possibly revealing sources that cannot be identified any other way. The preliminary PCS map is a useful tool in collecting community information. Although interviews can be fruitful, they also require a substantial investment of time. Additional time is required to verify the information obtained as a result of these interviews. There are several approaches to collecting local information. These include "windshield" surveys, on-site surveys, telephone interviews or mail surveys. Windshield surveys are conducted by driving through the delineated watershed areas and looking for anything that might be a PCS. This can be done to find new leads or to confirm information from electronic databases, hard copy files and the public. Land uses can indicate the types of PCSs to look for (e.g., private wells and septic tanks in rural residential areas, storage tanks in commercial areas, etc.). On-Site surveys include visits to reported or possible PCSs to complete the detailed information that is required. Contact with an owner may be required to complete other details, either by on-site visit, telephone interview or mail survey.

Community outreach is important in gaining the cooperation of community members. Before you begin any individual contacts, especially door-to-door surveys, it is essential to notify the public of the upcoming inventory. You can involve the media to promote the inventory through local publicity. Preparing the public for this survey and explaining its purpose will often increase the response rate and improve the quality of information you collect.

Once all additional information collection is complete, you should update all PCS data sheets with additional information gained during this process and complete a data sheet for each new PCS identified. You should also update the preliminary PCS map.

### 3.1.5 Summarize the information from all PCS data sheets

Once all information on PCSs within the SWPA has been collected, it should be summarized in the most useful form before moving to the next step. The goal is to organize the information, so PCSs and pollutants are accurately identified in the SWPA, which makes the task of ranking sources easier. A unique identification number should be assigned to each individual PCS and included on the appropriate PCS data sheet. These same identification numbers should be plotted on the final inventory map to indicate the location of the PCS. This final map is basically a revised, clean version of the preliminary working map developed earlier in the inventory process. If there are zoning ordinances in effect, it will be helpful to combine this with a zoning map. This will help to determine later whether new or existing ordinances are needed to protect the public water supply system. These identification numbers will also be transferred to the Final Inventory Form after the PCSs have been ranked by risk.

### 3.1.6 Estimate risks and rank PCSs

Once the PCSs are identified, the next step is to estimate the risks posed to your water supply. The SWP team should rank each PCS according to the threat it poses to the water supply intake. A systematic evaluation of the relative risk of contamination from each PCS identified in the inventory will allow the team to determine which water supply intake is at the greatest risk of contamination and which PCSs should be considered first because they pose the greatest threat.

Good risk assessment is the best basis for setting priorities to manage PCSs and protect your water supply.

The risk associated with a particular PCS can be considered the product of several factors such as the severity of the PCS, likelihood and magnitude of a release, and likelihood of the released contaminant reaching the intake. Examples of additional considerations relevant to each of these factors are:

- Severity of PCS
  - Toxicity of each contaminant
  - Persistence of the contaminant in the environment
  - Mobility and attenuation
  - Quantity of the contaminant that could be released by this source
- Likelihood of Contamination Release
  - Nature of the source activity
  - Compliance history of a permitted facility
- Likelihood of delivery to intake
  - Distance to intake
  - Time of groundwater travel to intake
  - Hydraulic characteristics of the watershed

A very general approach to estimating risk can be based on a simple grouping of PCSs into categories of low, moderate or high risk. While this kind of approach is fairly broad, it may give a reasonable basis for initial prioritization in situations where detailed background information and technical expertise is lacking.

The next level of risk assessment considers both the ranking of the PCS itself and its distance from the public water supply – an indication of the likelihood that the PCS can actually contribute contamination to the public water supply system. For example, a moderate risk PCS close to the water supply may be of more concern than a higher risk PCS located farther away.

There are more sophisticated systematic risk assessment methods available to evaluate the various risk factors and arrive at a numeric score for each pollution hazard. Some methods are better suited for assessing the risks posed by a variety of sources; others focus on evaluating risks from a single source. For information on contaminants that may be found in drinking water, visit the Environmental Protection Agency's Website at: What contaminants may be found in drinking water?

### 3.1.7 Involving the public

Public education and involvement programs in source water protection can create greater awareness of pollution prevention and drinking water protection and lead to better management. If residents understand that the purpose is protecting their drinking water, their investment and their health, they will likely support the effort. Broad public support can lead to better participation in surveys and more complete information. The effectiveness of your SWP program can only be as good as the information gathered in this step. If a significant PCS is overlooked,

your drinking water cannot be protected from it. Therefore, it is important to get public cooperation in making the inventory as thorough as possible.

The public can provide helpful input in many phases of the inventory and ranking process. Residents may know of unused wells or buried wastes that are not recorded elsewhere. Educating the public about the purpose of source water protection usually leads to improved cooperation and better information. The PCS inventory process is an excellent opportunity to learn about the needs and perceptions of the community. Residents may believe, for example, that a PCS exists in a former industrial site. Investigation of this situation may lead to the discovery of a new PCS, or it may be shown that there is no cause for concern. In either case, the process will demonstrate community concerns are taken seriously and the resulting SWP plan will address local needs.

Local volunteers may be used for surveys to collect community information. Following the initial inventory, students, retirees and other volunteers can help you complete a field search for existing and potential contaminants. In most cases, volunteers will need training in administering the survey and knowing what to look for in the field. Confidentiality issues must also be addressed.

The public can also be included in the ranking activities. It is critical that the SWP Team listen to the concerns of the community. At the same time, it should be cautioned that the public often seriously misunderstands risk and public perceptions of risk may not always agree with actual risk assessment. A public process can be a good opportunity to educate the community with regard to actual risks associated with drinking water contamination.

## 3.2 Products that should result from Step 3 and be included with the final plan

Plan components that should result from this step include:

- Map of PCSs,
- PCS inventory data sheets,
- Summary of PCS inventory, and
- Ranking and prioritization of PCSs and an explanation of the process used.

# Step 4: Develop Management Strategies

In the previous step, the SWP Team completed an inventory of existing and potential contaminant sources (PCSs) and ranked them according to the risk they pose to the community's drinking water supply. In this step, the SWP Team will develop a management plan that sets up methods for managing the threat posed by each PCS identified in the inventory. Management strategies will vary widely based on the types of PCSs and the level of risk they pose to the drinking water source. The goal is to reduce or mitigate the potential of the identified PCSs to contaminate the community's drinking water supply.

Before the process of developing a management plan begins, the SWP Team should have a clear understanding of the way its water supply system works and the SWP planning process. Even if members consider themselves knowledgeable, bringing everyone to the same starting point can help the SWP Team function smoothly. It can be helpful if a member of the public water supply system explains the local drinking water system to the members of the SWP Team. In order to successfully protect the source, it is important to understand how raw water is extracted from the surface water source, treated and distributed to citizens as drinking water. In addition, the SWP Team should become knowledgeable about the susceptibility of the system to contamination.

Your community can use a number of strategies to manage and protect the land around its source of drinking water. These include both regulatory and non-regulatory (voluntary) controls that can be used in your management plan. Regulatory controls may include new local ordinances, zoning and subdivision restrictions such as requirements for low impact development around drinking water sources and health regulations. Non-regulatory controls may include community education and outreach, household hazardous waste collection programs, stream watch programs, community based recycling, implementation of best management practices within the source water protection area and conservation easements or even outright purchase of property around the source of public water supply. Communities may also choose to monitor the compliance of PCSs with the requirements of existing federal and state regulatory programs.

