



Office of the Auditor General of Ontario

Value-for-Money Audit:
Ontario Clean
Water Agency



December 2021

Ontario Clean Water Agency

1.0 Summary

The Ontario Clean Water Agency (OCWA), a Crown agency reporting to the Ministry of the Environment, Conservation and Parks, provides drinking-water and wastewater treatment services to an estimated 4.5 million Ontarians. OCWA receives no transfer payments from the province. It competitively acquires its water and wastewater treatment contracts by competing against private-sector organizations. As of 2020, OCWA had approximately 200 agreements, primarily with municipalities, to operate and maintain drinking-water and wastewater treatment facilities. It generated \$223 million in revenues, with \$10 million in net income: OCWA employs almost 900 staff.

In 2020, OCWA operated 181 (27%) of the 679 municipal drinking-water systems in Ontario. Our audit found that the agency does well in treating drinking water compared to other private operators and municipally-run facilities. It has fewer contaminant exceedances per operated facility and resolves those exceedances quickly. In addition, OCWA operates 167 Ministry-regulated wastewater facilities and reports fewer bypasses and overflows of untreated or partially treated sewage per facility compared to other private operators and municipally-run facilities. However, OCWA-operated municipal residential drinking-water systems did experience more boil water advisories on average over the last five years compared to other operators.

According to the Ministry of the Environment, Conservation and Parks, OCWA's role is to fill

gaps in the marketplace within the water and wastewater industry, especially for smaller, remote and First Nation communities where private operators are not willing to offer services. However, we noted that OCWA is not required to provide services at a subsidized price and that OCWA provides operations and maintenance services to only six First Nations. In 2020, there were no instances where OCWA knowingly entered into an operations and maintenance contract where it would not be able to recover its costs. Some large clients generate a large portion of OCWA's revenues and profits while other clients generate losses. In 2020, OCWA experienced a combined loss of \$723,000 on operations from 33 of its clients.

We found that OCWA could do more to support First Nation communities (some of which have been under boil water advisories for years), to reduce the amount of biosolids being sent to landfills, and to prepare its clients for the impacts of climate change. We also noted that OCWA's asset management system is missing key information on the age, cost or performance of the assets it operates. The annual capital/major maintenance plans OCWA sends to its clients does not provide a sufficient rationale for its asset-replacement recommendations.

Our more significant audit findings include the following:

- **For each of the last five years, Ministry-regulated municipal drinking-water facilities that were operated by OCWA had fewer adverse water-quality incidents than those run by either municipal or private operators.** In cases where chemical and microbiological contaminants

exceeded drinking-water-quality standards, OCWA had fewer incidents per facility than other operators. For example, in 2020/21, OCWA experienced 0.20 chemical incidences per facility compared to 0.56 for municipal operators and 0.44 for private operators. Similarly, in 2020/21, OCWA experienced 0.25 microbiological incidences per facility compared to 1.17 for municipal operators and 0.27 for private operators. OCWA was also able to resolve these chemical and microbiological exceedances more quickly. In 2020/21, it took OCWA, on average, 44 days to resolve chemical exceedances compared to 62 days for all operators, and three days to resolve microbiological exceedances compared to 13 days for all operators.

- **OCWA-operated wastewater facilities generally reported exceedances of contamination limits as required, but missed some required testing.**

In 2020, for the 25 wastewater facilities we selected for testing, we noted that OCWA staff sampled the wastewater in accordance with the testing frequency established in each facility's Environmental Compliance Approval (with one exception), and reported exceedances to the Ministry as required. The frequency of testing was missed at one facility where OCWA staff sampled for nitrogen only 29 times in calendar year 2020 instead of 52 times as required. OCWA had not identified this error in testing frequency until we brought it to its attention, at which point OCWA reported the non-compliance to the Ministry.

- **Drinking water continues to be an issue in First Nation communities, but OCWA's support of these communities is limited.** Water quality on First Nation reserves is a federal responsibility. As of July 2021, there were 44 long-term boil water advisories active at 26 Ontario First Nation communities. Although the Ministry has asked OCWA to support efforts to eliminate long-term drinking-water advisories in First Nation communities, OCWA is hesitant to provide support without achieving full cost recovery.

- **OCWA tested samples from its drinking-water and wastewater as required and tests were conducted by accredited labs.** Based on the sample of facilities we reviewed, we noted that OCWA had tested samples from its drinking-water systems in accordance with legislation, and had tested samples from its wastewater systems in accordance with the facilities' Environmental Compliance Approvals (with one exception). As well, the samples we selected for review showed that the water samples were tested by a Ministry-accredited lab.
- **OCWA's electronic monitoring system is not able to identify adverse test results.** We noted that OCWA's Process Data Management system stores the test results from its regular testing of drinking-water and wastewater samples, but not the allowable limits for tested contaminants. Because of this, the system cannot flag adverse test results. Similarly, because the system does not store the maximum amount of water a drinking-water treatment facility is permitted to take from a water source, it cannot flag when a facility has exceeded its maximum water intake. Instead, OCWA relies on facility operators and labs to manually identify issues and report any exceedances noted.
- **OCWA manages assets, including planning and preventative maintenance, without complete information on the age, criticality or performance of them.** As of July 2021, 71% of the assets in OCWA's asset management system were missing an installation date, 42% were missing cost information such as purchase price or replacement cost, and no performance data was available for any of the assets. This information is important to better manage critical assets over their lifecycle, and determine the right time for replacements to achieve a good balance of cost, reliability and risk. OCWA currently relies on local operational staff to identify major repairs.

- **OCWA relied on Ministry inspections and mandatory drinking-water audits by external consultants without conducting its own compliance audits for years.** OCWA did not conduct any compliance audits using corporate staff from 2016 to 2020. During this period, only Ministry inspections and the mandated annual Drinking Water Quality Management Standards audit, conducted by an external consultant, took place. OCWA implemented a new internal audit approach in 2021, which is designed to review compliance with key requirements. However, the methodology it uses to select facilities for audit needs to consider any non-compliance at its facilities, such as adverse water-quality incidents, or outcomes of Ministry inspections or the annual mandatory Drinking Water Quality Management Standards audit.
- **Bypasses, overflows and spills occurring at OCWA-operated wastewater facilities were reported to the Ministry as required, but the Ministry's spills database lacked key details.** Based on our review of a sample of bypasses, overflows and spills, we noted that all events were reported in a timely manner to the Ministry as required. However, a lot of key information was missing from the Ministry's database, such as the start and end times of the event, the name of the facility where the spill occurred, the volume of the spill, the environmental impact caused by the spill, and sufficient information on the cause. It is important for a public database to have all of the key spill details because it directly impacts the environment and may also impact the people and wildlife living in the surrounding areas.
- **Significant amounts of biosolids are still being sent to landfills, and an initiative to reduce greenhouse gases is limited to a few sites.** In 2020, we noted that most biosolids produced at OCWA-operated facilities were either incinerated (48%) or applied to farmland (32%) if they were in solid form, or sent to lagoons (52%) or applied to land (21%) if they were in liquid form. However, over 4,000 tonnes of biosolids in solid form were sent to landfills and over 14,600 cubic meters (4%) of liquid biosolids were sent to landfills. Sending biosolids to landfills releases greenhouse gases (carbon dioxide and methane) into the air, which is a significant contributor to climate change. OCWA operates 16 facilities with anaerobic digestors that can break down organic matter and produce biogas for other uses. OCWA approached these 16 facilities to participate in projects to help reduce greenhouse gas emissions by capturing methane from the process and using it as a source of renewable energy, but as of September 2021, only one project is currently moving towards construction. According to OCWA, these projects have been delayed because of the COVID-19 pandemic and shifting municipal priorities. OCWA also noted that municipalities are reluctant to take the lead on such pilot projects, and instead prefer to wait to see other municipalities successfully implement them first.
- **OCWA's cybersecurity plan needs improvement as the agency does not conduct regular penetration testing.** The risks of cyberattacks are increasing. In February 2021, unidentified cyber actors obtained unauthorized access to the supervisory control and data acquisition system at a Florida drinking-water treatment facility. OCWA's senior management acknowledges cyberattacks as a key risk, yet OCWA has never conducted a penetration test of its systems to identify exploitable vulnerabilities. OCWA is currently in the process of setting up a secondary data centre, to be completed by June 2022; a secondary data centre is critical for a sound disaster-recovery plan, along with regular testing of the recovery plan.
- **OCWA has significant investment assets, but no plan to return generated funds to the Province.** According to its strategic plan, OCWA plans to focus its efforts on growing its revenues from \$223 million in 2020 to \$303 million by 2026. As of December 31, 2020, OCWA had an accumulated surplus of \$233 million and \$75 million

invested in bank balances, term deposits and other notes, but it did not transfer surplus funds to the Province. In our discussion with the Ministry, we were told that it has no plans to request a stipend or profits from OCWA.

- **Seed funding provided by the Province is no longer needed to sustain OCWA's operations.** In 2003, OCWA made a \$120 million loan to the Ontario Infrastructure and Land Corporation, using seed money it received from the Province to help it sustain its operations. Since OCWA has been generating a profit from its operations for the last six years, it no longer needs the interest income generated by the \$120 million loan to the Ontario Infrastructure and Land Corporation to sustain its operations. This loan matures in March 2023.
- **OCWA assigns operational staff mostly based on historical numbers, and no workload measures are in place to assess the effectiveness and efficiency of staff.** We reviewed OCWA's regional staffing allocation in 2020 and noticed that there were significant discrepancies in the number of staff assigned per facility in each region. For example, OCWA manages five facilities in the South Peel region, and has assigned 178 staff at a ratio of over 35 staff per facility. Six other regions, however, had a ratio of less than one staff per facility. According to OCWA, the region of South Peel wants operators to be onsite at all times. When we inquired about how OCWA allocates staff, it told us that its full-time-employee counts are usually based on the original requests for proposals submitted to the client. OCWA does not assess staffing levels based on workload such as work orders, and has no workload data to measure the efficiency and effectiveness of staff.
- **OCWA's publicly reported performance measures do not measure drinking-water and wastewater quality.** OCWA only reports publicly on its goals of growing its business, improving productivity, and supporting its clients and employees, but not on the quality of its treated drinking-water or wastewater operations. OCWA

does internally report water-quality measures to its board; for example, it reports boil water advisories due to microbiological incidents and inadequate disinfection, the percentage of Ministry inspections that achieve a rating of 100%, and the number of Ministry inspections with a rating higher than 90%.

This report contains 21 recommendations, with 47 action items, to address our audit findings.

Overall Conclusion

Our audit concluded that the Ontario Clean Water Agency (OCWA) provides safe and reliable drinking-water and reliable wastewater treatment services in compliance with legislation. The drinking water and wastewater at its facilities is tested as required and adverse results are reported to the Ministry of the Environment, Conservation and Parks (Ministry) in a timely manner. However, OCWA is not able to assess whether it is providing services cost-effectively and efficiently because it relies on historical information to allocate staffing resources and does not collect and assess data to measure staff efficiency.

Without clear direction from the Ministry of the Environment, Conservation and Parks, OCWA's Board of Directors and management have shifted their focus towards generating revenue and competing with private operators, instead of providing drinking-water and wastewater services to communities in need. OCWA did not conduct any compliance audits using corporate staff from 2016 to 2020, and the audit selection methodology it uses for its new compliance program needs to focus on the risk of non-compliance at its facilities.

We also found that OCWA's current information systems need improvement to provide more useful information. Its tracking system of water samples tested cannot identify adverse results because the system does not contain maximum concentration limits for substances tested during the treatment of either drinking water or wastewater and therefore the system cannot flag exceedances to allow for central monitoring. Also, its asset management system lacks

critical information about the cost, age and performance of client assets it manages, increasing the risk that these assets are more susceptible to emergency repairs or unexpected failures.

We also found that OCWA does not include performance measures for its key activities in its annual reports. For example, it does not report on drinking-water quality and number of wastewater bypasses and overflows. This is important for the public to assess how well OCWA is delivering on its mandate to provide safe and reliable drinking water and treated wastewater that protects human health and the environment.

OVERALL OCWA RESPONSE

The Ontario Clean Water Agency (OCWA) thanks the Auditor General for this report and is pleased that the audit found that facilities operated by OCWA provide safe and reliable drinking-water and reliable wastewater treatment services in compliance with legislation. The Agency looks forward to working with the Ministry of the Environment, Conservation and Parks to implement the recommendations included in the audit report to enhance OCWA's value to its clients, the province and the people of Ontario.

OCWA provides a wide range of water, wastewater and other related services to enable clients to effectively and efficiently manage their water and wastewater facilities and ensure the long-term sustainability of their water and wastewater systems. OCWA's core business is the operation and maintenance of water and wastewater treatment facilities and their associated distribution and collection systems on behalf of municipalities, First Nation communities, institutions, and private-sector companies across Ontario. OCWA has a mandate to provide these services in a manner that protects human health and the environment and encourages the conservation of water resources.

In addition to operation and maintenance, OCWA offers clients related services, including

engineering, training and technical and advisory services such as process optimization, energy and asset management. OCWA also provides management, administration and specialized support services to its clients.

As the Agency does not receive any transfer payments from the province, OCWA's continued focus on business growth is critical to ensuring that the Agency not only continues to provide safe, reliable and cost-effective operation and maintenance services, but also that it is able to meet the evolving needs of its clients related to climate change, asset management and infrastructure sustainability. The agency's business activities have resulted in strong financial, health and safety, and compliance results.

2.0 Background

2.1 Overview

The Ontario Clean Water Agency (OCWA) is a Crown agency of the Province of Ontario established in 1993 under the *Capital Investment Plan Act, 1993*. It provides treated drinking water to an estimated 4.5 million Ontarians.

OCWA's main line of business is to operate and maintain drinking water treatment facilities and wastewater treatment facilities and/or their respective distribution and collection systems for municipalities and, to a lesser extent, some industrial clients and institutions. As of February 28, 2021, OCWA operated and maintained 739 water and wastewater systems for approximately 200 customers. These facilities range in size from small municipal wastewater pumping stations to large urban water treatment and collection/distribution systems. This activity accounted for 98% of OCWA's operating revenue in 2020. The remaining 2% of revenue is interest income generated through investments.

OCWA offers other services, including project management for facility construction; the

development of preventative maintenance procedures and capital improvement plans; and loan financing for the construction of water and wastewater facilities. However, these activities generate very little revenue for OCWA.

Municipalities account for over 92% of OCWA's operating revenues. The remaining operating revenue is generated from providing operation and maintenance service to a small number of commercial, industrial and institutional facilities, as well as management oversight services to several First Nations communities.

OCWA reports to the Legislature through the Ministry of the Environment, Conservation and Parks (Ministry). In 2020, the agency generated a net income of \$10 million, consisting of \$225 million in revenue and \$215 million in expenses.

2.2 Mandate and Mission

OCWA's mandate is to operate water treatment and wastewater treatment facilities and provide other related services to clients in a manner that protects human health and the environment, and encourages the conservation of water resources.

