

July 2019



THE PROTECTION OF DRINKING WATER

An independent audit report

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of British Columbia

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The Honourable Darryl Plecas
Speaker of the Legislative Assembly
Province of British Columbia
Parliament Buildings
Victoria, British Columbia
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Dear Mr. Speaker:

I have the honour to transmit to the Speaker of the Legislative Assembly of British Columbia the report *The Protection of Drinking Water: An Independent Audit*.

We conducted this audit under the authority of section 11 (8) of the *Auditor General Act* and in accordance with the standards for assurance engagements set out by the Chartered Professional Accountants of Canada (CPA) in the *CPA Canada Handbook*—Canadian Standard on Assurance Engagements (CSAE) 3001—and Value-for-money Auditing in the Public Sector PS 5400.



Carol Bellringer, FCPA, FCA
Auditor General
Victoria, B.C.
July 2019

AUDITOR GENERAL'S COMMENTS

WE UNDERTOOK THIS AUDIT because of the considerable importance of safe drinking water, and because the risks to drinking water are increasing. Climate change, industrial activity, as well as a growing population, all have an impact on B.C.'s drinking water.

When drinking water is exposed to harmful pathogens at any point from source to tap without adequate treatment, people can become sick. Severe cases of water-borne illness may result in long-term illness and even death. B.C. hasn't had an outbreak of a water-borne illness since 2004, but constant vigilance is needed. It's estimated that for every reported case of illness, hundreds may go unreported.

The risks of contamination are intensified in small water systems, where communities struggle to afford sufficient water protection systems and find staff who are qualified in water treatment. B.C. has over 4,400 known small drinking water systems that serve approximately 480,000 British Columbians.

Oversight of drinking water is very complex, involving 23 pieces of legislation and many ministries and agencies. To ensure clear accountability, government stated that the Ministry of Health (Health) would provide the leadership and coordination of the many ministries involved. However, over time, Health's leadership has waned. As a result, most coordinating bodies have disbanded, there is no strategic plan to guide the direction of drinking water protection, and efforts to protect small water systems have been limited. Health has undertaken some action but more needs to be done.

Government also stated that the Provincial Health Officer (PHO) was to ensure the accountability of government in delivering drinking water to British Columbians. The PHO was legislated to provide an annual report to the Minister of Health on actions taken in the past year under the *Drinking Water Protection Act*, but this reporting has occurred infrequently.



CAROL BELLRINGER, FCPA, FCA
Auditor General

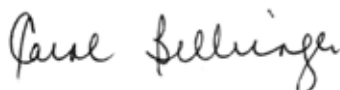
AUDITOR GENERAL'S COMMENTS

In June of this year, the PHO provided its report for the years 2012 to 2017 and made 32 recommendations. Unfortunately, many of the PHO's recommendations from previous reports have seen limited or no progress.

Overall, Health and the PHO's accountability to ensure drinking water was protected is of grave concern. In our report, we're making eight recommendations. Five are to Health and include providing leadership to coordinate the ministries, undertaking a legislative review, identifying risks and developing a strategic plan, and reporting out to the public. Three recommendations are for the PHO and include taking action to improve the PHO's oversight, reviewing legislation, monitoring progress and trends, and reporting out on a timely basis.

Given the complexity of drinking water protection and the challenges faced by the Ministry of Health, it is time for government to clearly articulate roles and ensure that ministries and agencies are held accountable.

I would like to thank the staff at the Ministry of Health and the Office of the Provincial Health Officer for their cooperation and assistance with this audit.



Carol Bellringer, FCPA, FCA
Auditor General
Victoria, B.C.
July 2019

REPORT HIGHLIGHTS

Zero outbreaks of water-borne illness in B.C. since 2004 but **RISKS** to drinking water are **INCREASING**



Water infrastructure is aging.
32,000KM OF WATER PIPES IN B.C.

About **4,800** drinking water systems in B.C. **~90%** are small water systems

About **480,000** **PEOPLE** in B.C. **RELY ON SMALL WATER SYSTEMS**

Ministry of Health's actions to address risks in **SMALL WATER SYSTEMS ARE INADEQUATE**

HEALTH HAS TAKEN ACTIONS to protect drinking water but risks remain



HEALTH DOESN'T HAVE a comprehensive **STRATEGY** for drinking water protection



Health needs to strengthen its **LEADERSHIP** and coordinate with its partners

PROVINCIAL HEALTH OFFICER made recommendations to improve drinking water. Many **STILL OUTSTANDING**

SUMMARY

WHILE NORTH AMERICA has not experienced many major outbreaks of water-borne illness, there have been enough regular occurrences over the past 20 years to warrant concern and the need for continued vigilance.

The last known outbreak of waterborne illness in British Columbia was in 2004. However, this does not necessarily indicate that all drinking water throughout the province is safe. For every reported case of water-borne illness there may be hundreds of cases that go unreported.

Risks to drinking water throughout the province are increasing from a number of factors, including population growth, increasing industrial practices, climate change and shortages within the water treatment workforce. In rural and remote communities that are supplied by small water systems, these risks are amplified.

In 2002, in its [*Action Plan for Safe Drinking Water in British Columbia*](#), government committed to ensuring safe, reliable and accessible drinking water for all people in British Columbia, from source to tap. Government went on to state that achieving this goal would require leadership and the coordination of the many ministries that are involved in drinking water protection. The plan states that because safe drinking water is a public health issue, the Ministry of Health (Health) was to take on this leadership role, and the Provincial Health Officer (PHO) would have oversight of government and government agencies that have responsibilities for delivering safe drinking water.

For this audit, we examined whether the Ministry of Health and the Provincial Health Officer were taking adequate action to protect drinking water for all British Columbians.

We focused on the three pillars that government established to protect drinking water:

1. leadership and coordination by Health
2. actions by Health and the PHO
3. accountability of Health and the PHO

We concluded that Health and the PHO are not taking the needed actions to protect drinking water for all British Columbians. However, Health had taken a number of actions, including developing guidance documents and working with some of its partners to advance an approach to identifying and mitigating risks.

The PHO had not demonstrated adequate oversight of drinking water officers, nor had the Office of the PHO been able to show the tracking and resolution of significant impediments to drinking water protection.

Overall, the accountability to government by Health and the PHO for the protection of drinking water was of concern. Health provided no information on drinking water in its annual service plan reports, and the PHO has reported sporadically on drinking water and potential issues over the years, but not annually, as required in the *Drinking Water Protection Act*.

SUMMARY

Health's leadership

Legislation is the foundation from which action can be taken. There are many pieces of legislation that affect drinking water, including the *Drinking Water Protection Act* (Act), which was enacted in 2001. Eighteen years have passed since this Act was created, and many changes have occurred in other legislation that affects drinking water.

We assessed whether Health had reviewed the legislative framework. We found that Health had undertaken a limited review but it was not comprehensive. In our own cursory review of the legislation, we found areas that may be creating a number of risks to government's commitments of:

- ◆ placing public health as the first priority
- ◆ providing flexibility for small water systems while ensuring the protection of human health
- ◆ supporting a proactive, preventative approach to protecting drinking water

Health had been active in coordinating the ministries after the action plan was created in 2002, but we found that, over time, this coordination has waned and many of the committees that were created have since disbanded.

Health's and PHO's actions

A strategy for drinking water is needed to provide the necessary detail for government to achieve its commitments as outlined in the action plan. We found that Health had not developed a drinking water

protection strategy or a strategy for small water systems where risks to drinking water are particularly high.

We assessed whether Health was identifying risks and taking action to ensure the multi-barrier approach (source water protection, and drinking water treatment and distribution) was effective. We assessed Health's actions in identifying risks to source water protection, and to drinking water treatment and distribution.

We found that Health had coordinated with many ministries to address systemic and site specific risks to source water, but overall, Health's efforts were limited and risks remain. The Act also allows the PHO to recommend a drinking water protection plan to ensure source watersheds are protected. We found that this tool has not been used in the 16 years since the Act was amended.

We found Health had been effective in addressing risks to treatment by collaborating with its partners to improve water treatment operator training. Health is also working with its partners in the development of a water system risk management plan to assist in the identification of risks from watershed to tap, and sink to watershed. Health had also created treatment objectives for both groundwater- and surface water-supplied systems. However, Health had not determined how many systems are out of compliance with these objectives, and therefore had not identified high-risk treatment facilities.

For drinking water distribution, we found that Health had provided guidance on both the need for residual chlorine to keep the water safe when it arrives at the tap and guidelines for mitigating lead leaching.

SUMMARY

However, Health had not determined if health authorities were following the guidance for chlorine, and their lead leaching guidance was too new for us to have evaluated whether it was being implemented.

Drinking water issues are intensified in small water systems. It's estimated that, as of 2017, there were approximately 4,400 small water systems in B.C. In 2013, Health had initiated a regulatory review and a policy analysis and identified potential options and recommendations to better support small water systems. However, we found that most of the action items set by the Assistant Deputy Ministers' Committee on Small Water Systems were not achieved, and the committee disbanded in 2016. We found that Health had been coordinating with its partners and developed a series of guidance documents and tools to help aid small water system operators. However, Health had not evaluated the effectiveness of these guidance documents.

There are provisions in the Act for the PHO to report to the minister any situation that significantly impedes the protection of drinking water. We found one record where the PHO has done so. It was in relation to the approval process under the *Environmental Management Act* and government's reliance on a professional's opinion, citing the specific approval for a landfill facility in the Shawnigan Lake watershed. The Act also states that the minister must bring situations forward to Executive Council if the situation has not been resolved to the satisfaction of the PHO. We found no evidence whether this situation was resolved or if the minister brought it to the attention of Executive Council. It is unknown whether this situation is the only situation that has been reported to the minister, as the PHO does not have a formalized tracking

document showing all assessments that are brought to the PHO's attention.

