



Developing a Municipal Source Water Protection Plan:
A Guide for Water Utilities and Municipalities

Step 4

Develop a Source Water Protection Management Plan



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Step 4

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Designing Plans for Source Water Protection in Nova Scotia

A Drinking Water Strategy For Nova Scotia describes a multiple-barrier approach to clean, safe drinking water for Nova Scotians. The first line of defence in this multiple-barrier approach is to keep clean water clean. This booklet series describes how water utilities and municipalities can do that. It guides you through the process of developing a source water protection plan for your municipal water supply.

To keep clean water clean, we must protect the source water supply area. This guide describes **Step Four** in the process recommended by Nova Scotia Environment (NSE) for implementing a source water protection plan: Develop a Source Water Protection Management Plan.

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Step Four Flow Chart



Introduction

Source water protection is an approach to water-resource management that enables individuals, groups, and institutions with a stake in management outcomes (often called stakeholders) to participate in identifying and addressing local issues that affect local water supply areas.

Source water protection plans should be community-based and involve local stakeholders. This approach results in solutions that respect a community's unique social, economic, and environmental conditions and values. Stakeholder participation also creates a sense of commitment to resolve identified problems and develop solutions, thus ensuring long-term support for resulting management plans.

Almost every activity on the land has the potential to affect the quality of water in a community. Management planning brings together the people within the source water protection area to address those activities, regardless of existing political boundaries. By working together, individuals within the source water protection area can design a coordinated management plan that builds upon the strengths of existing programs and resources, and addresses the water quality concerns in an integrated, cost-effective manner.

Matching management options to issues that affect source water quality (**Step Three**) is a critical step in the development of a source water protection plan. At this stage the advisory committee will focus on developing management options for risks to water quality identified in **Step Three**.

Review: Steps 1 to 3:

A source water protection management plan cannot be developed until **Steps One to Three** are complete:

- An Advisory Committee is formed
- The source water protection area is delineated and characterized
- Sources of contamination are identified and addressed
- Source water issues that are currently being addressed have been defined
- Source water issues that will be addressed in the new management plan have been defined
- Source water issues that need to be addressed in the long term have been defined
- Resources and funding have been thoroughly explored

A source water protection plan is not a single strategy, but an approach to water resource protection. The goal of a management plan is to protect the source water supply area while considering the social and economic factors relevant to that area.

By now you should have completed Steps 1, 2 and 3. In **Step One**, the advisory committee is formed. In **Step Two**, the area to be managed is delineated and marked on a map. **Step Three** helps to identify sources of contamination, and demonstrates how to evaluate risks to source water quality within the delineated protection area.

Step Four will focus on the development and implementation of the management plan for the source water supply area. Management plans will be variable; however groundwater supplies generally use a management method that employs wellhead protection zones with management controls that become more stringent the closer the lands are located to the actual wellhead (**Step Two**). Surface water supplies tend to use a broader range of potential management options to protect water quality. A management plan for a surface water supply is often based on controlling activities that could harm the water.

Source Water Protection Management Options

Acquisition of Land: Land acquisition gives direct ownership and control of the source water protection area to the utility or municipality. This is a preferred option because of its obvious benefits. The purchase of land may include all lands within the source water protection area, or may be confined only to land areas that play a critical role in protecting the water source.

Bylaws: Land-use planning through the use of municipal planning strategies and zoning is a very powerful tool to ensure that potential contaminant threats or activities are sited away from the water source. Developing bylaws is subject to mandatory public consultation requirements.

Best Management Practices (BMPs): Once individuals and industries understand they may be part of the problem, they also understand they can be part of the solution. BMPs are a good way to introduce a change in the way businesses, industry and individuals treat the environment.

Preventing drinking water contamination at the source makes:

- Good public health sense
- Good economic sense
- Good environmental sense

Contingency Planning: An emergency response plan provides a blueprint for action in the event of a dangerous contamination occurrence within the source water protection area. All utilities or municipalities must have a contingency plan in place for their source water protection areas.