OCWA's mission is to demonstrate service excellence through the delivery of safe, reliable and cost-effective clean water.

2.3 Organizational Structure and Operations

OCWA is governed by a 12-member Board of Directors, which is appointed by the Lieutenant-Governor-in-Council on the recommendation of the Premier and the Minister of the Environment, Conservation and Parks. Members of the Board are appointed from outside the provincial government, and the Board is accountable to the Provincial Legislature through the Minister.

OCWA operates out of its head office in Mississauga and 11 regional hubs. It employs 894 staff (143 corporate staff and 751 regional staff), mostly

water management professionals such as facility operators, mechanics, engineers and project managers. OCWA also has five Emergency Response Teams to deal with water emergencies across the province.

OCWA's primary operations are run by the regional managers who report to the agency's head office. At the regional level, OCWA shares staff and resources between large municipal plants and smaller satellite facilities. The shared regional structure is intended to provide economies of scale that lessen operation and maintenance costs for individual municipalities. This structure is also intended to benefit clients by sharing management, administration and specialized support services. The current regional hubs, including their related water treatment and wastewater treatment facilities and number of full-time employees, are shown in **Figure 1**.

OCWA's key functions related to operating and managing drinking-water and wastewater facilities include:

- drinking-water testing;
- wastewater testing;
- facility monitoring and compliance; and
- staff certification and licensing.

All drinking-water systems and wastewater systems are inspected regularly by the Ministry. Municipal residential drinking-water systems are inspected every year, while municipal wastewater systems are inspected on a risk-based approach depending on the availability of inspection staff. A Ministry inspection follows a standard protocol to verify that the facility is in compliance with the applicable legislation and their environmental compliance approval. The Ministry inspector visits the facility and assesses the effectiveness of the treatment process, checks the system's monitoring procedures, verifies operator certification, evaluates overall operational practices and may collect water samples for testing. An inspection report is subsequently issued that may result in provincial officer's orders for significant issues of non-compliance or a report detailing required actions for deficiencies of lesser severity.

Figure 1: Number of Drinking-Water Systems and Wastewater Systems Managed by Ontario Clean Water Agency (OCWA)

Source of data: Ontario Clean Water Agency

Regional Hubs	Drinking Water Systems	Wastewater Systems	Others*	Regional Total	OCWA Full-Time Employees by Region
Northwestern	93	52	1	146	66
Eastern	89	39	1	129	77
Georgian Highlands	81	24	0	105	70
Northeastern	63	40	0	103	62
Kawartha Trent	70	23	0	93	67
Southwest	31	29	5	65	46
Essex	11	36	3	50	67
Midwest	13	6	0	19	38
Waterloo	1	16	0	17	43
Huron Elgin	6	0	0	6	37
South Peel	3	2	0	5	178
Other GTA Business	0	0	1	1	0
Total	461	267	13	739	751

* Others include storm water ponds, remediation sites for clean-up, and construction projects.

For a general description of the treatment processes involved in treating drinking water and wastewater, see **Appendix 1**.

2.4 Drinking-Water Testing

A regulation under the *Safe Drinking Water Act, 2002* requires the testing for almost 150 substances to ensure that the level of contaminants does not exceed the limits for Ontario's drinking-water-quality standards, as specified in O. Reg. 169/03 under this act. The substances tested fall within four broad categories:

- **microbiological**—all types of coliform bacteria such as *Escherichia coli* (E. coli);
- **chemical**—66 different chemicals such as arsenic, lead, and mercury;
- **radiological**—78 substances such as radium and uranium; and
- **physical**—features such as temperature and alkalinity (pH or acidity level).

Operators at drinking-water facilities collect water samples for testing. The frequency and type of testing required varies according to the substance being tested for, as well as the type of drinking-water system, the size of the population served, and the water source. For instance, for a large municipal residential drinking-water system that serves more than 100 private residences, the frequency of testing may be *continuous* (for example, when testing for chlorine and turbidity /murkiness); *weekly* (for example, when testing for E. coli and total coliforms); *quarterly* (for example, when testing for nitrites and nitrates); *yearly* (for example, when testing for mercury and benzene where the water source is surface water such as a lake or a stream); and *every 60 months* (for example, when testing for sodium and fluoride).

The turnaround time for test results varies depending on the substance being tested for. For example, the turnaround time for E.coli is about two days, whereas more complex testing for chemicals can take up to two weeks. Continuous monitoring of chlorine and turbidity is done using SCADA (supervisory control and data acquisition), a remote system that monitors

the inflow and outflow of water and wastewater at each metering station, water tower, pumping station and plant in the water system and sends the data wirelessly to a central hub where it can be viewed by an operator; the system also sends alerts when alarms are triggered. But microbiological, chemical and radiological samples must be sent for testing to accredited laboratories licensed by the Ministry. The Ministry requires operators to use accredited laboratories to test samples, instead of the Ministry testing all the samples, which would require the Ministry to have a high number of facilities across the province to ensure a quick turnaround of test results. At the time of our audit, there were 51 licenced accredited labs in the province to test water samples. Accredited labs send all test results to the operator.

Where OCWA manages the treatment plant only, OCWA operators need to test, on a sample basis, the water entering the treatment facility and the treated water that leaves the facility and enters the distribution network of pipes. Where OCWA has responsibility for the distribution system, OCWA also needs to test the water in the distribution pipes and at a sample of households or end users.

Contaminants in drinking water can pose a serious risk to human health. Therefore, a timely response for corrective action is required. The Ministry has established a notification protocol for all system owners and operators when they discover any indicators of adverse drinking-water quality. The laboratories and drinking-water system owners/operators must immediately notify the Ministry's Spills Action Centre and the local Medical Officer of Health and outline the actions taken to correct the situation. This is to be followed up with written or electronic notification within 24 hours. Finally, within seven days after the issue has been resolved, a written notice summarizing the action taken and the results achieved is to be provided to the Spills Action Centre and the local Medical Officer of Health.

The Ministry publicly reports information on Ministry-regulated drinking-water systems. This includes the inspection results of treatment plants, adverse

water-quality incidents, and time taken to resolve incidents.

2.5 Wastewater

2.5.1 Wastewater Testing

The Environmental Compliance Approval issued by the Ministry to each wastewater treatment facility lists, among other things, the acceptable levels of contaminants in the treated water leaving the facility. These levels may be specified as a daily limit, a monthly average concentration, or an annual average concentration. Samples for testing are generally taken from the point where the raw sewage (influent) enters the facility and the point where the treated sewage (effluent) is discharged into a receiving body of water such as a lake or river.

Under the Environmental Compliance Approvals, wastewater treatment facilities are to sample for various microbiological, chemical and physical parameters at various sampling points throughout the process and submit them to an accredited laboratory for analysis.

2.5.2 Bypasses, Overflows and Spills

A bypass is an intentional diversion of excess wastewater around one or more wastewater treatment process(es). Bypassed wastewater undergoes part of the treatment process and gets re-combined with the fully treated water prior to its release into the receiving body of water at the approved discharge location. An overflow is another intentional diversion of excess wastewater into the receiving water body through another designed location in the facility, but not through the approved discharge location. So, while the key difference between an overflow and a bypass is the location of the discharge, the effect is the same: untreated (typically through an overflow) or partially treated (through a bypass) wastewater is discharged into the environment. A bypass and an overflow can be planned (for example, when performing facility maintenance) or unplanned (for example, due to a

heavy rainfall). A spill is a discharge of a pollutant into the natural environment from a structure/container that is abnormal in quality or quantity in light of all the circumstances.

While not desirable, emergency bypasses may be necessary during high flow events to prevent spills and flooding at the wastewater treatment plant. Bypasses are also essential to protect the treatment plant's core biological treatment process (micro-organisms that treat the sewage) from being washed out and potentially causing long-term treatment impacts until the biological community is re-established. In 2020, there were 81 bypasses at OCWA-operated wastewater facilities.

3.0 Audit Objective and Scope

Our audit objective was to assess whether the Ontario Clean Water Agency (OCWA) had effective oversight and management procedures in place to:

- provide safe and reliable drinking-water and reliable wastewater treatment services cost-effectively and in compliance with legislation and corporate policy; and
- measure and publicly report on its performance.

In planning for our work, we identified the audit criteria (see **Appendix 2**) we would use to address our audit objective. These criteria were established based on a review of applicable legislation, policies and procedures, internal and external studies, and best practices. Senior management at OCWA reviewed and agreed with the suitability of our objectives and associated criteria.

We conducted our audit from January to September 2021, and obtained written representation from OCWA's management that effective November 23, 2021, it has provided us with all the information it was aware of that could significantly affect the findings or the conclusion of this report.

Our audit focused on OCWA's operation and maintenance of drinking-water and wastewater facilities across the various regions. As part of the review, we

assessed the agency's processes to ensure that drinking water from the facilities it operates is safe and that wastewater is appropriately treated in accordance with legislation and regulations before it is discharged into lakes and other bodies of water. In this regard, we reviewed whether OCWA collected and tested water samples in accordance with legislated requirements in the case of drinking water, and Environmental Compliance Approvals in the case of wastewater. We also reviewed whether OCWA reported exceedances in contaminants to the Ministry of the Environment, Conservation and Parks (Ministry) as required. We compared the performance of OCWA-operated ministry regulated drinking water systems and wastewater systems with those operated by municipalities or private operators, with respect to adverse water-quality incidents; bypasses, overflows and spills; convictions and fines; and inspection results for all regulated treatment systems regardless of operator.

We toured a drinking-water and a wastewater facility operated by OCWA in the region of Peel (OCWA's largest client). We conducted jurisdictional comparisons to assess how municipalities in other jurisdictions conduct water and wastewater treatment. We spoke with representatives from the Association of Municipalities of Ontario and the Canadian Association of Municipal Administrators to understand the challenges and best practices in operating drinking-water and wastewater systems.

We conducted our work and reported on the results of our examination in accordance with the applicable Canadian Standards on Assurance Engagements—Direct Engagements issued by the Auditing and Assurance Standards Board of the Chartered Professional Accountants of Canada. This included obtaining a reasonable level of assurance.

The Office of the Auditor General of Ontario applies the Canadian Standards of Quality Control and, as a result, maintains a comprehensive quality control system that includes documented policies and procedures with respect to compliance with rules of professional conduct, professional standards and applicable legal and regulatory requirements.

We have complied with the independence and other ethical requirements of the Code of Professional Conduct of the Chartered Professional Accountants of Ontario, which are founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

4.0 Detailed Audit Observations

4.1 Mandate

4.1.1 OCWA's Role in Ontario's Water and Wastewater Services Unclear

According to the Ministry of the Environment, Conservation and Parks, OCWA's role in the water and wastewater industry is to fill gaps in the marketplace, especially for smaller remote and First Nations communities where private operators are unwilling to offer their services. The Ministry noted that some small municipalities may not have the expertise to operate water and wastewater systems by themselves or it may be difficult to find private operators who would be willing to operate systems in remote locations. According to the Ministry, OCWA is able and willing to deploy resources effectively across the province. However, we noted that OCWA has service contracts with only nine of the 133 First Nations communities in Ontario, six of which are for operating and maintaining water systems, and the rest are for other services such as capital work or consultations on ongoing capital projects.

OCWA is not required to provide services to small rural communities or First Nations at a subsidized price that does not result in cost recovery. We are unaware of any instances where OCWA knowingly entered into an operations and maintenance contract where it would not be able to recover its costs.

The Ministry also noted that OCWA can provide cheaper services than the private sector because it operates on a low-margin model and keeps its costs down due to its shared staffing model. However, there is no evidence that OCWA offers lower prices when

compared to its competitors. For the three-year period from 2018 to 2020, we reviewed OCWA's success rate when bidding for new clients, and noted that it was successful in only 45% of cases. It generally lost bids because of pricing.

When discussing the need for OCWA's presence in the industry, the Ministry could not name any special services OCWA provides that other operators cannot provide. The Ministry did note that OCWA is responsible for responding to drinking-water and wastewater emergencies for communities in need. The emergency response team staff are specially trained operations staff that are assigned these responsibilities in addition to their regular operating responsibilities. However, we noted that OCWA's emergency response teams have not been deployed for an emergency since 2017.

4.1.2 OCWA's Original Mandate of Cost Recovery Changed to Focus on Revenue and Income Growth

Originally, OCWA's mandate was "to provide reliable and cost-effective water and wastewater services on a cost-recovery basis." In 2010, the "cost-recovery basis" was dropped from its mandate to allow OCWA to earn a profit on its contracts and to play a role in making Ontario an innovation hub for all things water.

In April 2016, an external consultant completed a review of OCWA's current mandate to assess whether it remained relevant to the goals and priorities of the Government of Ontario. The report concluded that OCWA's mandate and its core business is not aligned with the goals and priorities of the Province. According to the review, OCWA was in the business of operating assets not owned by the Province and there were concerns about OCWA's continuous financial losses from operations.

The report recommended that an exit strategy should include a more formal review of options such as privatization and other alternatives, including transferring ownership to a shared service municipal corporation or a not-for-profit organization. The Ministry did not accept the primary recommendation

and noted that the perceived misalignment was overstated. A 2017 Ministry document indicated that, in the ministry's view, its 2014 and 2016 mandate letters laid out the expectation for OCWA to improve drinking water for Indigenous communities, and that financial concerns regarding OCWA were alleviated as its largest client had indicated its intent to enter into a new 20-year contract.

In our discussions with the Ministry, the Ministry told us that providing water and wastewater treatment is OCWA's priority. However, OCWA has approached the Ministry with plans for putting greater emphasis on loan financing and revenue growth. Through the approval of OCWA's 2020 business plan, the Ministry supports OCWA's approach towards revenue growth.

RECOMMENDATION 1

In order to clarify the role of the Ontario Clean Water Agency, we recommend the Ministry of the Environment, Conservation and Parks assess whether the agency's goals should focus on revenue and income growth or on providing cost-effective drinking-water and wastewater services to clients who need these services.

MINISTRY RESPONSE

The Ministry agrees that the Ontario Clean Water Agency (OCWA) continue to focus on providing cost-effective drinking-water and wastewater services to clients who need these services. These services are as important to rural, remote and First Nations communities, where it is often not viable for the private sector to operate, as they are to larger municipalities that seek a cost-effective alternative to their water/wastewater service needs. Revenue growth and cost-effective service delivery are not necessarily mutually exclusive.

The Ministry is working with OCWA to ensure the long-term sustainability of OCWA services and to enable the agency to support more clients, including First Nations communities, across the province.

4.1.3 Problem of Unsafe Drinking Water for First Nations in Ontario Persists, But Support from OCWA is Limited Despite the Mandate to Help Improve Drinking Water for First Nations

Drinking water advisories warn people that water is unsafe to drink. A "boil water" advisory warns that water is unsafe for consumption unless boiled because it has viruses, bacteria or parasites. A "do not consume" advisory is issued when contaminants, such as lead, are in the water and cannot be removed through boiling.

