

Commentary



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Delivering the Basics: The Ongoing Indigenous Water Crisis in Canada

This is the fourth in a series of four articles.

An overview of water delivery systems and barriers to provision

Matthew Cameron with Ken Coates

While the need for clean drinking water is simple and straightforward, safely supplying it to all of the households in a given community is anything but. It takes surprisingly little for drinking water to become contaminated, whether at the source or at various points along the distribution line, and potentially put public health in peril. Indeed, the journey of drinking water from source to tap (or spigot) is inherently complex and fraught with vulnerability, as is all too familiar for many First Nations communities in Canada that have precarious access to safe, clean drinking water. 27 Indigenous communities are currently impacted by 31 long-term drinking water advisories, according to the latest numbers from the Government of Canada.¹

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There are three basic types of water systems used in Canada. The most common, especially for non-First Nations Canadians and others that reside in off-reserve municipalities, is water piped into the home, delivered from a centralized water treatment plant managed by the local government. Those who don't have treated water piped directly into their house typically depend on either water delivered by truck and stored in a cistern or water storage tank, or a private well to meet their household water needs.

A national assessment of First Nations community water systems commissioned by the federal government and completed in 2011 found that 72 per cent of homes had piped water delivery, 13.5 per cent received water by truck delivery and 13 per cent relied on individual wells – the remaining 1.5 per cent of households reported having no water service (i.e., “without plumbing in the house”).² Each method has its benefits and drawbacks, including capital costs and maintenance, as well as distinct vulnerabilities to contamination on account of the components involved in each system. For example, the life spans of water pipes, which have high capital costs, are typically measured in decades (e.g., 50 to 70 years, depending on materials used in their construction). Wells and cisterns are less expensive to build but require more frequent cleaning and monitoring. They also use water pumps that often need to be replaced within a decade or so of installation.

“ *All methods of water delivery originate with a source of water, either groundwater (i.e., aquifers) or surface water (e.g., lakes, rivers and reservoirs).* ”

All methods of water delivery originate with a source of water, either groundwater (i.e., aquifers) or surface water (e.g., lakes, rivers and reservoirs). 46 per cent of First Nations water systems draw on groundwater and 29 per cent draw on surface water, which is most common in Ontario and Manitoba.³ Depending on the depth of a given groundwater source, it can be adversely impacted by surface water. (Simply put, the closer to the water table or surface water bodies the groundwater is, the more vulnerable it is to surface water.) For example, some wells draw groundwater that is susceptible to surface water

and thereby to more frequent contamination. These are known as *GUDI* wells – which stands for groundwater under the direct influence of surface water.

Per the national assessment, six per cent of First Nations water systems use *GUDI* wells.⁴ A further 19 per cent of water that reaches First Nations communities is supplied through formal agreements with neighbouring municipalities.⁵ The assessment continues, “[n]ationally, 52 [per cent] of the groundwater systems, 51 [per cent] of the *GUDI* systems, 36 [per cent] of the surface water systems 7 [per cent] of the [municipal type agreement] systems are high risk systems,” meaning they have “major deficiencies” that “may lead to potential health and safety or environmental concerns” and require “immediate corrective action.”⁶

Protecting source water from contamination is vital to ensuring a safe supply of drinking water. Without clean water sources, it is exceedingly difficult to supply people with safe drinking water. The 2011 national assessment noted that source water protection plans, which are intended to identify threats to source water and ways to mitigate contamination of groundwater and surface water, were “uncommon” in First Nations communities.⁷ Nevertheless, a Health Canada study of drinking water advisories in First Nations communities from 1995 to 2007 found that less than 10 per cent of long-term drinking water advisories were the result of source water contamination. Much more common causes included issues with equipment (24 per cent), the microbiological quality of water samples (43 per cent), system operation (21 per cent) and, most commonly, disinfection (56 per cent).⁸ During the same period, the most common cause of drinking water advisories that lasted less than a year was unacceptable microbiological quality (28 per cent), with the rest owing to equipment malfunction (29 per cent), disinfection (27 per cent) and unacceptable levels of turbidity, or cloudiness due to particles (25 per cent).⁹ Problems with water system management appear to be the more common reason for long-term drinking water advisories in First Nations communities.