Designation: Formal designation as a Protected Water Area under Section 106 of the Nova Scotia Environment Act, is a mechanism for utilities or municipalities to develop regulations for activities that have the potential to impair source water quality. Regulations will apply to the source water protection area defined by the utility or municipality and advisory committee. Designation is subject to mandatory public consultation requirements.

Education and Stewardship: Few people will make changes without understanding what changes need to be made, why change is needed, how to make the change, and how the change will affect the individual. Educating people and communities on the importance of source water protection will help introduce a change in behavior and begin a move toward environmental stewardship. Educating the people who live and work within source water protection areas creates a sense of ownership and shared responsibility for the protection of the water resource.

Moving Forward from Step Three to Step Four

To begin Step Four, the advisory committee should have completed (in **Step Three**):

- A list of potential water quality contaminants
- Identified sources of contamination
- Knowledge about pathways of contamination into the water supply
- A ranking of priority water quality issues to address

Example: Tables like those outlined below provide important information that is critical to making management decisions in **Step Four**.

Prioritization of Risk

Contamination	Priority Ranking
Sediments	1
Bacteria	2
Nutrients	3
Hydrological flow	4
Oils, Grease, Metals	5

Ranking: 1 = high priority 5 = low priority

Contamination	Sources	Causes
Nutrients	<ul style="list-style-type: none"> • Livestock in streams • Failing septic systems 	<ul style="list-style-type: none"> • Uncontrolled access • Improper siting and maintenance
Sediment	<ul style="list-style-type: none"> • Livestock in streams • Road-stream crossings 	<ul style="list-style-type: none"> • Uncontrolled access • Undersized culverts • Human access
Bacteria	<ul style="list-style-type: none"> • Livestock in streams • Failing septic systems 	<ul style="list-style-type: none"> • Uncontrolled access • Improperly sited/maintained septic systems
Hydrologic Flow	<ul style="list-style-type: none"> • Urban storm water 	<ul style="list-style-type: none"> • Paved surfaces, lack of infiltration areas
Oils, Grease and Metals	<ul style="list-style-type: none"> • Storm drains 	<ul style="list-style-type: none"> • Improper oil disposal, paved surfaces, parking lots

Now you are ready to examine management options and begin to develop the management plan. The management plan should be integrated with existing programs and tailored to the needs of the community and the unique character of the source water protection area. Ideally, multiple programs and solutions will be developed as part of the management plan to provide flexibility in the implementation of the final plan.

Key Elements of a Management Plan

- Clearly defined management objectives
- Range of management options
- Prioritization of management solutions
- Description of rationale and uncertainties
- Cost estimates and funding mechanisms
- Schedule for implementation and completion

The next few pages of this booklet will examine the management options in more detail. Management techniques recommended in **Step Four** are well established and are being used across North America and other parts of the world as practical ways to protect drinking water supplies. It is important to note that these options are only a partial list. Utilities and municipalities are free to develop new innovative or site-specific ideas or options to manage risks to water quality.

Lessons from Walkerton

The tragedy that occurred in Walkerton, Ontario resulted in many recommendations:

“Source water protection plans should be required for all watersheds in Ontario”

Set Management Goals and Objectives

A management plan should begin with a statement of goals and objectives.

For example, the goal of the management plan may be “to protect source water for drinking”. Objectives would include statements that relate to the mechanisms the committee will employ to achieve this goal. For example, one objective may be “to reduce and prevent sources of non-point pollution that are known to enter the source water protection area.”

What Should The Management Plan Achieve?

A source water protection plan should present a complete picture of the source water supply area. As you assemble your plan, keep in mind that a person with limited knowledge of the source water protection area should be able to read the plan and understand the needs and proposed solutions for effectively managing land uses and activities in the source water protection area.

The final product should be an action-oriented approach for addressing water quality in the source water protection area. The management plan is not static and may change as implementation proceeds. The utility or municipality should work with the advisory committee to review the management plan periodically to ensure that tasks are being implemented and that the plan is updated (see **Step Five**).