During our 2020 audit on Indigenous Affairs in Ontario, we noted that as of June 2020, there were 46 active long-term drinking-water advisories affecting 20% of Indigenous communities. Five of these were "do not consume" advisories and the remaining 41 were "boil water" advisories. The 46 water advisories represent 75% of all active long-term water advisories in Canada. On average they have been in place for 12 years. The report also noted that most of these drinking-water quality problems are the result of inadequate or malfunctioning infrastructure to treat the water.

As of July 2021, there were still 44 long-term water advisories active at 26 First Nation communities. According to Indigenous Services Canada, construction work is under way at 40 of the 44 water systems, and the other four systems are currently going through the feasibility and designing stage.

The federal government is responsible for the quality of drinking water on reserves and provides funding to develop, operate and maintain water-treatment facilities on reserves under the *Safe Drinking Water for First Nations Act*. The Ontario Government is responsible for regulating and creating standards of drinking water in off-reserve locations, such as municipalities.

During the period 2018 to 2020, OCWA provided drinking-water-related services to two First Nation communities with six water advisories. These two clients are still on the boil water advisory list despite OCWA working to support or operate their drinking

water systems. For Neskantaga (which has the longest active boil water advisory in Canada), OCWA responded to a call in November 2020 by the Neskantaga Chief and Council for emergency operating and maintenance support. OCWA also conducted a 14-day performance test on their drinking-water facility, and then performed minor modifications and provided training to the local water-treatment staff. Although OCWA has been providing operating and maintenance services since November 2020, it had not established a long-term operation and maintenance agreement with Neskantaga. For Mohawks of the Bay of Quinte, OCWA performs operations and maintenance for both drinking water and wastewater.

Over the last several years, the Minister (through mandate letters for 2018, 2020 and 2021) has stated that one of OCWA's priorities is to help improve drinking water for Ontario's First Nation communities. OCWA provides training and operational support services, including remote monitoring and oversight, to support First Nations in operating and maintaining drinking-water and wastewater systems within their communities.

In 2016, the then Ministry of the Environment and Climate Change established the Indigenous Drinking Water Projects Office to work collaboratively with the federal government and First Nation communities to support the development and implementation of sustainable sources for safe drinking water for on-reserve communities in Ontario. The Office provides engineering and technical advice, services and support, and has seven full-time employees and spends about \$600,000 annually. The Ministry considered transferring the functions and staff of the Indigenous Drinking Water Projects Office to OCWA in 2020, but decided against it because the transfer may be seen negatively by First Nation communities because OCWA planned to charge the First Nations for these services while the Ministry provided these services free of charge. OCWA had planned to assess First Nation water systems starting in 2020, but abandoned these plans once the transfer was cancelled.

In 2020, OCWA generated \$1.6 million in revenues from its First Nation clients. OCWA's current

strategic initiative for First Nation communities is to work to improve and maintain their drinking-water and wastewater systems, with a goal of supporting the development of sustainable drinking-water and wastewater solutions, including effective infrastructure management. OCWA also has plans to hire an employee dedicated to clients who are First Nations in the North. However, OCWA intends to achieve full cost recovery by the end of 2022 for the First Nation program. It plans to implement a First Nation client dashboard and maintain separate revenues and expenses tracking within its system for First Nations clients.

To address boil water advisories in Ontario's First Nation communities, a tri-partite committee was formed in September 2016 between the Ministry of the Environment, Conservation and Parks; the Department of Indigenous Services Canada; and the Chiefs of Ontario. OCWA is not directly involved in this committee.

Some of OCWA's plans and actions to support the First Nation communities include:

- In 2017, the OCWA Board established a First Nations Committee that regularly updates the Board on new/changes in First Nations business and long-term drinking water advisories.
- OCWA provides asset management planning support to the Ontario First Nations Technical Services Corporation, which was established in 1995 to provide expert technical advisory services to the First Nations in Ontario. The corporation receives most of its funding from Indigenous Services Canada.
- OCWA provides training to First Nation communities using federal funding through the Ontario First Nations Technical Services Corporation.
- In 2017 and 2018, OCWA installed six cloud-based remote-monitoring systems to allow for remote monitoring at Dalles, Eagle Lake, Wabaseemoong First Nation, and Shoal Lake, Wabigoon Lake Ojibway Nation and Wabauskang First Nation.
- OCWA plans to create a First Nations Advisory Circle of five to seven members to act as an advisory body in which participating First Nations will

share their advice, knowledge and unique experiences with OCWA on how the agency can enhance its partnerships with First Nation communities and better support their water and wastewater treatment needs and concerns. The goal is to have the advisory circle in place by September 2021.

According to the Ministry, the responsibility for drinking water of First Nation communities lies with the federal government. The Ontario government supports First Nation communities when asked, but regardless of provincial efforts, there may be broader issues with drinking-water advisories. The Ministry told us that issues include inadequate infrastructure and lack of education to operate the facilities. The Ministry's Indigenous Drinking Water Projects Office provides technical advice to First Nations, but is not responsible for drinking-water advisories. According to the Ministry, OCWA is not responsible for eliminating boil water advisories but instead is mandated to help improve drinking water for First Nation communities through training and operational support, as long as it receives payment for the services provided.

RECOMMENDATION 2

In order to improve the quality of water on First Nations and make it safe for human consumption, we recommend that the Ontario Clean Water Agency work with the Ministry of the Environment, Conservation and Parks and the federal government through the Ontario First Nations Technical Services Corporation to:

- create the First Nations Advisory Circle and implement any resulting recommendations by the advisory circle;
- complete assessments of First Nation community water systems for the 26 First Nation communities with boil water advisories; and
- provide training to First Nation operators once the water facilities' upgrades are completed.

OCWA RESPONSE

The Ministry and OCWA are committed to working with First Nations to help improve the quality

of water on their reserves and are establishing the First Nations Advisory Circle by the end of 2021. Advice and recommendations from the First Nations Advisory Circle will be reviewed by OCWA's Board of Directors and approved for management's implementation.

OCWA provides hands-on, site-specific training to First Nations operators when requested, as part of ongoing services to First Nations, and must receive permission before entering a community. OCWA will continue to work with First Nations and co-ordinate with the Walkerton Clean Water Centre, which is the lead for the provision of classroom training, to ensure all First Nation communities in the province with boil water advisories are aware of the training opportunities available and will receive the supports necessary.

4.2 Drinking Water Testing, Reporting Adverse Results, and OCWA's Performance

4.2.1 Drinking-Water Samples Collected and Tested According to Regulation

For a period of one month in 2020, we reviewed all water-quality tests for contaminants (microbiological, chemical, and radiological) for 10 drinking-water facilities (two facilities each from the Southwest, Northeast, South Peel, Essex and Eastern regions) operated by OCWA. Our purpose was to assess whether samples were collected and tested in accordance with legislated requirements. We found that all of the water samples we tested were taken in accordance with regulations and that OCWA was using Ministry-accredited laboratories to analyze the samples taken.

4.2.2. Few Exceptions Noted in Reporting Adverse Water-Quality Incidents

We analyzed the test results for drinking-water samples provided by accredited laboratories and recorded in OCWA's Process Data Management

System to assess whether all adverse water-quality incidents were communicated to the Ministry's Spills Action Centre and the local Medical Officer of Health in a timely manner. We noted the following:

- **Microbiological contaminants testing:** For the two-year period from 2019 to 2020, we compared all laboratories' results in the Process Data Management system for all drinking-water facilities to the incidents reported to the Ministry for two microbiological contaminants, *E. coli* and total coliforms. We noted that all adverse water-quality incidents were reported in a timely manner (within 24 hours) to the Ministry and the Medical Officer of Health.
- **Chemical contaminants testing:** For the five-year period from 2016 to 2020, we compared all laboratories' results in the Process Data Management system for all drinking-water systems to the incidents reported to the Ministry for four chemical contaminants (trihalomethanes, haloacetic acids, sodium and fluoride). We noted two instances of adverse trihalomethane results that were not reported and one instance of delays in reporting adverse haloacetic acids results to the Ministry's Spills Action Centre and the local Medical Officer of Health. The length of the reporting delay was six days.

4.2.3 Ministry Does Not Set Benchmarks for Resolving Adverse Quality Incidents

When we asked the Ministry about which adverse water-quality incidents were more critical or how long it should take to address them, the Ministry noted that there is no best practice or benchmark for the length of time it should take to address issues. According to the Ministry, aging infrastructure, equipment malfunctions, sampling errors and impacts on source water (such as from spills and drought conditions) may cause adverse test results in drinking water. According to the Ministry, regular monitoring and sampling is required to ensure that water-quality issues are identified and that swift action is taken to resolve them. In addition, adverse water-quality

incidents range in complexity and the time needed to resolve them is affected by many factors, such as the type of contaminant that is exceeded (e.g., microbiological versus chemical). The Ministry noted that it requires owners and operators to continue to undertake corrective action(s) until the system is providing safe drinking water, and for this reason it would not be appropriate to assign a benchmark.

4.2.4 OCWA Performs Well Compared to Municipal Operators and Private Operators in terms of Adverse Water-Quality Incidents, But Lags in Timely Resolutions

The Ministry collects data on exceedances in water-quality standards (referred to as adverse water-quality incidents) on all municipal residential drinking-water systems. We reviewed Ministry data for the last five fiscal years (2016/17 to 2020/21) to assess how OCWA performed relative to other operators in relation to the number of incidents of exceedances in water-quality standards by facility and the average amount of time taken to resolve those exceedances.

As seen in **Figure 2**, we found that OCWA performed well against private operators and municipally run facilities when comparing the number of incidents per facility overall for chemical and microbiological contaminants. However, for other types of contaminants, in some years OCWA reported a slightly higher number of incidents per facility than privately run facilities. The other category includes incidents such as low chlorine, loss of pressure, chlorine residual, equipment malfunction such as water main break, loss of power, high turbidity, and low UV dosages. These other categories are generally less critical to human health (except for the boil water advisories).

As seen in **Figure 3**, we found that OCWA generally resolved chemical and microbiological exceedances in drinking water at municipal systems sooner than the average time it took for all operators. However, OCWA took longer to resolve exceedances in other contaminants compared

Figure 2: Adverse Drinking-Water Incidents at Municipal Systems Operated by Ontario Clean Water Agency (OCWA), Municipalities and Private Operators, 2016/17–2020/21

Source of data: Ministry of the Environment, Conservation and Parks

	Number of Incidents			Incidents per Facility		
	OCWA Operated	Municipally Operated	Privately Operated	OCWA Operated	Municipally Operated	Privately Operated
Chemical						
2016/17	37	357	60	0.21	0.80	0.88
2017/18	38	260	59	0.22	0.60	0.78
2018/19	43	268	61	0.24	0.62	0.84
2019/20	42	217	48	0.23	0.51	0.67
2020/21	36	237	31	0.20	0.56	0.44
Microbiological						
2016/17	59	658	27	0.34	1.48	0.40
2017/18	61	588	36	0.35	1.36	0.47
2018/19	57	484	23	0.32	1.12	0.32
2019/20	54	537	36	0.30	1.25	0.50
2020/21	45	498	19	0.25	1.17	0.27
Other*						
2016/17	170	477	60	0.98	1.07	0.88
2017/18	153	496	84	0.88	1.15	1.11
2018/19	187	475	64	1.05	1.10	0.88
2019/20	138	436	58	0.77	1.02	0.81
2020/21	109	435	39	0.60	1.02	0.55

denotes the type of operator that performed the best (i.e., they had the lowest incidents per facility) that year.

* Other includes incidents of low chlorine; loss of pressure; high chlorine residual; equipment malfunction such as water main break; boil water advisory; loss of power; high turbidity; and low UV dosages.

to those operated directly by municipalities or private operators.

According to OCWA, it does not compare its total or per unit number of adverse water-quality incidents to municipally or privately-operated system incidents because each drinking-water system is unique. OCWA's management told us that it does compare the Ministry's inspection rating results for facilities it operates to those facilities operated by others.

In responding to the length of time taken to resolve issues, OCWA management notes that each adverse water-quality incident is the result of site-specific circumstances and the actions necessary to resolve the issues. OCWA management stated that it always seeks to resolve all adverse water-quality issues as

quickly as possible. However, as discussed in 4.2.3, it does not have any internal benchmarks for resolving such events.

4.2.5 Convictions of Drinking-Water System Operators

As of May 2020, 27% of Ministry-regulated municipal residential drinking-water systems were operated by OCWA, 63% were operated by municipalities, and the remaining 10% were operated by private operators. We reviewed convictions for operators of the regulated municipal residential drinking water systems and noted that over the last five years (2016-2020), OCWA received three convictions related to drinking water (two for false statements/improper log entries

Figure 3: Average Days Taken to Resolve Adverse Drinking-Water Incidents at Municipal Systems by Type of Operator, 2016/17–2020/21

Source of data: Ministry of the Environment, Conservation and Parks

	Ontario Clean Water Agency	Municipalities	Private Operators	Overall Average
Chemical				
2016/17	46.7	100.1	133.7	100.4
2017/18	9.7	12.0	7.1	11.0
2018/19	41.4	45.4	43.4	44.7
2019/20	67.3	60.5	68.7	62.5
2020/21	43.6	60.7	85.8	61.9
Microbiological				
2016/17	15.6	22.9	68.3	24.0
2017/18	3.9	5.5	3.4	5.2
2018/19	10.8	8.9	3.2	8.9
2019/20	42.4	92.6	28.8	84.5
2020/21	3.4	14.1	10.6	13.1
Other*				
2016/17	29.2	13.7	29.1	18.8
2017/18	4.4	3.3	5.0	3.7
2018/19	10.2	9.2	21.2	10.5
2019/20	63.2	50.8	93.3	56.9
2020/21	16.9	13.1	35.1	15.3

denotes the lowest average number of days to resolve incidents of water exceedances.

denotes the years when OCWA performed worse (i.e., on-average it took longer to resolve adverse drinking water incidents) than both municipal and private operators.

* Other includes incidents of low chlorine; loss of pressure; high chlorine residual; equipment malfunction such as water main break; boil water advisory; loss of power; high turbidity; and low UV dosages.

and one for employing an operator with an expired licence); its fines totalled \$90,000. Over the same period of time, we noted that municipal operators received 11 convictions, but with lower fines totalling \$42,900. Private operators did not have any convictions for the five-year period. As of September 2021, the Ministry had ongoing water-related investigations at one OCWA-operated drinking-water system and at five municipally operated drinking-water systems. The Ministry had no ongoing investigations at privately operated drinking-water systems.

4.2.6 More Boil Water Advisories per Facility Issued for OCWA-Operated Municipal Drinking-Water Systems over the Last Five years

All adverse drinking-water incidents are reported to the local medical officer of health, who can issue a boil water advisory based on the severity of the incident. Over the last five years, as seen in **Figure 4**, OCWA has had slightly more boil water advisories per facility than municipal-run systems and privately-operated systems. Generally, it has resolved each advisory in less than 30 days on average, except for the fiscal year 2019/20.