You should keep several points in mind in developing a management plan. First, an entirely non-regulatory approach alone may work, but a completely regulatory approach will rarely be successful. Education is a critical part of any program to protect a natural resource like drinking water. Second, understand that not every approach will work in every town or region. Management approaches must fit the local natural, social, economic and political landscape. This is an important reason for local SWP efforts. North Carolina's SWP Program provides local governments with the ability to broaden the protection already provided through state regulatory programs, better control the location of future PCSs and protects public water supplies from PCSs that are not currently regulated. Third, the place to start is with the most urgent problems or highest risks. Immediate threats should be dealt with first, and then the SWP Team can work to prevent future contamination. Finally, in deciding what management tools are appropriate, the Team should first assess whether existing programs are adequate to protect drinking water before proposing new strategies. The North Carolina Department of

Environmental Quality (NCDEQ) has a number of existing regulatory and non-regulatory programs designed to protect watersheds. Information on these programs can be found at NCDEQ - Contacts and click on the program of interest. Other examples include:

- Division of Water Resources (DWR): The DWR has several programs related to watershed protections, which are summarized below. Its home page is NCDEQ - DWR - Home

- Water Supply Watershed Protection Program: The Water Supply Watershed Program (WSWP) is within the NCDEQ's Division of Energy, Mineral and Land Resources (DEMLR). The SWP Team can find out more about the water supply watershed classification, model ordinances, whether there are local ordinances in place and how to develop and implement local ordinances by visiting the WSWP program site at: NCDEQ DEMLR - Water Supply Watershed Protection

- Basinwide Planning Branch: The DWR has prepared Basinwide Assessment Reports on the state's 17 river basins. If your local drinking water source is a river basin, you can download your report by visiting NCDEQ - Planning – Basin Planning Branch and clicking on your river basin. Gathering the appropriate information will give local SWP Team the information needed to begin delineating and prioritizing the sub areas within the watershed to be protected.

- Nonpoint Source (NPS) Management Program: Non-point source pollution is described in the N.C. DEQ DWR Nonpoint Source Management Program as pollution contained in stormwater and snowmelt runoff from agricultural, urban, mined and other lands. Nonpoint source pollution comes from diffuse sources in contrast to "point" source pollution, which is discharged through a pipe or outlet. The DWR NPS Management Section is the lead state agency responsible for the control of nonpoint source pollution in North Carolina.

  The NPS Unit seeks to pull together all NPS programs and efforts within DEQ and the state at large with the goal of reducing the harmful effects of land uses on surface and ground water. This is done, in part, by allocating about one quarter of the Section 319 grant awards to NPS programs within DEQ and by allocating the remainder of the grant to a competitive contracting process. To learn more about this program go to NCDEQ - 319 Grant Program.

- N.C. Division of Mitigation Services: The NCDMS combines an existing wetlands-restoration initiative by N.C. DEQ with ongoing efforts by the N.C. DOT to offset unavoidable environmental impacts from transportation-infrastructure improvements. The mission of this program is to restore, enhance, preserve and protect the functions associated with wetlands, streams and riparian areas, including but not limited to those necessary for the restoration, maintenance and protection of water quality and riparian habitats throughout North Carolina. To learn more about this program, go to the NC DEQ, Division of Mitigation Services.

- N.C. Forest Service: The N.C. Forest Services' primary purpose is to ensure adequate and quality forest resources for the state to meet present and future needs. The Forest Services has a Water Quality Section that is a good resource for best management practices for protecting forestland around watershed protection areas. To find out more about this program, go to NCFS - Water Quality.

- N.C. Division of Soil and Water Conservation: The N.C. Division of Soil and Water Conservation cooperates with federal agency and local partners to administer a comprehensive statewide program to protect and conserve the state's soil and water resources. The Division serves as staff for the North Carolina Soil and Water Conservation Commission to help deliver conservation programs at the local level. The Division provides leadership and assistance to the state's 96 local Soil and Water Conservation Districts and their state association in locally-led conservation by providing financial, technical and educational assistance to districts, landowners, agricultural producers and the general public. The Division delivers programs in nonpoint source pollution management, cost share for agricultural best management practices, technical and engineering assistance, soil surveys, conservation easements, and environmental and conservation education. To learn more about this program, go to North Carolina Department of Agriculture & Consumer Services

- North Carolina Natural Resource Conservation Service: The North Carolina Natural Resource Conservation Service (NRCS) assists owners of private land with conserving their soil, water, and other natural resources. They provide technical assistance to local partners known as Soil and Water Conservation Districts. Every county in North Carolina is served by a Soil and Water Conservation District and NRCS office. To learn more about NRCS, go to North Carolina NRCS

- Cooperative Extension Service: The N.C. Cooperative Extension Service is cooperating with other agencies in a variety of watershed projects spanning all three physiographic regions of the state. The purpose of these projects is to document and characterize water quality at a watershed scale, identify nonpoint sources of pollution and evaluate the effectiveness of best management practices used to prevent or treat nonpoint source pollution. Contact your local county Cooperative Extension Center for more information. The following Website provides contact information for the Cooperative Extension Center in your county: North Carolina Cooperative Extension: Home

In addition to the information available through these programs, the SWP Team is encouraged to download the Supplemental Guide to North Carolina's Basinwide Planning. This serves as the 2nd edition to the Water Quality Citizen's Guide. The Supplemental Guide includes information about North Carolina's water quality issues. It also describes North Carolina's current restoration and protection programs as well as other state and federal water quality management programs. To download a copy of this document, go to NCDEQ - Supplemental Guide Also, the EPA Website, online at Watersheds | Watersheds | US EPA, provides a number of resources for watershed protection. It includes basic information about the water used for drinking water and the federal, state, and local programs that assess and manage potential public health risks, including a Web guide – an annotated guide to EPA source water resources.

## 4.1 Regulatory Management Strategies

In general, regulatory tools require sufficient administrative and technical resources to carry them out. Regulations must be specific and must address actual threats or problems appropriately to avoid court challenge. Because regulatory tools require legal authority, issues of jurisdiction must be dealt with at the start. A town with a SWPA entirely inside its borders can control planning, management and future development through town policies and ordinances. A town with all or part of its protection area outside its own borders cannot zone the entire protection area. The town must cooperate with the neighboring town(s) or approach the county to include it in the countywide zoning program. The following is a brief description of the regulatory strategies available to protect source water in North Carolina.

### 4.1.1 Zoning Ordinances

Zoning is the division of land in a town or county into districts and applying land use regulations uniformly through each district. Within each district, the zoning ordinance can specify permitted uses, lot size, and design and performance requirements for specific activities. Zoning is widely used by towns to guide development under a comprehensive plan and can be adapted to protect land around surface water intakes or wellheads. In North Carolina, the use of zoning to protect water supplies is within the scope of local government authority to promote public health and welfare and provide water, sewerage, and other public requirements.

Zoning has some drawbacks. It can be politically contentious to enact new zoning or change existing zones. Usually zoning affects future development rather than existing uses, although nonconforming uses can be phased out eventually. Uniform zoning can be difficult when more than one town is involved or if the area around the source is located outside planning jurisdictions. In North Carolina, municipalities may extend zoning boundaries up to one mile beyond their city limits. County zoning only applies outside of municipal jurisdiction.

The NCDEQ, DEMLR, Water Supply Watershed Protection Program maintains and enforces rules and regulations governing water supply watershed protection. The Water Supply Watershed Protection Rules, adopted in 1992, required that all local governments having land use jurisdiction within water supply watersheds adopt and implement water supply watershed protection ordinances, maps and a management plan. The plan includes language useful for local governments adopting protective ordinances, zoning overlay districts or subdivision regulations. The SWP Team should contact the local government to obtain a copy of the local water supply watershed protection ordinances. To find out more about this program, visit the website at NCDEMLR - Water Supply Watershed Protection These existing rules and regulations provide a baseline of protection to public water supply watersheds. The SWP Team may conclude that additional controls need to be added to the existing ordinance. Some useful zoning options include:

- Overlay Districts: SWP districts can be incorporated into existing zoning with an overlay district – a district with more restrictive controls superimposed over or within an existing

district(s). Overlays may specify different density requirements, source prohibitions or design standards for the protection of the area surrounding the source of drinking water.