A well-written management plan describes how the utility or municipality and community will work together to implement the source water protection plan and meet the goals and objectives for protecting water quality.

Assembling the Plan

The management plan may use a variety of options or strategies to address water quality issues affecting the source water protection area.

The advisory committee needs to carefully consider and evaluate each of these options and others that may be identified to determine the most appropriate ways to protect water quality. This is achieved by examining the benefits and disadvantages of each management option. One of the roles of the advisory committee will be to consider the effect of each management option. This is necessary to properly balance water protection with land uses and economic activity within the source water supply area.

Public Input

Public review or comments may be needed during evaluation of specific management options. This will help to inform the advisory committee about the various effects and acceptability of the management options under consideration. The final recommended management plan should also receive input from the public, and address public concerns, before it is considered to be complete.

Identify Management Options

The ABCs of Source Water Management Planning:

(A) ACQUISITION OF LAND

The direct purchase and ownership of land comprising the source water protection area affords one of the highest levels of water quality protection. This is because the utility/municipality can:

- a) control the use of the land in the supply area,
- b) provide close surveillance of the entire area, and
- c) enforce rules and regulations to protect drinking water resources.

Land acquisition can take several forms:

- Purchase of the entire source water protection area
- Acquisition of the most sensitive and critical sites within the source water protection area
- Acquisition of property that may affect water quality (waterfront lots, etc.)
- Acquisition of lands surrounding the water treatment plant intakes

Utilities and municipalities may choose to work with non-profit organizations to acquire land and easements for riparian buffers to protect source water supply areas, or develop a comprehensive land acquisition program of their own. Given the expansion of urban areas across the province, there is a narrowing window of opportunity to take advantage of opportunities to acquire private lands within source water supply areas.

(B)YLAWS

Land-use planning can be an excellent tool for the protection of source water areas, and many water quality benefits can be derived from a successful land-use planning strategy.

A Municipal Planning Strategy (MPS) allows a municipality to develop land-use bylaws (LUB) that manage development. These bylaws can be geared toward the protection of drinking water supplies. Existing planning strategies and bylaws can be amended to reflect changes designed to protect source water, or in cases where no planning strategy exists, a MPS and LUB can be developed, specifically with water quality in mind. In either case, land-use planning techniques must be developed in conjunction with municipal planners.

A variety of land-use planning techniques can be used to manage land use in source water protection areas. Some of these include:

- Limit the number of lots
- Provide separation from watercourses
- Impose erosion and sediment controls during construction
- Require vegetation for sediment and erosion control
- Limit permitted uses
- Require large lot sizes

The basic objective of involving land-use planning as a part of a source water protection plan is to manage new development and protect sensitive areas within the source water supply area.

More information regarding land-use planning in source water supply areas can be found in the Service Nova Scotia and Municipal Relations Local Government Resource Handbook: *Municipal Water Supply Watershed Planning Model - Section 5.7*. <http://www.gov.ns.ca/snsmr/muns/manuals/mga.stm> .

The process for adopting or amending a municipal planning strategy is subject to public consultation.

(B)EST MANAGEMENT PRACTICES (BMPs)

Best Management Practices: (Also known as “BMPs”) Common-sense actions to keep soil and other pollutants out of streams and lakes. BMPs are designed to protect water quality and to prevent pollution.

Best Management Practices for source water protection areas are those that are determined to be the most effective and practical known means of preventing or reducing the amount of pollution. The underlying philosophy is to conduct everyday activities in an ecologically sound manner in order to keep pollutants out of source water. This is generally cheaper and more practical than removing them later. All stakeholders can use BMPs to direct land use activities and protect water quality.

BMPs have been developed for most industries and sectors of the economy. Many can be used as guidelines for conducting business or everyday activities in ways that protect to water. A best management practice can be found for almost every activity that may occur within a given source water protection area. The forestry and agriculture sectors have developed BMPs for activities that can affect water quality, in addition to BMPs that have been developed for a wide range of large and small-scale commercial activities. BMPs are also developed to reduce sources of urban pollution like storm water runoff.