The Act also requires the PHO to monitor drinking water officers' compliance with the guidelines and directives established by Health. We found that the PHO tracks drinking water officers' actions in its report on drinking water; however, there is no formal monitoring of compliance with specific requirements associated with each guideline.

Accountability of Health and the PHO

We assessed whether Health was being accountable to legislators and the public by reporting out on its outcomes and activities for improving the protection of drinking water and providing the public easy access to water quality information. We found no reporting on outcomes of the actions that Health had undertaken to protect drinking water. This may be because Health had not identified drinking water as a priority area.

We did find that government's websites on drinking water quality explain the roles and responsibilities under the Act and does include a link to the action plan. However, the websites do not include information regarding whether activities to protect drinking water are achieving outcomes.

The Act requires the PHO to prepare an annual report on drinking water activities. We looked to determine whether the PHO was meeting this legislative requirement and found that the PHO's adherence to this accountability requirement had been inconsistent.

SUMMARY

The PHO informed us that there are challenges in meeting the annual commitment proposed in legislation due to staffing resource limitations and difficulties in collecting data in a timely manner from external ministries and the regional health authorities. To address this issue, the PHO led a project to develop new reporting indicators and revised the report structure to become more meaningful and to align with the multi-barrier approach. Before full adoption of this revised framework, in June 2019, the PHO released an interim report. This report detailed activities for fiscal years 2012/13 – 2016/17 and made 32 recommendations.

We found that the PHO's recommendations to the various ministries and agencies in the 2007, 2008, 2011 and 2015 reports have seen limited or no progress. This may be due to the lack of an accountability structure that could have ensured that the ministries were held responsible for implementing the recommendations.

SUMMARY OF RECOMMENDATIONS

WE RECOMMEND THAT THE MINISTRY OF HEALTH:

- 1** in conjunction with partner ministries lead a review of legislation and regulations that affect drinking water to ensure that legislators are informed of risks and legislative gaps that may affect government's commitments are addressed. These commitments include:
 - a) clear lines of responsibility
 - b) safety of drinking water as the first priority in decision making
 - c) preventative rather than reactive approaches in addressing health hazards
 - d) tools that mitigate risks
 - e) controls to ensure that small water systems provide safe drinking water and that the creation of unsustainable small water systems is limited
- 2** provide the leadership necessary to develop a cross-ministry commitment to coordinate strategies to address risks to drinking water. This includes establishing clear roles, responsibilities and accountabilities for all government agencies that are responsible for ensuring safe drinking water.
- 3** lead the development of a provincial strategic plan for the protection of drinking water that includes prioritized activities based on the risks identified in an integrated (interoperable) province-wide data system.
- 4** undertake the following actions:
 - a) identify where and what type of risks exist in relation to source protection, drinking water treatment, distribution and small water systems
 - b) coordinate with ministries and agencies to develop actions to mitigate identified risks
 - c) develop a process for the evaluation and adjustment of Health's guidelines to ensure they are effective

SUMMARY OF RECOMMENDATIONS

WE RECOMMEND THAT THE PROVINCIAL HEALTH OFFICER:

- 5** take action to improve the oversight of drinking water, including the development of:
 - a) policy and procedures for reporting significant impediments to the Minister of Health
 - b) guidance for drinking water officers on how and when to report situations to the Provincial Health Officer that significantly impact drinking water
 - c) a process for evaluating and tracking significant impediments
 - d) a process for monitoring drinking water officers' compliance with guidelines and directives
- 6** in collaboration with the Ministry of Health, review the legislative provisions regarding drinking water protection plans and report out to the Minister of Health on impediments to the protection plan's implementation.

WE RECOMMEND THAT THE MINISTRY OF HEALTH:

- 7** report out to the public on the progress it is making in improving the protection of drinking water for all British Columbians.

WE RECOMMEND THAT THE PROVINCIAL HEALTH OFFICER:

- 8** monitor progress and trends in the protection of drinking water and report on a timely basis to the Minister of Health and the legislative assembly on whether activities are mitigating risks.

RESPONSE FROM THE MINISTRY OF HEALTH

I WOULD LIKE to thank the Office of the Auditor General (OAG) for the work they have undertaken to review the role of the Ministry of Health (MoH) in the delivery of safe drinking water in British Columbia and to address some of the many challenges in ensuring safe, reliable and accessible drinking water for all British Columbians. The MoH places a high priority on the delivery of safe drinking water to all B.C. communities as a fundamental goal of public health and works across government with the Provincial Health Officer (PHO) and other ministries and agencies that have an impact on drinking water in the province to achieve this important public health goal.

Background:

The OAG report uses the 2002 Action Plan for Safe Drinking Water in British Columbia (Action Plan) to evaluate MoH's activities since 2013. In 2002, the Action Plan stated: "In keeping with the principle that the safety of drinking water is a public health issue, the Ministry of Health Services will now be the lead ministry responsible for implementing the Action Plan. The ministry will provide the leadership needed to co-ordinate their activities and will assume ultimate responsibility for providing safe drinking water for British Columbians." The OAG report documents some of the changes in roles and responsibilities of agencies that have occurred since the adoption of the Action Plan in 2002. There was a significant change in leadership responsibilities for MoH in the drinking water system between 2002 and 2013.

The OAG report notes that in July 2006: "The ADM's Committee on Drinking Water was restructured, becoming the ADM's Committee on Water. While the initial ADM's coordinating committee on Drinking Water was led by Health, the ADM's committee on Water was led by the Ministry of Environment". With

this change in ADM's committees, the leadership and coordination of the multi-agency Action Plan was transferred from MoH to Ministry of Environment (ENV). The OAG notes, the 2006 ADM Committee on Water mandate was broad and inclusive of water generally: watersheds, groundwater, source water (which is water that may need to be treated to produce drinking water) and drinking water.

MoH's mandate and role is primarily related to oversight of drinking water treatment and distribution systems under the legislative framework of the *Drinking Water Protection Act* (DWPA) and the *Public Health Act* (PHA), with a role in source water protection. The first four OAG recommendations assigns MoH as 'lead role' for water in the province, consistent with the responsibilities outlined in the 2002 Action Plan. The OAG also recognizes, the complexity of drinking water protection and the many challenges that MoH faces with a need for government to clearly articulate roles and ensure that ministries and agencies are held accountable. Given that Government's position on leadership with respect to water has changed since 2002, as outlined above, MoH will seek clarification from Government on leadership

RESPONSE FROM THE MINISTRY OF HEALTH

roles and, on this basis, MoH will take action in response to the recommendations to strengthen the protection of drinking water in B.C. It is with this understanding that MoH now addresses the OAG recommendations.

MoH is responding to the five recommendations directed at the MoH, and the recommendation that identifies both the MoH and the PHO to take action.

RECOMMENDATION 1:

- ◆ MoH acknowledges that a legislative review, inclusive of the many Ministries with legislation that affect drinking water, would be required to ensure clear lines of responsibility, to ensure a proactive approach is taken to protecting drinking water, and to ensure that protection of drinking water is a first priority in decision-making.
- ◆ The OAG report acknowledges that B.C. is unique in providing legislative protection of small water systems (> 1 connection to < 500 people per day) and that MoH has identified potential options and developed tools for small water systems. MoH accepts that to ensure safe drinking water for small systems and to address the creation of unsustainable small water systems, there must be collaboration among many partner Ministries and water industry organizations.

RECOMMENDATION 2:

- ◆ MoH accepts that a cross Ministry commitment to a coherent drinking water strategy would lead to greater protection of drinking water.

RECOMMENDATION 3:

- ◆ MoH accepts that B.C. needs an interoperable province wide data system for drinking water and water management in general. A drinking water data system would need to ensure coordination of water data such that water quantity, quality and source water protection needs were captured and such that water protection policy under many statutes could function in concert. The data base would facilitate a provincial drinking water strategy.

RECOMMENDATION 4:

- ◆ MoH accepts the actions in the recommendation with respect risk prioritization and mitigation. MoH is in development of a 'water system risk management plan' concept that is focused on a "watershed to tap; sink to watershed" approach. This initiative is designed to integrate the Ministries with local governments to ensure sustainable drinking water. The policy intent behind the design of the plan is to give Ministries the ability to prioritize resources and activities based on the risks identified, and to enable them to coordinate activities. This work will continue to be advanced by MoH.
- ◆ MoH also accepts there is a need to evaluate the guidance provided and effective implementation of drinking water policy.

RESPONSE FROM THE MINISTRY OF HEALTH

RECOMMENDATION 6:

The OAG report acknowledges there was a change in policy intent of Drinking Water Protection Plans (DWPP), “In 2001 government anticipated this tool would be used 1-3 times per year; however, in 2002, the Minister of Health stated that the use of this tool would be “quite rare”. The policy intent for DWPPs in 2001 was that it was to be a tool intended to provide direction to statutory decision makers. In 2002, the policy intent changed to reflect the current application of DWPP under the revised 2003 DWPA with a multi-agency approach to drinking water protection that was set out in the Action Plan. The Minister of Health’s rationale was “because the framework we have set up will actually lead to empowering the officials at the community and regional levels to be able to ensure the safety of drinking water. It is only in those areas where those issues cannot be resolved at a regional level that, in fact, it comes to the provincial health officer”.

Of note, the 2003 DWPA enables the development of DWPPs with the caveat that “no other practicable measures available under this Act are sufficient to address or prevent the drinking water health hazard.” Under the WSA, water objectives are being developed to support protection of watersheds, and source water. The water objectives will enable water suppliers to develop source water assessments under the DWPA, and support source water protection plans. Therefore, for source water protection, the WSA and DWPA can work in concert for proactive protection of source water.