- Zoning for Source Controls: Because zoning is meant to promote public health and safety, limiting or banning the use of specific hazardous substances for the purpose of protecting water supplies is a permissible zoning measure. Zoning districts especially overlay districts, can be defined to prohibit the use of substances that would be hazardous to the drinking water supply or activities that use such substances.

- Zoning for Performance and Design Standards: Through zoning, local governments can guide structure design and set standards to ensure that certain activities do not threaten the drinking water supply. Design standards can require certain safety precautions for activities that might threaten drinking water, such as facilities that store or handle pesticides or solvents. Performance zoning sets standards for permissible effects of land use activities; any use is allowed in the zone as long as standards are met. This technique is commonly used to set standards for noise and dust in industrial areas; for SWPAs, performance standards can limit the amount of hazardous substances stored on site or promote control of runoff from storage and loading areas.

- Zoning for Density Standards: Reducing the number of housing units can reduce the impact of residential development within the SWPA. Requiring large lots in unsewered developments, for example, reduces the number of units within the SWPA, reducing the amount of septic system leachate. Cluster zoning increases density in a section of a zone while the remaining area of the zone is left in open space. Average density throughout the zone remains the same. Cluster zoning can be used to guide more dense residential development to outside the SWPA, while not restricting the total number of units allowed.

### 4.1.2 Subdivision regulations

Subdivision ordinances are applied to ensure that growth does not outpace available local facilities when a piece of land is being divided into lots for sale or development. Subdivision ordinances are therefore useful primarily for controlling new development. Like zoning, subdivision regulations can establish source controls, density standards and design/performance standards. An important feature of subdivision regulations for SWP is the open space dedication requirement. In North Carolina, towns can require developers to set aside some land to be preserved as open space. Locating the open space lands within SWPA boundaries could be an important protection tool.

### 4.1.3 Building Code Enforcement Strategies

Cities and counties have the authority to establish building codes that govern the construction and maintenance of buildings and other structures. Under this authority, structures can be inspected during and after construction to ensure that codes are followed. By including SWP design standards in the building code, especially for industrial and commercial facilities, application of the standards can be enforced.

### 4.1.4 Public Health Regulations

The local board of health may have the authority to adopt more stringent rules in the protection area to safeguard public health, safety, and welfare. Specific measures could include regulation of or prohibition of underground fuel storage tanks, regulation of small private sewage treatment plants, septic system maintenance programs, toxic and hazardous material handling regulations, and private well inspection/protection. Health ordinances might be used to require developers within the protection area to monitor surface water for contaminants.

### 4.1.5 SWP ordinance

Land use regulations beyond those required by the water supply watershed protection program can be enforced under a town's general ordinance-making authority. This authority enables local governments to regulate or prohibit activities that are damaging to the health, safety, and general welfare of its citizens. Under this authority, a community can draft a freestanding SWP ordinance that sets source controls, density standards, and performance/design standards within the SWPA within its jurisdiction. Local ordinances must be written carefully; a SWP ordinance that attempts to regulate too broadly may be susceptible to legal challenge.

### 4.1.6 Site plan reviews

Site plan review is a critical part of all of the above options. A systematic site plan review procedure for all proposed development provides an opportunity to verify and enforce other requirements. However, this tool requires sufficient administrative and technical resources, and must be specific in its application to actual threats in order to avoid court challenge. Site planning places the burden of proof on the developer, and like other regulatory tools, it is more effective for future development than for existing development.

*Special considerations for regulatory options:*

- Agriculture: Farms cannot be zoned by a county with the exception of swine farms (see North Carolina General Statute (NCSG) 153A-140 and 153A-340), or if they are used for "non-farm" purposes. The North Carolina Department of Agriculture and Consumer Services has some regulatory authority as set forth in NCGS Chapter 106.
- Enforcement: What can you realistically do with the staff that you have? Do not let enforcement be your only tool for accomplishing protection.
- Plan review: Provide guidance and clear expectations for developer application requirements; consider developing a checklist.
- Permits: What data do you need on the permit? What kind of format should the data be in? Who is to review the permit? How will compliance be monitored?
- Construction inspections: If you are enforcing design standards, you need field staff to ensure that specific design requirements are being met.
- Fees: Determine and publish your fee structure.

- Abandonment requirements: Set requirements for closing facilities and clean up, especially for sites housing potential pollutants. Pay attention to proper sealing of abandoned wells.
- Inspection protocols.
- Penalties and fines.
- Appeals, variances and waivers.

## 4.2 Non-regulatory (voluntary) management strategies

Management of the SWPA does not have to include regulation of land use or activities to protect the drinking water supply. Voluntary management strategies can reach a broad spectrum of the community and cross municipal boundaries. These measures can be taken by themselves or in combination with regulatory approaches. For a link to a list of EPA sponsored management strategies, go to Watershed Academy Web | US EPA

### 4.2.1 Acquisition

Purchases of property, development rights or conservation easements are secure but potentially expensive ways to protect source water. The only way to absolutely guarantee control over the activities on lands in the SWPA may involve outright purchase of the land or of a more limited interest, such as surface-use rights. These may be accomplished using fee simple purchase, purchase of partial interests, conservation easements or restrictive covenants. Setting priorities as part of a long-range plan can decrease the cost of acquisition as can the encouragement of donations and bargain sales.

The Clean Water Management Trust Fund, created in 1996, makes grants to local governments, state agencies and conservation non-profits to help finance projects that specifically address water pollution problems. Many of the loans are for the purpose of acquiring property to protect water quality. To find out more about this program, go to Clean Water Management Trust Fund.

The Conservation Trust for North Carolina is a statewide land trust dedicated to protecting land and water resources. It is comprised of 22 local and regional land trusts. For more information about the Conservation Trust, visit their website.

From the state and federal government to private groups, open space is being permanently protected by many different agencies. For more information about funding mechanisms for land acquisition, go to Funding and protection programs

### 4.2.2 Monitoring regulated or potentially regulated sites

The state maintains and enforces rules and regulations governing the protection of human health and the environment. These include rules regulating point and non-point sources of contamination, drinking water supplies, waste disposal, underground injection, underground storage tanks, mining, landfills, coastal concerns and hazardous waste facilities. Because these existing rules and regulations provide a baseline of protection to public water supply systems, developing a local SWP Program is voluntary in North Carolina. Local governments and public

water suppliers are not expected to manage PCSs that are state or federally regulated. However, the public water supply system may choose to monitor compliance with existing water quality protection measures. Monitoring the compliance of a regulated facility requires that the SWP Team work with both the lead agency of that regulatory program and with the operator(s) of the facility itself. The goals are to make sure that operators of potential sources of contamination fully understand their responsibilities and are complying with their permits, and that the regulatory agencies are fully aware of conditions and activities in the SWPA.

The following are examples of non-regulatory management strategies for PCSs that relate to existing regulatory programs.

- The National Pollutant Discharge Elimination System (NPDES) Permitting Program controls water pollution by regulating point sources that discharge pollutants into the surface waters of the state. Point sources are discrete conveyances such as pipes or man-made ditches. Industrial, municipal and other facilities must obtain permits if their discharges go directly to surface waters. The SWP Team will contact the DWR regarding facilities within the SWPA with NPDES permits to determine if all such NPDES discharges are in compliance with applicable regulatory and permit requirements pertaining to environmental protection. Notification will be made to the DWR if it is determined that the facility has failed to maintain compliance with any regulatory or permit requirements pertaining to environmental protection, such as routine monitoring and reporting requirements.

