Town of Shelburne

SOURCE WATER PROTECTION PLAN

Prepared by: The Source Water Protection Plan Advisory Committee
Approved by Town Council:

Contents

1.0 Introduction

The Town of Shelburne is located along the South Shore of Nova Scotia. Shelburne's source of drinking water comes from Rodney Lake located in the Municipality of the District of Shelburne.

In 2002, the province of Nova Scotia introduced the Drinking Water Strategy, to ensure clean drinking water for all Nova Scotians. The main goal of the water utility is to provide safe, clean drinking water to its customers. Protecting the quality of the source water is a top priority for utilities and one step in the multiple barrier strategy developed for the protection of drinking water quality in Nova Scotia.

The fundamental goal of the Source Water Protection Plan is to ensure the continued safety and quality of the area's drinking water supply through the protection of its source waters in the Town and Rodney Lake watersheds. The procedures for the Plan are: 1) Form a Source Water Protection Advisory Committee; 2) Delineate a Source Water Protection Area Boundary; 3) Identify Potential Contaminants and Assess Risk; 4) Develop a Source Water Protection Management Plan; 5) Develop a Monitoring Program to Evaluate the Effectiveness of a Plan. An additional achievement will be to help ensure the quality of water for the country residents drawing from this supply through the education and monitoring process.

1.1 Source Water Protection Advisory Committee

A Source Water Protection Advisory Committee was appointed to develop Source Water Management and provide advice to the Town and Municipal Councils as well as residents living in the area. The Advisory Committee was established in February 2010 and consists of members representing a cross section of the various interested stakeholders such as Water Treatment Plant Operator, Town and Municipal Council Members, Land Owner, Department of Natural Resources, and Department of Fisheries and Oceans. A Terms of Reference (Appendix I) was developed that explains the operations and procedures of the Committee.

To further this effort any water quality or consumption data collected by the Town from production or monitoring wells will be presented at meetings held no less than twice a year to monitor any changes in water quality, quantity and availability.

2.0 Delineating the Source Water Area

The source water area is the watershed that contributes all the water used to supply drinking water from the source. The source water area for the Town of Shelburne is located within the Rodney Lake area. There are plans to designate the source water area in the future.

The map (Appendix 3) shows the topographical details of the watershed area.

3.0 Identification of Risks to Source Water Quality

Potential risks to water quality have been identified and are discussed with respect to the activity or land use they are associated with below. These include activities associated with transportation, residential development, waste disposal, agriculture and recreation. Potential risks associated with these activities can be seen in Table 1.

Table 1.

Potential Risks

Risk Ranking: 1-very high risk, 2-high risk, 3-medium risk, 4-low risk, 5-very low risk

	Potential Contaminant	Description	Quality	Likelihood
1.	Forest Fire	Threatening boundary	1	4
2.	Herbicide/Pesticide use	Defoliate	4	4
3.	WTP Fire- buildings	Sediment	1	5
4.	Forestry- logging	Sediment	3	4
5.	Illegal dumping		4	1
6.	Off-highway vehicles		4	1
7.	Transformers on power poles	Leakage- PCB's	2	1
8.	Vehicles travelling over Lake Rd.	Hazardous Fuel Trucks	2	4
9.	Boaters	Gas Engine- fluids, debris	4	4
10.	Delivery trucks to WTP	Potential Spills	1	3
11.	Chemicals on site at WTP	820L sodium hypo chlorite	3	4
		1000kg soda ash dense	3	4
		2600L stern pac	3	4
		450L ammonia hydroxide	3	4
		500gal fuel for genset	3	4
12.	Wildlife ie. Beavers		5	5
13.	Shoreline development/sediment	Around lake & within protected area	5	5
14.	Calcium Chloride		4	4

3.1 Transportation/Road Maintenance

A potential risk associated with transportation is an accidental spill during transport of various materials through the watershed area. Risks can be from petroleum products, or chemicals used in commercial or industrial businesses. The area is susceptible to accidental spills because of the use of oil for residential heating and the need for the delivery trucks to travel through this area. Petroleum products could enter watercourses and subsequently drinking water as a result of a transport accident. Contaminants could also be biological, as in the case of a septic spill for an example. Accidents are always a possibility; therefore these risks must be managed properly.

