



# **Greater Sudbury Source Protection Area Assessment Report**

Approved on September 2, 2014

**The following amendments have been made to the original document**

<b>Date</b>	<b>Type of Amendment</b>	<b>Description</b>
March 15, 2018	Minor/Typographical amendment under O. Reg. 287/07 section 51(6)	Map 3.7: The vulnerability score for the lake bottom was corrected to "9".
		Map 4.4: The Intake Protection Zone 3 was amended to correct buffers around regulated areas.
March 1, 2017	Minor/Typographical amendment under O. Reg. 287/07 section 51(2)	Sections: 11.4, 19.3, 24.3, 29.3, 34.2, 39.2, 44.2, 49.2, and 54.2 – "Identification of areas where threats can occur" were amended to remove a table which did not conform with requirements established under the Accessibility for Ontarians with Disabilities Act (AODA). The alternative option provided is the online Source Water Protection Threats Tool.
		Appendix 5 – Drinking Water Threat Circumstances was amended to remove references tables which did not conform with requirements under the Accessibility for Ontarians with Disabilities Act (AODA). The online alternative is explained in this appendix.

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## Limitations of this Report

This report has been prepared according to the provincial requirements laid out under the *Clean Water Act, 2006*. It should not be used for other purposes without consulting the Nickel District Conservation Authority (NDCA).

The information contained within is current as of the date of issuance and this report is based upon the best information available at the time. The information, data and conclusions contained in the report were prepared for the specific purposes laid out in the *Clean Water Act, 2006*.

The assessment report has been prepared and reviewed by the Greater Sudbury Source Protection Area Source Protection Committee, the Greater Sudbury Source Protection Authority and members of the Nickel District Conservation Authority technical team.

All information contained herein is produced solely for the purposes to fulfill the obligations under the *Clean Water Act* and is not to be used for any other intention. For confidentiality purposes, any personal information related to the assessment has been removed.

## Executive Summary

The assessment report is written in compliance with the *Clean Water Act*. The Greater Sudbury Source Protection Committee, a local multi-stakeholder committee, was formed to oversee the production of this report and the drinking water source protection plan which contains policies to address the findings of this report. The Nickel District Conservation Authority is coordinating the production of this report and the source protection plan. With the passage of the *Clean Water Act*, the Nickel District Conservation Authority became the Greater Sudbury Source Protection Authority for the purposes of meeting conservation authority responsibilities under the *Clean Water Act*.

There are three major watersheds in the planning area: the Wanapitei, the Vermilion and the Whitefish River watersheds, covering approximately 9,150 km<sup>2</sup>. There is one municipality, the City of Greater Sudbury, which has municipal residential drinking water systems in the area. Two First Nations, Atikamsheng Anishnawbek (Whitefish Lake) and Wahnapiatae First Nation are located within the city boundaries and both participate on the source protection committee.

The purpose of the assessment report is to delineate areas around municipal drinking water sources that are the most vulnerable to contamination and overuse. Within these vulnerable areas, land use activities were identified that could pose a threat to municipal water sources.

The population of the City of Greater Sudbury is 160,274, approximately 90% of which obtain drinking water from the municipality. There are eight municipal systems servicing the area.

Municipal drinking water systems in the Greater Sudbury Source Protection Area

Drinking Water System	Description
Valley	13 wells, serving approximately 35,000 residents
Dowling	2 wells serving approximately 1,850 residents
Falconbridge	3 wells serving approximately 750 residents
Garson	3 wells serving approximately 4,890 residents
Onaping	3 wells serving approximately 2,150 residents
Vermilion River	Serving approximately 13,000 residents in the communities of Copper Cliff, Lively, Naughton and Whitefish
Ramsey Lake	Ramsey Lake David Street Water Treatment Plant and Wanapitei River Water Treatment Plant combined, serving approximately 90,000 residents
Wanapitei River	

To date, 95 significant drinking water threats, as defined by the *Clean Water Act*, have been identified in the Greater Sudbury Source Protection Area. In addition, Microcystin LR (blue green algae) and sodium have been identified as issues in the Ramsey Lake system. As a result, all properties in the Ramsey Lake vulnerable areas have been identified for their potential to contribute to these issues. Elevated levels of sodium have also been measured in the Dowling, Valley and Garson systems. No significant threats have been identified in the Falconbridge or Vermilion River vulnerable areas.