- If facilities permitted to discharge waste to the land surface (non-NPDES permitted facilities) are located within the SWPA, the SWP Team will contact the DWR to ensure that such operations are in compliance with applicable regulatory and permit requirements, such as routine monitoring and reporting requirements.

- Animal waste operations permitted by the state (hog farms) are required to have operation and management plans. The local SWP Program should verify that the animal waste operations have valid permits and management plans. Animal waste operations should be mailed information regarding best management practices, prevention of lagoon overflows and other materials pertinent to the protection of the source water.

- Poultry farms with greater than 30,000 birds are required to have waste management plans; however, land application of the poultry waste is not regulated. Poultry farms should be mailed information regarding best management practices, establishment of buffer zones away from surface water and other materials pertinent to the protection of the source water.

- If any soil or ground-water contamination incidents have been identified within the SWPA, the SWP Team should contact the property owners and the DWR, Groundwater Protection Section, to insure that remediation efforts proceed in accordance with schedules established by these agencies. The SWP Team should also notify the DWR of the location of the facility within the SWPA and its proximity to a source of public water supply.

- All owners/operators of regulated underground storage tanks (USTs) and other facilities subject to federal and/or state regulations located within the SWPA can be asked to supply documentation that their facility is in compliance with said regulations. If any UST sites are found to be non-compliant, the Division of Waste Management (DWM), UST Section, should be notified.

- If an abandoned UST site is found within the SWPA, the SWP Team should contact the DWM, UST Section, to determine if a closure report was submitted. Closure reports document that either no soil or ground-water contamination was identified during the closure of the USTs or that any contamination identified was remediated to state standards. If a closure report was not submitted, the Team should notify the UST Section of the location of the facility within the SWPA and its proximity to a source of public water supply.

- Facilities with an underground buried storage capacity of more than 42,000 gallons of oil or an aggregate above ground storage capacity greater than 1,320 gallons of oil, or an above ground storage capacity of a single container in excess of 660 gallons are subject to the Oil Pollution Prevention regulations contained in federal regulations found at 40 CFR 112. These facilities must prepare and implement a Spill Prevention Control and Countermeasures Plan. The SWP Team should verify the status of the SPCC Plan for each subject facility located within the SWPA. The North Carolina General Statutes require registration of any facilities storing more than 21,000 gallons of petroleum product. Subject facilities not in compliance with these regulations should be notified of their regulatory responsibility under this regulation. The SWP Team should also notify the DWR, Groundwater Protection Section, if such facilities are not complying.

- Abandoned dumps are regulated by the DWM, Solid Waste Section. Management strategies include installation of a monitoring well between the dump and the public water supply to monitor for contaminants or proper closure of the facility which may involve constructing an impermeable cap on top of the dump to reduce infiltration from precipitation.

- Pesticide laws are enforced by the NCDA&CS, Pesticide Section. The State of North Carolina Pesticide Board licenses pesticide dealers and applicators. If you have large areas of intensive agriculture in your SWPA, you may want to contact the Pesticide Section to see if growers in the SWPA or their contracted applicators have current pesticide applicators licenses.

### 4.2.3 Educational programs

Public education and involvement are essential parts of any SWP effort. Public education can be used first to inform community residents about the connection between land use in the SWPA and the quality of their drinking water. Sometimes common, legal activities can pose threats to drinking water, and these behaviors can change only through awareness and learning. Through public education, communities can work to prevent pollution of their water supplies through

applying best management practices. Communities can also use education programs to build support for regulations.

Education efforts should target businesses, industries, farms and residents within the SWPA. Education programs may be the best, and only, way to apply a SWPA management plan across multiple political jurisdictions. Examples of educational activities include:

- Educational materials: public service announcements, newsletters, brochures, bill inserts about the SWP program and signs along major roads to alert people that they are entering the SWPA.
- Surveys: conduct a community-wide water knowledge survey.
- Guidance: distribute best management practices guidelines to appropriate audiences.
- Speakers: provide speakers to community groups to discuss topics like septic system maintenance and underground storage tanks.
- Media coverage: submit press releases, stories and articles to local media to publicize SWP efforts and keep public informed on progress and issues.
- Schools: encourage local school districts to participate, e.g., by adding surface water protection to curriculum or holding art or essay contests.
- Volunteer monitoring: Set up a volunteer monitoring program for surface water quality or land use activities in the SWPA.
- Water festivals: organize public activities to promote the management program, present progress, and recognize the protection effort.

The SWP Team should distribute information on waste handling practices, best management practices, standard operating procedures and waste disposal methods that could reduce the potential for contamination of the drinking water supply. Examples of target audiences include:

- Personnel at municipal owned and/or operated facilities.
- Facilities within the SWPA that store types and amounts of hazardous materials and are subject to the reporting requirements of SARA Title III Section 312, Emergency Planning and Community Right to Know Act.
- All businesses in the SWPA that produce auto wastes (oils, acids, antifreeze, etc.).
- Facilities within the SWPA with pesticide storage or otherwise involved with the application of pesticides. Ensure that each has pesticide operators licensed by the State of North Carolina, and that proper records are maintained to ensure compliance with all state pesticide laws.
- Farms, residents, businesses and industries in the SWPA with septic systems can be provided information on the SWP Program and on proper septic system maintenance.
- Homeowners should be educated on the use and disposal of household hazardous wastes. Household products that contain hazardous substances such as oil-based paints, solvents, or pesticides may threaten the drinking water supply when disposed of improperly. The N.C. Cooperative Extension Service has brochures and publications appropriate for educating homeowners on various topics including proper waste disposal.

### 4.2.4 Pollution Prevention

The N.C. Division of Environmental Assistance and Customer Service provides technical assistance to reduce or eliminate wastes and pollutants. Its staff may also help develop a local recycling economy by promoting the efficient and sustainable collection, processing and end use of recycled materials. The SWP Team may request that local industry within the SWPA receive confidential, no-cost waste reduction and energy conservation technical assistance from a team of highly experienced volunteer engineers. To learn more about the program, go to NCDEQ - DEACS or call (877) 623-6748.

In addition to focusing on specific PCSs within the SWPA, the SWP Team can generate awareness and participation in general pollution prevention activities. Examples of such activities include:

- Hosting household hazardous waste collection days,
- Arranging an annual or semi-annual pesticide container collection day,
- Identifying and removing old buried tanks,
- Identifying improperly functioning septic systems, and
- Promotion of pollution prevention and best management practices within the SWPA.

### 4.2.5 Stream Watch

This voluntary program involves members of the community in a hands on activity to clean up surface waters. Local citizen groups adopt a waterway, or a portion of one, and become informed stewards, learning how to react to the changing stream conditions. There are more than 200 existing Stream Watch groups in North Carolina. They are composed of elementary school students, scout troops, businesses, and retirement groups. Stream Watch groups can be started from scratch or existing organizations can adopt streams; they are asked to conduct two visual monitoring and litter clean up sessions per year. They also are encouraged to become the local experts on their streams' dimensions, history and wildlife, and act on behalf of the streams' best interests. For more information, go to NC DEQ - DWR - Stream Watch or contact the N.C. Division of Water Resources at (919) 707-9009.

## 4.3 Best Management Practices (BMPs)

Best Management Practices are protective measures that have worked in many locations to prevent or control threats to drinking water quality. Best management practices may be structures like improved storage tanks or behaviors like reduction of the amount of household hazardous materials used in the SWPA. Some BMPs are farming practices that reduce the chances of fertilizers, pesticides or soil entering the water supply. Other BMPs are design, operation and maintenance requirements for commercial and industrial facilities. Still others may be small lifestyle changes for homeowners that reduce pollution potential. In some cases BMPs may be written into a regulatory requirement, such as in setting design standards in a zoning overlay district. Often, these practices are voluntary measures that can be encouraged through public education or through technical assistance.