Calcium chloride is a type of contaminant associated with winter road maintenance. If the calcium chloride contamination gets into the groundwater via ditches or direct infiltration, it can affect the water quality.

A risk associated with transportation is the high occurrence of excessive vehicular speeding on various roads near the watershed area. Speeding can lead to accidents, so this issue should be addressed.

For more information on protecting the source water area, see the Off- Highway Vehicles Act, Section 12F (Appendix 4).

3.2 Forestry

Potential risks under forestry include the risk of a forest fire. Due to the fact that the water source area is surrounded by forest, there is potential for fire and degraded water quality from the loss of forest cover and possibly from the use of chemical suppressants.

Herbicides and pesticides are poisons used to kill plants, insects, etc. The use of these chemicals in and around the water source area could possibly contaminate the drinking water. Runoff from areas where these chemicals have been applied can enter drinking water and pose a human health risk.

Logging is also a potential risk. Logging requires the use of specialized machinery. These machines use petroleum products for fuel and lubrication. An accidental fuel spill can occur during refueling and this can pose a high risk if the operation is within the area of the water source

3.3 Recreation

The potential sources of contaminants affecting water quality that are associated with recreation in the water source areas and are mainly chemical and biological in nature.

Illegal dumping and garbage disposal can cause harmful affects to the quality of the ground and surface water, which may cause drinking water contamination.

A risk associated with boating is the gas engine and the debris and fuel leaks that may occur because of it.

The use of off-highway vehicles such as ATVs in the watershed area can cause fuel and other related chemicals to get into the watershed area affecting the quality of the water. There is also the risk of accidents occurring, which may cause drinking water contamination.

3.4 Other

a. Water Treatment Plant fire- buildings

A potential risk with the Water Treatment Buildings is the risk of a building fire. This could decrease the water quality due to debris, chemical suppressants, etc. See Appendix 5 for a list of chemicals used in case of fire.

b. Transformers on power poles

There is one transformer that is located near the watershed area which could possibly leak PCBs, which can be harmful to the quality of the water.

c. Chemicals on site –Water Treatment Plant

Chemicals are used at the Water Treatment Plant as listed in Table 1. If any of this was to get into the water source area, it could affect the quality of the water.

d. Wildlife

Wildlife around the watershed area poses biological risks. The main concerns for wildlife are beavers around the area. Appendix 6 contains information regarding the NS Wildlife Habitat & Watercourse Protection Regulations.

e. Shoreline Development

Development around the shore may cause debris and chemicals to get into the drinking water. The Environmental Act (Appendix 6) should be followed to ensure protection of the area.

4.0 Risk Management Recommendations

A SWPP contains a variety of management options that address and manage the risks to water quality in a watershed. Management options fall into a variety of categories referred to as the ABC's source of water protection as outlined by the Nova Scotia Department of Environment and Labour's guides to source water protection planning. They include Acquisition of Land, Bylaws, Best Management Practices (BMP's), Contingency Plans, Designation and Education and Stewardship.

Acquisition of Land: The acquisition of land by the Town gives direct ownership and control of portions of the source water area to the Town. This allows a high level of protection of a source area due to direct control over the activities that can take place there.

Best Management Practices: These standardized and widely accepted practices for activities and products are the most practical and effective means of preventing or reducing contaminants from reaching source water.

Land Use Bylaws: Development and implementation of a Municipal Planning Strategy allows a municipality to develop land-use bylaws to manage development and control activities near sensitive areas. The Municipal Planning Strategy for the Rodney Lake Watershed Area can be found in Appendix10.