A source water protection plan that uses BMPs as the primary mechanism for protecting water quality should work closely with stakeholders within the source water protection area to implement the most appropriate BMPs.

In addition to BMPs published by the Nova Scotia government, there are numerous other sources of information on this subject. The United States Environmental Protection Agency (EPA) has developed a wide range of BMPs for industries and activities within source water protection areas. Many of these can be applied to land-based activities in Nova Scotia. Managers of water supplies can take advantage of the large body of existing material associated with BMPs and drinking water, to encourage good management practices by stakeholders within a source water protection area. More information can be found at the following web link: <http://www.epa.gov/safewater/sourcewater>

Best Management Practices (BMPs) currently exist for many kinds of activities that could harm water quality:

Residential/Homeowners

1. On-site Sewage Disposal (Septic Systems)
2. A Homeowners Guide to Oil Tank Safety
3. Home Garden Pest Control
4. Composting Yard Trimmings and Leaves (Waste Reduction Fact Sheet)
5. Sustainable Gardening
6. Pollution Prevention: At Home, at Work, and in Business
7. Preserving Shorelines

- <http://www.gov.ns.ca/nse/water/>
- <http://www.gov.ns.ca/nse/pests/athome.asp>
- <http://www.gov.ns.ca/nse/pollutionprevention/docs/P2HomeWorkBiz.pdf>
- <http://www.gov.ns.ca/nse/pubs>
- <http://www.extension.umn.edu/distribution/naturalresources/components/DD6946a.html>

Commercial Activities

1. Pollution Prevention Guide for Printers in Atlantic Canada
2. Pollution Prevention for Businesses
3. Developing Environmental Policy
4. Pollution Prevention: A Discussion Paper
5. Composting Facility Guidelines

- <http://www.gov.ns.ca/nse/pollutionprevention>
- http://www.gov.ns.ca/nse/waste/docs/Composting_Facility_Guidelines.pdf
- <http://www.gov.ns.ca/nse/pubs/>
- <http://www.epa.gov/owow/nps/urbanmm/index.html>

Forestry

1. Constructing Forest Access Roads
2. The Forest Professional - Guidelines for the Stewards of Tomorrow's Forests (2nd Ed.)

- <http://www.gov.ns.ca/natr/publications/forpubs.htm>
- <http://www.gov.ns.ca/nse/pubs/>
- <http://www.epa.gov/owow/nps/forestrygmt/>
- <http://www.chesapeakebay.net/pubs/subcommittee/nsc/forest/sect06.pdf>

Agriculture

1. Manure Management Guidelines
2. Stream Bank Protection Brochure
3. Stream Crossings Guidelines
5. Milkhouse Wastes Guidelines
6. Environmental Farm Plan Program
7. Soil Conservation Program
8. Recommended Agricultural Practices within Municipal Drinking Water Supplies in Nova Scotia

- <http://www.gov.ns.ca/agri/>
- http://www.gov.ns.ca/agri/rs/envman/env_handbk.pdf
- http://www.gov.ns.ca/agri/rs/envman/manureguide_2006lowres.pdf
- <http://www.nsfa-fane.ca/waterresources>
- <http://www.agr.gc.ca/pfra/>
- <http://www.epa.gov/owow/nps/agmm/index.html>
- http://www.usawaterquality.org/newengland/focus_areas/ne_npm/default.html

Recreation

1. Waterfront Recreation BMPs
 2. Boating Stewardship
- <http://www.epa.gov/owow/nps/mmsp/index.html>
 - <http://www.extension.umn.edu/distribution/naturalresources/components/DD6946e.html>

Developers/Construction

1. Erosion and Sediment Control Handbook for Construction Sites
 2. Construction & Demolition Debris Disposal Site Guidelines
- <http://www.gov.ns.ca/nse/pubs/>
 - <http://www.mrsc.org/Subjects/environment/water/sw-bmp.aspx?r=1>

(C)ONTINGENCY PLANS

The goal of a contingency plan is the immediate and long-term protection of the source water supply area.