Figure 4: Boil Water Advisories at Municipal Drinking-Water Systems Operated by Ontario Clean Water Agency (OCWA), Municipalities and Private Operators, 2016/17–2020/21

Source of data: Ministry of the Environment, Conservation and Parks

Fiscal Year	Number of Advisories			Advisories per Facility			Average Days Taken to Resolve Advisories		
	OCWA	Municipal Operators	Private Operators	OCWA	Municipal Operators	Private Operators	OCWA	Municipal Operators	Private Operators
2016/17	27	20	9	0.16	0.04	0.13	27.0	24.6	57.3
2017/18	15	29	8	0.09	0.07	0.11	5.6	6.0	6.5
2018/19	24	17	2	0.13	0.04	0.03	3.7	15.8	25.2
2019/20	12	17	6	0.07	0.04	0.08	63.6	53.9	59.6
2020/21	8	30	6	0.04	0.07	0.08	15.4	17.5	34.8
Total	86	113	31	-	-	-	-	-	-
Five-year Average	-	-	-	0.10	0.05	0.09	20.8	20.9	38.2

denotes the type of operator that performed the best in the year.

denotes the years when OCWA performed worse (i.e., it had more boil water advisories per facility) than both municipal and private operators.

4.2.7 Nearly a Quarter of Adverse Water-Quality Incidents at OCWA's Municipal Drinking-Water Systems Occurred at Five Water Systems

In 2020, OCWA operated 181 municipal drinking-water systems. In 2019 and 2020, 65 water systems (36%) had no adverse water-quality incidents and 89 water systems (49%) had less than five incidents over the two years combined. The remaining 27 (15%) had at least five incidents over the same two-year period. We followed up with municipal systems that had more than seven incidents in either 2019 or 2020, as seen in **Figure 5**. These facilities accounted for 24% of incidents in municipal drinking water systems operated by OCWA over the last two years.

RECOMMENDATION 3

In order to provide safe and reliable water services, we recommend that the Ontario Clean Water Agency assess the turnaround times taken to resolve adverse water-quality incidents and take steps to expedite the resolving of such incidents.

OCWA RESPONSE

The Ontario Clean Water Agency agrees with the Auditor General that resolving adverse water-quality incidents is extremely important. OCWA will look into how current turnaround times for adverse water quality incidents can be improved.

4.3 Wastewater Testing, Performance and Environmental Impact

4.3.1 OCWA-Operated Wastewater Facilities Generally Reported Incidents of Non-compliance, but Missed Some Required Testing

Influent and effluent monitoring requirements are specific to each of OCWA's wastewater treatment facilities, and are noted in each facility's Environmental Compliance Approval (Approval). However, OCWA has not inputted the Approval parameters and corresponding limits for each of its wastewater treatment facilities into its Process Data Management system. Because of this, the system cannot automatically flag exceedances in treated wastewater quality. At the time of our audit, OCWA was working to add concentration limits into the system for all regulated

Figure 5: Ontario Clean Water Agency's (OCWA) Municipal Water Systems with Seven or More Adverse Water-Quality Incidents, 2019–2020

Source of data: Ministry of the Environment, Conservation and Parks

Municipal Drinking-Water System	Number of Incidents			Cause of Incidents	Action Taken to Resolve Incidents
	2019	2020	Total		
South Peel Distribution System	18	15	33	Hydraulic Pump and other water main leaks.	Watermain and valves repaired/replaced as issues occurred.
Schreiber Drinking Water System*	18	7	25	The facility's licence prescribed a chlorine disinfection process that used a level of chlorine that caused exceedances in haloacetic acids and other chemicals.	At the time of our audit, the Ministry was in the process of revising the facility's licensing requirements for the level of chlorine to be used in the disinfection process.
Geraldton Drinking Water System	9	10	19	Watermain breaks, and a loss of pressure after installing a new valve and hydrant.	The assets that failed were repaired or replaced.
Fenelon Falls Drinking Water System	6	9	15	Elevated levels of chlorine needed for disinfection led to trihalomethanes and haloacetic acids levels exceeding limits.	In September 2019, the Ministry approved an ultraviolet treatment as the primary disinfection process, which was implemented in fall 2020.
Verner Drinking Water System	8	0	8	The facility used a chlorine dioxide disinfection process because of the poor quality of incoming water, which led to water-quality issues.	OCWA implemented a new disinfection process in June 2020 to eliminate the need for chlorine dioxide disinfection. The filter was also upgraded, and no issues were noted in 2020.
Total incidents	59	41	100		
% of total for all municipal drinking-water systems operated by OCWA	25	22	24		

* OCWA was fined \$30,000 in October 2020 for failing to immediately report an adverse turbidity test result in 2017.

facilities by September 2022, as part of its Business Transformation Project (discussed in **Section 4.13**).

We obtained data on the sample testing of wastewater that had been completed at OCWA-operated wastewater treatment facilities in 2020. We selected 25 facilities in total from five regions (Eastern, Northeastern, Northwestern, Southwest and Waterloo) and obtained their respective Approval documents to see whether they complied with the sampling and monitoring requirements set out in their Approvals. We compared the sampling frequency (daily, weekly, monthly, annually) required

under each facility's Approval to the sample testing data, and the test results against the limits prescribed in their respective Approvals. The testing checked for traces of the eight most common contaminants noted in Environmental Compliance Approvals: biochemical oxygen demand, carbonaceous biochemical oxygen demand, total kjeldahl nitrogen, total phosphorus, total suspended solids, and total ammonia nitrogen, pH and E. coli (see **Appendix 3** for a glossary).

For the 25 facilities we selected, we noted that with one exception OCWA staff sampled the

wastewater in accordance with the testing frequency established in each facility's Approval and reported exceedances to the Ministry as required.

The exception we noted involved one facility where OCWA staff sampled for total kjeldahl nitrogen only 29 times in calendar year 2020 instead of 52 times as required by its Approval. OCWA told us the error in testing frequency occurred because its staff had been using an old testing schedule with incorrect sampling dates. OCWA had not identified this error in testing frequency until we brought it to its attention, at which point OCWA reported the non-compliance to the Ministry.

Lab Testing Done by Approved Labs

We also checked the sample testing data to see whether OCWA facilities were using approved labs to process the wastewater test samples. We selected 10 wastewater facilities from five regions (Northeastern, Waterloo, Kawartha Trent, Georgian

Highlands and Eastern), and confirmed that the samples of wastewater were analyzed by Ministry-accredited laboratories.

Five Facilities with Most Exceedances Over the Last Two Years (2019 and 2020)

In the last five years (2016-2020), 119 (or 71%) of OCWA's 167 wastewater facilities and related systems reported two or fewer incidents of contaminant exceedances in their final effluent (that is, treated wastewater discharged to a body of water). The remaining 29% reported more than two exceedances each during the same five-year period. We noted that five facilities had more than five reported exceedances in their final effluent in 2019 or 2020. We followed up with OCWA staff to understand the cause of the exceedances at these five facilities and to confirm whether corrective action was taken (see **Figure 6**). We noted that OCWA had recommended or taken corrective action at all five facilities.

Figure 6: OCWA-Operated Wastewater Facilities with More Than Five Reported Contaminant Exceedances in Final Effluent, 2019–2020

Source: Ministry of the Environment, Conservation and Parks

Wastewater Treatment Plant	Number of Exceedances			Reason for Exceedances	Corrective Action Taken by OCWA
	2019	2020	Two-Year Total		
Shelburne Wastewater Treatment Plant	39	0	39	Major maintenance and repairs in 2019, during which time only half of wastewater was being fully treated (planned bypass from April to June 2019).	OCWA completed the maintenance work in 2019; 2020 had no exceedances.
Arthur Wastewater Treatment Plant	8	11	19	High amounts of ammonia in the influent stemming from the activities of a chicken-processing plant in the area.	OCWA is monitoring the chicken-processing plant's wastewater to identify issues earlier.
South Woodslee Water Pollution Control Plant	3	6	9	Multiple types of exceedances resulting from mechanical and equipment failures.	In 2020, OCWA recommended capital improvements to the client to replace failing assets.
Kirkland Lake Wastewater Treatment Plant	6	1	7	Mechanical failure of a clarifier tank. Exceedances occurred during a three-month period in 2019 when repairs were being done.	OCWA completed the repairs within three months.
Wellesley Wastewater Treatment Plant	7	0	7	Bypasses in April 2019 because of heavy rain, as well as plant upgrades that reduced the plant's capacity.	OCWA completed the upgrades in 2019 and the plant did not note any exceedances in 2020.

Note: Only facilities that are regulated by the Ministry of the Environment, Conservation and Parks are included.

4.3.2 Environment Compliance Approvals for OCWA-Operated Wastewater Facilities Not Standardized

Of the 167 regulated wastewater facilities operated by OCWA, 125 (or 75%) had their Environment Compliance Approval (Approval) issued prior to 2018, as shown in **Figure 7**. The terminology and requirements for older Approvals are significantly different from newly issued Approvals, particularly relating to wastewater bypasses and overflows. According to OCWA, Approvals issued before 2018 do not typically mention or define a bypass or overflow, so wastewater affected by either of these events is subject to different standards at different facilities. According to a new requirement in Approvals issued after 2018, treated wastewater that is combined with wastewater that has bypassed a part of the treatment process must be tested at the time of discharge into the environment to ensure it meets the compliance limits stipulated in the Approval.

Further, Approvals issued after 2018 require operators to test overflows for contaminants as well, although it does not require them to report the test results.

Because of these differences, facilities operating under older (pre-2018) Approvals may be

Figure 7: Year of Issue for Environmental Compliance Approvals at OCWA-operated Wastewater Treatment Facilities

Source of data: Ministry of the Environment, Conservation and Parks

	# of Environmental Compliance Approvals Issued	% of Total Environmental Compliance Approvals
1970-1979	5	3
1980-1989	14	8
1990-1999	15	9
2000-2009	33	20
2010-2017	58	35
2018-2021	42	25
Total	167	100

Note: Only facilities that are regulated by the Ministry of the Environment, Conservation and Parks are included.

understating their exceedances compared to facilities operating under newer Approvals (post-2018).

We selected a sample of 10 Environment Compliance Approvals issued to OCWA-operated facilities between 1978 and 2007 to assess how many included requirements for testing for bypasses and overflows. We also looked at whether the Approvals included a requirement to submit an annual wastewater report to the Ministry and a requirement to test for E. coli. We noted that none of the Approvals had a testing requirement of a bypass or an overflow. In addition, four facilities were not required to submit an annual report to the Ministry. We also noted that six of the 10 facilities did not have a requirement to test their final effluent (discharged wastewater) for E. coli.

The Ministry told us it is aware of these differences in the Environment Compliance Approvals, and acknowledged that it started using a standardized Approval template in 2018. The Ministry told us that, as of September 2021, about 20% of wastewater treatment plants have been issued a new standardized Approval. It does not plan to update the terms of the older Approvals until system owners apply to amend their Environment Compliance Approvals.

RECOMMENDATION 4

In order to collect comparable and reliable data on the quality of wastewater effluent, we recommend that the Ministry of the Environment, Conservation and Parks proactively standardize Environmental Compliance Approvals for all wastewater systems regardless of whether any amendments are made to the wastewater systems by:

- including consistent definitions and testing requirements for bypasses and overflows;
- requiring test results be included in annual reports to the Ministry of the Environment, Conservation and Parks; and
- requiring operators to test key wastewater contaminants.

MINISTRY RESPONSE

The Ministry agrees with the Auditor General's recommendation and has already implemented action to improve how wastewater effluent data is collected, including moving to a standardized template, with consistent definitions and monitoring and reporting requirements, for municipalities to use when amending their current Environmental Compliance Approval. The template is being used by over 100 municipalities. The Ministry is working to update this template for Spring 2022, at which time it will assess expanding its use.

4.3.3 Few Owners of Wastewater Facilities with High Number of Bypasses/Overflows Not Taking Timely Action to Prevent Them

Over the last five years (2016 to 2020), 121 (or 72%) of OCWA's 167 wastewater facilities and related systems have reported five or fewer combined events of bypasses or overflows. The remaining 28% have reported more than five events of bypasses or overflows.

As seen in **Figure 8**, we took a closer look at the five facilities that had more than 10 reported bypass or overflow events in 2019 or 2020 to understand the causes and what actions were being taken to address them. We also reviewed OCWA's annual major maintenance report for these facilities to assess whether OCWA had identified the need for improvements to prevent future incidents of overflows and bypasses. For four of the five facilities, OCWA operates both the collection and treatment systems and made recommendations to address the issues. Of these four facilities, two clients had not taken action to address OCWA's recommendations. Without corrective action, the facilities will continue to experience bypasses and overflows. For the other remaining facility (Stratford Wastewater Treatment), OCWA is only responsible for the treatment process, and the issues originated in the collection process. The City of Stratford is planning an upgrade to reduce infiltration of its collection system in 2021/22.

RECOMMENDATION 5

In order to detect and/or prevent adverse wastewater events such as overflows, bypasses and contaminant exceedances, we recommend that the Ontario Clean Water Agency:

- input all testing schedules into its information system to alert operators of upcoming tests; and
- follow up that owners take timely corrective action to address the cause of overflows/bypasses and contaminant exceedances.

OCWA RESPONSE

OCWA will look at how routine sampling schedules could be implemented into the Workplace Management System (Maximo), with work orders issued as reminders, and work orders closed as confirmation of the sampling being completed.

OCWA agrees that it is important to follow up with system owners. Clients are provided an annual capital recommendation report that prioritizes compliance and facility improvements. If the owner does not implement the recommended improvement projects, they become a reoccurring request to the owner. OCWA will follow up with owners to encourage that timely corrective actions are taken.

4.3.4 Climate Change Risk Acknowledged but Response Initiative Not Being Proactively Supported by OCWA

Climate change is acknowledged by OCWA's senior management as a key risk. Accordingly, OCWA has identified a number of initiatives to mitigate this risk. In order to be able to cope with severe climate change events, OCWA has enhanced the training of its emergency response teams and provided the emergency response teams with new flood-containment equipment to address potential flooding and other climate change events across the province. OCWA has completed emergency plans for each facility. We reviewed a sample of emergency plans for 10 facilities that

Figure 8: OCWA-Operated Wastewater Facilities with More Than 10 Reported Bypasses/Overflows, 2019–2020

Source: Ministry of the Environment, Conservation and Parks

Facility (type of service) and Region	# of Bypasses or Overflows			2020 Average Daily Flow Rate Compared to Daily Capacity	Causes	Corrective Action Taken by OCWA
	2019	2020	Two- Year Total			
Wellesley Wastewater Treatment (collection and treatment) <i>Waterloo</i>	21	18	39	98%	Capacity issues and high flows related to rain.	OCWA recommended expansion, but the client has no plans to expand capacity.
Stratford Wastewater Treatment (treatment) <i>Midwest</i>	12	8	20	51%	Rain leading to storm water infiltrating the collection system.	OCWA did not take action, but a capital project is planned by the City of Stratford for 2021-2022 to reduce infiltration of the collection system.
Longlac Wastewater Treatment (collection and treatment) <i>Northwest</i>	17	2	19	58%	Rain leading to storm water infiltrating the collection system.	OCWA recommended the facility owner make equipment repairs to prevent excessive bypassing, which Municipality of Greenstone completed in 2020.
Galt Wastewater Treatment (collection and treatment) <i>Waterloo</i>	13	5	18	51%	End-of-life sand filters struggling hydraulically during rain.	In 2019, OCWA recommended the facility owner (Region of Waterloo) replace sand filters (\$60,000 cost); at the time of our audit the upgrades were not done. However, the Region of Waterloo has started a large capital project that is expected to replace the sand filters in late 2021 or early 2022.
G.E. Booth (Lakeview) Wastewater Treatment (collection and treatment) <i>South Peel</i>	11	1	12	86%	High flows related to rain.	OCWA and Region of Peel are in the process of expanding the capacity of the treatment facility.
Total reported bypasses and overflows	74	34	108			
% of total for all wastewater facilities operated by OCWA	35%	24%	30%			

Note: Only facilities that are regulated by the Ministry of the Environment, Conservation and Parks are included.