## Greater Sudbury Source Protection Area Assessment Report

### Significant drinking water quality threats for each municipal system

Drinking Water System	Drinking Water Threat	Number of Occurrences
Ramsey Lake Intake	Operation or maintenance of a waste disposal site.	2
	Storm sewers	2
	Application of road salt.	1
	Transportation of hazardous substances along transportation corridors.	3
	The application of commercial fertilizer to land.	3
Wanapitei River Intake	Handling and storage of fuel.	1
	The application of road salt.	1
	Transportation of hazardous substances along transportation corridors.	2
Valley	Operation or maintenance of a waste disposal site.	1
	Septic systems.	34
	The application of agricultural source material to land.	1
	The storage of agricultural source material.	6
	The application of commercial fertilizer to land.	1
	Handling and storage of commercial fertilizer.	1
	Handling and storage of pesticide.	1
	Storage of snow.	2
	Handling and storage of fuel.	2
	Handling and storage of a dense non-aqueous phase liquid.	4
	Use of land as livestock grazing, pasturing land, or farm-animal yard.	6
	Transportation of hazardous substances along transportation corridors.	2
	Water Quantity (water takings)	10
	Water Quantity (recharge reduction)	1
Garson	Handling and storage of fuel.	1
	Transportation of hazardous substances along transportation corridors.	2
Onaping	Septic systems.	2
	Transportation of hazardous substances along transportation corridors.	2
Dowling	Transportation of hazardous substances along transportation corridors.	1

## Greater Sudbury Source Protection Area Assessment Report

Drinking water quality issues and associated threats for the Ramsey Lake system

Drinking Water System	Drinking Water Issue	Associated Threat	Number of properties in Ramsey Lake Watershed
Ramsey Lake Intake	Microcystin LR (blue green algae)	Septic systems	210
		The application of commercial fertilizer to land	4,550
		Discharge of untreated stormwater from a stormwater retention pond	2
		Lift stations	8
	Sodium	The application of road salt	4,550
		The handling and storage of road salt	205
		Septic systems	210
		Storage of Snow	19

Public consultation is an integral part of developing both the assessment report and the source protection plan. The public has identified a number of other potential threats not listed in the *Clean Water Act* Technical Rules that are of concern in the Greater Sudbury Source Protection Area. These include abandoned and improperly constructed wells; removal of top soil; and concerns specific to Ramsey Lake such as motorized boats, vehicles and planes, and pet waste and bird waste near the Ramsey Lake intake.

A water quantity analysis was done for each major watershed and for each individual drinking water system. There was low stress for all watersheds and for all municipal systems, except for the Valley groundwater system where a significant water quantity risk was identified.

The source protection committee wrote a source protection plan to address threats and issues that were identified in the 2011 approved assessment report. The plan was submitted to the Minister of the Environment in August 2012. The assessment report and the source protection plan are being updated concurrently to add water quantity threats and policies for the Valley groundwater system. The municipality and landowners affected by the source protection plan were involved in developing the policies. The Nickel District Conservation Authority is responsible for preparing annual reports on the implementation of the source protection plan and coordinating the updating of assessment reports and source protection plans.



## Sommaire

Le Rapport d'évaluation est rédigé en conformité avec la Loi de 2006 sur l'eau saine. Le Comité de protection des sources du Grand Sudbury, un comité local multipartite, a été créé pour surveiller la production du présent rapport et du Plan de protection des sources d'eau potable qui contient des politiques visant à traiter les constatations du présent rapport. L'Office de protection de la nature du District du Nickel coordonne la production de ce rapport et du Plan de protection des sources d'eau potable. Par l'adoption de la Loi de 2006 sur l'eau saine, l'Office de protection de la nature du District du Nickel est devenu l'Office de protection des sources du Grand Sudbury afin de remplir ses responsabilités en tant qu'office de protection de la nature, conformément à la Loi de 2006 sur l'eau saine.

La zone de planification comprend trois grands bassins hydrographiques : Les bassins hydrographiques des rivières Wanapitei, Vermilion et Whitefish couvrent une surface d'environ 9 150 km<sup>2</sup>. La Ville du Grand Sudbury est une municipalité qui compte des systèmes résidentiels d'eau potable municipale dans la zone. Deux Premières nations, soit celles d'Atikamsheng Anishnawbek (lac Whitefish) et de Wahnapitae, se situent dans limites de la ville et font partie du Comité de protection des sources.