DWPPs are dependent on unique local circumstances and, as the 2002 Action Plan says, “locally-developed solutions will be encouraged”. The MoH accepts the recommendation and will work with the PHO to review the purpose and the provisions for DWPP in the context of the WSA and DWPA.

RECOMMENDATION 7:

- ♦ MoH accepts and recognizes the importance of reporting to the public on the progress it is making in improving the protection of drinking water and of communicating with many stakeholders with a view to collaborating on managing drinking water system risks.

In conclusion, MoH will be seeking further direction from Government in light of the recommendations, and will work to review, identify and address any further issues. MoH is committed to continuous improvement in the regulation of the provincial drinking water system to assure safe, secure and accessible drinking water for all British Columbians, and to working across government with our key partner ministries to keep drinking water safe in B.C.

RESPONSE FROM THE OFFICE OF THE PROVINCIAL HEALTH OFFICER

THE OFFICE OF the Provincial Health Officer (PHO) would like to thank the Office of the Auditor General (OAG) of BC for their independent audit of drinking water protection in BC. Ensuring that the public has access to clean, safe, and reliable drinking water is imperative for public health. Protecting this resource is no small task and involves inter-agency coordination across different levels of government, ministries, communities, and non-government organizations. The role of drinking water programs within BC is to ensure that the quality of drinking water is maintained for all British Columbians.

The PHO is the senior public health official for BC and is responsible for monitoring the health of the population of BC and providing independent advice to the ministers and public officials on public health issues. The *Public Health Act* outlines most of the responsibilities of the PHO. The PHO also holds oversight and accountability under the *Drinking Water Protection Act* (DWPA) for drinking water protection. Duties of the PHO under the DWPA include monitoring compliance of drinking water officers by way of guidelines and directives; preparing and delivering an annual report to the Health Minister regarding activities under the Act; report on issues that threaten public health by negatively impacting drinking water; making recommendations to the Minister of Health with regard to drinking water protection plans; and reviewing decisions of drinking water officers. The PHO also provides recommendations for improvement in the protection of drinking water in BC.

On June 12, 2019, the PHO released *Clean, Safe, and Reliable Drinking Water: An Update on Drinking Water Protection in BC and the Action Plan for Safe Drinking Water in British Columbia* (the report) available at:

www.health.gov.bc.ca/pho/reports/drinkingwater.

The report describes activities under the DWPA for fiscal years 2012/13 through 2016/17 and serves as a transitional report to a new framework for reporting on drinking water in BC. It still provided an update on progress towards the Action Plan, but also introduces new indicators and a reporting structure going forward that is consistent with a multi-barrier approach. The recent restructure of the PHO drinking water report, the new information it tracks, and the 32 recommendations it offers address most of the recommendations provided by the OAG for the PHO.

The audit report identified and supports many of the same challenges identified in the recently released PHO report. These include challenges with inter-agency coordination; lack of clarity around roles and responsibilities surrounding source protection; a lack of pro-active legislative tools for source protection; inadequate data; small water system challenges; and program resource limitations. The PHO report made three recommendations to the provincial government pertaining to the overall governance of drinking water:

RESPONSE FROM THE OFFICE OF THE PROVINCIAL HEALTH OFFICER

1. Review the existing governance structure of drinking water protection to ensure clear lines of responsibility and accountability are defined.
2. Revisit and update the *Action Plan for Safe Drinking Water in British Columbia* and the 2006 Memorandum of Understanding regarding inter-agency accountability and coordination on drinking water protection, and recommit to modernized principles and actions across government.
3. Identify a new framework for inter-agency collaboration and coordination that aligns with current structures and issues.

The PHO identified the Ministry of Health (MOH) and the Ministry of Environment and Climate Change Strategy (ENV) as the leads for this work (i.e., PHO recommendations 1-3), with shared accountability and input from other ministries and agencies with responsibilities in drinking water protection. In our view, this important work requires shared leadership from both ministries as well as others in the natural resource sector and local government.

Like the OAG report, the PHO report recommended a review of the legislated tools under various statutes to protect source water by the respective government ministries responsible. This includes a review of the DWPA and source protection tools such as drinking water protection plans (i.e., PHO recommendations 4-5). As such, the Office of the PHO agrees a review of legislation to protect drinking water by MOH, ENV and others with legislated responsibilities source protection is necessary. The PHO also accepts the OAG recommendation to work with MOH on a review of the legislated provisions regarding drinking water protection plans.

The Office of the PHO also accepts the recommendation that the PHO take action to improve the oversight of drinking water. This work will include the development of; a) policy and procedures for reporting significant impediments to the Minister of Health, b) guidance for drinking water officers on how and when to report situations that significantly impact drinking water to the Provincial Health Officer, and c) a process for evaluating and tracking significant impediments. The Office of the PHO has already developed a new process for monitoring drinking water officers' compliance with guidelines and directives through the development of the new indicators based on the multi-barrier approach. As an example, the indicator for robust treatment tracks the progress of water suppliers in achieving the BC water treatment objectives for both surface and groundwater supplies.

Our office also accepts the recommendation to continue to monitor progress and trends of drinking water. We will continue to achieve this goal through our new reporting structure, which provides updates covering several fiscal years. Our office will continue to refine and track activities under the Act on an annual basis and will develop a timely reporting process for these activities. In addition we plan to include the annual data within a larger, more comprehensive report on the status of drinking water protection every five years recognizing that improvements to drinking water infrastructure occur slowly over time.

The Office of the PHO would again like to thank the OAG for their independent insights to improve drinking water oversight in BC.

ABOUT THE AUDIT

BACKGROUND

SAFE DRINKING WATER, or “potable” water, is water that is safe to drink and fit for domestic purposes without further treatment. Drinking water becomes unsafe for human consumption when it is exposed to harmful pathogens or chemicals, caused by either natural occurrences or human activity (see Exhibit 1).

When drinking water is exposed to harmful pathogens at any point from source to tap without subsequent treatment, it may result in individuals falling ill with a water-borne illness. Severe cases may result in long-term illness and even death.

While major outbreaks of water-borne illness in North America are rare, there have been enough regular occurrences over the past 20 years to warrant concern (see [Appendix A](#)) and the need for continued vigilance (see sidebar).

The last known outbreak in B.C. of a drinking water-related illness was in 2004 (see [Appendix A](#)). However, although there has not been an outbreak in 15 years, this does not necessarily mean that all drinking water throughout the province is safe.

“Since Dr. John Snow’s 1854 discovery in London, England, that drinking water could kill people by transmitting disease, the developed world has come a long way towards eliminating the transmission of water-borne disease. The Walkerton experience warns that we may have become victims of our own success, taking for granted our drinking water’s safety. **The keynote in the future should be vigilance.** We should never be complacent about drinking water safety.” ~Justice Dennis O’Connor, 2002, *Report of the Walkerton Inquiry (Part Two)*

Exhibit 1: Common sources of pathogens and chemicals in drinking water



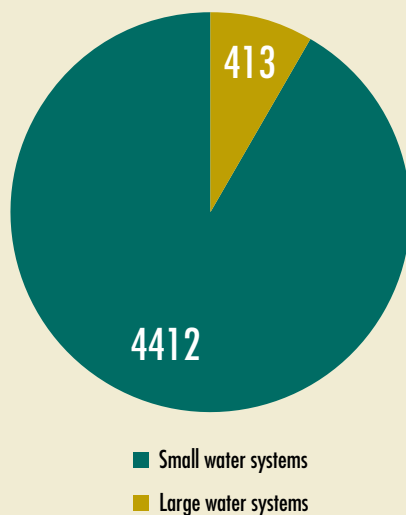
Source: North Carolina Department of Health and Human Services, 2011

ABOUT THE AUDIT

Scientific research has indicated that for every reported case of water-borne illness there may be hundreds of cases that go unreported, as the majority of infected individuals will only have mild symptoms lasting a few days and may not choose to seek medical attention. Therefore, the necessary investigation to confirm whether there is an outbreak caused by contaminated drinking water may not be undertaken.

The Provincial Health Officer (PHO) has stated that as of 2017, B.C. had approximately 4,800 drinking water systems on record and approximately 90% of these systems are small. Small water systems are classified as systems that serve fewer than 500 people in a 24-hour period. These systems are generally located in small communities or rural areas throughout the province. The majority of water systems in B.C. are small water systems (see Exhibit 2) which serve approximately 10% of the province's residents.

Exhibit 2: Drinking water systems in B.C.



Source: Office of the Auditor General of British Columbia, from the Office of the Provincial Health Officer's data from 2017

B.C. differs from other Canadian jurisdictions in that it regulates many more water systems than other provinces. In B.C., government regulates down to two or more dwellings connected to a water main, whereas other provinces, in most cases, do not regulate systems as small as B.C. does. This regulation threshold, as well as the province's size and geography result in British Columbia having a higher number of small water systems to regulate compared to other provinces. This creates additional challenges for the province in regards to regulating such a large number of small systems.

Risks to drinking water are increasing

Drinking water sources are at risk from a number of factors, including:

- ◆ increasing demand from a growing population
- ◆ industrial practices, such as forestry, oil and gas, and mining
- ◆ proximity of agriculture, and livestock and range activities, to drinking water sources
- ◆ recreation in source watersheds

Climate change is also expected to impact B.C., resulting in increased wildfires, more frequent and intense rainfall and flooding, and more frequent and severe droughts. All of these impacts affect the quality and quantity of drinking water sources.