OCWA identified as having higher risk of flooding, and noted that climate change impacts were assessed for these facilities.

One of OCWA's key initiatives on climate change is to work with clients to develop an asset management plan with a stronger focus on climate change impacts on critical assets. However, not all clients who would benefit from this service are receiving it, as the asset management plan is offered as a fee-for-service upon request by the client. At the time of our audit, OCWA was in the process of developing asset management plans with climate change impacts for 14 clients, which is only 7% of the 201 clients that had operating and maintenance contracts with OCWA in 2020. OCWA has created an in-house process and resources that can support additional clients if asset management plans are requested by them.

RECOMMENDATION 6

In order to support its municipal clients in addressing the risk of climate change and its impact on critical assets, we recommend that OCWA work with its clients to ensure that asset management plans are in place to address the risks of climate change.

OCWA RESPONSE

OCWA remains committed to working with clients to address the impacts of climate change and the risks posed to critical water and waste-water infrastructure. Climate change risks are currently part of asset management plans provided to clients on a fee-for-service basis. Climate change risks will be included when engaging with clients as part of the capital planning process.

4.3.5 OCWA Performs Well Compared to Municipal and Private Operators on Bypasses and Overflows, But Not on Contaminant Exceedances and Timely Resolutions

We reviewed data collected by the Ministry of the Environment, Conservation and Parks in the last

five years (2016 to 2020) to compare OCWA's wastewater performance with that of municipal operators and other private operators. Based on our review, we found that OCWA performed well against these other operators in terms of the number of bypass/overflow incidents. As shown in **Figure 9**, the number of bypass and overflow incidents at OCWA-operated wastewater facilities was less on a per facility basis (1.20) than those operated by municipalities (2.76) or private operators (1.79).

However, when it came to the number of times the final effluent in a wastewater facility exceeded the permitted level for any contaminant, or the amount of time on average taken to resolve an exceedance, OCWA's performance was mixed. As seen in **Figure 10**, over the five-year period from 2016 to 2020, we found that OCWA averaged more exceedances per facility (0.62) compared to the municipal operators (0.52) and private operators (0.58). In addition, as seen in **Figure 11**, in 2020 OCWA took on average almost the same amount of time as private operators to resolve wastewater reported exceedance, but on average 15 days longer than municipal operators. We also noted that private operators performed better on average in resolving wastewater exceedance than OCWA for each of the last four years (2017 to 2020).

4.3.6 Convictions of Wastewater System Operators

In 2020, 31% of Ministry-regulated wastewater facilities were operated by OCWA, 57% were operated by municipalities and the remaining 12% were operated by private operators. We reviewed convictions of wastewater operators and noted that over the last five years, OCWA received one conviction, and a fine for \$50,000, for discharging odours at the Wasaga Beach facility. Over the same period of time, we noted three convictions with total fines of \$80,000 for municipal operators and no convictions or fines for private operators. As of September 2021, neither OCWA nor any private or municipal operators had any ongoing wastewater investigations.

Figure 9: Bypasses and Overflows in Wastewater Treatment Facilities¹ Operated by OCWA, Municipalities or Private Operators, 2016–2020

Source of data: Ministry of the Environment, Conservation and Parks

Year	OCWA Operated			Municipal Operators			Private Operators		
	# of Bypass/Overflow Incidents	# of Facilities	# of Incidents per Facility	# of Bypass/Overflow Incidents	# of Facilities	# of Incidents per Facility	# of Bypass/Overflow Incidents	# of Facilities	# of Incidents per Facility
2016	173	166	1.04	689	300	2.3	39	55	0.71
2017	303	166	1.83	1,153	298	3.87	60	57	1.05
2018	161	164	0.98	789	303	2.6	131	66	1.98
2019	213	165	1.29	851	301	2.83	159	67	2.37
2020	143	167	0.86	668	303	2.2	166	65	2.55
Five-Year Total	993	-	-	4,150	-	-	555	-	-
Five-Year Average	-	-	1.20	-	-	2.76	-	-	1.79

denotes the type of operator that performed the best in the year (i.e., had the fewest incidents per facility).

1. Only facilities that are regulated by the Ministry of the Environment, Conservation and Parks are included.

Figure 10: Exceedances at Wastewater Treatment Facilities¹ Operated by OCWA, Municipalities and Private Operators, 2016–2020

Source of data: Ministry of the Environment, Conservation and Parks

Year	Ontario Clean Water Agency			Municipal Operators			Private Operators		
	# of Exceedances	# of Facilities	Average Exceedance per Facility	# of Exceedances	# of Facilities	# of Incidents per Facility	# of Exceedances	# of Facilities	# of Incidents per Facility
2016	78	166	0.47	155	300	0.52	26	55	0.47
2017	116	166	0.70	137	298	0.46	54	57	0.95
2018	113	164	0.69	179	303	0.59	27	66	0.41
2019	152	165	0.94	228	301	0.76	47	67	0.70
2020	62	167	0.37	91	303	0.30	27	65	0.42
Five-Year Total	521	-	-	790	-	-	181	-	-
Five-Year Average	-	-	0.62	-	-	0.52	-	-	0.58

denotes the type of operator that performed the best in the year (i.e., had the fewest exceedances per facility).

denotes years when OCWA performed worse (i.e., had more exceedances per facility) than both municipalities and private operators.

1. Only facilities that are regulated by the Ministry of the Environment, Conservation and Parks are included.

4.3.7 Significant Amounts of Biosolids Still Being Sent to Landfills

The wastewater treatment process produces sewage biosolids (organic waste in both solid and liquid forms) that are then either incinerated, sent to a

storage lagoon or landfill, or further processed and applied to farmland.

We gathered biosolid disposal information on the top 20 OCWA-operated wastewater sites in 2020 in terms of population served. These sites serve almost 2.7 million people in total. As shown

Figure 11: Average Days to Resolve Exceedances at Wastewater Treatment Facilities¹ Operated by OCWA, Municipalities and Private Operators, 2016–2020

Source of data: Ministry of the Environment, Conservation and Parks

Year	OCWA Operated	Municipal Operators	Private Operators	Average per Year
2016	33.0	33.9	38.0	34.1
2017	35.3	33.4	34.5	34.3
2018	30.3	34.7	27.4	32.5
2019	29.7	34.9	23.2	31.8
2020	50.2	34.7	49.2	42.2
Average by Operator	34.0	34.4	33.2	34.1

denotes the lowest average number of days to resolve incidents of wastewater exceedances.

denotes years when OCWA performed worse (i.e., took longer to resolve exceedances on average) than both municipalities and private operators.

1. Only facilities that are regulated by the Ministry of the Environment, Conservation and Parks are included.

in **Appendix 4**, for the sites that produced biosolids, most biosolids in solid form were either incinerated (48%) or applied to farmland (32%); in both of these cases, the biosolids undergo further tests or processing before releasing to the environment. However, over 4,000 tonnes of these biosolids were sent directly to landfills without further testing or processing, which contributes to climate change because the biosolids release both carbon dioxide and methane (very potent greenhouse gases) into the air.

Similarly, most biosolids in liquid form were either sent to lagoons (52%) or applied to land (21%). However, over 14,600 cubic meters of liquid biosolids are still being sent to landfills.

Testing of Biosolids for Farmland Application Done as Required

Wastewater facilities that generate biosolids for land application at farms are regulated under the *Nutrient Management Act, 2002*. As set out in O. Reg. 267/03 of the Act, the biosolids must be tested for the presence of 11 different metals (including arsenic, copper, lead and mercury), E. coli and other parameters to prevent environmental damage to farmland. For municipal wastewater treatment plants, the biosolids must be sample-tested bi-weekly, and depending on the design capacity of the treatment plant, between two and four samples should be taken during the two-month period before the transfer date and between

one and two samples should be taken one month before the transfer date. The facility's sewage works approval may require additional sampling and analysis of biosolids.

For the two regions that we inspected, only one facility had sent biosolids to farmland. This facility sent 73% of its biosolids for land application and the remaining went to landfill. Based on our review of testing records for 2020, biosolid testing was performed as required for the two months prior to the transfer.

4.3.8 OCWA Pilot Projects to Reduce Greenhouse Gas Emissions and Divert Biosolids from Landfills Are Limited and Moving Slowly

OCWA's mandate letter states that it should increase waste diversion by supporting the development and implementation of renewable energy centres that use wastewater and concentrated organic waste to generate biogas for productive use. With the proposed ban on organic waste in Ontario landfills commencing in 2030, municipalities are either building new facilities to process organic waste or are leveraging existing assets and modifying existing plants to process organic waste using co-digestion. Co-digestion is the process of using anaerobic digestors (bacteria) to break down organic matter and produce biogas, a

renewable energy source that can be upgraded and then injected into natural gas pipelines. It therefore has the dual benefit of reducing the amount of biosolids destined for landfill, and reducing greenhouse gases by capturing methane (a by-product of the anaerobic digestion of organic waste) and preventing its emission into the atmosphere. In Ontario, there are currently 68 anaerobic digestors, 16 of which are located in OCWA-operated wastewater facilities.

OCWA has several projects in the works to help achieve these goals. The Stratford Net Zero project includes co-digestion and the production of renewable natural gas, and OCWA estimates it will reduce the equivalent of 49,000 tons of carbon dioxide by the end of the facility's first year of operation. The Stratford project is in the final stages of design and is estimated to go into the construction phase by the end of 2021. According to OCWA, this project received the first co-digestion Environmental Compliance Approval in Ontario from the Ministry. The Petawawa Net Zero project is also progressing, and is expected to divert 7,000 tonnes of organic waste away from landfills once implemented. This project is now in the initial design phase.

In addition to these projects, OCWA has conducted or plans to conduct four feasibility studies for Belleville, Cornwall, Georgian Bluffs, and Timmins related to co-digestion, and five feasibility studies for Espanola, Essex, Carleton Place, Renfrew and Greenstone related to biosolids diversion. Its goal is to implement two or more projects by end of 2021. So far, the feasibility study for two projects have been completed and the remaining clients are in the initial phases of the study. According to OCWA, there have been delays in completing the studies because of the COVID-19 pandemic and because of changes in municipal councils and shifting municipal priorities. Also, OCWA told us that the uptake on these types of projects is often slow because municipal clients are generally reluctant to take the lead on such pilot projects, and instead prefer to wait and see other municipalities successfully implement them first.

RECOMMENDATION 7

In order to support its municipal clients in meeting the 2030 goal of diverting organics away from landfills and reduce greenhouse gas emissions, we recommend that the Ontario Clean Water Agency work with all of its municipal clients who send their biosolids to landfills to implement the new environmentally friendly initiatives focusing on reduction of greenhouse gases through co-digestion or other related initiatives.

OCWA RESPONSE

OCWA recognizes the importance of diverting biosolids away from landfills in order to reduce greenhouse gas emissions. Therefore, OCWA will increase efforts to engage with and present options to its municipal clients to co-develop resource recovery, biosolids management and cogeneration solutions. However, municipalities are responsible for, and are the ultimate decision-makers on these issues. OCWA will provide technical support, business/partnership development, and collaborate on funding support for these projects. While co-digestion is not an option that can be utilized by all of OCWA's municipal clients, the agency will discuss options that fit best in each individual community.

4.4 Reporting of Bypasses, Overflows and Spills

4.4.1 Bypasses and Spills Occurring at OCWA-operated Wastewater Facilities Reported to the Ministry as Required

Each wastewater facility's Environment Compliance Approval outlines the requirements for notifying the Ministry's Spills Action Centre of any bypasses, overflows and spills, including the date, time and, in the case of bypass, which treatment process was bypassed and the reasons for the bypass. Notification to the Spill's Action Centre is required immediately, which typically means within 24 hours. The facility is

also required to collect a sample of the final effluent during the bypass event and analyze it for contaminants; and within 10 working days of the occurrence, it must submit a full report of the event to the Ministry describing the cause and the preventative measures being taken to address the event.

Extent of Bypasses, Overflows and Spills at OCWA-Operated Wastewater Facilities

In 2020, OCWA-operated facilities experienced a total of 81 bypasses and 61 overflows. Two regions accounted for 65% of all bypasses (Waterloo-26 and Northeastern-26) and two regions accounted for 54% of all overflows (Northeastern-25 and Eastern-10).

Figure 12 shows a three-year summary of the number of bypasses, overflows and spills for OCWA-operated facilities in 2020. Based on our review of five facilities in **Section 4.3.3** that had more than 10 reported bypass or overflow events in 2019 or 2020, we noted that many of these events occurred due to heavy rain leading to storm water infiltrating the sewage collection system.

Reporting on Bypasses/Overflows at OCWA-Operated Wastewater Facilities

OCWA's corporate office could not provide a detailed summary and pertinent records of all bypasses and

overflows/spills for 2020. Therefore, we reached out to the six regions that had experienced most events in 2020, as shown in **Figure 12**, for more details. We selected a sample of 10 facilities for testing; they had a total of 44 bypasses/overflows in 2020. Based on our testing, we noted that OCWA complied with the Ministry's reporting requirements by notifying the Ministry's Spills Action Centre by phone and submitting a report to the Ministry within 24 hours of the event occurring; submitting a more complete report summarizing the details of the event within 10 working days; and testing the bypassed effluent for the listed contaminants.

Reporting on Spills at Wastewater Facilities

We also reviewed seven facilities that reported a total of 12 spills in 2020. We found supporting evidence that the Ministry was notified of the incidents within 24 hours and a full written report of each occurrence was submitted within the required 10 working days. The reports described, among other things, the cause, clean-up, and preventative measures taken.