Le Rapport d'évaluation a pour objet de délimiter les zones entourant les sources d'eau potable municipale qui sont les plus vulnérables à la contamination et à la surutilisation. Dans ces zones vulnérables, on a déterminé les activités d'utilisation des terres qui pourraient représenter une menace pour les sources d'eau municipale.

La Ville du Grand Sudbury compte une population de 160,274, dont environ 90 % obtient son eau potable de la municipalité. Huit systèmes d'eau potable municipale desservent la zone.

Systemes résidentiels d'eau potable municipal dans la zone de protection des sources du Grand Sudbury

Systeme d'eau potable	Description
Valley	13 puits qui desservent environ 35 000 résidents
Dowling	2 puits qui desservent environ 1 850 résidents
Falconbridge	3 puits qui desservent environ 750 résidents
Garson	3 puits qui desservent environ 4 890 résidents
Onaping	3 puits qui desservent environ 2 150 résident
Rivière Vermilion	Desservant environ 13 000 résidents dans les communautés de Copper Cliff, Lively, Naughton et Whitefish
Lac Ramsey	L'usine de traitement de l'eau de la rue David approvisionnée par le lac Ramsey et l'usine de traitement de l'eau de la rivière Wanapitei desservent un total d'environ 90 000 résidents.
Rivière Wanapitei	

À ce jour, 95 menaces importantes pour l'eau potable, aux termes de la Loi de 2006 sur l'eau saine, ont été identifiées dans la zone de protection des sources. En plus, la microcystine LR (algues bleu-vertes) et le sodium ont été identifiés comme questions liées à l'eau potable dans le système du lac

Ramsey. En conséquence, toutes les propriétés dans les zones vulnérables du lac Ramsey ont été identifiées pour leur potentiel à contribuer à ces questions. En plus, des taux élevés de sodium ont été mesurés dans les systèmes de Dowling, Valley et Garson. Aucune menace importante n'a été décelée dans les zones vulnérables à Falconbridge et la rivière Vermilion.

## Greater Sudbury Source Protection Area Assessment Report

Menaces importantes pour l'eau potable (qualité et quantité) pour chaque systèmes résidentiels d'eau potable municipale

Système d'eau potable	Menace pour l'eau potable	# d'occurrences
Prise d'eau du Lac Ramsey	Exploitation ou entretien d'un site d'élimination des déchets.	2
	Égouts pluviaux.	2
	Application de sel de voirie.	1
	Transportation des produits dangereux par voie de transportation.	3
	L'application d'engrais commercial aux terres.	3
Prise d'eau de la Rivière Wanapitei	Manipulation et entreposage de carburant.	1
	Application de sel de voirie.	1
	Transportation des produits dangereux par voie de transportation.	2
Système d'eau potable de la Vallée	Exploitation ou entretien d'un site d'élimination des déchets.	1
	Fosses Septiques.	34
	L'application de matière fertile agricole aux terres.	1
	L'entreposage de matière fertile agricole.	6
	L'application d'engrais commercial aux terres.	1
	Manipulation et entreposage d'engrais commercial.	1
	Manipulation et entreposage de pesticides.	1
	Entreposage de neige.	2
	Manipulation et entreposage de carburant.	2
	Manipulation et entreposage de liquides en phases dru et non aqueux .	4
	Utilisation des terres pour l'exploitation de pâturages, les terres de pâturage ou la cours d'animaux agricoles.	6
	Transportation des produits dangereux par voie de transportation.	2
	Quantité d'eau (prises d'eau).	10
	Quantité d'eau (reduction de recharge)	1
Garson	Manipulation et entreposage de carburant.	1
	Transportation des produits dangereux par voie de transportation.	2
Onaping	Fosses Septiques	2
	Transportation des produits dangereux par voie de transportation.	2
Dowling	Transportation des produits dangereux par voie de transportation.	1