Best management practices for specific conditions can be found on EPA's website, located online at Watershed Academy. The SWP Team should select and tailor these measures to the needs of your SWPA. The NCRWA consultants and PWSS representatives can discuss specific management techniques that have worked in other communities and offer advice on the feasibility of proposed management strategies.

## 4.4 Involving the public in management strategies

Effective management of the SWPA will rely heavily on public support and public action. Additionally, public involvement in the process of developing and implementing a management plan must be documented and included in your plan.

Community involvement with a sense of ownership can generate support for the work and cost involved in protecting the drinking water supply. Educating the public about the importance of good drinking water and the damage of seemingly harmless activities can have builds awareness. Heightened awareness, along with information about how to prevent pollution of the water supply, is a key ingredient of an effective management program. An educated, involved public can make informed decisions about the future of its water supply, including changing their own practices and supporting new regulations. The fact is, because so many water protection measures are voluntary, management of your SWPA cannot succeed without public involvement.

How can you involve the community? Start public meetings and education programs when you first begin your source water protection effort. Organize a citizen advisory group or subcommittee of the SWP Team to develop a public involvement strategy and coordinate outreach activities. The work of this group could include developing and carrying out public information campaigns, organizing community action efforts like hazardous waste pick-ups, and developing a system for soliciting public input to the management plan. It is vital to build a foundation for sustainable community involvement; the need for source water protection will not go away after the plan is written. Finally, document and record all public involvement in the process.

## 4.5 Products that should result from Step 4 and be included with the final plan

When the SWP Team has completed this step, they should have the following information to include with the final plan submitted to PWSS:

1. Management strategies adopted for each selected PCS type occurring within the SWPA;
2. Funding strategies for developing and implementing selected management strategies; and
3. Documentation of public involvement in the process of choosing management strategies.

# Step 5: Emergency Contingency Planning

The goal of SWP planning is to protect the drinking water supply by reducing or mitigating the impact of identified PCSs located within the SWPA. Unfortunately, even with the best plans in place, occasional disruptions in supply may occur. They may be in the form of accidental spills, power outages, vandalism and natural disasters. The most effective way to ensure the community continues to receive safe, reliable drinking water is to be prepared for such events with a contingency plan.

The contingency planning step should include a set of procedures – prepared in advance – to respond to contamination or disruption of the water supply. The contingency planning step should be tailored to the community's particular situation and address PCSs identified in Step 3. By anticipating problems and planning for them, the community can rapidly mobilize the technical, financial and administrative resources needed to keep a spill from entering the distribution system or intake. To respond effectively, procedures must already be in place when threats occur. Developing an emergency contingency plan requires the SWP Team to:

- Assess the physical components of the water supply system,
- Identify likely causes of supply disruption, including the PCSs identified in Step 3, and
- Coordinate and establish broad support from emergency responders and the community.

Consult your local public water supply system to determine if a plan has been prepared. Where emergency management planning has been established, consult with your local emergency planning committee for input and review of any SWP related emergency response procedures. Consult with national organizations such as the American Water Works Association (http://www.awwa.org) and the National Rural Water Association (http://www.nrwa.org/) for access to additional emergency response guidance related to protecting source water. This document is provided in full on the PWSS Website: http://deq.nc.gov/node/82906.

Additional documents that provide useful information for the development of an effective emergency management plan are listed below along with other useful links:

- "Large Water System Emergency Response Plan Outline: Guidance to Assist Community Water Systems in Complying with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002" (EPA)
- "Emergency Response Plan Guidance for Small and Medium Community Water Systems to Comply with the Public Health and Bioterrorism Preparedness and Response Act of 2002" (EPA)
- "Response Protocol Toolbox: Planning for and Responding to Drinking Water Contamination Threats and Incidents," Interim Final – August 2004 (EPA)
- "Drinking Water Security and Emergency Preparedness," Top Ten List for Small Ground Water Suppliers (EPA New England)

Useful Links:

- EPA Basics of Water Resilience: https://www.epa.gov/waterresilience/basics-water-resilience
- Local Emergency Planning Committees: https://www.epa.gov/epcra/local-emergency-planning-committees

## 5.1 Emergency Management Planning

Information the SWP Team will need to develop the contingency planning step of the SWP plan may already be available in the water system's emergency management plan. The N.C. *Rules Governing Public Water Systems* (i.e., 15A NCAC 18C) require that water systems serving over 3,300 people develop an emergency management plan and make the plan available to public water supply system personnel responsible for emergency management at all times. For community water systems, the emergency management plans includes the following elements:

- Identification and phone numbers of personnel responsible for emergency management, including system, local, state and federal emergency contacts.
- Identification of foreseeable natural and human-caused emergency events including water shortages and outages.
- Documentation of the emergency response plan for each identified event.
- A description of the notification procedures for identified events.
- Identification and evaluation of all facilities and equipment whose failure would result in a water outage or water quality violations.

A complete copy of the PWSS guidance on emergency management planning can be found on the PWSS website.

### 5.1.1 Bioterrorism Act

Drinking water security is an important facet of contingency planning. The terrorist attacks of 2001 brought about a new era in security for a host of institutions in America, including the drinking water supply community. In 2002, Congress included a drinking water component into the Public Health Security and Bioterrorism Preparedness and Response Act (PL-107-188), also known as the Bioterrorism Act. This component mandated that drinking water utilities serving more than 3,300 people perform vulnerability assessments to gauge their vulnerability to various threats including contamination. The Act also set deadlines for completion of the vulnerability assessments and for updating emergency response plans based on knowledge gained on during the vulnerability assessments.

Local, state and federal partnerships are required to effectively address homeland security. Improving the security of public water supplies is one of EPA's top priorities. Visit the PWSS' website for information on the following security topics:

- Vulnerability assessments,
- Emergency management,
- Security,

- Public involvement,
- Tools and technical assistance,
- Information sharing, and
- Grants and funding for security measures.

Additional information on security of public water supplies is available on the EPA's website, *Drinking Water and Wastewater Resilience*. This website provides resources for water utilities, state and local governments, public health officials, emergency responders and planners, assistance and training providers, environmental professionals, researchers and engineers, and law enforcement among others. The American Water Works Association website contains an executive summary and link to a report titled "Contamination Warning Systems for Water" by J. Alan Roberson, PE and Kevin M. Morley. For this and other security related publications, go to http://www.awwa.org/index.cfm.

## 5.2 Procedure: What you need to do to complete Step 5

The Team should consider both short-term and long-term contingencies. Short-term contingencies include power loss, line breaks, mechanical failures or other emergency situations that last less than 48 hours. Long-term contingencies include drought or source contamination that requires a temporary or permanent alternate supply.

Developing a contingency plan can be done in a series of steps. First, set some priorities based on knowledge of the water system, possible disruptions (contamination or other) and community needs – both short-term and long-term. Second, determine what procedures will be necessary to respond to the most serious threats. Third, inventory the resources available to you, including services, expertise, funding and equipment. Next, determine if additional resources are needed. Finally, define procedures and responsibilities to determine who will do what in an emergency. Each of these steps is explained below.

### 5.2.1 Set priorities

Start with the PCS inventory from Step 3. Add local sources of contamination or disruption, such as rail car spills, truck accidents, power outages, vandalism, etc. Make judgments about probabilities of these threats occurring, and the severity of disruption caused. Then, rank risks and set priorities accordingly. Setting priorities allows the greatest threats to receive the most urgent attention. Regardless of how priorities are established, the Team's first priority should be to protect the health of those who drink the water.

