

# RESULTS OF THE METRO ATLANTA SOURCE ASSESSMENT PROJECT

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**Abstract.** The 1996 Amendments to the Safe Water Drinking Act resulted in an EPA mandate that every State be required to submit an implementation plan for comprehensive Source Water Assessment Programs. The Atlanta Regional Commission in coordination with the State of Georgia Department of Natural Resources and local water managers developed these assessments for 28 Metro Atlanta water supply watersheds. These assessments resulted in an inventory of almost 6,000 potential individual sources of pollution. Watershed susceptibility to contamination through non-point source runoff using land use analysis as an indicator was also evaluated. A combined susceptibility ranking of high, medium or low was then determined for each of the watersheds. In the Metro Atlanta Region, four watersheds ranked highly susceptible to potential pollutant sources, three ranked medium to high, sixteen ranked medium and five ranked low.

## INTRODUCTION

The 1996 Amendments to the Federal Safe Drinking Water Act (SDWA) brought about new pollution prevention measures to help ensure clean and safe drinking water. As a result, the U. S. Environmental Protection Agency (USEPA) has set a national goal that by 2005, the majority of the population is to receive its drinking water from systems with Source Water Protection Plans (SWPP) in place. The initial step in the development of this Plan is to prepare an inventory and assessment of each water supply watershed in the state. This step is the Source Water Assessment Project (SWAP).

## BACKGROUND

In 1999, the Georgia Environmental Protection Division (GAEPD) contracted the Atlanta Regional Commission (ARC) to coordinate and facilitate the implementation of the EPD Source Water Assessment and Protection Plan (2000) for 28 Metro Atlanta public

drinking water intakes. ARC created a Technical Task Force made up of local water managers to develop and implement Source Water Assessments. The Source Water Assessments for the 28 Metro Atlanta Watersheds were completed in December 2001.

## METHODS

### SWAP Task Force

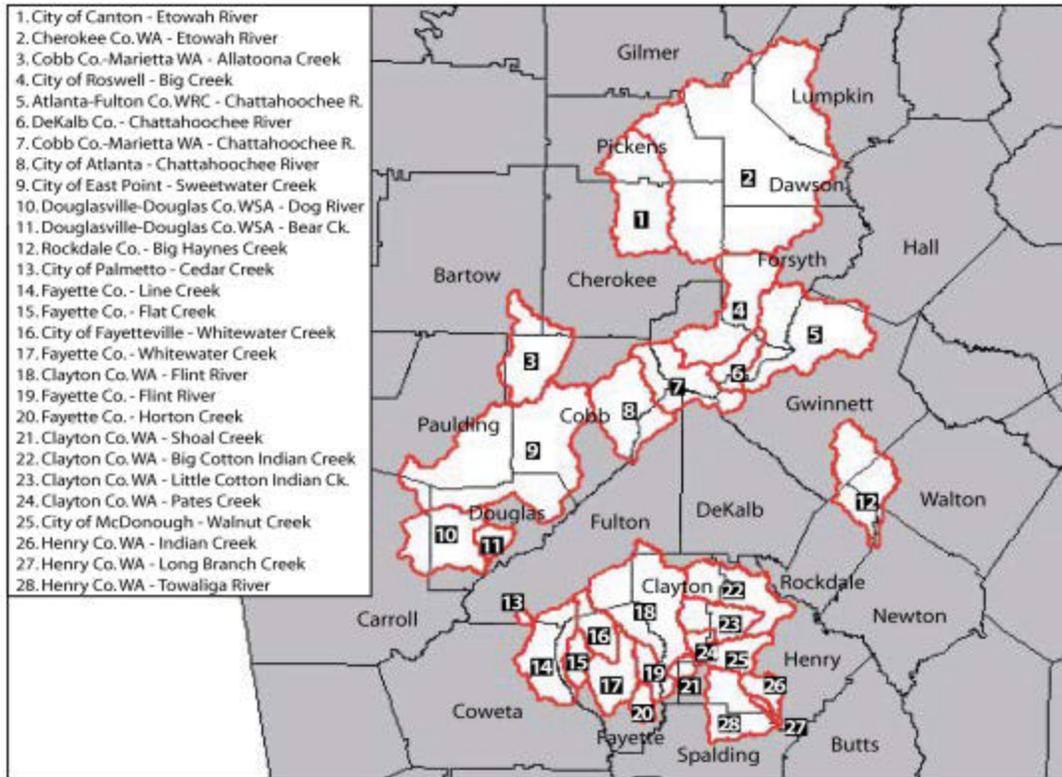
A Technical Task Force consisting of water suppliers involved in the Metro Atlanta SWAP, GAEPD, Lake Allatoona Preservation Authority (LAPA) and ARC staff was created to assist with the work on each component of SWAP. The Task Force provided technical direction to the project. The Task Force also assisted with the direct implementation of specific tasks as necessary.

### Components of SWAP

The implementation of the state SWAP required four major components. These components include: delineation of the water supply watershed and determination of assessment areas; inventory and analysis of the potential sources of water supply contamination within the assessment areas; determination of the susceptibility of each intake to potential contaminants; and lastly, development of a communication plan for the public. Detailed discussion of each of these components and methodologies can be found in the 2001 Proceedings of the Georgia Water Resources Conference (Daniel and Witcher, 2001).

