SOURCE WATER PROTECTION STRATEGIES FOR METRO ATLANTA WATERSHEDS

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Abstract. Source water is a finite resource that needs to be protected for the long-term benefit of human health. The current approach for protection of source water is two-fold: assessment of existing vulnerability of a source water watershed to contamination and development of a protection plan. The US Environmental Protection Agency (USEPA) and Georgia Department of Natural Resources Environmental Protection Division (GAEPD) have provided extensive guidance on how to conduct a source water assessment; however, relatively little guidance exists on how to prepare and implement a protection plan. Source Water Assessment Plans (SWAPs) for twenty-eight Metro-Atlanta water supply intakes were completed in 2001 by the Atlanta Regional Commission (ARC) . These Assessments indicate that some intakes have a potentially high susceptibility to pollution due to the density of contaminant point sources and high amounts of impervious surface (indicator of nonpoint source impacts). The source water protection strategies described herein outline a framework for local protection plans and provides a number of strategies that are appropriate for source water watersheds of different sizes and levels of impact.

The recommendations in this document include programmatic recommendations that would be applied in each of the jurisdictions as well as pollution source specific strategies. Programmatic strategies include implementation of the Metropolitan North Georgia Water Planning District Model Stormwater Management Ordinances adopted in October 2002 to address nonpoint source loadings, implementation of the G AEPD Environmental Planning Criteria to require set backs from streams in source water watersheds, better enforcement of existing regulations, and acquisition and preservation of land within source water watersheds.

A number of unique challenges exist in the development of source water protection strategies, some of which overlap with recommendations from Total Maximum Daily Load (TMDL) implementation strategies being developed simultaneously. Implementation of effective nonpoint source/stormwater control measures will address many of the primary sources of pollution contributing to both water quality impairments associated with TMDL listings and potential source water contamination. In order to minimize costs, source water protection strategies should be combined, to the extent possible, with watershed protection and management programs.

BACKGROUND AND INTRODUCTION

In 1999, the GAEPD contracted the ARC to coordinate and facilitate the implementation of the Source Water Assessment Plans 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 purpose of these Assessments was to delineate and map the watersheds, inventory potential sources of pollution (point and nonpoint) and provide a ranking of the intake's susceptibility to these potential pollutant sources.

CH2Mhill and ARC provide consultant and watershed planning assistance to local governments and also provide support to the Metropolitan North Georgia Water Planning District (MNGWPD). As a preemptive step in Source Water Protection Planning, CH2Mhill and ARC are developing source water protection strategies for the Metro Atlanta water supply watersheds. Source water protection strategies are being developed to address specific pollutants of concern for the water supply intakes found throughout the Atlanta metropolitan area.

Recommended source water protection strategies include programmatic measures as well as potential source specific activities. Programmatic measures include activities that overlap existing or planned watershed and stormwater management measures as

well as enforcement of existing programs. Pollution source specific measures are focused on working with individual sources to improve awareness and ensure proper site procedures are used to limit pollutant runoff and potential water contamination.

PROGRAMMATIC STRATEGIES

Implementation of Nonpoint Source Controls

Watershed assessments completed in the area have documented that much of the pollutant loads reaching water supply sources is related to nonpoint source runoff. Therefore, the primary strategy for addressing nonpoint source contributions will be implementation of the recommended MNGWPD Model Stormwater Management Ordinances (MNGWPD, 2002). Implementation of the essential recommendations in these ordinances will significantly decrease the amount of nonpoint source related pollutant loadings to source water watersheds.

Implementation of the State of Georgia Environmental Planning Criteria

These criteria include requirements for protection of wetlands, floodplains, and water supply watersheds. It should be recommended that each of the local governments with a water supply watershed within their jurisdiction be responsible for implementing the minimum criteria for large (or small) water supply watersheds (GA Code § 391-3-16-.01). This will require local governments to develop and implement an ordinance to require the minimum set backs from perennial streams. These set backs may be implemented through land purchases by the local government that could be incorporated into their local Greenspace program.

Enforcement of Existing Regulations

Existing programs for water pollution prevention, stormwater control, and water quality permitting address many of the potential pollution sources in the water supply watersheds. Unfortunately, the GAEPD programs have been under-funded and existing staff are not able to commit the level of effort required to fully enforce the current requirements. Similarly, at the local government level, often the sedimentation and erosion control programs and stormwater programs have been under-funded. Additional support at both state and local level will be needed.

Land Acquisition

One of the most effective source water protection strategies is to purchase significant portions of a watershed leading to the water supply source and protect it from further development or disturbance. Throughout most of the area, this alternative is not possible due to the level of existing development. However, as Greenspace alternatives are evaluated, acquisition of lands within water supply watersheds should be considered high priority areas for purchase.

Public Education and Awareness

As part of a source water protection plan, specific recommendations for public education and awareness programs should be identified. Specific programs should be recommended to assist with the education of the general public. Additional education materials should be developed to educate specific potential pollutant sources about pollution prevention and the need to protect the water supply watershed. A common set of materials can be developed for all the jurisdictions within the region.

POTENTIAL POLLUTANT SOURCE-SPECIFIC PROTECTION STRATEGIES

In addition to the programmatic strategies listed above, local governments need to include additional measures to address specific pollutant sources highlighted in the SWAPs. The Georgia guidance for the SWAPs outlines a number of potential pollutant sources that need to be evaluated in water supply watersheds . However, the results of the majority of the SWAPs for the Metro area found that several types of pollutant sources were found to be consistent issues. These sources include sediment and erosion from exposed land, large amounts of impervious surface area, oil and gas pipelines and railroads crossing streams, septic systems, sewer lift systems, large industries which utilize hazardous chemicals, and fuel facilities.