Following best practices of water system management, after being drawn from a source, raw water is treated and tested at a water treatment plant before being supplied to individuals for consumption.¹⁰ Water treatment plants are inherently complex, making them expensive to construct and vulnerable to breakdowns, especially in the absence of proper management, which is also expensive. Water systems in First Nations communities are owned and operated by the respective First Nations, while the federal government funds their construction and, as of 2020-2021, provides 100 per cent of the

funding for operations and maintenance (prior to 2020, First Nations were responsible for 20 per cent of operations and maintenance costs, the federal government 80 per cent; the change followed a troubling report from the Auditor General of Canada that highlighted the shortcomings of the federal government’s approach to addressing drinking water concerns in First Nations communities¹¹). Nevertheless, while a recent report from the Parliamentary Budget Officer found that capital spending from 2016-2026 is expected to be sufficient, operations and maintenance spending from 2016-2026 is only expected to cover two thirds of needed funding, leaving an annual gap of \$138 million.¹² This is particularly concerning given that most long-term drinking water advisories tend to result from water system management issues.

“*Routine drinking water treatment can address known aspects of the source water to ensure it is suitable for drinking.*”

Routine drinking water treatment can address known aspects of the source water to ensure it is suitable for drinking (e.g., adding chlorine, as is common practice in Canada, to eliminate bacteria and viruses). Testing occurs prior to distribution to ensure that drinking water meets applicable guidelines and regulations before it is consumed. Given the implications for public health, treating and testing drinking water are both specialized tasks requiring training and certification to comply with applicable guidelines and regulations.¹³

For most Canadians, drinking water quality is regulated by provincial or territorial legislation that specifies standards and enforcement measures. First Nations Canadians subject to the Indian Act, however, fall under the jurisdiction of the federal government rather than their home provincial or territorial government. In stark contrast with the territories and provinces, the federal government has no legislation governing water quality, instead relying on voluntary (though to be sure, encouraged) compliance with national guidelines. As such, the drinking water in many First Nations communities is not legally required to be provided at the same quality standard as in neighbouring communities, and there is no legal enforcement mechanism available if this drinking water does not meet the national guidelines.

The national assessment completed in 2012 found that only 54 per cent of water systems in First Nations communities had fully certified primary operators while 81 per cent had backup operators. As the report notes,

The ability to develop and retain suitable certified operators is critical to having a well run water or wastewater system. Certified operators are more likely to operate facilities in compliance with applicable guidelines and legislation. The absence of a certified operator may impact other issues such as monitoring, reporting and record keeping, and increases risk associated with these components (p. 25).

The assessment also found a considerably lower percentage of certified operators as communities became more remote. The number of individuals available and interested in becoming and remaining certified water system operators (or backup operators, for that matter) is severely limited by the small population size of many impacted First Nations. Moreover, the remoteness of such communities makes it difficult for such individuals to access training and receive and maintain certification. Water system operators working for First Nations are also underpaid compared to water system operators in municipalities (who enjoy high wages and benefits afforded by union representation) making attraction and retention challenging.¹⁴

The proper maintenance of water treatment plants is instrumental to the sustainable supply of safe, clean drinking water and for avoiding preventable system breakdowns. Proper maintenance also reduces costs in the long run by addressing minor, routine repairs before they become major, expensive problems that can upend water distribution for prolonged periods of time. In 2012, only 28 per cent of First Nations water systems had maintenance management plans. Such plans, according to INAC, “represent a change from reactive to proactive thinking and, when executed properly, optimize maintenance spending, minimize service disruption, and extend asset life.”¹⁵ Likewise, just 28 per cent of systems had emergency response plans.¹⁶