For the 12 spills we reviewed, the spills were attributed to equipment failure (3), operator/human error (2), chemical reaction with industrial discharge (2), weather conditions (2), site maintenance

Figure 12: Number of Bypasses, Overflows and Spills Reported by OCWA-Operated Facilities¹ by Region, 2018–2020

Source of data: Ministry of the Environment, Conservation and Parks

Region	2018			2019			2020		
	Bypasses	Overflows	Spills	Bypasses	Overflows	Spills	Bypasses	Overflows	Spills
Northeastern	40	22	3	27	31	5	26	25	5
Waterloo	25	5	4	40	6	3	26	7	0
Eastern	3	0	2	14	19	2	3	10	2
Midwest	3	10	0	3	12	0	6	5	0
Essex	4	11	1	2	6	1	6	9	0
Northwestern	4	1	0	22	4	0	1	2	1
Kawartha Trent	14	2	0	9	0	0	6	1	1
South Peel	5	5	0	10	1	0	1	0	2
Georgian Highlands	1	0	2	5	1	0	3	2	8
Southwest	4	2	3	1	0	2	3	0	0
Huron-Elgin	0	0	0	0	0	2	0	0	0
Other ²	0	0	0	0	0	0	0	0	1
Totals	103	58	15	133	80	15	81	61	20

1. Only facilities that are regulated by the Ministry of the Environment, Conservation and Parks are included.

2. Neskantaga First Nation Reserve

(1), order discharge (1), potential fuel spill (1). The majority of the spills could have been prevented with proper maintenance, better training and oversight, better planning and by working with nearby industrial clients. In the case of wet weather and unknown causes, spills may not have been preventable. See **Appendix 5** for details on the spills.

4.4.2 Ministry's Public Database on Spills and Bypasses Lacks Detail to be Informative

For the spill reported to the Ministry in 2020, we compared OCWA's spill information to the Ministry's public database on spills posted on the Ontario Data Catalogue. We were able to find all spill reports submitted by OCWA in the Ministry's records. However, a lot of key information was missing from the Ministry's database, such as the start time and end time of the event, the name of the facility where the spill occurred, the volume of the spill, the environmental impact caused by the spill, and sufficient information on the cause. It is important for a public database to have all of the key spill details because it directly impacts the environment and may also impact the people and wildlife living in the surrounding areas. Similarly, for four bypass events we reviewed, the Ministry's database did not show the total volumes of wastewater that bypassed the full treatment process, as well as the duration of the events, even though this information had been communicated by OCWA to the Ministry. In our 2021 audit report titled *Hazardous Spills*, we also comment on the incomplete information about spills in the Ministry's public database.

RECOMMENDATION 8

In order to inform the public about the details of bypasses, overflows and environmental spills, and to notify recreational water users of the risks of potentially contaminated waters, we recommend the Ministry of the Environment, Conservation and Parks publicly report all relevant details about bypasses, overflows and spills in a timely manner, including the start time and end time of

the event, the name of the facility where the event occurred, the volume of the bypass, overflow or spill, the complete cause of the event, and the environmental impact caused by the event.

MINISTRY RESPONSE

The Ministry takes spills very seriously and agrees that providing timely data on spills is very important. The Ministry is looking into posting all relevant details on environmental occurrences and spills, to the public Open Data Catalogue, in an accessible format. In addition, the Ministry is committed to improving transparency and helping to ensure the public is aware of bypasses and overflows. In the 2020 Budget, the Province announced \$10 million over two years to provide support for wastewater monitoring and public reporting and to improve transparency around sewage overflows and bypasses. This funding program is expected to be launched shortly and will focus on areas where the funding can have the greatest impact. Eligible municipalities would be expected to make a sustained effort to monitor/model all sewage overflows and bypasses and publicly report them in as close as possible to real-time.

4.5 IT Issues

4.5.1 OCWA's Monitoring System is Unable to Identify Adverse Test Results

All drinking-water and wastewater testing results are entered into OCWA's Process Data Management system (also known as the Water Information System). This data comes from various sources through various different means. For example, operators can either manually input their in-house test results, while external lab testing reports are directly uploaded into the Process Data Management system. As well, a supervisory control and data acquisition (SCADA) system monitors the inflow and outflow of drinking water and wastewater at each metering station, water tower, pumping station

and plant in the water system and sends the data wirelessly to a central hub where it can be viewed by an operator; the system also sends alerts when alarms are triggered. Sample results from the SCADA system are automatically uploaded into the Process Data Management System. This system can validate, correct and aggregate the data it receives, and produce compliance reports, maps and dashboards on water quality.

However, we found that the Process Data Management system does not contain:

- the maximum allowable concentration limits for substances tested during the treatment of either drinking water or wastewater; and
- the maximum amount of water a drinking-water treatment facility can take from the lake on a periodic basis.

Therefore, the system cannot flag exceedances in water-sampling test results or water intake. This is left to facility operators and regional compliance managers. It also does not permit central monitoring by the corporate compliance team, which is responsible for supporting overall compliance.

For the treatment of drinking water, the maximum allowable limits for the substances tested are specified in a regulation to the *Safe Drinking Water Act, 2002*, and are consistent across all facilities. The limits on how much water can be taken to process drinking water is unique to each facility and is outlined in their individual Permit to Take Water, issued by the Ministry of the Environment, Conservation and Parks. Allowable limits from the regulation and from Permits to Take Water have not been uploaded into the Process Data Management system.

As noted in **Section 4.3.1**, for the treatment of wastewater, testing requirements and allowable limits are outlined in each treatment facility's Environmental Compliance Approval (Approval). However, Environmental Compliance Approvals are not uploaded into the Process Data Management system. They are also not stored centrally by the corporate compliance team responsible for supporting overall compliance at all of OCWA's facilities. Instead,

regional offices keep records of all Approvals for the facilities in the region.

According to senior staff responsible for corporate compliance, OCWA is working on adding information contained in individual Approval documents into the Process Data Management system. The corporate team told us that the responsibility for testing, ongoing monitoring and reporting adverse results to the Ministry remains solely with the regional hubs and that the role of the corporate compliance team is to provide support and compliance tools to the regions and address systemic non-compliance issues across OCWA's facilities. The corporate compliance team uses information reported by the regions to compile a central list of exceedances. However, this information is less reliable because it does not come directly from the system, making it more difficult for the corporate compliance team to monitor and address frequently occurring exceedances.

RECOMMENDATION 9

In order to have all adverse results for both drinking-water and wastewater facilities identified and investigated in a timely manner by regional hubs, we recommend that the Ontario Clean Water Agency have:

- regional hubs input all maximum concentration limits for testing parameters at both drinking-water and wastewater systems into the Process Data Management system;
- regional hubs input all Permit to Take Water limits into the Process Data Management system; and
- its corporate compliance team monitor the testing results to confirm adverse results are reported to the Ministry by regional hubs, verify that any adverse trends in test results are investigated, and take corrective actions when necessary.

OCWA RESPONSE

OCWA agrees with the recommendation and regional hubs will input all site-specific maximum

concentration limits for testing parameters at both drinking-water and wastewater systems into the Process Data Management system. As operational centres around which regional services and capacity are delivered, regional hubs are well placed to input this site-specific information.

OCWA also agrees with the recommendation to input Permit to Take Water limits into its system. OCWA will begin implementation, expected to be completed in three years.

OCWA agrees that the corporate compliance team should monitor testing and ensure adverse results are reported to the Ministry. System upgrades will be required to monitor these activities at the corporate level. These upgrades are part of the Business Transformation Program, and will enable the monitoring of testing and reporting of adverse test results. Timeline for completion is the end of 2023. OCWA will verify that any adverse trends in test results are investigated and corrective action is taken.

4.5.2 OCWA's Cybersecurity Plan Needs Improvement

Cybersecurity is a critical function to ensure secure, continuous and effective operations for organizations. The risks of cyberattacks are increasing and it is essential for organizations to have strong controls in place to mitigate the risk of cyberattacks. Recently, a water plant in Florida was targeted by hackers who used the SCADA system's software to increase the amount of sodium hydroxide used in the water-treatment process. Also, a 2011 report by the Illinois Statewide Terrorism & Intelligence Center entitled "Public Water District Cyber Intrusion" detailed its initial findings of anomalous behaviour in a SCADA system at a Central Illinois public water district.

Since 2018, OCWA has not tested its disaster-recovery plan to assess its ability to recover its operations in the event of a disaster, such as a cyberattack or an outage. According to industry best practice, organizations should perform a comprehensive

disaster-recovery test at least once a year. We also noted that OCWA does not have a secondary data centre in the event that its primary data centre experiences a disaster. A secondary data centre is an alternate facility that is equipped with critical IT infrastructure components, such as servers, network equipment and software, to restore business operations quickly in an event that the primary data centre is unavailable. OCWA's senior management acknowledges cyberattacks as a key risk, and OCWA is currently in the process of setting up a secondary data centre to be completed by June 2022.

In addition, organizations typically perform penetration testing on their IT network and critical IT systems to identify and mitigate cybersecurity weaknesses. We found that although OCWA conducted a vulnerability assessment in November 2020, it has never performed a comprehensive cybersecurity scan, such as penetration testing, to further identify cybersecurity vulnerabilities. According to industry best practices, it is recommended that penetration tests be performed at least annually or anytime there is a major change made to IT systems.

Similarly, OCWA performed a threat risk assessment in 2018 and has not performed another one since, despite major changes to its IT systems through the Business Transformation project.

RECOMMENDATION 10

To protect itself more effectively against the risk of cyberattacks, safeguard client assets and help ensure continuity of services with minimal disruption, we recommend that the Ontario Clean Water Agency test its cybersecurity systems annually or anytime there are changes made to critical systems, specifically by:

- penetration testing its IT systems;
- implementing a secondary disaster recovery site;
- testing its disaster-recovery plan; and
- performing a threat risk assessment.

OCWA RESPONSE

OCWA recognizes the importance of securing its systems from cyberattacks and other IT system risks. OCWA will complete penetration testing by the end of December 2022, and will conduct annual penetration testing thereafter.

OCWA is in the process of setting up a new disaster recovery site, to be completed and tested by December 2022. Disaster recovery plan testing will be completed by December 2022. A complete Threat Risk Assessment will be completed by December 2022.

4.6 Asset Management and Maintenance

4.6.1 OCWA's Preventative Maintenance and Asset Planning Not Based on Age or Performance of Assets

OCWA publicly reports that it manages more than \$20 billion in municipal infrastructure. However, OCWA does not have key information on the age, cost or performance data for most of the assets it manages.

An analysis of an asset's criticality, age and performance helps to determine just the right time to maintain, rehabilitate or replace it in order to achieve a good balance of cost, reliability and risk over the lifecycle of the asset. Proper performance monitoring of an asset includes tracking the number of failures or performance issues and any needed repairs.

As of June 5, 2021, OCWA's clients had 54,565 assets consisting of water tanks, lagoons, sludge holding tanks, power generators, water filters and chlorine analysers. These assets are operated by

OCWA and are listed in its asset management system. Of these assets, we found that:

- 71% (or 38,741) had no known installation date and, as a result, the age of the assets is unknown to both OCWA and its clients.
- 42% (or 22,881) did not include a purchase price or an estimated replacement cost.
- none had any performance score, even though the system contains a field to track performance scores for each asset. (According to OCWA, the performance score is a recent initiative and OCWA is working toward inputting data into this field over the next few years.)

Without sufficient information on the age and performance of the assets, these assets are more susceptible to emergency repairs or unexpected failures. The lack of this information also impacts the effectiveness of long-term asset management planning. **Figure 13** shows the number of client assets that OCWA tracks in its asset management system.

OCWA's mandate letter states that one of its priorities is to "work with clients to develop comprehensive, long-term asset plans for their water and wastewater systems." However, without having access to key asset information such as age, performance rating, cost and replacement cost, it is difficult to properly maintain, anticipate replacements and develop a long-term asset management plan.

As OCWA currently does not analyze asset failure data, it is hard to measure the effectiveness of the preventative maintenance work. When OCWA takes on a new client, the assets at the client location are tagged (each asset gets an asset number) and an automated preventative maintenance plan is created for each asset based on the type of asset. However, without

Figure 13: Information Tracked for Client Assets, as of June 2021

Source of data: Ontario Clean Water Agency

	Type of Information Tracked		
	Cost or Replacement Price	Age	Performance
# of client assets where this information is tracked	31,684	15,714	0
# of client assets where this information is not tracked	22,881	38,851	54,565
Total	54,565	54,565	54,565

tracking additional information specific to each asset, OCWA currently follows the same routine preventative maintenance schedule for all assets without considering the age, performance or condition of the assets.

Problems with Asset Management Are Known, But No Action Taken

OCWA hired an external consultant in 2017 to review OCWA's asset management practices. The consultant's findings were similar to what we noted during our audit. The consultant's main observations included:

- overall, OCWA's approach to maintenance is reactive instead of proactive;
- OCWA is unable to assess the effectiveness of preventative maintenance;
- the ratio of preventative maintenance to corrective maintenance is not measured and reported;
- critical assets are not identified and work priorities are not set based on asset criticality; and
- OCWA cannot work to optimize the preventative maintenance schedules of its assets because its asset management system does not include any data on asset performance and reliability/failures. For example, OCWA's engineering group cannot review asset reliability data to help prioritize maintenance schedules and improve overall asset management based on assets' health status and trends.

We followed-up with OCWA on the status of the consultant's recommendations and learned the agency was not tracking the status of the recommended items.

Emergency Work Orders and Corrective Actions Declining Overall, but Increasing at Some Sites

Over the last three years, from 2018 to 2020, the number of work orders for preventative work such as preventative maintenance and operational work (that is, regular duties such as sampling, cleaning, lab work) have increased or remained steady, as shown in **Figure 14**. And reactive work such as emergency maintenance, corrective maintenance (non-urgent) have declined, and after-hour call-backs (where an operator must attend to an issue onsite outside of regular hours) have increased.

We followed up with five sites that had the most reactive work orders (emergency, corrective maintenance or after-hour call-backs) in 2020. We found increasing trends for this type of work order at four of the five sites, and we noted that OCWA had not investigated the reasons for the increase in reactive work at these sites.

We also reviewed the annual Recommendations for Capital/Major Maintenance Plans for these five sites and found no direct correlation between the assets recommended for replacement and the assets that had the most issues. This is mainly due to OCWA not tracking all preventative and corrective

Figure 14: Number of Work Orders by Type, 2018–2020

Source of data: Ontario Clean Water Agency (Maximo, Hansen, Megamation, and Lucity)

Type of Work Order	2018	2019	2020	% Change
Preventative Maintenance ¹	105,024	97,802	105,898	1
Operational ^{1,2}	9,254	10,160	11,293	22
Corrective Maintenance	14,612	11,118	9,754	(33)
After-Hours Call-Back	7,203	8,123	7,769	8
Capital/Projects works	3,495	3,659	3,507	0
Emergency Maintenance	2,616	2,325	2,019	(23)
Admin/Training	1,053	1,017	874	(17)
Total	143,257	134,204	141,114	(1)

1. Considered preventative work.

2. Set up to capture employees' time for regular duties such as labs, cleaning, taking samples, etc.

work orders against assets listed in its asset management system.

According to OCWA, there could be a few reasons that contribute to OCWA not recommending assets that have the most reactive/corrective work for replacement. One such reason is when OCWA is aware that the client has plans to replace or upgrade these assets. However, OCWA could not identify which assets were planned to be replaced or upgraded for the five sites we reviewed. Other reasons OCWA noted for not recommending assets that have the most reactive/corrective work for replacement was the clients' inability to fund equipment replacements, and the client's differing approaches on replacement decisions, as some clients might run the asset to failure before replacing them.