### 5.2.2 Identify resources

The purpose of this step is to make sure that proper personnel, equipment, technical and financial resources will be available when needed. The contingency plan should enable local officials and water system managers to rapidly identify and coordinate resources in an actual emergency. Resources to consider include:

Personnel

- Existing utility staff.
- Technical assistance that may include local contractors willing to enter into an agreement to provide emergency services.
- Existing state and federal emergency responders, depending on mobilization time required for the event.
- Existing local and county emergency response agencies (e.g., police, fire, EMS).
- Technical experts from local, state, federal, academic institutions and private organizations.

Financial Resources

- Existing local revenues dedicated for water system maintenance and source water protection.
- Long-term and emergency financial reserves.
- Financial, equipment and personnel resources available through existing agreements with neighboring localities, state or federal agencies like mutual aide agreements for equipment and services.
- Local, state and federal grants and funds. Examples include state and federal Superfund programs and Federal Emergency Management Agency funds.
- Organizations that can provide in-kind (non-monetary) assistance.
- Drinking Water State Revolving Fund provides funding for infrastructure improvements to reduce disruption due to infrastructure failure. For scheduled capital improvements, see the system's 20 Year Capital Improvement Plan.
- More information can be found at the UNC Environmental Finance Center Water Leadership Program's Website, located online at EFC | Water Management Leadership Program

Essential services, equipment and supplies

- Water supply alternatives.
- Supply from within the system. For example, determine if other wells or surface sources can be brought online.
- Supply from outside the system. For example, develop mutual aide agreements for equipment and services with neighboring public water utilities.
- Water sampling and analysis equipment and supplies.
- Portable pumps and generators.
- Chemical supplies.
- Treatment equipment.
- Repair facilities and spare parts.
- Alternative distribution equipment.
- Vehicles and equipment for emergency evacuation and transportation.
- Personnel protection equipment and supplies.
- Heavy equipment contractors.

Emergency Response Training

- Tabletop emergency response exercises.

- Real-world drills with local emergency responders.
- Volunteer and public water supply system personnel training.

Depending on the water system's size and its public/private status, the required resources may be found in-house or may be available from another branch of local government, an adjoining county or municipality, or a state agency. Response services and equipment that are identified as essential but cannot be secured at the present time must be highlighted. Contact information for external resources that may be needed in an emergency should be recorded prominently and kept up to date.

### 5.2.3 Define emergency response standard operating procedures.

After the Team has prioritized the potential threats to the local water supply, determined any special emergency response needs and defined the resources necessary to respond to threats or emergencies, the next step is to establish the specific procedures for emergency response. These response procedures form the core of the contingency plan. The procedures should be carefully thought out and, when possible, tested through drills and training before they are needed.

Establish Standard Operating Procedures (SOPs)
Generally, SOPs for plant operators are included in the Emergency Management Plan prepared by the water system. Ask your local water system manager if a copy of the plan is available. These procedures will include the emergency contact information and additional instructions for handling emergency situations.

Identify Responsible Individuals
Emergency responders may not be the same people responsible for implementing the rest of the SWP plan. However, they will have experience and knowledge of the local water system, strong management capabilities and a willingness to work with others to reach consensus. In addition, emergency responders will be locally available on short notice. He or she should have the community's respect and be capable of acting with authority. Responsibilities for other aspects of the emergency response should be carefully matched to the team members' capabilities to assure effective emergency response when it is needed the most. The PWSS regional engineering supervisor or water plant consultant should be included on the Emergency Contact Form developed during this step. The following is a link to the PWSS regional engineers listed by county: PWSS Contacts by County

Establish Procedures to Isolate the Intake
The contingency plan should clearly state that if evidence of surface water contamination exists, the intake would be taken off line immediately and not returned to service until water quality from the affected intake is in compliance with standards governing public water supplies. The plan must state clearly who has the responsibility and authority to declare that an intake is actually or potentially contaminated.

Establish Procedures if Contamination Enters the Intake
Describe how the system will be flushed/purged of contamination following such an event. State the criteria (such as sampling and analysis) to be used to determine when the flushing/purging is

successful. Describe how the public will be notified of such events. The specific procedures below should be addressed to:

- Determine that an emergency exists.
- Notify key personnel.
- Determine the incident direction and control.
- Determine the need to isolate the intake.
- Initiate public communications/community relations.
- Assess contamination and management strategies.
- Determine if alternative supplies are required.
- Determine if water use restrictions are necessary.
- Determine if alternative water treatment is required
- Assess surface water remediation requirements.

This should include a training agenda and timetable for utility workers and local responders. This training program will be ongoing as conditions in the surface water protection areas and the techniques for dealing with contamination both change. Contingency planning should improve the SWP Team's ability to respond when a potential threat becomes a reality. Test the plan to identify any problems. The plan should also be periodically reviewed and updated. Specific steps clearly understood by the operators on duty and by the public will allow problems to get the prompt attention necessary to minimize their impact.

### 5.2.4 Involving the public

Those who have a part in creating an emergency operations plan are more likely to cooperate in the event of a real emergency. Public meetings to involve the public in emergency planning may be useful in setting priorities. In fact, the public's response may be an indication of the feasibility of the proposed plan. Additionally, town residents may present reasons for ranking threats that differ from those perceived by public officials.

If they are not already members of the SWP Team, bring in local emergency responders to discuss strategies. Present possible emergency plans for public input. Without support at the local level, response to a real threat can be slow and cumbersome. Coordination can be as important as access to technical assistance when it comes to developing the Team and getting the job done. In addition, an informed public is more likely to support necessary investment in new equipment or services.

It is critically important to make the public aware of contingency plans produced during this step. Additional public education and training efforts should address the community's part in any emergency response. Residents should know:

- How to report a potential contamination incident,
- How they will be notified of an emergency,
- What to do in an emergency, and
- How to conserve water when the quantity is reduced.

For additional information on public involvement, go to the PWSS Source Water Assessment Program website.

## 5.3 Products that should result from Step 5 and be included with the final plan

When this step is complete, the SWP Team should have the following information to include with the final plan submitted to the PWSS:

- Forms and information for emergency contacts;
- SOP documents for water supply staff that include long-term and short-term emergency response procedures;
- Documentation of planned education and training for citizens and emergency responders;
- Documentation of citizen participation in developing emergency procedures; and
- A plan for publicity and public education regarding citizen response during an emergency.

# Step 6: Implementing, Maintaining and Updating the SWP Plan

When the SWP Team submits the SWP plan to PWSS for review and approval, it must include the means and timetable for putting the plan into action. Once the SWP plan is in place, continued administration, periodic evaluation and possibly revision will be necessary to continue protection efforts. Administration includes establishing SWPA for new intakes, periodic intake and intake site inspection, regular updating of PCS inventories, and the review and revision of SWP management strategies.

*The SWP plan cannot be a static document. It must be maintained and revised to respond to changing conditions in the community.*

## 6.1 Procedure: what you need to do to complete Step 6

### 6.1.1 Implementing the SWP Plan

The SWP Team must anticipate and plan for implementation while developing the SWP plan. After the plan is approved, implementation can begin. Implementation details will vary by community but will need to address the following items.

Appoint a local SWP Program administrator

The assignment of a person to oversee the administration and implementation of a SWP plan is critical. Responsibility and appropriate authority must be given to this person for the plan to be implemented successfully. This may or may not be the same person who led the plan preparation. It is important that adequate resources be allocated to the administrator. Examples of local SWP program administrators include town public works director, town manager or town water plant superintendent.

Notify property owners within the SWPA

Property owners contacted in Step 3 should be contacted again when the plan is implemented. Information sheets regarding PCSs and appropriate management measures should be shared at this point. An educational approach, including some of the activities outlined in Steps 3 and 4, should be carried out or revisited at this time.