A contingency plan will identify personnel, testing equipment, procedures, and materials which can be used for the rapid correction or mitigation of environmental accidents which might constitute a water supply emergency. A contingency plan should also include response protocols, notification procedures and methods of containment. Accidents which might directly affect the source water protection area also need to be addressed with methods for isolating portions of the water supply and/or providing water from an alternative source.

A water supply emergency may range in severity from a power outage to the effects of a widespread natural disaster. For the purposes of source water protection, the most probable threat requiring an emergency response will be from a hazardous substance spill within the source water supply area. Such a spill may occur at a fixed location involving the handling or storage of chemicals. It could result from a transportation accident. No matter what the cause, once it is contaminated your source water supply may never be recoverable. A contingency plan is critical.

Water Supply Information

Emergency responders may or may not know a lot about the source water supply area. The contingency plan needs to make sure there are ways of telling them the:

- location and capacity of all surface water sources/wells and storage tanks
- location and size of all major distribution lines (Distribution Map)
- critical locations of isolating valves for the distribution system
- options available for providing an alternative water supply
- location and capacity of water treatment facilities

Alternative Water Supply Options

Your contingency plan should consider how to provide water from an alternate source. If a water supply emergency occurs, system operators need to be able to quickly provide uncontaminated water to any portion of the distribution system.

Generally, there are five means of managing a water supply. Contingency planners should consider:

1. Reducing water use: Where additional capacity is not available, restricting water use may be a viable alternative. Applying this approach requires effective communications with water users to obtain a reduction in water use.

2. Supplying water from within the system: An alternative water source may be available within the system through isolation of the affected area and providing water from wells and/or portions of the distribution system unaffected by the water supply emergency. This option requires a thorough understanding of the distribution system dynamics and prior development of additional capacity generally at a different location.

3. Providing bottled water: Can be an option for some customers affected by a drinking water emergency.

4. Supplying water from outside the system: This is generally accomplished by connection to an adjacent drinking water supply.

5. Treat affected source water: A method may be made available to provide treatment to the affected source water by removing contaminants to an acceptable level.

Contents of the Contingency Plan

A contingency plan is required as part of a utility's operations program. The contingency plan should include as a minimum:

- General procedures for routine emergencies or major emergencies within a water supply area
- A procedure for equipment becoming inoperable in a major emergency and/or due to power failure
- A procedure for dealing with spills or releases
- A boil water advisory procedure*
- Facility-specific information on the hazardous material stored or transported in the source water area.
- Provision for annual review and update by the utility.

- * A utility must ensure that drinking water meets the bacteriological requirements set out in the "*Guidelines for Monitoring Public Drinking Water Supplies*" published by NSE and available on line at: http://www.gov.ns.ca/nse/water/docs/Guidelines_for_Monitoring_Public_Drinking_Water_Supplies.pdf . These guidelines outline procedures for reporting and correcting deficiencies in quality due to microbiological contamination of drinking water.

(D) ESIGNATION

Section 106 of the Environment Act allows the Minister of Environment to designate an area surrounding a drinking water source as a Protected Water Area (PWA), provided certain requirements are met. The Environment Act specifies that designation will be put into place only when a formal request is received from the municipality or water works operator, and sufficient public consultation has occurred.

Designation involves developing regulations that are specific to the PWA. Regulations control activities that are known to harm water quality in the source water protection area. A complete designation consists of a description of area to be protected and the regulations required to control or prohibit activities or development that may harm water quality in the designated area. The development of regulations is based on consensus among committee members, and involves open communication among the committee, the utility or municipality, stakeholders, and the local community.

The following outlines the designation requirements contained in Section 106, Environment Act, chapter 1, S.N.S, 1994-95.

Designation of protected water area

106 (1) The Minister, when requested by an operator of a water works or proposed water works, may designate an area surrounding any source or future source of water supply for a water works as a protected water area.