The increase in frequency and intensity of these climatic events is expected to increase the need to upgrade drinking water treatment and distribution infrastructure. This is of particular concern in B.C., where most of the water infrastructure is over 50 years old, and aging equipment can be at risk of failure during climatic events.

ABOUT THE AUDIT

Another risk is that future changes within the water treatment workforce may challenge suppliers' ability to provide safe drinking water to the public. Currently, there is a shortage of skilled workers in the water and wastewater sector, with the demand for new workers likely to grow significantly in future years in part because many operators will be retiring. In rural and remote areas that are supplied by small water systems, these risks are amplified.

How is drinking water protected?

In 2000, in the rural community of Walkerton, Ontario, more than 2,300 people became infected from contaminated drinking water and seven people died. The inquiry into the Walkerton tragedy resulted in a number of recommendations to improve public safety in relation to drinking water, which influenced drinking water policy across Canada. One of the

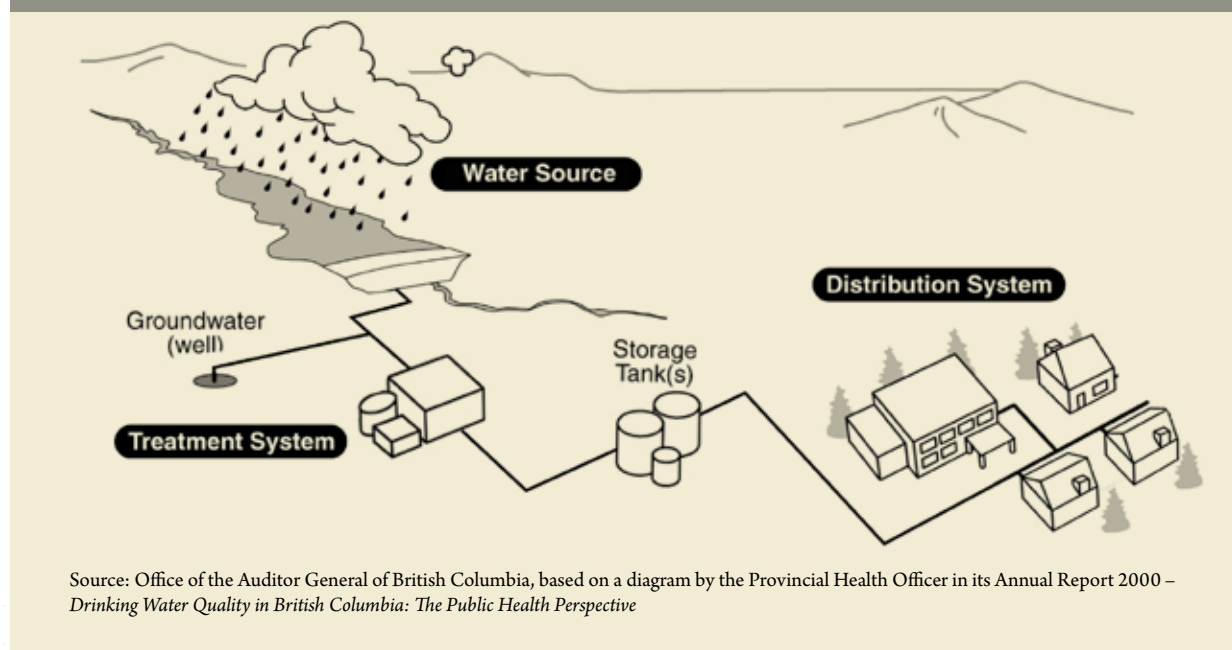
recommendations was the universal adoption of the multi-barrier approach to safe drinking water.

The multi-barrier approach is an integrated system of procedures, processes and tools to prevent or reduce the contamination of drinking water from source to tap. The three major components of the multi-barrier approach include source protection, and drinking water treatment and distribution (see Exhibit 3).

Who is responsible for protecting drinking water in B.C.?

In 2000, the premier stated that his government would develop a strategy that would embrace the multi-barrier approach. And in 2001, the *Drinking Water Protection Act* (Act) was enacted. Subsequently, in 2002, government created the [Action Plan for Safe Drinking Water in British Columbia](#) (action plan), and the Act was amended in 2003 to incorporate

Exhibit 3: The multi-barrier approach—from source to tap



Source: Office of the Auditor General of British Columbia, based on a diagram by the Provincial Health Officer in its Annual Report 2000 – *Drinking Water Quality in British Columbia: The Public Health Perspective*

ABOUT THE AUDIT

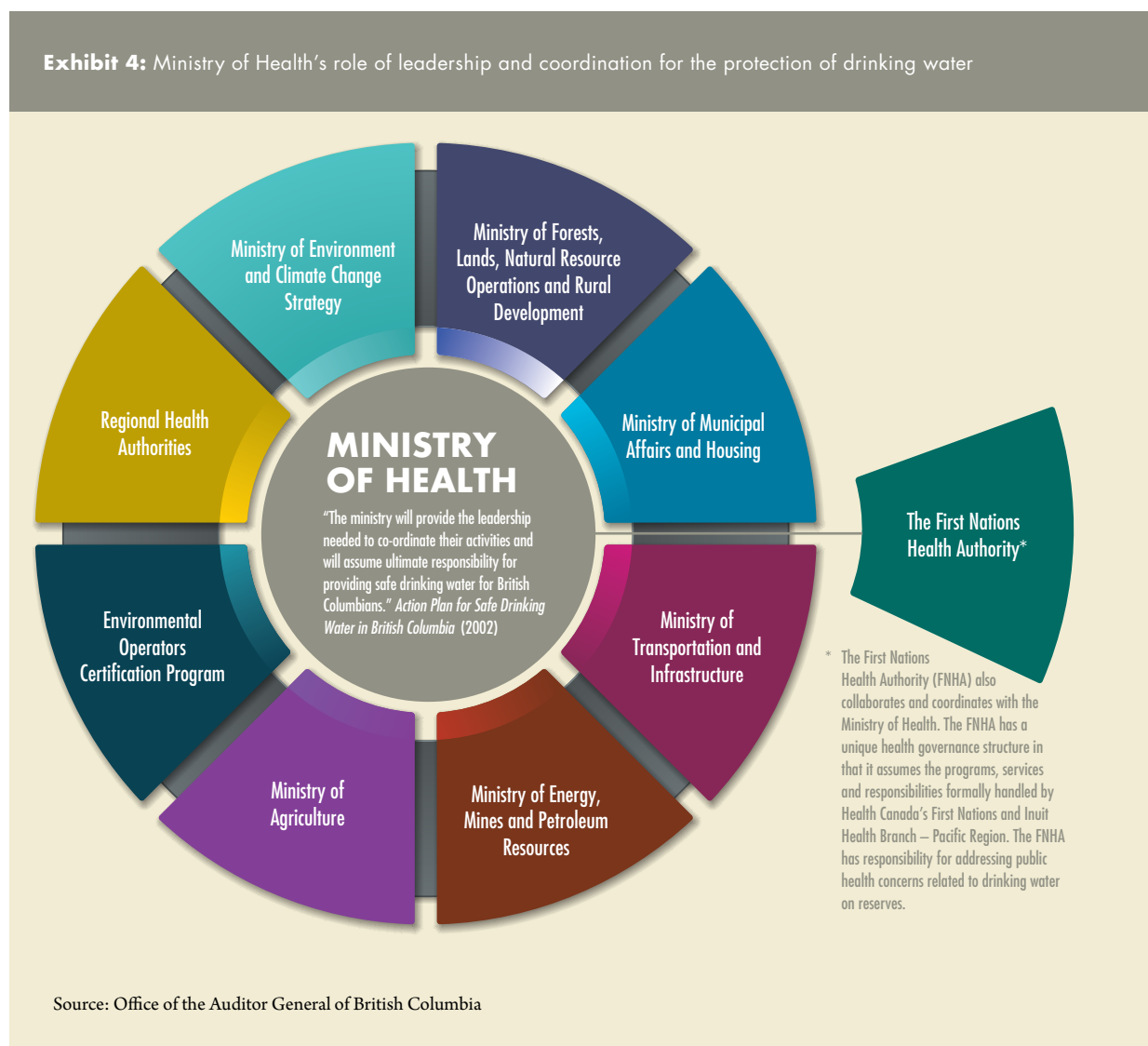
provisions in the action plan. The Minister of Health stated at the time that both the action plan and the Act provided the framework for protecting public health.

In the action plan, government committed to ensuring safe, reliable and accessible drinking water for all people in British Columbia, from source to tap. According to the action plan, achieving this goal

would require leadership and coordination of the many ministries that are involved in drinking water protection. The plan states that because safe drinking water is a public health issue, the Ministry of Health (Health) was to take on this role (see Exhibit 4).

Health's role of leadership and coordination is extremely complex and challenging, given that there

Exhibit 4: Ministry of Health's role of leadership and coordination for the protection of drinking water



ABOUT THE AUDIT

are approximately 23 different pieces of legislation with varying ministries that have responsibilities for various components of the multi-barrier approach (see [Appendix B](#)).

Under the action plan, government stated that the PHO was to take an oversight role of government and other organizations that have responsibilities for delivering safe drinking water. The PHO's oversight role under the Act includes:

- ♦ monitoring drinking water officers
- ♦ reporting to the minister on activities under the Act
- ♦ reporting on significant impediments to protecting drinking water to the minister
- ♦ providing advice to the minister on the need for source water protection

AUDIT SCOPE

Our audit focused on Health and the PHO. Out of scope were the other ministries that have responsibilities under their own acts for the protection of drinking water, as well as the regional health authorities, drinking water officers and water operators. We focused mainly on actions and activities carried out after 2013, when government stated its objective was to improve the safety of drinking water for British Columbians by implementing actions under the *Action Plan for Safe Drinking Water in British Columbia*.