Annual Recommendations for Capital/Major Maintenance Plans to Clients

We reviewed OCWA's 2019 and 2020 Capital/Major Maintenance Plans for a sample of 10 facilities (20 plans in total) to assess whether the plans provided sufficient information for the client to make informed spending decisions. A good plan will include the current age and condition of the assets, the number of times an asset has failed recently, the criticality of the asset (how important it is to the operation of the plant), the cost of replacement, and how the recommended change will improve performance.

Based on our review, the plans for three sites lacked a rationale for all assets recommended for replacement in either of the two years. The other seven sites provided some rationale, but no failure data on the asset being recommended for replacement and only limited information on the age and condition of the asset. One of the clearest examples of a rationale provided by OCWA to its client was "Existing Blower has failed several times in 2019 and is currently out of service. Needs to be replaced in order to comply with existing Environmental Compliance Approval." In addition, four of the 10 sites failed to assign a criticality level to all assets being recommended for replacement in either of the two years.

Furthermore, only two of the 10 facilities were tracking whether the recommended replacements were approved by the client. We also noted that only two of the 10 facilities were tracking the progress of the recommended items.

RECOMMENDATION 11

In order to effectively manage the water and wastewater infrastructure for its clients and recommend timely replacements of related assets, we recommend that the Ontario Clean Water Agency (OCWA):

- work with its clients to identify the installation dates of critical assets, so that the useful life of assets can be tracked and managed accordingly;
- use failure data and repair data to drive preventative maintenance and asset management plans;
- develop key performance indicators for asset management that will allow OCWA to measure the effectiveness of preventative maintenance work orders;
- focus efforts on improving performance at sites with increasing number of corrective and emergency work orders;
- track all preventative and corrective work orders against assets;
- provide sufficient information to clients in annual recommendations included in Capital/Major Maintenance Plans prepared for clients; and
- track the progress of these recommended replacements.

OCWA RESPONSE

OCWA agrees that the management of water and wastewater infrastructure is critically important. OCWA will capture the replacement cost and year of installation followed by a performance score for critical assets at OCWA-operated facilities, allowing for assets to be better tracked and managed. Completion is anticipated by mid-2024.

OCWA agrees that failure and repair data is useful information for maintenance planning. OCWA will use the information available to enhance maintenance and long-term asset care planning.

OCWA agrees with this recommendation and will continue to develop the Workplace Management System (Maximo) dashboards that show planned, reactive, and preventative maintenance information with the goal of reduced emergency failures as a best practice.

OCWA will enhance its current practice to have hub management and operations staff review, track and communicate issues to clients, and recommend appropriate interventions.

OCWA acknowledges the need to properly track preventative and corrective work orders. As such, OCWA is now tracking Preventive and Corrective work orders in the Workplace Management System (Maximo). OCWA is also in the process of developing Asset Data Standards in an effort to build capacity in data stewardship and move OCWA to industry best practices for the documentation and tracking of data against assets.

OCWA will provide clients with the best available information to assess recommendations presented for capital/major maintenance plans.

OCWA will work to standardize the tracking of asset maintenance and upgrade recommendations and client implementation of the recommendations.

4.7 Ministry Monitoring

4.7.1 OCWA-Operated Drinking-Water Facilities Get High Marks in Ministry Inspections

The Ministry of the Environment, Conservation and Parks inspects municipal residential drinking-water systems every year. The purpose of the inspections is to check whether drinking-water system owners and operators are complying with the *Safe Drinking Water Act, 2002* and its associated regulations. The Ministry

assigns a rating for each inspection it conducts. The rating is calculated based on the number of areas where a system is deemed to be non-compliant during the inspection, and the significance of these areas to administrative, environmental, and health consequences. According to the Ministry, a rating below 80% indicates that there are serious non-compliance issues or many less serious issues of non-compliance that have added up.

In the annual Chief Drinking Water Inspector's report, the Ministry reports the percentage of water systems that score 100% and the percentage of systems that score below 80%. According to the 2019-2020 Chief Drinking Water Inspector's report, 71% of the province's 657 municipal residential drinking-water systems received a 100% rating. Only 0.3% (or two systems) received a rating of 80% or below. Neither of these was operated by OCWA.

Figure 15 shows that, overall, operators in the province performed well on Ministry inspection ratings with an average four-year rating of 98.5%. However, municipally-operated systems consistently scored slightly higher than OCWA-operated facilities.

4.7.2 Owners of Water-Treatment Systems Do Not Always Report Operator Changes to the Ministry as Required

Owners of drinking-water and wastewater treatment systems must register their systems with the Ministry and keep operator profile information up to date, otherwise the Ministry may attribute adverse water-quality issues to the wrong operator. We compared the list of OCWA-operated facilities maintained by the Ministry with information in OCWA's database and noted 15 drinking-water facilities had operator's information that was not accurately captured in the Ministry's database. According to the Ministry, the operator's information for all 15 facilities was based on the profile information submitted by the drinking water system owners to the Ministry.

Figure 15: Average Ministry Inspection Rating¹ for Municipal Residential Drinking-Water Facilities, 2016/17 – 2019/20 (%)

Source of data: Ministry of the Environment, Conservation and Parks

Fiscal Year	OCWA- Operated Facilities	Municipally Operated Facilities	Privately Operated Facilities	Annual Average Rating
2016/2017	98.4	98.6	98.1	98.5
2017/2018	98.4	98.8	98.2	98.6
2018/2019	98.6	98.5	97.6	98.4
2019/2020	98.0	98.6	98.2	98.4
Four-Year Average	98.4	98.6	98.0	98.5

denotes the type of operator that had the highest average rating on ministry inspections in the year.

denotes years when OCWA performed worse (i.e., its average rating was lower) than both municipalities and private operators.

1. One in three inspections conducted by the Ministry are unannounced.

RECOMMENDATION 12

In order to maintain and publicly report accurate information about the operators responsible for drinking-water and wastewater systems, we recommend that the Ministry of the Environment, Conservation and Parks annually remind owners to report to the Ministry in a timely manner when there is a change to the operators of their facilities.

MINISTRY RESPONSE

The Ministry agrees with the Auditor General's recommendation to remind municipal wastewater system owners to report changes in operators on an annual basis.

4.8 Internal Monitoring

4.8.1 OCWA Did Not Conduct Compliance Audits Using Corporate Staff from 2016 to 2020, While it Revamped its Compliance Program

Prior to 2020, OCWA's internal compliance consisted of Facility Assessment Reviews, Compliance Audits and Annual Drinking Water Quality Management Standards Audits.

- **Facility Assessment Review:** a checklist-based review conducted by regional staff to assist in monitoring the facility's compliance with

applicable environmental and occupational health and safety requirements.

- **Compliance Audits:** an expanded/more comprehensive version of the Facility Assessment Review conducted according to auditing principles by regional compliance advisors at the corporate level. It includes a detailed examination of the specific regulatory requirements for the site being assessed.
- **Annual Drinking Water Quality Management Standards Internal Audit:** Mandated through the *Safe Drinking Water Act, 2002*, an operating authority must conduct this internal audit at least once every calendar year to maintain municipal residential drinking-water systems accreditation. This can be done without visiting the site; however, the auditor must conduct an onsite audit once every three years. For OCWA, this audit is conducted by an external provider, SAI Global. Because they are mandated, these audits were still occurring during the 2016 to 2020 period. Over the last three years, OCWA paid SAI Global \$541,000 for these audit services (\$161,000 in 2018, \$273,000 in 2019 and \$107,000 in 2020). OCWA told us it did not complete any compliance audits using corporate staff from 2016 to 2020 while it revamped its audit approach. The regional compliance advisor's position at the corporate level (which was responsible for performing the audits)

was eliminated in August 2016. A new compliance manager position, called the Safety, Process and Compliance Manager, was introduced at the regional level. Early in 2016, two of five regional advisors left; one retired and the other two moved to the new regional compliance manager role.

A new audit and compliance process was implemented in 2021, led by a regional Safety, Process and Compliance Manager. It mainly focuses on:

- **Integrated Systems Audit:** designed to evaluate each OCWA facility's Quality & Environmental Management System (which lists procedures and policy requirements) and Occupational Health & Safety System process, to ensure compliance with legislative, contractual and other requirements.
- **Safety, Process and Compliance Audits:** designed to evaluate facility performance against specific environmental and health and safety compliance requirements, and to identify areas of concern/deficiencies. The regional compliance manager is responsible for conducting these audits for the selected facility in their regional hub.

OCWA plans to conduct its integrated system audit or the Safety, Process and Compliance audit once every five years.

In addition, according to OCWA, it did not conduct any Facility Assessments in 2020 due to the COVID-19 pandemic. At the same time, it was undergoing a new audit transformation so the Facility Assessment Reviews were discontinued. **Figure 16** presents statistics on facility assessment reviews for the last six years. According to OCWA's corporate compliance, the new Safety, Process and Compliance Audits are

similar to facility assessments. During our review, we compared the scope of the discontinued Facility Assessment Reviews and Compliance Audits and noted that all relevant items are being covered under both the Integrated Systems Audit and the Safety, Process and Compliance Audits. The Integrated Systems Audit is an enhanced version of the Facility Assessment Reviews (which used a checklist approach). Similar to the Compliance Audit, the Safety, Process and Compliance Audit includes a detailed examination of the specific regulatory requirements for the site being audited and is similar to the Compliance Audit.

4.8.2 Audit Selection Methodology Can be Improved to Focus on Risk of Non-Compliance

Starting in 2021, OCWA selects facilities for Integrated Systems Audits and Safety, Process and Compliance Audits annually based on expected coverage of approximately 20% of each region's facilities. The goal is to complete either an Integrated Systems Audit or a Safety, Process and Compliance Audit at each facility every five years. OCWA assesses the following 10 risk factors to select facilities for audit: identification as high-risk by operations management; significant upgrades or changes in operational/compliance requirements; ownership by a new client; regulatory investigation or enforcement; high staff turnover; near-miss health and safety events; pending WSIB claims; health and safety incidents; issues identified during operational reviews (not audits); and status of client relations or contracts. Once the risks are

Figure 16: Status of Drinking-Water and Wastewater Facility Assessment Reviews Completed Annually, 2016–2021

Source of data: Ontario Clean Water Agency

	2016	2017	2018	2019	2020	2021*
# of assessments completed	29	40	37	33	0	2
% of assessments with issues identified	86	93	95	91	0	100
# of issues identified	152	253	204	115	0	9
# of issues identified per audit	5.24	6.33	5.51	3.48	0	4.5
# of issues addressed	152	253	204	109	0	0
# of issues outstanding	0	0	0	6	0	0
% of issues outstanding	0	0	0	5.5	0	0

* In 2021, the Facility Assessment Review was replaced with an Integrated Systems. The number of assessments completed are as of September 2021.

assessed, OCWA's corporate compliance team consults with regional staff to finalize the facilities for audit. According to OCWA, all new clients must undergo a Safety, Process and Compliance Audit in the first year.

We found that OCWA does not consider Ministry inspections, SAI Global audits, or exceedances and bypasses as part of the risk factors for audit selection. In 2021, 95 facilities were selected for an Integrated Systems Audit or Safety, Process and Compliance Audit. We compared the list of facilities selected to the list of facilities that experienced the most operational and water-quality issues (such as bypasses/overflows and exceedances) in the last two years (2019 and 2020) to assess whether the audit selection process appropriately considered these issues. We noted that only one of the 10 facilities with the most bypasses/overflows over the last two years was selected for an audit in 2021. Of the 10 facilities with the most exceedances in drinking water in 2019 and 2020, OCWA selected four for audits; and, of the 10 facilities with most exceedances in wastewater in 2019 and 2020, OCWA selected four for audits. None of the facilities with compliance issues identified in SAI Global audits in 2019 and 2020 were included in the 2021 audit selection. Additionally, of the 10 drinking water and 10 wastewater facilities with the highest number of non-compliance issues identified by Ministry inspections in the past two years, we noted that no wastewater facilities and only four water facilities were selected for audit.

Since our audit in 2008, the number of facilities assessment reviews conducted on an annual basis decreased by over 90% to 33 in 2019 (from over 400 in 2008) because OCWA implemented a risk-based selection process in 2009.

In the absence of OCWA's internal compliance audits and Facility Assessment Reviews, the only independent source for identifying incidents of non-compliance at its facilities are Ministry inspections and the annual Drinking Water Quality Management Standard internal audit. For a list of the top 10 non-compliance issues noted in Ministry inspections from 2016 to 2020, see **Appendix 6** (for drinking-water systems) and **Appendix 7** (for wastewater

systems). Wastewater issues stem from non-compliance with the Environmental Compliance Approval for a facility. Because the Ministry only conducts inspections annually for drinking-water treatment facilities and much less frequently for wastewater treatment facilities (as seven out of ten wastewater facilities we selected had not been inspected since at least 2019), there could be non-compliance issues that go undetected in between Ministry inspections.

Although OCWA's corporate compliance team records the issues noted in Ministry inspections, it does not track whether issues have been addressed. According to the compliance director, the purpose of tracking the Ministry's findings is to find common themes and trends to improve processes. The corrective actions are each region's responsibility and the Ministry inspector always follows up to ensure a corrective action plan is submitted. The regions do not report to the corporate compliance team on the status of issues noted during Ministry inspections. In our discussions with the Ministry, it does not track turnaround times on inspection findings. The Ministry inspector requires an action plan to be submitted by OCWA to correct the noted items, but a follow-up is done at the discretion of the Ministry inspector if the action plan is not sufficient to address the findings. OCWA regional staff do not track the turnaround time on Ministry's findings.

Compliance auditors under the new program report directly to the regional manager. This reporting structure, however, could increase the risk that compliance auditors, who are meant to provide independent recommendations, will be influenced by their regional managers. However, OCWA's management believes that this approach is better than the corporate auditor approach because the regional managers want to improve as well and get better ratings on Ministry inspections. And the auditors, being regional staff, are more familiar with the facilities and can be used with a more targeted approach by the regional manager. All audit findings from the new audit program will be uploaded to the central system, but there are no plans for the corporate compliance team to ensure corrective action is taken.

OCWA's corporate compliance team does not ensure that all adverse water-quality incidents are reported to the Ministry. According to section 18 of the *Safe Drinking Water Act, 2002*, all adverse water-quality test results from either the lab or direct testing by OCWA are to be reported to the Spills Action Centre and the local Medical Officer of Health. Because the corporate office's Process Data Management system is not capable of identifying and flagging non-compliant test results, regional staff are responsible for reporting incidents to the Ministry instead. (Please see **Section 4.5** for a discussion of the limitations of OCWA's Process Data Management system).