Notice of designation

(2) The operator of a water works or proposed water works named in a designation made pursuant to subsection (1) shall

(a) give notice of the designation of the area as a protected water area by publishing the notice in

a newspaper having circulation in the county or counties in which the area is located and in the Royal Gazette;

(b) have the notice of designation recorded at the registry of deeds and the land registration office in the county or counties in which the area is located; and

(c) post signs in the area indicating that it has been designated a protected water area.

Responsibility of operator

(3) The operator of a water works or proposed water works is responsible for taking all measures to protect the area designated, and the enforcement of any regulations made pursuant to subsection (6).

Designation Checklist

Here's a summary of how to designate a Protected Water Supply area under the Environment Act:

- Form an advisory committee consisting of landowners and other stakeholders affected by the designation process (**Step One**).
- Gather information on the source water supply area. This information should include: the watershed boundary, variety and pattern of land uses, land ownership patterns, sources of contamination and other information that will assist in decisions regarding the development of regulations for the proposed designation (**Steps Two, Three, and Four**).
- The utility or municipality in conjunction with the advisory committee identifies issues and concerns; then develops a draft management plan for the proposed Protect Water Area, including public information materials. The advisory committee helps ensure appropriate public consultations.
- Send the description of the Protected Water Area, proposed regulations and a summary of the public consultation to NSE for review and comment.
- Formal designation as a Protected Water Area by the Minister occurs after:
 - a) the regulations are found to be acceptable to the water utility or municipality, the advisory committee and NSE;
 - b) there has been sufficient public consultation, and
 - c) the documents are reviewed by a NSE solicitor representing the Province.
- Designation takes effect when filed with the Provincial Registrar of Regulations and published in the Royal Gazette.
- The utility or municipality should also have notice of the designation recorded at the Registry of Deeds, and published in local newspapers.
- The water utility or municipality is responsible for posting signs to clearly identify the boundary of the Protected Water Area and indicate that regulations are in effect for the designated drinking water supply.

Cancellation

(4) When requested by an operator of a water works or proposed water works, the Minister may cancel a designation made pursuant to this Section, in whole or in part.

Designation continues

(5) Any protected water area designated pursuant to the Water Act, prior to the coming into force of this Act remains so designated.

Regulations

(6) At the request of the operator of the water works or proposed water works, the Minister may make regulations to prohibit, regulate or require the doing of any act or acts in a protected water area that may impair or prevent the impairment, as the case may be, of the quality of the water in the protected water area.

Public consultation

(7) Before designating a protected water area, the Minister shall ensure that the operator of the water works or proposed water works has provided opportunities for public consultation.

Claim for injurious affection prohibited

(8) No claim for injurious affection lies against any person as the result of a designation of a protected water area.

Once the designation is completed, the utility or municipality is responsible for administering the regulations within the PWA.

(E)ducation and Stewardship

Source water protection can also be achieved through an education and stewardship program developed and promoted by the utility or municipality.

Management plans based on education and stewardship promote ideas and information related to source water, water quality, water pollution issues, and strategies to protect water resources. They promote cooperative relationships between stakeholders and the broader community. They are based on the mutual benefits to the community and the water supply. It requires strong public support.

In order to make a management plan based on education and stewardship effective, the utility or municipality should begin consulting with the community right from the start. This builds trust, support and understanding for the plan. If it proceeds too far before the public is informed, there may be problems with rumours and the spreading of misinformation.

There are many ways for utilities or municipalities to promote a stewardship approach to source water protection in their community. Submitting information to community newspapers at the start of the campaign, for example, will help spread information.

However, it's important that key community people and stakeholders are well informed prior to any development of the management approach. Whenever possible, provide a contact name and information about any upcoming activities related to stewardship programs being promoted. People are often motivated to ask questions or provide input after they learn about the proposed plan through fact sheets, brochures, community papers and other sources of local information.

A source water protection plan that uses an education and stewardship approach will greatly benefit from partnerships with local environmental organizations and other Non-Government Organizations (NGOs) at the community level. Organizations dedicated to clean river projects, adopt-a-river, and other types of water-related stewardship programs, can provide an established network for promoting source water protection. Watershed clubs are also becoming more common across Nova Scotia, and local watershed clubs can be a valuable source of support for source water management plans that promote education and stewardship.