Contingency Planning: Contingency planning provides protocols to use in case of a contamination emergency in the source water area. The goal of the plan is to protect residents against contamination and ensure the immediate and long-term viability of the source area for a clean drinking water supply.

Designation as Source Water Protection Area: Designation is not being considered as a management option at this time.

Education and Stewardship Initiatives: The development and promotion of an education and stewardship program can be an effective management option for protecting source water quality.

Education of stakeholders can reduce the uncertainty of the objectives of the Town and can help introduce a change in behavior if necessary. Education also creates a sense of ownership and responsibility among residents in a water supply area, which can significantly increase the success of other con-current management practices adopted.

The following section describes the management options selected to address and reduce the risks identified in Section 3.0 to source water in the Town of Shelburne.

4.1 Transportation/Road Maintenance

In Section 3.1, the main risks identified with transportation and road maintenance were associated with accidental spills of petroleum, road salt contamination and inappropriate vehicle use. The recommended options to manage these risks are:

- Establish signage along public access routes indicating the presence of the Water Supply Area and to use caution.
- Develop an awareness program (BMPs ie reduced speeds) for transport companies focusing on watershed protection. Include contact numbers for Emergency Response.
- Implement Contingency/Emergency Response Plan for spill response and containment (Appendix 11).

4.2 Forestry

Healthy and maintained forests support quality water protection, generate economic activity, and support wildlife and recreation. The potential risks to water quality outline in Section 3.2 are biological, chemical and petroleum contamination. The following management options have been identified to manage the risks associated with forestry.

- Encourage landowners to minimize forestry and to follow the best practices regarding logging, and fuel use and storage. (Forest Management Plan- in Appendix)
- Educate the benefits of maintaining the forest cover in the watershed area to residents.
- Discourage the use of pesticides and herbicides by educating (through newsletters, signage, etc.) the residents on the harmful effects on the water.

4.3 Recreation

Recreation in rural areas tends to be a popular activity. Passive recreation must be promoted to protect the environment and the sensitive areas around the watershed.
Some recommended management options to promote passive recreation are:

- Establish signage around the watershed area educating users on the sensitive areas and to keep the area clean by not littering and being diligent with respect to forest fires.
- Target recreation usage

4.4 Other

Some of the other risks identified include building fires around the watershed area, transformers on power poles, chemicals being used in the water treatment plant and wildlife around the area.

- Education and information packages should be assembled targeting commercial and industrial use. This package should include the proper disposal of chemicals that could affect the water quality. It should highlight the best practices for substance storage and spill.

4.5 Implementation Plan

Following the adoption of the SWPP, the Town of Shelburne must implement the management options or strategies that have been identified to manage risks. Several of the management strategies can be implemented immediately after the SWPP plan has been approved.

- Develop a broad education and stewardship program outlining the purpose and status of the management plan and opportunities for participation. This could be in the form of a newsletter to property owners including information on initiatives mentioned above. Feedback and questions can be encouraged from residents and other interested parties. Newsletters would also be available on the website.

- Establish signage at access road indicating the nature of the area as a source water protection zone and provide contact information in case of an emergency.

- Review and update current contingency and emergency response plans to ensure appropriate action will be taken in the event of an accidental contaminant spill in the watershed.

The remaining strategies identified in Section 5 are listed in the below table to illustrate when the strategy will be implemented.

Table 2

	2011				2012			
Management Strategy	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**	**Jan-Mar**	**Apr-Jun**	**Jul-Sep**	**Oct-Dec**
Develop and distribute SWPP letter addressed to stakeholders								
Review existing contingency and EMO plans								
Establish Signage at Access Roads								
Develop an information package for industrial/commercial sector								
Develop an information package for managers of recreational participants								
Assemble Home Owners Information Package								
Distribute Home Owners Education Package								
Develop Contingency Plan for Accidental Spills/Accidents								
Develop Transportation BMP's								
Distribute Transportation BMP's								
Review and update SWPP (ongoing)								

5.0 Evaluation and Monitoring

An evaluation and monitoring program has been developed in conjunction with the management plan described above. The purpose of the program will be to carry out on going monitoring of water quality within the watershed area in order to assess the effectiveness of management controls, warn of potential problem areas and contaminants in the watershed and track the overall health of the supply area.