AUDIT METHOD

Our work involved:

- ♦ reviewing legislation, regulations, policies, agreements, strategies, service plans, reports, audits, reviews, evaluations, project proposals, project reports, contracts and meeting minutes
- ♦ reviewing high-profile cases where drinking water was at risk
- ♦ conducting interviews with staff from Health and the Office of the PHO, the various stakeholder ministries, health authority staff, the First Nations Health Authority, academics and non-government organizations
- ♦ undertaking site visits throughout the province to see water systems of various sizes
- ♦ consulting with a subject matter expert

The report is dated July 22, 2019. This is the date the audit team completed obtaining the evidence used to determine the findings and conclusions of the report.

AUDIT OBJECTIVE AND CONCLUSION

AUDIT OBJECTIVE

OUR AUDIT EXAMINED whether the Ministry of Health (Health) and the Provincial Health Officer (PHO) are taking adequate action to protect drinking water for all British Columbians.

AUDIT CRITERIA SUMMARY

Our audit objective and criteria were primarily based on the *Drinking Water Protection Act*, the *Drinking Water Protection Regulation* and the *2002 Action Plan for Safe Drinking Water in British Columbia*.

We focused on the three pillars that government established to protect drinking water:

1. leadership and coordination by Health
2. actions by Health and the PHO
3. accountability of Health and the PHO

For more information on our audit criteria, see [Appendix C](#).

AUDIT CONCLUSION

We concluded that Health and the PHO are not taking the needed actions to protect drinking water for all British Columbians.

Specifically, we found that Health was not taking a strong leadership and coordination role of other ministries. We found that many of the committees to facilitate the protection of drinking water have been disbanded. We found that Health had not developed a strategic plan to provide clear direction on the actions needed by the ministries and regional health authorities to improve the protection of drinking water.

However, Health had taken on a number of actions, including developing guidance documents and working with some of its partners to advance an approach to identifying and mitigating risks.

We found that the PHO had not demonstrated adequate oversight over drinking water officers, nor had the Office of the PHO been able to show the tracking and resolution of significant impediments to drinking water protection.

The PHO has authority to recommend to the Minister of Health a localized drinking water protection plan to prevent threats to a drinking water source; however, government has not used this tool.

Of the three pillars in our audit criteria summary, the third, accountability, was of particular concern. Health has provided no information on drinking water in its annual service plan reports, and the PHO has reported sporadically on drinking water and potential issues over the years, but not annually, as required in the Act.

KEY FINDINGS AND RECOMMENDATIONS

TAKING CHARGE — EXERCISING LEADERSHIP AND SETTING DIRECTION

THE EXPECTATION OF government was that the Ministry of Health (Health) was to lead and coordinate the other ministries in protecting drinking water. We found better performance is needed in both of these areas.

The legislative framework does not fully support Health's leadership role

As stated in the 2002 *Action Plan for Safe Drinking Water in British Columbia* (action plan), Health was to provide the leadership necessary to coordinate the other ministries involved in drinking water protection—and by doing so, would assume ultimate responsibility for providing safe drinking water.

We found that the legislation does not support Health in assuming ultimate responsibility for providing safe drinking water. The ministry can lead and coordinate the other ministries but it has no authority to compel the other ministries to act.

Legislation is the foundation from which action can be taken. While there are many pieces of legislation that affect drinking water (see [Appendix B](#)), government has noted that the *Drinking Water Protection Act* (Act) is the central piece of legislation that protects public health in relation to the provision of safe drinking water.

It has been 18 years since the Act was created, and in that time, both internal and external changes to government have affected drinking water protection. Given these changes, we looked at whether Health had

conducted a review of all legislation and regulations that affect drinking water to determine if there were gaps.

We found that Health had undertaken a review of the Act and the Drinking Water Protection Regulation (regulation), as well as a limited review of other acts and regulations where it had noted areas of concern. Overall, we found that Health's review of legislation and regulations that affect drinking water was not comprehensive.

We conducted a limited review of the Act and other legislation that affects drinking water and found areas that may affect government's ability to deliver on action plan commitments, including the following:

- ◆ placing public health as the first priority
- ◆ providing flexibility for small water systems while ensuring the protection of human health
- ◆ supporting a proactive, preventative approach to protecting drinking water

In our limited review, we found that legislation may not support government in prioritizing the safety of drinking water when a decision is made to allow resource extraction activities or land uses that may adversely affect source water quality.

KEY FINDINGS AND RECOMMENDATIONS

We also found there were a number of exemptions for small water systems in the Act that created the flexibility noted in the action plan. However, these exemptions may create risk that potentially results in some British Columbians (who use small water systems) not receiving safe, reliable and accessible drinking water.

ELEVATED NITRATE LEVELS IN THE HULLCAR VALLEY'S DRINKING WATER

The Hullcar Valley in B.C.'s North Okanagan region has been on a water quality advisory since 2014 because of elevated nitrate concentrations in the unconfined aquifer, which is the drinking water source for approximately 250 people.

In 2017, the Minister of Environment and Climate Change Strategy ordered a review of the situation in the Hullcar Valley to inform and improve future approaches to management and decision making related to source water protection and agricultural nutrients. The result was the report *From Crisis to Solutions: Toward Better Source Water Protection and Nutrient Management in the Hullcar Valley*. The report found that there was confusion among the various ministries involved, resulting in uncoordinated reactions to water concerns identified by communities that were affected. The report highlighted the need for legislation to be preventative and not reactive, and recommended updating the regulatory framework.

The legislation also does not address the continued proliferation of these small water systems, which could result in these risks being exacerbated in the future.

Another issue that we found was confusion between ministries and regional health authorities as to under what circumstances actions to protect drinking water could be taken. We found one case where this confusion may have contributed to what local residents suggested was a slow reaction to elevated groundwater nitrate concentrations in the Hullcar Valley (see sidebar).

Overall, we found that there is a need for a more comprehensive review of the legislation and regulations to ensure that government's commitments that were made in the action plan are not compromised.

RECOMMENDATION 1: *We recommend that the Ministry of Health in conjunction with partner ministries lead a review of legislation and regulations that affect drinking water to ensure that legislators are informed of risks and legislative gaps that may affect government's commitments are addressed. These commitments include:*

- a) *clear lines of responsibility*
- b) *safety of drinking water as the first priority in decision making*
- c) *preventative rather than reactive approaches in addressing health hazards*
- d) *tools that mitigate risks*
- e) *controls to ensure that small water systems provide safe drinking water and that the creation of unsustainable small water systems is limited*

KEY FINDINGS AND RECOMMENDATIONS

Health had not effectively coordinated the involvement of the many agencies involved

Many government agencies and stakeholders are involved in drinking water protection, so it is essential that there is leadership and that actions are coordinated. The action plan clearly identified this as an expectation. To fulfill this approach, government committed to establishing:

- ◆ an inter-ministry committee under the leadership of Health
- ◆ a new advisory committee comprised of public health, private sector and academic experts

We assessed whether Health had established these committees.

There were comprehensive inter-ministry committees under Health's leadership but they no longer exist

After the action plan was created, Health was active in coordinating the ministries, but we found that, over time, this coordination has waned (see [Exhibit S](#)).

Health currently participates on inter-ministry committees, but these are limited to geographically specific situations (e.g., the Hullcar Aquifer and the Northeast Water Strategy) or specific issues such as drought.

There was no drinking water advisory committee to provide advice and recommendations to the minister

As stated in the action plan, government was to establish a drinking water advisory committee made up of public health, private sector and academic experts. This committee was to provide input and advice on specific issues and water quality problems. The Act provides the minister with the opportunity to establish such a committee in consultation with the PHO. We looked to see whether such a committee had been established.

We found that although Health had sought external advice on some technical issues, no advisory committee, as outlined in the action plan, exists. The absence of such advice and the lack of a comprehensive inter-ministry committee may have resulted in Health and the minister not receiving the information they needed to ensure that risks to drinking water were being mitigated.

RECOMMENDATION 2: *We recommend that the Ministry of Health provide the leadership necessary to develop a cross-ministry commitment to coordinate strategies to address risks to drinking water. This includes establishing clear roles, responsibilities and accountabilities for all government agencies that are responsible for ensuring safe drinking water.*

KEY FINDINGS AND RECOMMENDATIONS

Exhibit 5: Timeline of inter-agency coordination on drinking water

2003

The Drinking Water Leadership Council is established. Council meetings typically consist of staff from Health, regional health authorities, the First Nation Health Authority and the Ministry of Environment & Climate Change Strategy. The council's current terms of reference include:

- fostering communication between members and soliciting feedback from regional health authorities to identify issues and inform provincial drinking water policy development
- informing senior executives of drinking water issues and proposed solutions when required
- providing a linkage between other drinking water focused committees

2005

The Assistant Deputy Ministers' (ADMs') Coordinating Committee on Drinking Water is established. The committee's goals included:

- ensuring that decision makers give priority to human health in relation to drinking water
- coordinating policy and action on drinking water matters
- steering the work of the Directors' Committee and providing a response to the PHO's annual report on drinking water

2006

July 2006 – The ADMs' Coordinating Committee on Drinking Water was restructured, becoming the ADMs' Committee on Water. While the initial ADMs' Coordinating Committee on Drinking Water was led by Health, the ADMs' Committee on Water was led by the Ministry of Environment. The latter committee had a broader focus than drinking water alone and had the goals of:

- ensuring an integrated approach to defining, developing, implementing and evaluating water policies, plans and programs across government
- overseeing the development and implementation of the provincial water strategy
- making recommendations to the Deputies' Committees, caucus committees, as well as cabinet and treasury board

October 2006 – A Memorandum of Understanding on Inter-Agency Accountability and Coordination on Drinking Water Protection is established. This memorandum mandates the ADMs' Committee on Water and the Directors' Inter-Ministry Committee on Water to be the facilitating bodies of the action plan. The memorandum also calls for the creation of regional drinking water teams to identify and address regional drinking water issues. The memorandum is signed by several stakeholder ministries and government agencies.