### Metro Atlanta Study Area

Table 1 lists the water systems participating in the Metro Atlanta SWAP and the associated drinking water supply sources. Figure 1 illustrates the source watersheds for the water supply systems listed in Table 1. Overall, the watersheds cover over 3,000 square miles of land area.



**Figure 1. Metro Atlanta SWAP Watersheds.**

**Table 1. Metro Atlanta SWAP Water Systems and Drinking Water Sources**

**RESULTS**

Water System	Water Source
City of Atlanta	Chattahoochee River
Atlanta-Fulton Co. WRC.	Chattahoochee River
City of Canton	Etowah River
Cherokee Co. Water & Sewerage Authority	Etowah River
Cobb County-Marietta Water Authority	Chattahoochee River
Cobb County-Marietta Water Authority	Allatoona Lake
Clayton Co. Water Authority	Flint River
Clayton Co. Water Authority	Shoal Creek
Clayton Co. Water Authority	Pates Creek
Clayton Co. Water Authority	Little Cotton Indian Cr
Clayton Co. Water Authority	Big Cotton Indian Cr
DeKalb Co. Public Works	Chattahoochee River
Douglasville-Douglas Co. WSA	Dog River
Douglasville-Douglas Co. WSA	Bear Creek
City of East Point	Sweetwater Creek
Board of Commissioners of Fayette Co.	Flat Creek
Board of Commissioners of Fayette Co.	Line Creek
Board of Commissioners of Fayette Co.	Whitewater Creek
Fayette Co. Water System	Horton Creek
Fayette Co. Water System	Flint River
City of Fayetteville	Whitewater Creek
Henry Co. Water & Sewer Authority	Indian Creek
Henry Co. Water & Sewer Authority	Long Branch Creek
Henry Co. Water & Sewer Authority	Towaliga River
City of McDonough	Walnut Creek
City of Palmetto	Cedar Creek
City of Roswell	Big Creek
Rockdale County	Big Haynes Creek

**Inventory of Significant Potential Sources of Contamination**

The Task Force created a list of potential individual sources of pollution using GAEPD minimum criteria and a review of other identified contaminants of concern. This list contained specific types of facilities, which were generalized into pollutant source categories. Table 2 lists these categories with the number of facilities located in all of the watersheds. Overall, 5,971 potential individual sources of pollution were identified within the 28 watersheds. The City of Atlanta’s Chattahoochee River watershed had the highest number of facilities (1,429) and Fayette County’s Horton Creek watershed had the least number of facilities (0).

Fuel Facilities comprised 33% of the identified facilities. Fuel facilities included any properties with a gas tank on site including aboveground and belowground tanks. Twenty-six percent of the identified sites were in the Hazardous Waste Facilities category examples of which included dry cleaning establishments, auto body shops, paint stores, and car repair shops.

**Table 2. Metro Atlanta SWAP Potential Pollutant Source Inventory**

Potential Pollutant Source Category	# of Facilities
Agricultural	287
Airports	41
Asphalt Plants	35
Electric Substations	155
Fuel Facilities	1940
Garbage Transfer Stations	28
Hazardous Waste Facilities	1556
Junk/Scrap/Salvage Yards	93
Landfills	99
Large Industries which have Bulk Chemical and Petroleum Storage	2
Large Industries which have Federal Categorical Standards	40
Large Industries which Utilize Hazardous Chemicals	495
Land Application Site Permit Holders	46
Lift Stations (sewer)	431
Marinas	3
Mines	237
NPDES Permit Holders	134
Oil/Gas Pipelines	208
Recycling Centers	56
Water Treatment Plants	68
Wastewater Treatment Plants	17

When one facility was listed under several categories, duplicates were removed; therefore no facility is repeated or ranked twice within a watershed.

### Determination of Susceptibility of Public Water Supply(s)

The susceptibility component of the SWAP brings together the inventory with other relevant information to provide a determination of the likelihood of each potential pollutant source to impact water quality. ARC utilized the susceptibility determination methodology described in the GAEPD Source Water Assessment and Protection Plan (2000).

The susceptibility of the intake addresses two issues; the potential for the contaminant to reach surface water and eventually reach the surface water intake and the risk the contaminant poses to the drinking water supply if the contaminant reaches the surface water intake.

Individual pollutant source susceptibility rankings were performed for each site. Release potential for individual sources was determined through a combination of the following factors: potential volume of release, duration of release, the distance to surface waters and the ease of transport or travel to surface water. Also considered in the criteria are the uses of

on-site structural controls and best management practices (BMPs). Risk potential involves the distance to this water supply intake and the potential toxicity of the contaminants on site.

After the individual source rankings were completed for each facility using the generalized factors, the local water systems and stakeholders reviewed each facility and rank on an individual basis. Once the final rankings were processed, an overall individual source susceptibility ranking was established for the water supply intake.

