

“When we try to pick out anything by itself, we find it hitched to everything else in the universe.”

JOHN MUIR

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Is Your Land Use Agenda in Sync with Source Water Protection?

LAND USE STRATEGIES

Home rule—as it pertains to land use in the New England states—places most of the responsibility for land use regulation and consequently source water protection with local governments. While there are a variety of federal and state requirements and programs that address water quality issues, the day-to-day decisions associated with land use and resource protection are made by municipal officials—planning and zoning board members, conservation commissioners, wetlands commissioners, health officers, town sanitarians, zoning boards of appeal.

The good news is that most municipalities have sufficient authority to control land use activities and conditions that threaten their drinking water supplies. With this in mind, there are some key questions you should consider up front:

- Do you have clear drinking water protection goals?
- Are you currently doing the best you can to minimize the cumulative risks of land uses to your drinking water resources?
- What authorities and options are available to your community to ensure the future health of your water supply?



Is Your Source Water Protection House in Order?

Your Source Water Assessment report can be a powerful tool for your community. It is a jumping-off point from which you can:

- review existing policies, regulations, codes, standards, ordinances, and other land use controls—if you haven't already—to see if they are helping your community to protect source water
- carefully consider the prospect of discarding or revising outdated and ineffective regulations
- substantiate your Source Water Assessment report with regard to known and potential threat inventories and action priorities
- determine who in your community has the authority to address specific types of threats
- adopt and implement mitigative or protective measures

Best Management Practices (BMPs)

Established practices used to help reduce the impacts of activities (e.g., industrial activities, construction, road building, agriculture) that have the potential to threaten water quality.

Resource protection philosophies and strategies have evolved considerably over the past 50 years. Much of what has changed comes as the result of lessons learned about the long- and short-term effects of our land use activities on our environment. Your source water protection strategies should take into account the most current, science-based BMPs available, leaving the door open to effective, innovative techniques.

This chapter provides you with a list of Strategies for Action to protect source water, as well as selected case examples. Many of these strategies may already be in place in your community. *As a general rule, always check your state requirements and statutes.*

Strategies for Action

✓ **Make sure your water resource protection goals are in agreement with your comprehensive town plan.**

Are your source water protection areas clearly identified in your town plan as a protection priority? If not, update the plan so that these critical areas are given top priority. Work with other communities in the water supply watershed or service area.

✓ **Target critical water resource protection areas for land conservation.**

Does your community and/or water supply region have a plan for land conservation that is compatible with watershed and recharge area



CASE STUDY

Connecting Water Resources Throughout Your Water Supply Watershed

In many communities, water supply source areas extend partially or entirely beyond their jurisdictions. Sharing water resources within a given watershed requires the active support and cooperation of the other jurisdictions—even those that may not use the water themselves. Municipal officials and drinking water suppliers in many New England communities recognize the value of communicating with each other about land use proposals that could have an impact on water quality in the watershed as a whole. Such procedures are in place in many communities. In the first example that follows, communication is required by the state environmental agency. In the second example, it is nurtured by the communities within the watershed.

The **Massachusetts** Department of Environmental Protection requires public drinking water systems with reservoirs to establish and document procedures for staying in contact with municipal officials in other watershed communities to keep abreast of and respond to proposed development plans and projects. These procedures range from simply assigning a specific person the responsibility of scanning local newspapers for public hearing notices to hiring a person whose job is involved with watershed activities and commenting on new or expanded development proposals before various municipal boards in the watershed.

The town of **Meredith, New Hampshire** has embarked on a watershed planning project to protect the water resources associated with the Lake Waukewan Watershed. The lake serves as the raw water supply for the Meredith Water Department. There are also several groundwater sources of public drinking water located in the watershed. The timing for this project is perfect, as the lake is still in a relatively healthy condition. However, data provided by the Volunteer Lake Assessment Programs for Lake Waukewan and Lake Winona show that certain ecological indicators (e.g., phosphorus concentrations and conductivity values) are increasing, suggesting that human activity is starting to have an effect on water quality.

With the cooperation of the four other watershed communities, the Meredith Board of Selectmen appointed a 16-member volunteer Watershed Advisory Committee to identify and assess threats to water quality throughout the watershed. The committee prioritized the threats and developed strategies to address these concerns. A recommended Watershed Plan was prepared for the five watershed communities. The Northeast Rural Water Association is providing support services and guidance to the committee under a grant from the federal government.

protection? The most effective way to protect a water supply is to limit or restrict how the land can be used.

But the responsibility of land conservation doesn't stop with water suppliers. More and more communities are working with their water suppliers, nonprofit organizations, and neighboring communities to develop regional open space and recreation plans that target specific parcels of land for conservation.

Land conservation is about investing in the long-term health and welfare of the people in your community and their environment. It is also a means of linking existing open spaces, preserving important wildlife habitats, providing the public with low-impact recreational opportunities, and, most important, guiding growth away from sensitive water resources. There are several ways to secure land for conservation:

Purchase land – A strategy for water suppliers, the community, a group of communities, or a land trust. (See Chapter 9 for information on funding options.)