2009

The ADMs' Committee on Water **disbands**.

2011

- The Director's Inter-Agency Committee on Drinking Water meets for the last time and then **disbands**.
- Most regional drinking water teams **disband**, with the exception of the team in the Northern Health Authority.

Source: Office of the Auditor General of British Columbia

KEY FINDINGS AND RECOMMENDATIONS

Health did not have a strategy to provide clear direction for the protection of drinking water

The action plan is the primary policy document that establishes government's commitment to ensuring safe, reliable and accessible drinking water for all British Columbians. It outlines a platform for action but it does not include specific activities, targets and timelines that would indicate whether such outcomes are achieved. A strategy would provide the details needed to realize the outcomes that the action plan was to achieve. We looked to see if Health had developed a strategy based on improvements that were recommended in the action plan.

We found that while Health had taken action to address risks, it had not developed a drinking water strategy, even though the PHO, Internal Audit and regional health authorities, as well as the Ministry of Environment & Climate Change Strategy, had advised that there is a need for one. A strategy for small water systems was also recommended but had not been created. A possible cause is the absence of inter-agency collaboration and the lack of data to identify risks and prioritize actions.

Health collected data but it was not sufficient to identify major risks

We looked to see if Health was collecting and assessing drinking water data. We found that Health does collect data but it is on an ad hoc basis and is primarily from the regional health authorities. Also, we found that the regional health authorities

used two different information management and information technology systems that did not capture all of the information needed to properly administer the provincial drinking water program. Health faced additional challenges obtaining consistent drinking water data, as the protocols for data collection varied, and data was stored in several databases that were often incompatible.

Government had been made aware of the risks associated with not having an improved data management system. The PHO's reports on safe drinking water, the Ombudsperson's report – *Fit to Drink: Challenges in Providing Safe Drinking Water in BC Report*, Internal Audit's Report on the *Review of Drinking Water Resources* and government's independent review of the *Drinking Water Protection Act* all made recommendations for improving drinking water information collection and storage. We found that Health's Health Protection Branch had developed multiple proposals and requests for an improved information management and information technology system, but none of the branch's requests were approved.

In the absence of an information management and information technology system, we found that Health Protection Branch staff had been working to develop a drinking water information system to collect information specific to each drinking water system. However, this was a recent initiative, and the database was incomplete at the time of our audit.

The Office of the PHO has also undertaken work to better improve data collection. Beginning in 2014, staff have worked in collaboration with the regional

KEY FINDINGS AND RECOMMENDATIONS

health authorities, the Ministry of Health and other stakeholders on an initiative to revise reporting indicators and better improve data collection. It is intended for these efforts to be completed in approximately five years; however, the success of this project is dependent on the regional health authorities.

RECOMMENDATION 3: *We recommend that the Ministry of Health lead the development of a provincial strategic plan for the protection of drinking water that includes prioritized activities based on the risks identified in an integrated (interoperable) province-wide data system.*

TAKING ACTION— HEALTH'S MITIGATION OF RISKS

The three major components of the multi-barrier approach include source protection, and drinking water treatment and distribution. We examined whether Health was undertaking the following actions for each of these components:

- ◆ identifying where and what type of risks there are
- ◆ coordinating with the many ministries and agencies involved to address risks
- ◆ issuing guidelines and directives to mitigate risk, and evaluating them for effectiveness

We also examined whether Health was specifically addressing issues in small water systems, which are often at highest risk due to their inherent disadvantages with respect to economies of scale.

We found that Health's actions to address risks to source, treatment and distribution were limited, and its actions to address small water systems were not adequate. Overall, Health's actions need to be strengthened.

Health is taking actions to identify and mitigate risk but more needs to be done

Source protection

Protecting source water is the first step in avoiding drinking water contamination. Source water protection improves the quality of source water and can reduce the cost of treatment needed to ensure that the drinking water provided is safe. Many different ministries regulate activities on the land base that affect source water. We found that Health had coordinated with many of these ministries to address systemic and site specific risks, but overall, Health's efforts were limited and risks remain.

Determining where and what the risks are to a water supply is the first step for a water supplier in determining what level of treatment is needed to ensure that the drinking water is safe. We found that Health had created guidance for water suppliers on how to conduct such an assessment, but very few assessments have been completed. Without this information, Health cannot identify whether the treatment that is being applied is adequate to address the risks. Health also cannot gain the insight needed to learn where there may be high-risk drinking water sources and where Health may need to coordinate with its partners to mitigate them.

KEY FINDINGS AND RECOMMENDATIONS

Drinking water treatment

As no single form of treatment can eliminate all potential health hazards, multiple barriers of protection (i.e., two or more forms of treatment such as UV, chlorination and/or filtration) are normally necessary to ensure that drinking water is safe.

We reviewed Health's guidance documents and found that Health had created treatment objectives for both ground and surface water supplied systems. However, Health had not determined how many systems are out of compliance with these objectives, and therefore had not identified high-risk treatment facilities. This data is currently not available for Health to collect from regional health authorities.

However, we found that Health had been effective in collaborating with its partners to improve water treatment operator training, which is a critically important element for ensuring safe drinking water. Health is also working with its partners in the development of a water system risk management plan to assist in the identification of risks from watershed to tap, and sink to watershed. And Health had also developed a guide for drinking water officers. However, we found a number of gaps in the guide, including insufficient detail on:

- ♦ waiving operator qualifications for small water systems
- ♦ reviewing and updating operating permits
- ♦ guidance regarding emergency response and contingency planning

Drinking water distribution

According to Health's guideline on maintaining water quality in distribution systems, the best risk management practice is to maintain a secondary disinfection (chlorine residual) in the drinking water as it travels through the distribution system. While Health's guide strongly recommends this course of action, the guide also includes a section on how a drinking water officer can exempt a system owner from requiring chlorine residual. Under the Act, drinking water officers have been afforded this discretion, but Health does not require them to document why this was an appropriate course of action. We found that Health does not have information as to how many distribution systems lack residual chlorine.

In 2019, Health developed guidelines on evaluating and mitigating lead in drinking water supplies, primarily for the water in schools and daycares due to the joint responsibility of the property owner and Health in preventing lead leaching. As this was a new guideline, we were unable to assess its effectiveness.

The need for and effectiveness of residual chlorine, or measures taken to reduce lead, are also dependent on the quality of the infrastructure. According to the B.C. Water & Waste Association, there are more than 32,000 km of underground water pipes in the province. Asset Management B.C. had stated that the majority of B.C.'s water infrastructure was built more than 50 years ago, between 1950 and 1970 (see [Exhibit 6](#)). The B.C. Water & Waste Association estimated that the overall water and wastewater infrastructure deficit to renew and replace aging assets is approximately \$6.8 billion.

KEY FINDINGS AND RECOMMENDATIONS



Source: The Canadian Water Network's *Drinking Water Safety Plans*

As the Ministry of Municipal Affairs and Housing (MAH) provides infrastructure grants to communities, we examined whether Health is coordinating with MAH to mitigate risks associated with inadequate funding for distribution infrastructure. We found that Health was coordinating with MAH, but there were funding limitations that had not been addressed that could create risks, including:

- ◆ funding allocation is not based on which systems are at the highest risk
- ◆ funding allocation is not focused on bringing water systems into compliance with regulations
- ◆ funding is not available directly to improvement districts
- ◆ funding availability is inconsistent

Government-sponsored funding for infrastructure will likely never be sufficient to cover the increasing infrastructure deficit, nor, according to best practices, should it (see sidebar).

B.C. needs a user-pay model that reflects the true value of water to consumers. However, such a model must be supported by an educated public that understands both the value of safe drinking water and the costs for ensuring risks are mitigated. We looked to see if Health

had an effective public education program to address this issue and found that Health had not developed such a program. In 2008, the Health Protection Branch had identified the need for such a program to Health's executive. However, the initiative was not approved.

“When water supply infrastructure programs are self-funding, costs are borne by the ratepayers or service users through normal water billing. While government ‘special funding’ for water infrastructure is occasionally available and is important, the user-pay model may better relate the true value of water to consumers. Self-sufficiency is the only guaranteed method for communities to ensure sufficient funds are available when required.” ~Source to Tap: Guidance on the Multi-Barrier Approach to Safe Drinking Water – Canadian Council of Ministers of the Environment, 2004

Health's actions to address risks to small systems were not adequate

The issues noted above (ensuring that risks to source protection and to drinking water treatment and distribution are identified and mitigated) are intensified in small water systems. It's estimated that, as of 2017, there were approximately 4,400 small water systems in B.C.

In 2013, Health had initiated a regulatory review and a policy analysis and identified potential options and recommendations to better support small

KEY FINDINGS AND RECOMMENDATIONS

water systems. However, we found that most of the action items set by the Assistant Deputy Ministers' Committee on Small Water Systems were not achieved, and the committee disbanded in 2016.

We found that Health had been coordinating with its partners and developed a series of guidance documents and tools to help aid small water system operators. However, Health had not evaluated the effectiveness of these guidance documents. This may be due to limited staffing resources within the Health Protection Branch.