Sediment and Erosion

Although not distinctly outlined in the State guidance as a potential pollutant source, sediment and erosion was identified by the ARC SWAP participants as a major concern for the metro-Atlanta area. The percentage of land identified as “in transition” was determined from aerial photography. For some areas nearly 5% of the total land percentage of the watershed was found to be in transition. Much of these concerns regarding the sediment and erosions control will be addressed with the new State requirements in the revised Sedimentation and Erosion Control Act. However, additional emphasis on compliance will be

required at the local government level. Adequate staffing will be required to assure that the new requirements are being met during construction.

Impervious Surface Area

As discussed above, it is clear that large amounts of impervious area can be detrimental to water bodies (Schueler, 1994). Although it can be difficult, if not impossible to transition back to a pervious land surface, limiting impervious surfaces on a larger watershed basis can be important to limiting overall pollutant loadings to a water supply.

Land acquisition of the entire source water watershed (or at least major parts of it) is ideal for managing land uses and the associated potential contaminants. Ultimately the best way to control activities is to purchase the land and/or the development rights to the area. However, due to the high cost of purchasing property in much of the area, this recommendation relates primarily to newly planned water supply watersheds and those that will be entirely within a single jurisdiction.

Another option for land acquisition is the purchase of conservation easements offered voluntarily by landowners. Each easement, which would limit development, becomes a permanent part of the property title that must be adhered to by future owners of the land. In return, landowners can receive significant reductions in property taxes because the easement is no longer assessed as developable real estate. For those areas with extensive agriculture, the use of Federal funding associated with the Environmental Quality Incentives Program (EQIP) can be used as an incentive to farmers not to actively cultivate the land, but rather set it aside for conservation.

Oil and Gas Pipelines/Railroads

There area a number of oil and gas pipelines and railroads within the area that cross existing water supply watersheds. These facilities are currently regulated by the Federal Energy Regulatory Commission (FERC), GA Department of Transportation, or the Federal Department of Transportation. Liquid transportation pipelines are required to have emergency spill plans in place and to conduct periodic training with staff. Information could be distributed to facility owners and railroad companies identifying that their lines cross a water supply watershed.

Septic Systems

Septic systems can have significant impacts in source water watersheds, primarily due to failing systems or lack of maintenance. Local governments need to consider transitioning those areas with high densities of septic tanks to sewer. For many source water concerns, local governments can provide the requirement for ordinance changes to support protection.

Lift Stations and Sewer Lines Crossing Streams

The Capacity, Management, Operations, and Maintenance (CMOM) program required by US EPA will address many of the potential concerns associated with sewer line crossings and lift stations in water supply watersheds.

Large Industries Which Utilize Hazardous Chemicals

The primary method for addressing industrial and commercial sites is through existing regulations. Existing regulatory programs emphasize industrial good housekeeping practices, including equipment operation and maintenance, product storage, use, and handling, and waste storage and disposal. Enforcement of the existing programs described above will be critical to the success of the source water protection strategies. GAEPD is responsible for this enforcement. However, due to limitations in staffing and other resources, this task often does not receive adequate attention. Educational materials that emphasize the need for spill prevention and containment in water supply areas should be developed and distributed to these facilities.

Fuel Facilities

In Georgia, the Underground Storage Tank (UST) program is the primary way that fuel facilities are monitored and tracked. Recent requirements include the identification of those areas where USTs may be failing by testing methods and standards. In addition, the program requires implementation of an early leak detection system for new USTs and some retrofit, based on the size of the tank. Containment verification methods are also outlined with existing UST program. Depending on the type of tank, those verification methods include the implementation of a monitoring well system, double walled tanks, cathodic protection, and electronic monitoring.

CONTINGENCY PLANNING

Despite the use of any or all of the source water protection strategies described above, it is possible that accidents or disasters may still occur. Water supply replacement strategies are therefore critical for ensuring that a safe drinking water supply is available for

consumption. Generally, disruptions of the primary supply, either short- or long-term, occur as a result of the weather (e.g., drought) or a contaminant (e.g., a chemical spilled into the primary source water that cannot be removed by the WTP due to either its concentration or type).

The current approach for managing the water supply through GAEPD includes reservoir management, water conservation, and a drought contingency plan. The existing contingency plan should be supplemented by the following actions: 1) provide the emergency response organizations in the watershed with instructions to communicate to affected members of both local and State government in the event of a contaminant spill and 2) provide all personnel with a review of emergency response procedures.

LINKAGES BETWEEN SOURCE WATER PROTECTION AND TMDL STRATEGIES

A number of unique challenges exist with development of TMDL implementation strategies and source water protection strategies. Many of these challenges are common to both concepts and need to be fully addressed prior to implementation and include consistent enforcement of existing regulations, funding concerns, public outreach and education, each of which are discussed below:

In order to maximize cost savings, source water protection efforts should be combined to the greatest extent possible with watershed protection and management efforts (currently required through the wastewater and water supply permitting process) and water conservation efforts. Most of the source water in the area is from surface water and ultimately protecting stream segments for recreational, as well drinking water, uses would be ideal.

Public education is key to many aspects of source water protection, if not through direct human health risk, then through support of regulatory changes. Continued emphasis on school-age children to make long-term changes in behavior should be a central part of this effort. In addition, public outreach should target other groups and behaviors that affect source water (i.e homeowners, motor vehicle owners).

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