Solicit Input

Building support

Knowing your community is critical to building support for successful source water protection plans. One of the first steps in building grass roots support is to identify the individuals and organizations in the community who will be affected by the source water protection plan. Inviting the public to express its views and concerns about the plan can help to enhance community support and ultimately the success of the project. If the community doesn't support your source water protection plan as proposed, stand back and try to be objective.

- Have you provided enough information?
- Has the advisory committee used the comments it sought?

It is important to take advice from the community, and then let people know where their input has made a difference. This will empower the community to help set priorities, define issues and find solutions.

Informing the public

Open houses offer a way to spread information and educate the public about the importance of source water protection. An open house allows the public to learn more about water quality issues and management approaches to reducing impacts to water quality. An open house provides an opportunity for people to briefly express their concerns or support. It is important to ensure opportunities to provide written or oral input for people unable to attend. Ideally an open house is held at a local community hall where people can come and go at their leisure during designated hours.

Provide take-home materials to reinforce the water utility's message. If displays are being used to provide information, knowledgeable people should always staff them. Open houses can be used successfully at various stages of the project.

Semi-permanent displays at libraries or other public gathering places may also help educate the public about water quality issues that affect them at the community level, as well as introduce the concept of environmental stewardship. It is best to use the same materials as those displayed at open houses or create similar displays using more durable materials, so that messages and ideas are reinforced. Posting information about the water utility and the services it provides on an Internet site can give additional community support as well as wider coverage.

Consider whether public forums may be a useful way to educate the public, especially once the community is aware a source water management plan is being developed. A public forum allows for meaningful, in-depth dialogue and gives participants the opportunity to voice concerns about the project and provide input regarding alternatives. Water utilities may want to consider having a professional facilitator chair the forum and design a process for clarifying issues and exploring stewardship options.

A printed fact sheet outlining the management plan as proposed, including public benefits, is also a good way to convey information. It is best to make the fact sheet short and easy to read. Fact sheets can be distributed to the public via the mail, household drop-offs, grocery bag-stuffers, newspaper inserts or other appropriate methods. Encourage comments, questions and suggestions.

Draft the Management Plan

Management plans are specific to each individual source water supply area because they are based on the type of water supply and also on the land-use activities that surround the area. However, the elements that comprise the management plan are the same for all source water protection plans and include:

1. Introduction

- Delineation of the area for protection
- Background to conditions in the source water area
- The need for management
- The process of management plan preparation
- Terms of reference for the advisory committee
- Time frames

2. Water Quality Issues

- Activities within the source water supply area
- Potential sources of contamination
- Pathways of contamination
- Prioritization of issues based on risk
- Summary of issues

3. Goal and Objectives

- A statement of what the plan is meant to achieve
- Management practices that have been evaluated for effectiveness, cost, maintenance, useful life, adverse effects and public acceptability

4. Management Recommendations

- Options to address issues
- Proposed integration of management options
- Contingency plans
- Items for immediate action

5. Implementation

- Policies, action steps and guidelines on how the watershed management plan will be implemented.
- A schedule outlining time lines for implementation with details regarding resources needed, and the contact persons or agencies.
- A program to solicit public awareness and interest in water protection.
- Strategy for evaluating and updating the management plan.

The management plan should be reviewed regularly in order to assess the effects of activities within the source water protection area their effects on water quality and to assess whether changes are needed. The keys to success are communication and willingness to modify the plan when new information is available.

Final Product

The final management plan should include:

- A statement of the management objective(s)
- List of risks to water quality to be addressed in the plan
- List of evaluated management methods to be employed to protect water
- An implementation strategy for each management option with time frames
- Contingency plan for emergencies to source water
- Strategy for evaluation and updating of the management plan

For More Information

Nova Scotia Environment can provide input into the development of management practices and will review the final source water protection plan.

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