## Greater Sudbury Source Protection Area Assessment Report

### Questions liées à l'eau potable et menaces associées pour le système du lac Ramsey

Système d'eau potable	Question liée à l'eau potable	Menaces associées	Nombre d'occurrences dans le Lac Ramsey
Prise d'eau du Lac Ramsey	Microcystine LR (algues bleu-vertes)	Fosses septiques	210
		L'application d'engrais commercial aux terres	4,550
		Égouts pluviaux	2
		Poste de relevage des eaux usées	8
	Sodium	Application de sel de voirie	4,550
		Manipulation et entreposage de sel de voirie	205
		Fosses septiques	210
		Entreposage de neige.	19

La consultation publique constitue une partie intégrante de l'élaboration du Rapport d'évaluation et du Plan de protection des sources. Le public a décelé de nombreuses autres menaces éventuelles qui ne figurent pas dans les règles techniques de la Loi de 2006 sur l'eau saine, mais qui sont préoccupantes pour la Zone de protection des sources du Grand Sudbury. Elles comprennent les puits mal construits et abandonnés, l'excavation de la couche végétale et les préoccupations liées au lac Ramsey comme les bateaux motorisés, les véhicules et les avions, ainsi que les déchets d'animaux et d'oiseaux à proximité de la prise d'eau du lac Ramsey.

Une analyse de la quantité d'eau a été effectuée pour chaque grand bassin hydrographique et pour chaque système d'eau potable. Le niveau de stress était faible pour tous les bassins hydrographiques et pour tous les systèmes municipaux, à l'exception du système de puits de la Vallée où un risqué important pour la quantité d'eau a été identifiée.

Le Comité de protection des sources a élaboré un Plan de protection des sources visant à traiter les menaces et les questions identifiées dans le Rapport d'évaluation de 2011. Le plan a été présenté au ministre de l'Environnement en août 2012. Le plan de protection des sources et le Rapport d'évaluation sont mis à jour concurremment afin d'ajouter les menaces et les politiques de la quantité d'eau pour le système de puits de la Vallée. La municipalité et les personnes touchées par le plan de protection des sources ont été impliqués dans l'élaboration des politiques. L'Office de protection de la nature du District du Nickel est responsable d'élaborer des rapports annuels sur la mise en oeuvre du Plan de protection des sources ainsi que de coordonner le renouvellement des rapports d'évaluation et des plans de protection des sources.

## Acknowledgements

The Greater Sudbury Source Protection Committee would like to thank all the people who helped prepare this report. We sincerely thank members of the public for coming to our meetings and open houses to let us know what is important to them for protecting our drinking water sources. We thank Stephen Kaufman, Blythe Reiha, Roch Duval, Karen Besemann and other staff from Golder Associates for doing the water budget and water quantity work, and for surface water modeling to delineate intake protection zones; Rich Schmidt, Tom Killingbeck and Jean-François Dionne from WESA Inc for conducting the groundwater vulnerability analysis; Tim McBride and Ron DeGagne from AMEC for doing the initial surface water vulnerability assessment according to draft guidance material; Peter Richards of Waters Environmental Geosciences Ltd. for serving as the groundwater peer reviewer of the water quantity analysis and the water quality vulnerability analysis; Eric Smith for the surface water peer review of the water quantity analysis and the water quality vulnerability analysis; Anne Watelet of Laurentian University for peer reviewing the Tier 1 water budget analysis; Laura Landriault, Scott Bates and Mike Garraway from the Ministry of Natural Resources and Forestry for guidance on the water budget analysis; Conservation Ontario for program guidance; Ministry of the Environment and Climate Change Liaison Officers John Westlake and Neil Gervais for working to resolve issues expediently, and other Source Protection Programs Branch staff for keeping us apprised of changes as they occurred throughout the process; Richard Auld, Mark Rondina, Ed Gardner and Burgess Hawkins from the Sudbury and District Health Unit for attending committee meetings regularly and for advising the committee on health related concerns; the Greater Sudbury Source Protection Authority for support and guidance throughout the process; and Nickel District Conservation Authority staff who contributed to the research, writing and editing of the report, namely Sharon Bennett, Jessica Brunelle, Brianne Carter, Jamie Dumoulin, Linda Lachance, Katherine Mackenzie, Anoop Naik, Paul Sajatovic, Judy Sewell and Melanie Venne.