Initiate a management strategy

Implementation of the SWP plan includes application of the management measures outlined in Step 4 of the plan. If general public education efforts were proposed, begin developing

educational materials and specific plans for distribution. Site visits to PCSs should be scheduled and carried out. Establish regular contacts with the appropriate state or federal agencies to monitor compliance with discharge permits, UST management and other regulatory programs. If you proposed any local regulatory elements such as zoning overlay districts or building code modifications, begin the political and administrative process of adoption as soon as possible.

Community Education

Plans for broad-based community education drawn up in Steps 3 and 4 should be put into action. While tangible steps need to be taken at the outset to raise community awareness, remember that education and public involvement are ongoing efforts.

Contingency Plan Coordination and Assignments

Personnel, equipment and other resources needed to respond to contingencies (Step 5) should be checked and verified. Any training or additional resource needs identified in Step 5 must be part of the implementation plan. If financial resource needs were identified in Step 5, plans to raise necessary revenues should also be included in implementation. Personnel assignments for short-term and long-term problems need to be made immediately. Coordination with other community departments or units such as the fire department, local emergency planning committees and response agencies outside the town should be established early.

### 6.1.2 Maintaining the SWP plan

Maintaining the local SWP program is a continuous process of adjusting to the growth and changes that take place in the community. Maintaining and updating the SWP plan includes monitoring chemical use and land use in the SWPAs, updating PCS inventories on a regular basis, maintaining public awareness and involvement, and adding any new water supply intakes to the existing plan. After the plan is adopted and implemented, you may want to maintain the SWP planning team as a standing town committee to maintain the plan. Consider the following activities to keep the SWP plan up to date.

Monitor chemicals used in the SWPAs

As new industry comes into the SWPA, land use changes occur. Planning team members and city officials should be aware of new chemical sources and practices that could affect surface water quality. The PCS inventory and management plan should be updated for any new contaminants identified. Emergency responders should report additional hazardous materials that are registered with them.

Monitor land use within the SWPA

Land use changes may affect the SWPA and potentially the surface water supply. It is important to keep up to date with these changes in order to update the plan and to protect surface water resources. Maintain communication with people responsible for planning and zoning in the town. Tracking applications for building or zoning permits is a good way to keep up with development in the SWPAs. Planning team members may also be a good resource for monitoring land use changes. Simple surveys conducted at regular intervals can

be helpful. Finally, the public awareness and participation developed during the planning process may encourage residents to watch over activities in their SWPAs.

Maintain public awareness programs

Educational programs are crucial in letting residents and stakeholders know how important it is to be careful with any substance that could affect surface water quality. The educational programs developed in Step 4 should be implemented as part of the overall protection efforts. Information and education programs may need to be revised and/or repeated periodically after the initial effort.

Update the PCS inventory

Even in the absence of new development or major land use change, it is a good idea to update the PCS inventory on a defined schedule. Public records available at facilities identified as PCSs should be reviewed annually to insure program compliance. Every three years, the PCS inventory should be updated using the same procedures used to develop the original PCS inventory. Check to see if anything has changed in the SWAP report for your public water supply system. These reports are updated on a regular basis. At this time, any new PCSs can be added to the inventory; any sites eliminated through business or industry closure or modification can be removed from the active inventory. Additionally, any new chemicals registered with the local fire department should be evaluated with respect to their potential effect on the drinking water supply. This also is a good time to review ratings for PCSs and make necessary changes. Follow procedures outlined in Step 3.

Review management strategies

If new PCSs are identified, management strategies identified in your plan should be reviewed and amended if necessary. If new chemicals or processes are added, you may need to revisit the procedures in Step 4 to make sure that your plan includes the management strategies appropriate to all of the threats to water quality in the SWPAs.

Include new water supply intakes to your plan

When adding new intakes to the existing SWP plan, the local SWP program administrator should work closely with the community's public works personnel and any consultants involved with planning and constructing the intake. The first step in adding a new intake or intakes to an existing SWP plan is to delineate the SWPAs for the proposed intake. Next, a new PCS inventory must be developed for the proposed intake. This preliminary information should be given to the person responsible for the local SWP program (local SWP program administrator) for review. At this point, the local SWP program administrator may wish to consult with the PWSS' SWP program manager regarding the delineation of the preliminary SWPAs. Any information required by the PWSS relating to development of new public water supply intakes must also be submitted. If the person responsible for the local SWP program grants provisional approval of the proposed SWP plan and the PWSS grants approval to construct or expand the public water supply intake, then work may proceed with intake construction. Once the intake has been constructed, the revised SWP plan can be finalized. This involves finalizing the SWPA delineation and the PCS inventory. It may also be necessary to revise other SWP plan components (e.g., management plan, contingency plan, etc.) to deal with any new PCSs identified in the new intake's PCS inventory. The

revised SWP plan should then be sent to the PWSS for review and approval. Once approval is received, implementation of the revised SWP plan can begin.

Monitor PCS and drinking water supplies

Some of the PCSs you identified in the initial PCS inventory in Step 3 should be rechecked periodically to track changes in PCS activity. Consult electronic databases to monitor incidents of known contamination. Check with the UST Section of the Division of Waste Management to track issues related to USTs in your SWPA. You may wish to check with the Division of Water Quality to verify that operators of permitted facilities continue to comply with applicable regulatory and permit requirements. North Carolina regulations require monitoring of public drinking water supplies. It is a good idea to establish communication with the operator of your water provider, so you may be apprised of any change in water quality. If you anticipate a long-term problem with a PCS, you may want to consider developing a water quality-monitoring program.

Measure effectiveness

Ultimately, the effectiveness of your SWP plan can be judged by the continued quality of your drinking water supply. In addition, some features of your plan can be tracked to see how your plan is working. If your community has used some regulatory tools, public record of zoning and subdivision permits, site plan reviews, and health or building code inspections can provide insight into how these tools are working. State agencies can provide records on monitoring permitted facilities and any documented surface water contamination incidents. Effectiveness of public information and education can be tracked by documenting public participation in household hazardous waste pick-ups, septic tank maintenance, requests for information, participation in public meetings, etc.

### 6.1.3 Updating the SWP plan

Even with regular evaluation and maintenance, your SWP plan should be thoroughly re-evaluated on a regular basis, perhaps every three to five years. If you have been careful about maintaining your SWP plan, this job will be relatively easy. A major update of your SWP plan will be necessary if any of the following apply:

- Water supply or pumping volumes changes,
- New potential sources of contamination or new potential contaminants,
- Land use changes within the SWPA,
- New required or proposed management strategies,
- Contingency planning and emergency response procedure changes, or
- Addition of new water supply intakes.

Updating your SWP plan may not require you to completely repeat each of the steps in the process. Addition of a new intake, for example, may require an expanded SWPA and additional PCS inventory, but unless a completely new PCS is added, existing management approaches and contingency plans may be sufficient. Residential growth within the SWPA may stimulate discussion of new management approaches but may not add new PCSs to manage. It may be

wise to maintain the SWP plan development team as a standing town committee to make major plan updates easier.

Forecasting future water demand and water supply will help your community anticipate SWP plan updates. Future demand will depend on population change, the type of development (residential, industrial, etc.), and the safe yield of existing and future water supplies. North Carolina General Statute G.S. 143-355(l) requires all units of local government that provide or plan to provide public water service to prepare a Local Water Supply Plan (LWSP) and to update that plan at least every five years. A LWSP is an assessment of a water system's current and future water needs and its ability to meet those needs. By looking at current and future needs, local governments are better able to manage water supplies and better prepared to plan for water supply system improvements. Having a LWSP reduces the potential for water conflicts and water shortages. Early identification of these issues allows more time for resolution. Additionally, local governments must have an adopted current LWSP on file with the Division of Water Resources to qualify for certain grants and loans available for water supply systems in North Carolina. Comparing future water demand with safe yield of available supplies will help in anticipating the need for new intakes that would require major SWP plan updates and revisions.