Purchase development rights – Protects the land from development, while allowing the landowner to retain all other rights associated with land ownership.

Select subdivision open space areas (e.g., greenways, habitat corridors, expanded wetland buffers, protected forest fragments) – These are typically identified in the town open space plan and should be targeted during the subdivision approval process.

Use conservation easements – A transaction whereby the landowner transfers rights to develop a given area of land to a recipient organization (e.g., municipality, water utility, land trust) that assumes responsibility for monitoring the land to ensure that easement restrictions are met.

Transfer of development rights – Establishes special zones whereby development rights (through donation or purchase) are transferred away from sensitive areas to other areas in the community that are better able to accommodate growth.

FYI



Planning & Zoning Source Protection Tools

Here are examples of tools communities can use to protect drinking water sources. Additional tools are listed in subsequent chapters.

- **Zoning ordinances** – the primary means by which municipalities control the type of development allowed in a particular area. The assignment of land use “zones” allows a community to, among other things, control incompatible uses, promote public health and welfare, regulate the size of open space and population density, and protect existing and potential drinking water supplies.
- **Subdivision and site-plan review regulations** – local guidelines for the control of development. This authority sets forth design and engineering standards and construction practices that must be met to gain subdivision or site-plan review approval. These regulations are powerful tools for controlling stormwater runoff and erosion and sedimentation.
- **Cluster zoning and conservation development** – options that can significantly reduce the amount of additional impervious surfaces in a source protection area. Developers can “cluster” housing units together in less sensitive areas and leave more vulnerable areas (e.g., riparian zones, wetlands, buffers, areas with highly erodible soils) as permanent open spaces. (See <http://www.state.ri.us/dem/programs/bpoladm/suswshed/ConDev.htm> for more details.)
- **Vegetated buffer zones** – highly effective means for protecting critical areas around surface water supplies by requiring vegetated (e.g., shrubs, tall grasses, trees) areas between development and sensitive waterbodies. These zones can be created through such mechanisms as zoning ordinances, subdivision regulations, conservation easements, and landowner agreements.
- **Overlay protection zones** – watershed or recharge areas that are classified as environmentally sensitive and where development and high-risk land uses would threaten source water quality. These zones are designated (e.g., wellhead protection zone) by a community and can be used as a basis for prohibiting land uses.
- **Low impact development (LID) techniques** – use various site design practices simultaneously to conserve and protect natural resource systems and reduce infrastructure costs. This is a highly effective and creative approach to controlling nonpoint source pollution and preserving groundwater recharge. (For more details on LID, see Chapter 8.)

✓ **Review your land-use ordinances and bylaws to see if the areas identified in your Source Water Assessment report are protected from incompatible land uses now and in the future.**

One of the most difficult challenges communities face is determining how much risk they are willing to accept. If you can't keep a potential contamination source out of the source protection area—the most risk-free solution—you can limit the size or scale or ensure that BMPs are being used. Take measures to minimize risks as much as possible.

Are **zoning ordinances** adequate to minimize threats in high-risk areas? Have build-out, or future growth, analyses been conducted to determine future risk to critical areas? Where future risks are notably higher than current conditions, are permitted uses consistent with source water protection goals? Is there an opportunity to re-zone threatened areas to lower-density land uses? If not, are there standards for site design and best management practices to minimize risk?

Do **subdivision and site-plan review regulations** help minimize impacts to source protection areas by setting forth design and engineering standards and construction practices? To protect water quality, these regulations should include provisions and standards for effective stormwater



CASE STUDY

Mutual Source Protection Interests – Connecticut

New State Aquifer Protection Regulations

In 2004, the State of Connecticut took an important step toward increasing the protection of public water supply wells serving over 1,000 people by adopting statewide Aquifer Protection Land Use Regulations. The new regulations include a list of 28 regulated activities consisting of high-risk industrial and commercial land uses and activities that can contaminate groundwater.

The program will be administered at the local level by an existing municipal board to be designated as the local Aquifer Protection Agency and at the state level by the Department of Environmental Protection (DEP). In general, new regulated activities will be prohibited within the mapped boundaries of public water supply stratified drift aquifers.

Businesses with existing regulated activities can continue to operate but must register with the local Aquifer Protection Agency and certify that they are in compliance with BMPs intended to minimize the possibility of a contaminant release. These businesses can also apply for a permit to add a new regulated activity to their site. DEP will publish a Model Municipal Ordinance and approve maps of aquifer protection areas prepared by water utilities. It is anticipated that individual municipalities will have their local regulations in place sometime between 2005 and 2007.

Why the New Law?

The Connecticut General Assembly set forth some compelling reasons for its new aquifer protection regulations (Section 22a-354g of the General Statutes):

- Aquifers are an essential natural resource and a major source of public drinking water.
- Reliance on groundwater will increase because opportunities for development of new surface water supplies are diminishing due to the rising cost of land and increasingly intense development.
- Numerous drinking water wells have been contaminated by certain land use activities and other wells are now threatened.
- Protection of existing and future groundwater supplies demands greater action by state and local government.
- A comprehensive and coordinated system of land use regulations should be established that includes state regulations protecting public drinking water wells located in stratified drift aquifers.
- The state should provide technical assistance and education programs on aquifer protection to ensure a plentiful supply of public drinking water for present and future generations.

