

SOURCE WATER ASSESSMENT OF PUBLIC WATER SUPPLIES (SWAP)



INTRODUCTION

The Federal Safe Drinking Water Act (SDWA) Amendments of 1996 emphasize pollution prevention as an important strategy for the protection of ground and surface water resources. This new focus promotes the prevention of drinking water contamination as a cost-effective means to provide reliable, long-term and safe drinking water sources for public water supply (PWS) systems. In order to determine the susceptibility of public water supply sources to contamination, the amendments also required that all states establish a Source Water Assessment Program (SWAP). Specifically, Section 1453 of the SDWA Amendment requires that states develop and implement a SWAP to:

- Delineate source water assessment areas;
- Inventory potential contaminants in these areas; and
- Determine the susceptibility of each public water supply to contamination.

In North Carolina, the agency responsible for the SWAP is the Public Water Supply (PWS) Section of the DENR Division of Environmental Health (DEH). The PWS Section received approval from the EPA for their SWAP Plan in November 1999. The SWAP Plan, entitled North Carolina's Source Water Assessment Program Plan, fully describes the methods and procedures used to delineate and assess the susceptibility of more than 9,000 wells and approximately 207 surface water intakes. To review the SWAP Plan, visit the PWS website.

DELINEATION OF SOURCE WATER ASSESSMENT AREAS

The SWAP Plan builds upon existing protection programs for ground and surface water resources. These include the state's Wellhead Protection Program and the Water Supply Watershed Protection Program.

WELLHEAD PROTECTION (WHP) PROGRAM

North Carolinians withdraw more than 88 million gallons of groundwater per day from more than 9,000 water supply wells across the state. In 1986, Congress passed Amendments to the SDWA requiring states to develop wellhead protection programs that reduce the threat to the quality of groundwater used for drinking water by identifying and managing recharge areas to specific wells or wellfields.

Defining a wellhead protection area (WHPA) is one of the most critical components of wellhead protection. A WHPA is defined as "the surface and subsurface area surrounding a water well or wellfield, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or wellfield." The SWAP uses the methods described in the state's approved WHP Program to delineate source water assessment areas for all public water supply wells. More information related to North Carolina's WHP Program can be found on the DEH website.

WATER SUPPLY WATERSHED PROTECTION (WSWP) PROGRAM

DWQ is responsible for managing the standards and classifications of all water supply watersheds. In 1992, the WSWP Rules were adopted by the EMC and require all local governments that have land use jurisdiction within water supply watersheds adopt and implement water supply watershed protection ordinances, maps and management plans. SWAP

uses the established water supply watershed boundaries and methods established by the WSWP program as a basis to delineate source water assessment areas for all public water surface water intakes. Additional information regarding the WSWP Program can be found on the DWQ website.

SUSCEPTIBILITY DETERMINATION - NORTH CAROLINA'S OVERALL APPROACH

The SWAP Plan contains a detailed description of the methods used to assess the susceptibility of each PWS intake in North Carolina. The following is a brief summary of the susceptibility determination approach.

OVERALL SUSCEPTIBILITY RATING

The overall susceptibility determination rates the potential for a drinking water source to become contaminated. The overall susceptibility rating for each PWS intake is based on two key components: a contaminant rating and an inherent vulnerability rating. For a PWS to be determined "susceptible", a potential contaminant source must be present and the existing conditions of the PWS intake location must be such that a water supply could become contaminated. The determination of susceptibility for each PWS intake is based on combining the results of the inherent vulnerability rating and the contaminant rating for each intake. Once combined, a PWS is given a susceptibility rating of higher, moderate or lower (H, M or L).

INHERENT VULNERABILITY RATING

Inherent vulnerability refers to the physical characteristics and existing conditions of the watershed or aquifer. The inherent vulnerability rating of groundwater intakes is determined based on an evaluation of aquifer characteristics, unsaturated zone characteristics and well integrity and construction characteristics. The inherent vulnerability rating of surface water intakes is determined based on an evaluation of the watershed classification (WSWP Rules), intake location, raw water quality data (i.e., turbidity and total coliform) and watershed characteristics (i.e., average annual precipitation, land slope, land use, land cover, groundwater contribution).

CONTAMINANT RATING

The contaminant rating is based on an evaluation of the density of potential contaminant sources (PCSs), their relative risk potential to cause contamination, and their proximity to the water supply intake within the delineated assessment area.

INVENTORY OF POTENTIAL CONTAMINANT SOURCES (PCSS)

In order to inventory PCSs, the SWAP conducted a review of relevant, available sources of existing data at federal, state and local levels. The SWAP selected sixteen statewide databases that were attainable and contained usable geographic information related to PCSs.

SOURCE WATER PROTECTION

The PWS Section believes that the information from the source water assessments will become the basis for future initiatives and priorities for public drinking water source water protection (SWP) activities. The PWS Section encourages all PWS system owners to implement efforts to manage identified sources of contamination and to reduce or eliminate the potential threat to drinking water supplies through locally implemented programs

To encourage and support local SWP, the state offers PWS system owners assistance with local SWP as well as materials such as:

- Fact sheets outlining sources of funding and other resources for local SWP efforts.
- Success stories describing local SWP efforts in North Carolina.
- Guidance about how to incorporate SWAP and SWP information in Consumer Confidence Reports (CCRs).

Information related to SWP can be found on the DEH website.

PUBLIC WATER SUPPLY SUSCEPTIBILITY DETERMINATION IN THE BROAD RIVER BASIN

In April 2004, the PWS Section completed source water assessments for all drinking water sources and generated reports for the PWS systems using these sources. A second round of assessments were completed in April 2005. The results of the assessments can be viewed in two different ways, either through the interactive ArcIMS mapping tool or compiled in a written report for each PWS system. To access the ArcIMS mapping tool, simply click on the “NC SWAP Info” icon on the PWS website. To view a report, select the PWS System of interest by clicking on the “SWAP Reports” icon.

In the Broad River Basin, 249 public water supply sources were identified. Eight are surface water sources, one is a groundwater source under the influence of surface water and 240 are groundwater sources. Of the 240 groundwater sources, 237 have a Higher susceptibility rating and 3 have a Moderate susceptibility rating. Table 13-1 identifies the eight surface water sources, the groundwater water source under the influence of surface water and their overall susceptibility ratings. It is important to note that a susceptibility rating of Higher does not imply poor water quality. Susceptibility is an indication of a water supply’s potential to become contaminated by the identified PCs within the assessment area.

TABLE 13-1: SWAP RESULTS FOR SURFACE WATER SOURCES IN THE BROAD RIVER BASIN

PWS ID NUMBER	INHERENT VULNERABILITY RATING	CONTAMINANT RATING	OVERALL SUSCEPTIBILITY RATING	NAME OF SURFACE WATER SOURCE	PWS NAME
0123010	H	L	M	FIRST BROAD RIVER	CITY OF SHELBY
0123020	M	L	M	MOSS LAKE	TOWN OF KINGS MOUNTAIN
0123055	H	L	M	FIRST BROAD RIVER	CLEVELAND CO SANITARY DIST
0175010	H	L	M	BIG FALLS CREEK	TOWN OF TRYON
0175010	H	L	M	FORK CREEK	TOWN OF TRYON
0175010	H	L	M	COLT CREEK	TOWN OF TRYON
0181010	H	L	M	SECOND BROAD RIVER	TOWN OF FOREST CITY
0181035	H	L	M	BROAD RIVER	BROAD RIVER WATER AUTHORITY
0181106	H	L	M	SPRING #1	CHIMNEY ROCK PARK