With fewer certified operators and more haphazard management of water treatment plants, operation and maintenance inevitably suffer and lead to problems and potential emergencies. As with the number of certified operators, “[n]ationally, the overall risk of a water systems appears to increase with remoteness.”¹⁷ For example, “in Zone 4 [the least accessible zone, as defined by Indian and Northern Affairs Canada] the water systems are 2.5 times more likely to be high risk than low risk.”¹⁸

Once treated and tested for quality, water that leaves a treatment plant is distributed to consumers, either through watermains and pipes into homes or by truck to cisterns that can, in turn, serve individual homes or groups. Piping water into the home is the most effective way to deliver clean water to individuals. However, the local terrain, geography and remoteness of communities as well as the distance separating houses from water treatment plants can make it challenging and expensive to connect all the homes in a community. Laying pipe is expensive and labour intensive, especially in small communities that cannot always be accessed by road, making it more expensive to source the necessary materials, equipment and specialized labour. In order to provide funding for standard piped water delivery, the federal government also requires residential lot frontages to be no more than an average of 30 meters, beyond which cheaper alternatives (e.g., trucked water delivery) are generally used.¹⁹

This is problematic for First Nations communities like the Peepeekisis in Saskatchewan, which has around 150 houses in a community with an area of approximately 6-by-14 km.²⁰ Water delivered by truck to cisterns is a cheaper method, to be sure, but is not without its complications. Cisterns need to be cleaned and disinfected regularly, and some water advocates claim they pose health risks to consumers.²¹ Wells, too, require more regular cleaning and maintenance than piped delivery, and depending on their construction, are much more susceptible to contamination. In the case of GUDI wells, for example, such contamination can be the result of seasonal flooding and land use practices that can impact surface water (e.g., agricultural and industrial uses).

“*Delivering safe, clean drinking water to individuals is a complex and costly endeavour.*”

Delivering safe, clean drinking water to individuals is a complex and costly endeavour. Everything from the water source to treatment and distribution materials, to the local terrain, human resources, plans for proper operation and maintenance, and communication protocols between different authorities can prevent clean water from being provided to residents. Barriers to provision can occur at each stage.

Many First Nations communities in Canada have precarious access to clean drinking water due, in part, to their small size and remoteness and the added logistical challenges of delivering drinking water to such isolated locations. Communities currently subject to long-term drinking water advisories vary in population from around 50 to 2,500 people, with most of these communities having fewer than 1,000 residents. Approximately half cannot be accessed by road for at least part of the year.

Local geography largely determines the available water sources and feasible water distribution methods for a given community, while population and proximity to established urban centres affects everything from available materials and labour, construction costs and the possibility of pooling resources with neighbouring municipalities, to the accessibility of training for water system operators needed to manage and maintain local water delivery systems. While adequate financial resources can help address many barriers to provision of clean drinking water, they are no substitute for the human resources necessary to construct, operate and maintain effective and sustainable water delivery systems. [MLI](#)

About the authors



Matthew Cameron is a Yukon-based researcher and academic. He is an Instructor at Yukon University, where he has taught in the Liberal Arts, Indigenous Governance and Multimedia and Communications programs since 2016.

In addition to his academic work, Matthew has nearly a decade of experience working in various capacities for the Yukon Government, including as Director of Communications for the Yukon Government Cabinet. Through this work he has been directly involved in various intergovernmental structures in the Yukon, within Canada and at the circumpolar level and has developed an in-depth knowledge of public policy, politics and governance in Canada's North.

Matthew received a PhD in Philosophy from the University of St. Andrews. He holds a Master's degree in Philosophy from the University of Western Ontario and completed his undergraduate studies in Philosophy and Political Science at the University of British Columbia. Matthew works, lives and grew up on the traditional territory of the Kwanlin Dün First Nation and the Ta'an Kwäch'an Council in Whitehorse, Yukon. [MLI](#)



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Ken has also worked as a consultant for Indigenous groups and governments in Canada, New Zealand, and Australia as well as for the United Nations, companies, and think tanks. He has previously published on such topics as Arctic sovereignty, Aboriginal rights in the Maritimes, northern treaty and land claims processes, regional economic development, and government

strategies for working with Indigenous peoples in Canada. His book, *A Global History of Indigenous Peoples: Struggle and Survival*, offered a world history perspective on the issues facing Indigenous communities and governments.