ARC determined the release potential and risk assessment for non-point source analyses using 1999 ARIS land use coverage developed by the ARC through the use of aerial photography. An analysis of the percent of impervious surface area associated with the land use categories was used to determine the non-point source ranking. An impervious surface area of less than 10% was ranked as low, between 10-20% as medium and 20% or more as high susceptibility. Impervious surface area ranged from 2% to 26% in the watersheds.

Other factors considered in the non-point source rankings were areas where major roads and railroads crossed streams, sewer and non-sewered areas, sewer lines ten inches in diameter or greater crossing streams, and land in transition or under construction.

## CONCLUSION

### Metro Atlanta SWAP Results

Overall, of the 28 Metro Atlanta Source Water Assessment, four watersheds ranked as highly susceptible to potential sources of pollution, three were ranked as medium to high, sixteen as medium and five as low (Table 3.) Factors considered in this ranking included the individual facilities susceptibility ranking combined with the overall non-point source susceptibility ranking.

The four high-ranking watersheds include two within the Chattahoochee River Basin and two within the Flint River Basin. Each of these watersheds covered a large land area (greater than 100 square miles) and had a high density of both impervious surface area, an indicator of the degree of non-point source runoff within a watershed, and individual facilities. The medium/high-ranking watersheds had similar characteristics (although not as high a degree) to the high-ranking watersheds. An exception was the Indian Creek watershed in Henry County. This watershed is relatively small in area with little density of development however, this watershed contains a

four-mile segment of Interstate 75, which runs parallel to the creek and crosses the waterway very close to the intake.

The medium-ranked watersheds showed a wide variety of land areas. The Cherokee County and City of Canton Etowah River Watersheds were very large (greater than 500 square miles) however due to the lack of development in this more rural watershed, the rankings were lower than other watersheds that had large land areas and included urban development. The medium rank was assigned based on the location of the development in the watershed, which was relatively close to the intake. Many of the smaller watersheds were also ranked as medium, in many cases this was due to the proximity of the individual potential sources of pollution to the intake.

Consistently, the low-ranking watersheds had very few individual facilities and did not contain large areas of developed or urban land. These watersheds were relatively small and located in undeveloped areas.

The major water supply watershed issues in the Metro Atlanta area are non-point source pollution from urban runoff and the density of individual potential pollutant facilities. Urban non-point source runoff is caused by development and everyday activities that

take place in residential and commercial areas in urban locations and is carried by rainfall to streams and lakes. Leaky septic tanks and sewer lines, major transportation corridors, construction sites and areas of bare or exposed soils are other sources of non-point source pollution.

The density of development within water supply watersheds is also an indicator of the susceptibility to potential pollution. In highly developed areas, it was found that the intensity of the potential individual sources of pollution was significantly greater making the intake more susceptible to potential pollutant sources.

#### LITERATURE CITED

Daniel and Witcher, 2001. Metro Atlanta Source Assessment Project. In K.J. Hatcher (ed.) *Proceedings of the 2001 Georgia Water Resources Conference*. University of Georgia Institute of Ecology, Athens, GA, pp. 272-275.

State of Georgia Environmental Planning Division, Department of Natural Resources, Water Resources Group, 2000. EPD Source Water Assessment and Protection Plan.

**Table 3. Overall Watershed Rankings**

Water Utility	Water Source	Watershed Area (mi <sup>2</sup> )	Overall Watershed Rank
City of Atlanta	Chattahoochee River	419	High
Cobb County-Marietta Water Authority	Chattahoochee River	336	High
Fayette Co. Water System	Flint River	158	High
Clayton Co. Water Authority	Flint River	128	High
City of Roswell	Big Creek	99	Medium-High
Clayton Co. Water Authority	Big Cotton Indian Cr.	122	Medium-High
Henry Co. Water & Sewer Authority	Indian Creek	17	Medium-High
Cobb County-Marietta Water Authority	Allatoona Lake	81	Medium
DeKalb Co. Public Works	Chattahoochee River	164	Medium
Board of Commissioners of Fayette Co.	Flat Creek	19	Medium
Board of Commissioners of Fayette Co.	Line Creek	70	Medium
Board of Commissioners of Fayette Co.	Whitewater Creek	77	Medium
Atlanta/Fulton County WRC	Chattahoochee River	138	Medium
City of East Point	Sweetwater Creek	263	Medium
City of McDonough	Walnut Creek	31	Medium
Clayton Co. Water Authority	Little Cotton Indian Cr	50	Medium
Clayton Co. Water Authority	Shoal Creek	9	Medium
Douglasville-Douglas Co. WSA	Bear Creek	17	Medium
Douglasville-Douglas Co. WSA	Dog River	78	Medium
City of Fayetteville	Whitewater Creek	31	Medium
Henry Co. Water & Sewer Authority	Towaliga River	57	Medium
Cherokee Co. Water & Sewerage Authority	Etowah River	501	Medium
City of Canton	Etowah River	613	Medium
City of Palmetto	Cedar Creek	3	Low
Clayton Co. Water Authority	Pates Creek	9	Low
Fayette Co. Water System	Horton Creek	13	Low
Henry Co. Water & Sewer Authority	Long Branch Creek	4	Low
Rockdale County	Big Haynes Creek	82	Low