RECOMMENDATION 4: *We*

recommend that the Ministry of Health undertake the following actions:

- a) identify where and what type of risks exist in relation to source protection, drinking water treatment, distribution and small water systems*
- b) coordinate with ministries and agencies to develop actions to mitigate identified risks*
- c) develop a process for the evaluation and adjustment of Health's guidelines to ensure they are effective*

TAKING ACTION— THE PHO'S OVERSIGHT

The *Drinking Water Protection Act* (Act) requires the PHO to fulfill several functions related to drinking water. Among them are:

- ◆ reporting to the minister on situations that significantly impact drinking water arising from the actions or inactions of other ministries
- ◆ recommending to the minister the need for increased source protection through the development of drinking water protection plans
- ◆ monitoring drinking water officers' compliance with guidelines and directives set by the minister

We found that the PHO had performance gaps for each of these functions.

The PHO's reporting to the minister on significant issues was limited

The Act states that the PHO is to report to the minister on any situation that significantly impedes the protection of drinking water and arises in relation to the action or inaction of one or more ministries, government corporations or other agents of the government. We looked to determine whether the PHO was reporting to the minister on significant issues.

KEY FINDINGS AND RECOMMENDATIONS

We found one record from 2013 where the PHO formally informed the minister that there were issues with the approval process under the *Environmental Management Act* in relation to government's reliance on a professional's opinion, citing the specific approval for a landfill facility in the Shawnigan Lake watershed.

The Act also states that the minister must bring situations forward to the Executive Council if the situation has not been resolved to the satisfaction of the PHO.

We found no evidence whether the 2013 situation was resolved or if the minister brought it to the attention of Executive Council. It is unknown whether this situation is the only situation that has been reported to the minister, as the PHO does not have a formalized tracking document showing all assessments brought to the PHO's attention.

The PHO has also not defined what constitutes a situation that significantly impedes the protection of public health in relation to drinking water. The PHO stated that this is to allow flexibility and to avoid being bound by a definition that would hamper its independence. The PHO also noted that she informs the deputy minister or minister through less formal channels or that issues resolve themselves without the necessity of formal reporting.

However, this lack of information has translated into limited guidance for drinking water officers in the regional health authorities who are likely to identify a significant impediment, which could result in issues not being brought forward to the minister.

The PHO's monitoring of the compliance of drinking water officers was limited

We examined whether the PHO was monitoring drinking water officers' compliance with the guidelines and directives established by Health. We found that the PHO tracks drinking water officers' actions in her report on drinking water.

However, there was no formal monitoring of drinking water officers' compliance with specific guidance that Health has developed for the officers in undertaking their work. This creates a risk that drinking water officers may not be meeting the best practices set out by Health, or that the application of guidelines is inconsistent across regional health authorities.

RECOMMENDATION 5: *We recommend that the Provincial Health Officer take action to improve the oversight of drinking water, including the development of:*

- a) *policy and procedures for reporting significant impediments to the Minister of Health*
- b) *guidance for drinking water officers on how and when to report situations to the Provincial Health Officer that significantly impact drinking water*
- c) *a process for evaluating and tracking significant impediments*
- d) *a process for monitoring drinking water officers' compliance with guidelines and directives*

KEY FINDINGS AND RECOMMENDATIONS

Drinking water protection plans were not being used

Drinking water protection plans are a legislative tool under the Act. The PHO may request that the Minister of Health enact a drinking water protection plan to ensure that watersheds are protected. In 2001, government anticipated this tool would be used 1 – 3 times per year; however, in 2002, the Minister of Health stated that the use of this tool would be “quite rare.”

We found that no drinking water protection plans have been established in the 16 years since the Act was amended. We found that the PHO had requested that the minister establish a drinking water protection plan in the Comox Valley on four separate occasions, but that a protection plan was not established (see [sidebar](#)).

Some staff from the regional health authorities told us that they have not requested that the PHO ask the minister to implement additional drinking water protection plans in their jurisdiction, as they were waiting to see whether the tool was successfully implemented in the Comox Valley.

RECOMMENDATION 6: We

recommend that the Provincial Health Officer, in collaboration with the Ministry of Health, review the legislative provisions regarding drinking water protection plans and report out to the Minister of Health on impediments to the protection plan’s implementation.

ACCOUNTABILITY — REPORTING TO LEGISLATORS AND THE PUBLIC

In exercising accountability to both legislators and the public, Health had been deficient and the PHO’s efforts had been limited. Health’s annual service plan report did not mention drinking water, and the PHO’s legal obligation to account for government’s success in protecting drinking water had been sporadic. Overall, there had been limited accountability to the legislative assembly and the public for the protection of drinking water.

Health had not reported on its protection of drinking water

Health has a duty to report out on its programs under the *Budget Transparency and Accountability Act*. Under this Act, a minister must produce an annual service plan that includes a statement of goals and identifies specific objectives and performance measures. As well, a minister must produce a report on the status of the annual service plan that compares actual results with the expected results.

We looked at the 2016/17 and 2017/18 annual service plan reports to determine whether Health is reporting out on the outcome of its activities to protect drinking water. We found no reporting on outcomes of the actions that Health had undertaken to protect drinking water. This may be because Health had not identified drinking water as a priority area.

KEY FINDINGS AND RECOMMENDATIONS

WATER PROTECTION IN THE COMOX VALLEY

The Comox Valley Regional District is the water supplier for over 45,000 residents in the region, including the municipalities of Comox and Courtenay. The drinking water source—the Comox Lake—is the only viable drinking water source in the region for this growing population. The lake, however, has no restrictions on access and the shores are owned by a variety of private and public entities. Since 1963, medical health officers in the region have been concerned about the lack of protection of this watershed and the impacts it may be having on drinking water safety.

Timeline of events for the Comox Valley Regional District's water protection plan

- ♦ **1963** – The medical health officer notes the need for action to protect the region's drinking water source.
- ♦ **2001** – The *Drinking Water Protection Act* is adopted, enabling the authority to order drinking water protection plans.
- ♦ **2005** – The medical health officer orders an assessment of the drinking water source for Comox Lake watershed supply system.
- ♦ **October 2008** – The PHO recommends to the Minister of Health that the Comox Valley Regional District (CVRD) develop a drinking water protection plan.
- ♦ **December 2008** – The minister approves the development of a draft drinking water protection plan.
- ♦ **February 2009** – The Minister of Health directs that a consultation draft drinking water protection plan order be prepared for her review.
- ♦ **March 2010** – The minister and the member of the legislative assembly for Comox Valley review the draft drinking water protection plan order, agree that it should not move forward, and suggest stakeholder consultation and voluntary action.
- ♦ **June 2010** – The PHO reiterates its recommendation to the minister that the CVRD should develop a drinking water protection plan. The minister responds that she is satisfied with the current process.
- ♦ **2011 – 2015** – The CVRD develops a working group and hires a consultant to develop a watershed protection plan.
- ♦ **August 2015** – The PHO reiterates the recommendation to the minister that the CVRD develop a drinking water protection plan. The minister does not respond to the PHO.
- ♦ **January 2018** – The PHO reiterates the recommendation to the minister that the CVRD develop a drinking water protection plan. The minister does not respond to the PHO.
- ♦ **November 2018** – The B.C. government announces funding for a new drinking water treatment plant in the CVRD.

Source: Compiled by the Office of the Auditor General of British Columbia

KEY FINDINGS AND RECOMMENDATIONS

We did find that government's websites on drinking water quality explain the roles and responsibilities under the *Drinking Water Protection Act* and does include a link to the action plan. However, the websites do not include information regarding whether activities to protect drinking water are achieving outcomes.

Also missing from these websites is easily accessible water quality information. According to the action plan, government committed to regularly reporting to the public on water quality information. Government's website links to the regional health authorities and they provide this information, but we found that some links do not connect the user to drinking water information, and, overall, the information is difficult to navigate. The Interior Health Authority has recently created a drinking water advisory map interface that provides the necessary geographic referencing and points users to the location of water advisories.

RECOMMENDATION 7: *We recommend that the Ministry of Health report out to the public on the progress it is making in improving the protection of drinking water for all British Columbians.*

The PHO's reporting is moving toward meeting legislated reporting requirements

The action plan states that the PHO "has the mandate to ensure the accountability of government and those delivering drinking water to British Columbians." The Act follows through on this by requiring the PHO to prepare an annual report on drinking water activities and deliver it to the minister. The minister is required to lay such a report before the legislative assembly. It is through this

process that the PHO can "ensure the accountability of government" for protecting drinking water.

We looked to determine whether the PHO was meeting this legislative requirement and found that the PHO's adherence to this accountability requirement had been inconsistent. While the PHO has issued reports for most fiscal years, reports were not issued annually as required. The PHO released reports in 2007, 2008, 2011 and 2015. The information included in these reports was often dated by several years at the time of their release. For example, the 2015 report was based on data from fiscal years 2009/10 to 2011/12.

The PHO informed us that there are challenges in meeting the annual commitment required by legislation due to staffing resource limitations and challenges collecting data in a timely manner from external ministries and the regional health authorities. The PHO also noted that the data collected for these reports was not an ideal indicator of progress towards improvements in drinking water safety and management, and that staff from the Office of the PHO have faced difficulty in accessing information in a timely manner.

To address this issue, the PHO led a project to develop new reporting indicators and revised the report structure to become more meaningful and to align with the multi-barrier approach. Before full adoption of this revised framework, in June 2019, the PHO released [*Clean, Safe, and Reliable Drinking Water: An Update on Drinking Water Protection in BC and the Action Plan for Safe Drinking Water in British Columbia*](#). This report detailed activities for fiscal years 2012/13 – 2016/17 and made 32 recommendations.

KEY FINDINGS AND RECOMMENDATIONS

We also looked to see if the recommendations from past PHO reports were being addressed. We found that the PHO's recommendations to the various ministries and agencies in the 2007, 2008, 2011 and 2015 reports have seen limited or no progress. This may be due to the lack of an accountability structure that could have ensured that the ministries were held accountable for implementing the recommendations.