The evaluation and monitoring program will provide an ongoing snapshot of conditions in the watershed and help to provide an early warning of potential risks and target areas where attention is required. Monitoring will help to determine if the management plan is working, as it should be.

There are two components involved in the monitoring program – a water quality component and a general component to monitor land use changes and other activities in the watershed.

The SWPP should be reviewed and updated on a regular basis to assess the effectiveness and to reflect any major changes in activities or land use. It is recommended that the watershed committee meets at a minimum of once a year to review and discuss the plan and add any new information.

5.1 Water Quality Monitoring

The main component of the monitoring plan is the regular sampling of the source waters within the watershed for quality analysis. Water analysis will provide an indication of the overall source water quality within the watershed and any changes in quality that occur over time as a result of changing land use practices or other activities in the watershed. The Town of Shelburne performs several tests to ensure the quality of the water remains at an acceptable level. A color pH, turbidity and temperature test is done daily on the raw water. A standard water analysis and metals test is done on a quarterly basis. Every five years a MAC/IMAC water analysis is performed.

Active watershed monitoring also takes place. The Water Plant Operator monitors the brooks beside the watershed area on a monthly basis, weather permitting. Tests are done for temperature, color, pH and turbidity. These tests will be done to establish a baseline to determine irregularities in the Source Water Protection Area.

5.2 SWPP Evaluations and Review

Monitoring of these activities and issues identified during the risk analysis of the source water protection planning process should be carried out as a general provision of the overall monitoring activities. This can be accomplished by the Watershed Advisory Committee meeting regularly to exchange information regarding changes in land use, water quality or proposed activities throughout the watershed and other areas near by.

The following specific monitoring activities can be carried out, either informally or formally and then reviewed by the Source Water Protection Committee.

Transportation

- Monitor water quality results for any signs of potential contamination of source waters from road salting (ie high chloride levels).
- Monitor transportation patterns in the watershed, to ensure that dangerous goods that are being transported through the area follow BMP's.

Forestry

- Monitor changes in the nature of the forest cover due to the frequency, size and extent of harvesting or natural disasters such as from wind, fire, insects/diseases or other agents.

Recreation

- Continue monitoring recreation activities with respect to potential fuel spills and littering. Encourage recreational users of the watershed to report any regularities or problems they encounter.

APPENDICES

Appendix 1- Source Water Protection Plan Committee – Terms of Reference

A. Introduction

The delivery of safe water to consumers is the top priority of the Water Utility. The approach to achieve this in Nova Scotia and in many areas throughout the world is the Multiple-Barrier Approach. This is a series of steps taken by the water supplier which together provide multiple layers of protection to ensure that safe water is delivered to the consumer.

In Nova Scotia the barriers outlined in the Province's Drinking Water Strategy are as follows:

1. Keep It Clean – by insuring that the water source is protected from contamination
2. Making It Safe – by providing the required treatment
3. Proving It Safe – through continuous testing and monitoring

The Town of Shelburne Water Utility has a complete testing and monitoring program which is in full compliance with all regulations to provide a finished product which meets or exceeds the Guidelines for Canadian Drinking Water Quality as published by Health Canada.

To complete our multiple-barriers of protection the Utility must adopt a Source Water Protection Plan to ensure the source water remains clean. This Terms of Reference document is intended to initiate the Plan and outline the steps to complete the Source Water Protection Plan.