## Foreword

### Implementing the Greater Sudbury Source Protection Plan – The Assessment Report Phase

The *Clean Water Act* not only introduces a new level of protection for Ontario’s municipal drinking water, it represents a significant step toward a more integrated watershed based approach to water management. Based on the central principles of creating watershed scale and scientific-based, multi-stakeholder solutions, the *Clean Water Act* focuses on protecting water before it enters the drinking water system. Following the outcome of the Walkerton Inquiry, the province commenced an ambitious program to ensure that municipal drinking water was protected at the source and that high quality source water would become the first barrier to preventing unacceptable drinking water quality. Further, the plans were to be driven locally by source protection committees in each of the 19 defined Source Protection Areas (Conservation Ontario, undated).

The Sudbury Source Protection Area includes eight municipal drinking water systems in three major watersheds. It is a complex integrated system of wells, lake surface water intakes and river intakes. Most systems are owned and operated by the City of Greater Sudbury. One system is owned and operated by Vale.

The planning process is carried out under the direction of the Greater Sudbury Source Protection Committee (see Table 1.1), with representation from the local municipal, industrial and commercial business sectors, the public at large, the environmental NGO sector and the two local First Nations. The committee has been strongly supported by the Greater Sudbury Source Protection Authority, led by Chair Lin Gibson, and staff of the Nickel District Conservation Authority, led by General Manager Paul Sajatovic and Program Manager Judy Sewell, and the team of dedicated, talented staff. This leadership has allowed the committee to draft sound terms of reference that were approved by government in 2009 and, subsequently, to assess the threats to Sudbury’s municipal source water. The assessment report was submitted in May 2010, updated in 2011 and is now being amended to reflect the completion of technical studies on water quantity.

The residents of the Sudbury Region are very proud of the recent environmental accomplishments of the area and the City has proudly been dubbed the “City of Lakes.” On many of the City lakes, local volunteer stewardship committees measure water quality and help formulate lake-wide plans. Stewardship committees are supported by City staff.

From City Council to local residents, people have been very responsive to the source protection planning process and have facilitated the job of the committee. As well as the strong staff support, the committee has been supported by dedicated representation from the Ministry of the Environment and Climate Change and the Sudbury & District Health Unit.

The committee has identified a number of unique threats to source water, as well as threats prescribed in the rules laid out by the province. The report highlights issues that have been identified in the drinking water areas during public open houses and from local knowledge of the sources. In some areas, the committee has identified data gaps. Filling the gaps will require resources dedicated to ensuring that the gaps are narrowed to allow scientifically sound plans to be implemented.

Nels Conroy, Greater Sudbury Source Protection Committee Chair

## Preface

In May 2000, an outbreak of *E. coli* occurred in the drinking water supply in the small rural town of Walkerton, Ontario. The outbreak caused approximately 2,500 people to become ill and resulted in the deaths of seven people. The tragedy was felt throughout both the community and the province, and was one of the more publicized in a series of incidents across Canada resulting in a wave of concern throughout the country that greater attention needed to be given to the protection of drinking water supplies.

In response to the Walkerton tragedy, the provincial government initiated the Walkerton Inquiry to investigate the circumstances surrounding the event. Justice Dennis O'Connor of the Supreme Court of Ontario led the inquiry, the findings of which were released in 2002. The completed investigation determined that a number of the safety barriers designed to ensure a safe drinking water supply had been compromised.

In his report, Justice O'Connor outlined recommendations for the province of Ontario to ensure the safety of drinking water for the residents of Ontario and prevent another tragedy from occurring. He recommended that a multi-barrier approach be used to protect drinking water supplies. The first step in this approach is Source Protection.

The province of Ontario responded by passing the *Clean Water Act* in 2006. Under the Act, each source protection region is required to develop plans to protect both the quality and quantity of their municipal drinking water sources. The province was divided into 19 Source Protection Regions (SPRs) based on watersheds, with each SPR responsible for forming a source protection committee based on local stakeholder representation. The source protection committees have been tasked with preparing the assessment report and the source protection plans.

The Nickel District Conservation Authority and the Greater Sudbury Source Protection Authority are overseeing the Drinking Water Source Protection Program for Greater Sudbury. These partners will work with the committee to develop and implement the source protection plan.

This assessment report comprises a number of different technical background studies to assess the risk to water quality and quantity for source waters. This information is used for preparing the source protection plan for the Greater Sudbury Source Protection Area.