RECOMMENDATION 8: *We recommend that the Provincial Health Officer monitor progress and trends in the protection of drinking water and report on a timely basis to the Minister of Health and the legislative assembly on whether activities are mitigating risks.*

AUDIT QUALITY ASSURANCE

WE CONDUCTED THIS audit under the authority of section 11 (8) of the *Auditor General Act* and in accordance with the standards for assurance engagements set out by the Chartered Professional

Accountants of Canada (CPA) in the *CPA Canada Handbook – Canadian Standard on Assurance Engagements (CSAE) 3001* and *Value-for-money Auditing in the Public Sector PS 5400*. These standards require that we comply with ethical requirements and conduct the audit to independently express a conclusion on whether or not the subject matter complies in all significant respects to the applicable criteria.

We apply the CPA Canadian Standard on Quality Control 1 (CSQC) and, accordingly, maintain a

comprehensive system of quality control, including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements. In this respect, we have complied with the independence and other requirements of the code of ethics applicable to the practice of public accounting issued by the Chartered Professional Accountants of British Columbia, which are founded on the principles of integrity, objectivity and professional competence, as well as due care, confidentiality and professional behaviour.

APPENDIX A: SELECTED MAJOR OUTBREAKS OF WATERBORNE ILLNESS IN NORTH AMERICA (1993-2016)

History of Major Outbreaks in North America		
Year – Location	Outcome	Cause
1993 – Milwaukee, Wisconsin	Estimated 400,000 infected with <i>Cryptosporidium</i> with 50 deaths over 2 years following outbreak.	Inadequate filtration process at treatment plant.
2000 – Walkerton, ON	2,300 infected with <i>E.coli</i> O157:H7 and/or <i>Campylobacter</i> , 65 hospitalized, 27 suffered haemolytic uremic syndrome, 7 deaths.	Heavy rain washed cattle manure into the town's well, inadequate treatment for severe contamination.
2001 – North Battleford, SK	<i>Cryptosporidium</i> Outbreak. Estimated 5,800 to 7,100 cases.	Decreased function in filtration during a maintenance operation.
2008 – Alamosa, Colorado	<i>Salmonella</i> Outbreak ~1,300 cases of illness, 20 hospitalizations, 1 death.	Animal fecal waste contaminated an in-ground water storage tank that had several holes and cracks.
2013 – Baker City, Oregon	<i>Cryptosporidium</i> Outbreak, estimated 2,780 cases.	Cattle, goat and elk fecal waste contaminated a surface water supply with no filtration.
2016 – Flint, Michigan	Lead leaching – exposing over 100,000 residents. Possible cause of an outbreak of Legionnaires' disease that killed 10 people.	Inadequate treatment for a changed water source including the failure to apply corrosion inhibitors to the water.

APPENDIX A

Outbreaks related to drinking water in British Columbia 1995-2004		
Year – Location	Outcome	Cause
1995 – Victoria	Estimated 2,900 to 7,700 infected with Toxoplasmosis.	Assumed wildlife fecal waste in watershed.
1996 – Kelowna	Estimated 10,000 infected with Cryptosporidiosis (<i>Cryptosporidium</i>).	Unconfirmed, but believed to be human sewage contamination in the water source.
– Cranbrook	Estimated 2,097 households with at least one infected individual with Cryptosporidiosis.	Cattle fecal waste in watershed.
1997 – Princeton	88% of service area affected by norwalk-flu-like virus.	Sewage main break contaminating a well.
1998 – Chilliwack	19 infected with Cryptosporidiosis.	Wildlife fecal waste in watershed.
– Sunshine Coast	29 infected with Cryptosporidiosis.	Assumed fecal waste wildlife in watershed with the water supply not being disinfected when a boil water notice was ineffective.
2002 – Langdale	Suspected outbreak of campylobacteriosis.	Not determined.
2004 – Hagensborg	5 infected with campylobacteriosis.	Wildlife fecal waste in watershed. The drinking water supply was untreated surface water and a boil water notice was in effect.

APPENDIX B: LEGISLATION THAT SUPPORTS DRINKING WATER PROTECTION & AGENCIES RESPONSIBLE

Legislation	Agency responsible
<p><i>Drinking Water Protection Act</i> and its regulation:</p> <ul style="list-style-type: none"> ◆ Drinking Water Protection Regulation 	Ministry of Health (Health) (Policy) & Regional Health Authorities (Operations)
<p><i>Public Health Act</i> and its regulations:</p> <ul style="list-style-type: none"> ◆ Sewerage System Regulation ◆ Health Hazards Regulation 	Health (Policy) & Regional Health Authorities (Operations)
<p><i>Environmental Management Act</i> and its regulations:</p> <ul style="list-style-type: none"> ◆ Agricultural Waste Control Regulation ◆ Municipal Wastewater Regulation ◆ Organic Matter Recycling Regulation ◆ Contaminated Sites Regulation ◆ Hazardous Waste Regulation ◆ Antisapstain Chemical Waste Control Regulation ◆ Pulp Mill and Pulp and Paper Mill Liquid Effluent Control Regulation ◆ Land-based Finfish Waste Control Regulation ◆ Code of Practice for Industrial Non-Hazardous Waste Landfills incidental to the Wood Processing Industry ◆ Code of Practice for Soil Amendments ◆ Code of Practice for the Slaughter and Poultry Processing Industries 	Ministry of Environment and Climate Change Strategy (ENV)
<i>Integrated Pest Management Act</i> and its regulation	ENV
<p><i>Water Sustainability Act</i> and its regulations:</p> <ul style="list-style-type: none"> ◆ Groundwater Protection Regulation ◆ Water Sustainability Regulation ◆ Dam Safety Regulation ◆ Water Sustainability Fees, Rentals, and Charges Tariff Regulation 	ENV (Policy) & Forests, Lands, Natural Resource Operations and Rural Development (FLNR) (Operations)
<i>Water Protection Act</i>	ENV & FLNR
<p><i>Park Act</i> and its regulations</p> <ul style="list-style-type: none"> ◆ Park, Conservancy and Recreation Area Regulation 	ENV
<i>Water Users' Communities Act</i>	FLNR

APPENDIX B

Legislation	Agency responsible
<i>Water Utility Act</i>	FLNR
<i>Utilities Commission Act</i>	FLNR
<i>Forest and Range Practices Act</i> and its regulation: <ul style="list-style-type: none"> ◆ Government Actions Regulation 	FLNR
<i>Drainage, Ditch and Dike Act</i>	FLNR
<i>Dike Maintenance Act</i>	FLNR
<i>Land Act</i>	Ministry of Agriculture
<i>Local Governmental Act</i> and the <i>Community Charter</i>	Ministry of Municipal Affairs and Housing (MAH)
<i>Local Services Act</i> and its regulation: <ul style="list-style-type: none"> ◆ Subdivision Regulations 	MAH & Ministry of Transportation and Infrastructure (TRAN)
<i>Oil and Gas Activities Act</i> and its regulations: <ul style="list-style-type: none"> ◆ Environmental Protection and Management Regulation ◆ Drilling and Production Regulation 	Ministry of Energy, Mines and Petroleum resources (EMPR) (Policy) & BC Oil and Gas Commission (OGC) (Operations)
<i>Geothermal Resources Act</i> and its regulations: <ul style="list-style-type: none"> ◆ Geothermal Drilling and Production Regulation ◆ Geothermal Operations Regulation 	EMPR & OGC
<i>Mines Act</i> and the Health, Safety and Reclamation Code for Mines in B.C.	EMPR & Federal Government
<i>Hydro and Power Authority Act</i>	BC Utilities Commission
<i>Transportation Act</i>	TRAN
<i>Transportation of Dangerous Goods Act</i>	TRAN
<i>Environmental Assessment Act</i>	ENV & Environmental Assessment Office

Source: *Clean, Safe, and Reliable Drinking Water: An Update on Drinking Water Protection in BC and the Action Plan for Safe Drinking Water in British Columbia* (2012/13 - 2016/17)

APPENDIX C: COMPLETE AUDIT CRITERIA

We developed our audit objective and criteria using:

- ◆ The *Drinking Water Protection Act* (2001) and the *Drinking Water Protection Amendment Act* (2002)
- ◆ The Action Plan for Safe Drinking Water in British Columbia (2002)
- ◆ Canadian Council of Ministers of the Environment Source to Tap Guidance (2004)
- ◆ Memorandum of Understanding Regarding Inter-Agency Accountability and Coordination on Drinking Water Protection (2006)
- ◆ B.C.'s Guiding Framework for Public Health (2013)
- ◆ The Office of the Auditor General of British Columbia and the provincial government's Performance Reporting Principles for the British Columbia Public Sector (2003)

Line of enquiry 1: Leadership

Audit criteria 1: The Ministry of Health (Health) has assessed the legislative framework and is working to address any identified weaknesses and gaps in the protection of drinking water for all British Columbians.

Audit criteria 2: Health has provided the leadership and coordination to ensure the protection of drinking water for all British Columbians.

Line of enquiry 2: Planning/implementing/evaluating & adjusting

Audit criteria 3: Health has implemented an effective strategy to ensure the protection of drinking water for all British Columbians.

Line of enquiry 3: Reporting

Audit criteria 4: The Executive Council is being informed of significant impediments to the protection of public health in relation to drinking water that arise in relation to the action or inaction of government and are not resolved to the satisfaction of the Provincial Health Officer (PHO).

Audit criteria 5: Health and the PHO are reporting on government's activities and performance in protecting drinking water for all British Columbians.



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