### 6.1.4 Involving the public

The relationships you have developed in the planning process through communicating with your stakeholders need to be maintained throughout the process. If your support is broad enough, then you will maintain support for the program even when your elected administration changes. The effort to develop a truly representative stakeholder group at the beginning will bring rewards in the long run. Some examples of how town residents can help in local SWP program implementation and maintenance are listed below.

Citizen observations – Citizens will be more aware of PCSs after education and awareness and should be encouraged to notify town officials when they see potential contamination events.

Voluntary submission of updates – By emphasizing that the goal of SWP is protecting drinking water not just complying with regulations, operators of PCS facilities can be encouraged to volunteer information on changes in their facilities, consider management options for new chemicals, and approach the SWP committee for management ideas and information.

Future surveys – Future surveys for monitoring SWP plan effectiveness and for plan updates will depend on cooperation of town residents and volunteers to assist in information collection.

Public education – Planning team members and members of the community can be of assistance in public education. Specifically, members and volunteers can help disseminate educational materials by various modes, including mailings, door-to-door delivery and postings at public buildings, schools and churches. Refer to step 4 for other ideas.

## 6.2 Products that should result from Step 6 and be included with the final plan

- Timeline for implementation, maintaining and updating the SWP Plan.

# Step 7: Submitting the SWP Plan for Review and Approval

Once the draft SWP plan is complete, the SWP Team will submit it to the PWSS for review and approval. The PWSS will review the plan, verify that it is complete and meets the requirements the North Carolina SWP Program has outlined in these guidelines. The approval process typically involves some additions or revisions to the initial draft plan. The PWSS staff may have questions that need to be clarified, or some necessary elements may have been omitted. Revisions may add several months to the time required for approval of your plan. If you follow the guidance in Steps 1 through 6; however, the need for revision should be minimal.

## 7.1 Procedure: what you need to do to complete Step 7

### 7.1.1 What to submit

There are few specific requirements for the format of the SWP plan. The plan should start with a cover page that includes:

- Name of the water system,
- Town and county,
- PWS identification number (PWSID),
- Date, and
- Contact information for the person(s) submitting the plan.

The Plan should include a chapter for each of the steps in the SWP plan process, plus maps, data forms and other supporting information. A checklist for the plan contents is shown at the end of this step. The plan should be well organized. All text, tables, maps and drawings should be typed or printed neatly and legibly. The report should be stapled or bound, so all its pieces stay together. One copy should be submitted; always keep at least one back-up copy in a safe place.

### 7.1.2 Where to submit your SWP plan

Submit your plan to:

**Source Water Protection Program**
**Public Water Supply Section**
**1634 Mail Service Center**
**Raleigh, NC 27699-1634**
**Ph: (919) 707-9070 Fax: (919) 715-4374**

### 7.1.3 What to expect after you submit your plan

The time necessary for PWSS' Source Water Protection coordinator to review your plan and respond varies depending on the number of plans under review at the time. The office strives for a two- to four-week response time. You may receive requests for additional information or suggestions for revision. The questions or suggestions received will depend on how thorough the planning team has been in developing the plan. Examples of requests that could be made following initial review are:

- Give more detail on the PCS inventory and the risk classifications;
- Identify the person/position responsible for certain elements of the plan;
- Define the process for providing public notification on the availability of the SWP plan;
- Document the process for providing information to businesses located within the surface water protection area; and
- Describe future and on-going education and outreach activities that will support continued citizen participation in protecting local sources of drinking water.

The SWP Team will receive a detailed letter stating any questions or comments and explaining what is needed for approval. There are no time limits for response to such requests. However, revisions should be completed and submitted within a reasonable time; otherwise, a plan component such as a PCS inventory may become outdated and need to be revised.

Members of the SWP Team can help answer some of the review questions. It may be necessary to revisit the PCS inventory or decide who is responsible for some of the plan implementation elements. If the SWP Team needs outside help to respond to necessary revisions, contact either the PWSS Source Water Protection coordinator or North Carolina Rural Water Association at the following address – P.O. Box 540, Welcome, NC 27374 – or by phone at (336) 731-6963.

### 7.1.4 What to do with the plan

When the plan receives final approval, the SWP Team will be notified in writing. When you receive this notification, congratulate yourselves for the efforts the SWP Team has made to ensure safe drinking water for your community's residents. Make sure local businesses and citizens know that the public water supply system has an approved local SWP plan. Remember, just having an approved SWP plan is not the end of the story. Proper implementation, maintenance and revisions of the SWP plan are essential for the SWP program to be successful. Follow through on plans made and strategies outlined in Step 6. Keep in touch with PWSS' SWP Program to stay up-to-date on water supply protection information and programs. Ask about SWAP report updates to ensure that your plan includes the most recent PCS data. Finally, remember to keep good records of progress made in implementing the plan. Documentation of proper implementation, maintenance and revisions of the approved SWP plan may be required to obtain priority rating points for future loan and grant applications.

## 7.2 Checklist for a complete SWP plan

# Step 1: The Planning Team

- Names and roles of planning team members,
- Problems and needs identified by planning team,
- Goals of SWP plan and planning team, and
- Strategies for public participation.

## Step 2: Understanding the SWAP Report

- Basic SWAP report:
    - System name, location, town or community served;
    - Source of supply (watershed classification);
    - Water Supply Watershed Protection Program ordinances;
    - Local Ordinances in effect;
    - Inherent Vulnerability rating of the source;
    - PCS rating of the source; and
    - Susceptibility rating of the source.

- Map showing each intake location, with the delineated source water protection areas.
- Map of PCSs inventoried in the SWAP report.

## Step 3: Conducting a Potential Contaminant Source Inventory

- Verify accuracy of PCS data contained in the SWAP report using methods defined in Step 3.
- Search additional state and federal databases not included in the SWAP report and include printouts showing search results.
- Search local and county records for PCS information and include printouts or documentation showing search results.
- Provide a summary of data from each type of survey.
- Conduct on-site surveys to identify local PCSs. Include GPS coordinates and any other information available for each PCS.
- Document interviews with local citizens.
- Record all information about types, quantities of contamination on PCS datasheets, assign a Code, and summarize as defined in Step 3.
- Define the criteria used to rank PCSs.
- List PCSs grouped by high, moderate and low risk.
- Document public citizen involvement.

## Step 4: Developing Management Strategies

- Management strategy adopted for each prioritized PCS type occurring within the source water protection areas.
- Documentation of public citizen involvement in the process of choosing management strategies.

## Step 5: Developing a Contingency Plan

- Forms and information for emergency contacts.
- SOP documents for water supply workers.
- Long-term and short-term plans addressing response procedures.
- Documentation of public citizen participation in developing emergency procedures.
- Plan for public notification in the event of emergency involving disruption of the water supply.

## Step 6: Implementing, Maintaining and Updating Your Plan

- Process for appointment of a local SWP program administrator.
- Notification procedure for property owners within the source water protection areas.
- Community education materials.
- Personnel assignments for responsibilities identified in the contingency plan.
- Plans for training programs for local personnel.
- Program for monitoring PCSs and drinking water supplies through electronic databases, state agencies and local personnel.
- Implementation schedules.
- Schedule and procedures for regular plan maintenance and revisions.
- Procedures to update plans following construction of new intake, after introduction of any new PCS located within the source water protection areas, or following any major land use changes in the SWP areas (critical, protection, buffer).