B. Proposed Steps

The Nova Scotia Environment (NSE) has published an excellent guide document for developing a Source Water Protection Plan. The Town of Shelburne Water Utility proposes to follow these guidelines and proceed with the appropriate suggested steps of the guide:

1. Form a Source Water Protection Advisory Committee
2. Delineate a Source Water Protection Area Boundary
3. Identify Potential Contaminants and Assess Risks
4. Develop and adopt a Source Water Protection Management Plan.
5. Develop a monitoring program to evaluate the effectiveness of the Plan

C. Advisory Committee

The formation of an Advisory Committee is a critical component in developing the Source Water Protection Plan. The Advisory Committee will provide the Water Utility and Shelburne Town Council with advice:

- That will attempt to satisfy the water quality and quantity concerns of all stakeholders
- About the potential sources of contamination in and near the source water supply area

- About the management options available, and
- About the success of the protection plan

The Advisory Committee should reflect the broad spectrum of land owners, interested groups and government officials that have a stake in the development of the Source Water Protection Plan. As it is clear that the Source Water Protection Plan will be within the Municipality of the District of Shelburne, representatives from the County will be requested to participate on the Committee.

Committee membership:
Nova Scotia Environment – One water shed planner and one local environment and compliance representative to work with the Committee providing information and advice on topics related to source water protection, watershed management and regulation.
Natural Resources – One representative to work with the Committee providing information and advice on topics related to forestry.
Fisheries & Oceans Canada- One representative for habitat and one representative for conservation and protection to work with the Committee providing information and advice on topics related to habitat, protection and enforcement.
Municipality of the District of Shelburne Council – Two Councillors to represent the interests of the citizens served by the Municipality.
Town of Shelburne Council – Two Councillors to represent the interests of the citizens served by the Municipality.
Town of Shelburne Staff - One water treatment plant operator and one other staff, to provide the Committee with information and advice on topics relating to the Source Water Protection Plan.
Municipality of the District of Shelburne Staff – One planning and one bylaw enforcement officer, to provide the Committee with information and advice on the Rodney Lake Watershed Area Municipal Planning Strategy.
Land Owners - Adjacent land owners to Rodney Lake are responsible to express their concerns and interests to the committee and are responsible to report any problems or potential problems that they may encounter in the water shed area.

Voting Members
2 – Town of Shelburne Councillors
1 - Water Treatment Plant Operator
2 – Municipality of the District of Shelburne Councillors
1 – Land Owner
1 – Department of Natural Resources
1 – Fisheries & Oceans Canada – habitat
1 – Fisheries & Oceans Canada – conservation and protection

A quorum of the Committee shall be at least the majority of the voting members of the Committee. There being nine (9) voting members of the Committee, therefore a quorum is at least five (5) voting members.

Non Voting – Resource Members

2- Nova Scotia Environment
1 - Fisheries & Oceans Canada
1- Nova Scotia Transportation Infrastructure Representative
1 – Town of Shelburne Staff
2 – Municipality of the District of Shelburne Staff

D. Budget

The project will be accomplished with a combination of in house staff, consultants and volunteers.

E. Timeline

The Town of Shelburne requires a Source Water Protection Plan to be submitted for approval by October 15th, 2010 as per the Approval to Operate.

Monthly meetings will take place in 2010 allowing time to implement the Plan. Commencing in 2011 meetings will be reduced to a minimum of twice a year and continue thereafter for review, monitoring and updating of the Plan.

Appendix 2- Acronyms

BMP- Best Management Practice

PCBs- Polychlorinated biphenyls (PCBs) are a group of organic compounds that were used as fluids to cool and insulate electrical transformers and capacitors.