Cheshire Establishes Aquifer Protection Overlay Zones

In the late 1970s and early 1980s, two wellfields in Cheshire, Connecticut, owned by the South Central Connecticut Regional Water Authority (RWA) were found to be contaminated with trichloroethylene (TCE), a common industrial solvent. TCE can be found in many household cleaning products and is used in industrial applications to clean or degrease metal parts prior to painting or plating. Another chemical, 1,2-dichloropropane (DCP), used as

drainage and runoff controls, sewage disposal, erosion and sedimentation controls, vegetative cover and buffer zones, and storage of hazardous materials.

Consider hiring a local or regional environmental enforcement officer.

In many cases local plans and regulations are comprehensive, but there is no identified staff member to monitor and enforce current activities. Municipalities and water suppliers should identify ways to ensure compliance with local regulations, including hiring a local or regional environmental enforcement officer or designating existing town staff (e.g., health director, building inspector, planner, conservation commission officer) to conduct field inspections, educate landowners, home owners, businesses, and developers, and pursue enforcement actions. In some cases a conservation agent works part-time for more than one community, providing a comprehensive background that benefits all the communities.

Maintain forested buffers to wetlands and surface waters.

Are inland wetlands and watercourses adequately protected from the impacts of activities such as new housing, industrial and business

an agricultural pesticide, was detected in the groundwater at the north wellfield.

In both the TCE and DCP investigations, the exact sources of the contamination could not be pinpointed. Immediate steps were taken to reduce the amount of contaminated water entering the distribution system through the use of barrier wells to intercept the groundwater or by shutting down selected production wells. Aeration treatment facilities costing millions of dollars were subsequently constructed to remove volatile compounds from the groundwater.

In the years following these contamination incidents the RWA embarked on an effort to map its water supply aquifers using hydrogeologic modeling techniques and to promote the development of land use regulations in Cheshire to protect these critical groundwater sources. In 1994, the Cheshire Planning and Zoning Commission adopted an overlay Aquifer Protection Zone that included a list of 21 categories of land uses prohibited from establishment as new uses within the defined Aquifer Protection Overlay Zones. Since the adoption of Cheshire's regulations, the RWA has worked closely with town planning staff, the Economic Development Director, and the DEP in evaluating new land use proposals within the overlay zones. Counter to fears that these regulations would stifle economic development, a number of new major industrial uses have become established since 1994. In response to increased citizen involvement in drinking water protection issues, the regulations were strengthened with amendments adopted in 2003.

The Water Utility's Work

The RWA provides public water service to 12 municipalities in the greater New Haven area. The majority of the RWA's water comes from nine reservoirs. However, in the northern part of the distribution system, wells associated with aquifers located in the towns of Hamden and Cheshire are a significant component of the water supply. The RWA owns nearly 400 acres of land on its mapped aquifers to protect the quality of its groundwater supplies.

The RWA closely monitors the water coming from its wellfields and reservoirs and has an extensive sampling program to assess water quality throughout its water supply watershed and aquifers areas. The RWA owns over 25,000 acres of land and since 1997 has had an active land acquisition program in place to identify and acquire additional parcels to increase the level of long-term protection of its water supplies.

Other components of the RWA's source water protection program include site-plan reviews of proposed developments on water supply watersheds and aquifers, watershed and aquifer inspections, and a household hazardous waste collection center. Annual efforts typically involve reviewing over 200 site plans, conducting 2,500 watershed inspections, and collecting about 7,000 gallons of household hazardous waste from 6,000 households.

development, highway construction, logging, golf courses, and mining? Have setbacks from wetland and surface waters in drinking water protection areas been established and updated?



Establish service boundaries for water and sewer facility plans.

Do you have water and sewer districts that set limits for future sewer and water extensions into source water areas? Review and update the process for how applications to change established utility districts are handled in your state.



CASE STUDY

Tools for Managing Rhode Island's Scituate Reservoir

Providence Water, manager of the Scituate Reservoir, which serves 60 percent of Rhode Island's population, has teamed up with the Rhode Island Department of Environmental Management to fund a consultant to work with the three primary watershed towns of Scituate, Foster, and Glocester to promote the use of conservation development techniques. This approach to open space, or cluster, development uses flexible and creative designs to protect 50 percent or more of a parcel being developed.

The Source Water Assessment analysis identified the individual use of large parcels as a key concern for future impacts. Although density in these areas is low, impacts can be much greater than estimated if conventional development practices are used with existing frontage requirements, roads and other impervious surfaces, and large areas that are cleared for lawns. Conservation development subdivisions can allocate open space to increase wetland buffers and avoid backyard encroachment, which is very difficult to control—unprotected wetlands and tributaries are a key concern in this watershed.

As a result of leveraging funds, Providence Water agreed to contribute additional funds to cover the cost of a planning consultant to convert water quality recommendations (as approved by the towns) into ordinance language in all three towns. Funds were approved in 2004.