He was co-author of the Donner Prize winner for the best book on public policy in Canada, *Arctic Front: Defending Canada in the Far North*, and was short-listed for the same award for his earlier work, *The Marshall Decision and Aboriginal Rights in the Maritimes*. [MLI](#)

Endnotes

- 1 May 2023 figures from Indigenous Services Canada.
- 2 It is important to keep in mind that the Government of Canada’s official figures regarding long-term drinking water advisories (those in place for more than one year) only cover “public” water systems that serve at least five households and are funded (in part) by the federal government. Hence, the numbers do not cover the 13% of First Nations homes across the country that rely on individual wells (even those that were funded by the federal government (e.g., in Carmacks, Yukon). The 2011 national assessment tested approximately 5% of individual wells in each community and found that 36% had health concerns, 75% had aesthetic concerns (e.g., colour or smell) and 19% did not meet federal Guidelines. More recent estimates suggest 15% of homes in First Nations communities receive water by truck delivery (<https://globalnews.ca/news/7656235/lack-of-funding-for-piped-water-on-first-nations-in-sask-means-some-on-reserves-cant-drink-from-their-taps/>).
- 3 INAC (2011) p. 6.
- 4 INAC (2011), National Assessment of First Nations Water and Wastewater Systems National Roll-up (p. 6;9).
- 5 INAC (2011) p. 6
- 6 INAC (2011), pp. 15-16; p. 22.
- 7 INAC (2011), p. 26.
- 8 As the study notes, “Any given advisory can be attributed to more than one reason and therefore the sum of proportions will exceed 100%” p. 9.
- 9 The sum of these proportions exceeds 100% as multiple reasons may be given for any one advisory (see above footnote).
- 10 The 2011 national assessment identified 158 water systems that used raw water, 135 of which were high risk (p. 24). “Direct use of raw water is the most common in British Columbia, where it is the case for 40% of the systems”(p. 6).

- 11 Appearance before the Standing Committee on Public Accounts on OAG Report 3: Access to Safe Drinking Water in First Nations Communities, June 14, 2022 (<https://www.sac-isc.gc.ca/eng/1658511608564/1658511670434>)
- 12 Office of the Parliamentary Budget Officer (2021), Clean Water for First Nations: Is the Government Spending Enough?, p. 4.
- 13 The Government of Canada currently provides over \$12 million annually for the Circuit Rider Training Program, “a long-term capacity building program that provides training and mentoring services to operators of First Nations drinking water and wastewater systems.” (Indigenous Services Canada, Circuit Rider Training Program, <https://www.sac-isc.gc.ca/eng/1313424571273/1533818103401>).
- 14 For example, a 2021 survey found that two out of three water operators received wages lower than the median for operators in their territory (<https://www.aptnnews.ca/national-news/wages-first-nations-water-systems-saskatchewan/>).
- 15 INAC (2011), p. 26.
- 16 INAC (2011), p. 27.
- 17 INAC (2011), p. 19.
- 18 INAC (2011), p. 19.
- 19 Government of Canada, Water and Wastewater Policy and Level of Services Standards (Corporate Manual System), Appendix A 2.2 (<https://www.sac-isc.gc.ca/eng/1312228309105/1533729544122>).
- 20 <https://globalnews.ca/news/7656235/lack-of-funding-for-piped-water-on-first-nations-in-sask-means-some-on-reserves-cant-drink-from-their-taps/>
- 21 <https://globalnews.ca/news/7656235/lack-of-funding-for-piped-water-on-first-nations-in-sask-means-some-on-reserves-cant-drink-from-their-taps/>

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The Honourable Pierre Poilievre

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