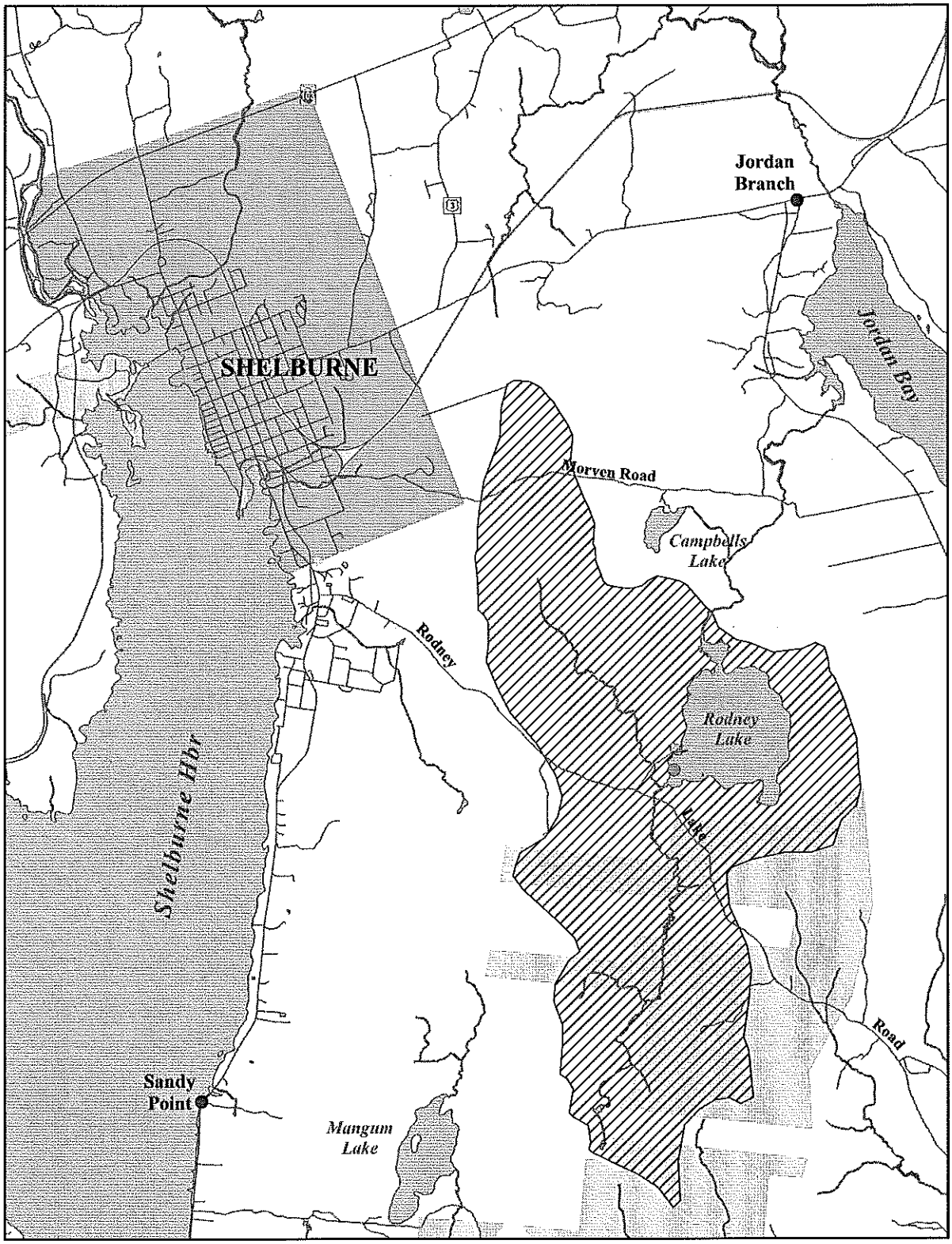
SWPP- Source Water Protection Plan

WTP- Water Treatment Plant

MAC- Maximum Acceptable Concentration

IMAC- Interim Maximum Acceptable Concentration

APPENDIX 3- Rodney Lake Watershed Area Map



Town of Shelburne Municipal Drinking Water Supply (Rodney Lake Watershed)

Legend

0 500 1,000 1,500 2,000 2,500 3,000 3,500 4,000 Meters

1:40,000

Municipal Supply Intake — Roads — River — Water

Natural Watershed Area — Town Limits — Crown Land

NOVA SCOTIA Environment

This map is a geographic representation and should not be used for legal purposes. The NSE accepts no liability for any errors or omissions herein.

Projection/Datum: UTM, NAD83 Zone 20

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