RECOMMENDATION 13

In order to fully manage compliance with the regulation and guidelines, we recommend that the Ontario Clean Water Agency:

- include exceedances, bypasses, Ministry inspection findings, and the findings of internal control inspections (by SAI Global) as part of its risk-based audit selection criteria for its new Integrated Systems Audits and Safety, Process and Compliance Audits; and
- centrally track at the corporate level the findings from all internal audits and Ministry inspections and ensure that the regions are taking the necessary corrective actions on a timely basis.

OCWA RESPONSE

OCWA agrees with the Auditor General's recommendation and will review the selection criteria to ensure that the agency is capturing the non-compliance indicators.

OCWA agrees that it can improve tracking of internal audits and Ministry inspections. The implementation of the planned Business Transformation Project for Compliance and Health and Safety will improve corporate monitoring and follow-up on corrective actions.

4.9 Measuring and Reporting on Performance

4.9.1 OCWA Does Not Publicly Report on Water Quality, and its Performance Measures and Related Targets are Constantly Changing

OCWA produces an annual report in which it assesses its performance on four strategic initiatives. These initiatives, although reworded each year, retain the same meaning and are focused on: delivering total solutions to clients; increasing productivity, efficiency and effectiveness; delivering value to communities and the Province; and supporting employees.

For each strategic initiative, we reviewed OCWA's performance measures, related targets and reported results in its annual reports from 2016 to 2020. We noted weaknesses with performance measures, the targets set and the reporting of results.

Under its initiative to deliver value to communities and the Province, OCWA has not developed performance measures for the quality of the drinking water or treated wastewater leaving the treatment facilities it operates. OCWA does not report on exceedances in contaminants and adverse water-quality incidents for OCWA-operated drinking-water facilities as a whole, nor does it report on exceedances in contaminants and the number of bypass events, overflows and spills for OCWA-operated wastewater facilities as a whole. OCWA also does not report the average annual inspection rating Ministry inspectors assigned to OCWA-operated drinking-water facilities. Some of this information is available on the Ministry's website (which lists, for example, adverse quality incidents by owner and inspection ratings for drinking-water treatment facilities by operator) or is reported by individual client municipalities (for example, in their respective municipal drinking water reports or wastewater annual facility reports). However, it would be beneficial to have high-level consolidated information in one place to allow the public to assess how well OCWA is delivering on its mandate to provide safe and reliable drinking water and treated wastewater that protects human health and the environment. We reviewed OCWA's performance in these areas in

Section 4.2 (drinking water) and **Section 4.3** (wastewater) and OCWA generally performs well in comparison with municipal operators and private operators, in terms of adverse water quality incidents at drinking water facilities and bypasses/overflows occurring at wastewater facilities.

Under its initiative to support employees, OCWA has useful performance measures related to the health and safety of employees that it has tracked for at least the last five years. For example, it has reported on the annual reduction in the agency's lost time injury rate and the annual reduction in the agency's recordable incident rate (which tracks the number of employees that have a recordable injury for every 100 full-time employees in the organization). However, another useful performance measure, the percentage of eligible operators that upgraded their drinking-water or wastewater treatment licences or certificate from a Class 2 to a Class 3 licence (Class 4 is the highest), was only tracked in 2017 and then abandoned. In that year, the agency did not reach its target of 20%. With respect to the health and safety measures, we noted that the agency often set future targets that were significantly worse than the performance achieved the year before. For example, OCWA set a target of 1.6 in 2020 for the recordable incident rate, when lower rates were achieved in each year from 2017 to 2019 and the worst rate achieved in any one of those years was 1.09. Similarly, OCWA set a target of 0.42 in 2020 for the lost-time injury rate, when lower rates were achieved in each year from 2017 to 2019 and the highest rate achieved in any of those years was 0.33.

As part of its initiative to support employees, OCWA states it wants to be a welcoming and inclusive place to work by promoting the benefits of a diverse workplace and addressing gaps in diversity and inclusion. However, OCWA has not identified what the diversity gaps are and there are no quantifiable measures on the types of diversity gaps that currently exist or are being targeted. The only measure being

reported is about creating a strategy for diversity and inclusion in the workplace.

We also noted that some of OCWA's performance measures are milestones rather than performance measures. Example of milestones include: regional hub structure to be fully implemented by the end of the year; First Nations advisory circle established and an action plan to be developed by the end of the year; Enterprise Resource Planning system implementation to be complete by the end of the year; requirements developed and vendor selected for an asset management solution by end of the year; and development of a new community-based strategy for supporting the elimination of long-term boil water advisories.

We also noted that some performance measures are activity-based rather than outcome-based, so they do not measure the actual impact or outcome of OCWA's efforts. For example, for a marketing campaign called "I Don't Flush," designed to discourage people from throwing garbage in the toilet, the target was set for 10 million media interaction or views by the public. The campaign features a website, twitter feed, Facebook page, public service announcements, as well as features in print and television media across the province. As of January 2020, phase four of the campaign had received more than 24 million media impressions. However, the outcome of the media impressions is not being measured to determine whether the marketing campaign resulted in improvement. Currently, OCWA has no plans to assess if the campaign has resulted in less garbage entering the wastewater treatment facility.

In terms of reporting performance results, we noted instances where the result for the year was not reported. For example, in the 2020 annual report, no results were reported for 15 of the 27 total performance measures because seven performance measures were meant to be achieved in future years and eight were deemed delayed because of the COVID-19 pandemic.

4.9.2 Unlike Measures Reported Publicly, Internal Performance Measures Focus on Drinking-Water and Wastewater Incidents

On a quarterly basis, OCWA management reports key performance and compliance results to the Board of Directors and the Compliance, Operational Risk Management Committee (sub-committee of the board). These performance measures focus on drinking water, wastewater and health and safety. These measures are a better indicator of OCWA's operational performance, but this information is not made public. See **Appendix 8** for internal performance indicators for 2016 to 2020, and the associated results that were reported to OCWA's Board of Directors.

RECOMMENDATION 14

In order to effectively measure its performance and publicly report on it, we recommend that the Ontario Clean Water Agency:

- identify quantifiable outcome-based measures;
- set improving targets; and
- report publicly on its core mandate of providing safe and reliable water and wastewater treatment services.

OCWA RESPONSE

OCWA recognizes the importance of outcome-based metrics and has been working to include fewer output-based measures and more outcome-based measures over time. OCWA will place a greater emphasis on outcomes when setting targets in the Agency's annual business plan and report back on them in the subsequent Annual Report.

OCWA will work to set continuously improving targets.

OCWA agrees it will report more fully on its core mandate, and will include performance measures in the 2022-24 Business Plan and report back in OCWA's 2022 Annual Report.

4.10 Contract Management

OCWA has three types of operations and maintenance contracts with customers, a fixed-price contract and two types of cost-plus contracts. The percentage mark-ups in individual contracts is used to cover the cost of OCWA's corporate overhead and generate a residual profit.

- **Fixed Annual Price:** baseline costs plus a 15% mark-up to set a fixed price for the length of the agreement. The client is billed monthly at 1/12 of the annual fixed price. The following year, the price is adjusted mainly for inflation, changes in flow volumes, and any costs associated with changes in the regulatory environment.
- **Cost Plus Fixed Management Fee:** baseline costs plus an 18% mark-up. The client is billed monthly on the projected costs; at year-end, once the costs are known, an adjustment is made to reconcile to actual costs (direct and regional allocation) plus an 18% management fee.
- **Cost Plus Percentage Mark-up:** baseline costs plus a 15%-25% mark-up. The client is billed monthly on the projected costs; at year-end, once the costs are known, an adjustment is made to reconcile to actual costs (direct and regional allocation) plus a 15%-25% mark-up. The percentage mark-up can vary depending on the client and the negotiation process. However, any contract with a projected margin below 15% requires the approval from the President and CEO.

Baseline costs refer to the estimated costs of operating the facility such as the cost of staffing, chemicals, supplies, insurance, energy, and a portion of regional overhead costs. In the case of the two cost-plus contracts, actual operating costs are determined at year-end and the client is either charged for the difference or given a refund.

Based on our discussions with OCWA's business development group, the preparation of pricing proposals for contracts attempts to achieve a balance between the organization's goal of cost-recovery (including all overhead) and the need to submit a low enough price to be selected as the operator.

According to OCWA, the negative margins generated on some client contracts were caused by incorrectly budgeting for labour costs on some fixed-price contracts, where the extra costs could not be passed on to the client.

4.10.1 Inconsistent Application of Regional Overhead

Two costs that are allocated to clients are direct costs and regional costs. Direct costs include the cost of direct labour, chemicals, supplies, insurance and energy, and are charged to individual client projects. Regional costs that affect the whole region are captured separately, such as staffing (regional manager, business development manager and SPC Manager), regional office leases and travel expenses. The regional costs are allocated to client projects at the end of each month based on either actual labour hours (southern regions) or in proportion to client revenue (north region) for cost-plus contracts. We reviewed regional cost allocation for the region of Essex for November 2019 and December 2019 and noted that those regional costs were allocated accurately based on labour hours.

There is no policy at OCWA regarding the method of allocating regional overhead costs across various

regions. For the regions that allocate regional expenses based on labour hours, the allocation may significantly fluctuate with fluctuations in actual labour hours charged to the project because of unexpected work compared to budgeted hours, and may create large variances year over year or from the projected costs. According to OCWA regional staff, the year-to-year fluctuation is a concern for the clients.

4.10.2 Unreliable Cost Projections Lead to Some Clients Generating Negative Margins

OCWA's larger clients make up a large portion of OCWA's overall gross margin (revenue generated from the contract less direct operating expenses and regional overheads), while some clients are generating negative margins.

Although OCWA's total revenue was \$222.7 million in 2020, OCWA experienced a combined loss of \$723,000 on the operations side from 33 of its clients combined. For 2019, OCWA experienced a combined loss of \$498,000 on the operations side from 51 clients.

As seen in **Figure 17**, the majority (76%) of the operational clients with negative margins in 2020 had a fixed annual contract. Four clients with cost plus fixed management fee and cost-plus mark-up

Figure 17: Gross Margin Range for OCWA Clients, 2020^{1,2}

Source of data: Ontario Clean Water Agency

Range of Margin on Client Contract	Total Gross Margin (\$)	# of Clients	% of Clients	Contract Type			Client Type				
				Fixed Annual Price	Cost Plus Fixed Management Fee	Cost Plus Percentage Markup	Municipal	Commercial	Provincial	Federal	First Nations
Negative Margin	-536,810	17	8.5	13	2	2	8	5	3	1	0
0% to 5%	226,356	12	6.0	12	0	0	10	2	0	0	0
6% to 10%	9,857,278	26	12.9	23	2	1	24	1	1	0	0
11% to 15%	3,283,537	31	15.4	24	6	1	27	3	1	0	0
Greater than 15%	15,200,765	115	57.2	95	18	2	67	27	10	5	6
Total	28,031,126	201	100	167	28	6	136	38	15	6	6
% Breakdown		100		83	14	3	68	19	7	3	3

1. The data above does not include information on 102 clients that had no operating contract with OCWA. These clients generated \$6.3 million in revenue and \$1.9 million in gross margin in 2020.

2. Gross margins would be reduced by the allocation of corporate overhead. In 2020, gross margins were likely higher than normal because of lower costs incurred during the year due to the COVID-19 pandemic.

contracts had a negative margin. For these four clients, OCWA had not yet billed the extra costs at the time of our audit. In 2020, OCWA's system did not allow them to provide operations and maintenance information separately from other sources of revenue. In 2020, of the 201 clients that OCWA had an operation and maintenance contract with, 167 (83%) had a fixed-price contract with OCWA.

In addition, we noted that only 49% of municipal clients generated more than a 15% margin for OCWA. In comparison, for all other types of clients, the majority of each generated more than a 15% profit margin (71% of commercial clients, 67% of Provincial clients, 83% of Federal clients and all 6 First Nations clients). For 2020, gross margins were likely higher than normal because of lower costs incurred during the year due to the COVID-19 pandemic.

Based on the gross margin information, OCWA's top 30 clients accounted for over 70% of its total operating revenue and gross margin in 2020. OCWA's business development team aims for a margin of 15%. For the 17 clients in 2020 with a negative gross margin, OCWA is not even recovering its direct costs and allocation of regional costs.

4.10.3 Fixed Contracts Carry a Risk of Loss When Cost Estimates are Not Reliable

With a fixed-price contract, OCWA takes the risk for changes in the cost of chemicals, supplies, and labour beyond the inflation adjustment. More than 80% of OCWA's contracts are at a fixed price, where OCWA

bears additional risk relating to price increases above the consumer price index for inputs such as labour and the chemicals used to treat drinking water. OCWA management told us it attempts to offer both fixed pricing and variant pricing to most clients. However, clients tend to prefer fixed-cost contracts to avoid fluctuations in costs and budgeted price.

We analyzed a sample of five fixed-price contracts with negative margins. For example, the costs of \$467,371 for one contract exceeded revenue by \$104,023. This was a five-year fixed-price contract to operate a treatment facility for both drinking water and wastewater. According to the regional business manager, the reason behind the negative margins was additional labour, sampling, and chemical costs that could not be charged to the clients. OCWA makes cost projections based on its assessment of the condition of the client's assets. OCWA staff told us that they had not accurately assessed the condition of assets at these five facilities.

Figure 18 shows that for the five large negative-margin clients, the gaps between actual margins and expected margins ranged from 20% to 42% in 2019.

RECOMMENDATION 15

In order to charge each client a reasonable and equitable gross margin and to avoid losing money on contracts, we recommend that the Ontario Clean Water Agency:

- account for all regional and corporate overhead costs when setting contract prices;

Figure 18: Budgeted vs. Actual Client Margins, 2019

Source of data: Ontario Clean Water Agency

Client	Net Margin (\$)	Actual Gross Margin (%)	Budgeted Margin (%)	Difference between Budgeted and Actual Margins (%)
Client 1	(104,023)	-29	13	42
Client 2	(23,382)	-12	15	37
Client 3	(1,700)	-12	15	27
Client 4	(6,650)	-6	17	23
Client 5	(10,194)	-5	15	20

- accurately assess the condition of the client's assets before making cost projections;
- annually re-evaluate contracts that are generating negative margins;
- allocate all regional overheads to clients by year-end using a consistent allocation methodology; and
- for fixed contracts, either charge a greater margin to account for risk of increasing costs, or add in clauses to account for significant changes in costs.

OCWA RESPONSE

OCWA agrees with the Auditor General's recommendation and will develop a policy to improve consistency of regional and corporate overheads.

OCWA agrees asset condition is an important factor in making cost projections. Condition assessments are originally done during facility walkthroughs as part of the competitive bidding process. While this activity does not allow for thorough assessments initially, condition assessments for contract renewals are based on experience, historical maintenance data and costs at facilities. OCWA will review its current process to see if improvements can be made to better assess the condition of client assets and related costs.

OCWA, through annual forecasting and budgeting, is already evaluating contracts. While this evaluation is happening at the regional level, OCWA also consolidates revenues and margins at the corporate level in order to provide an all-agency level review of margins. OCWA will put more emphasis on re-evaluating individual contracts that are generating negative margins.

OCWA will work to establish and implement a consistent allocation methodology.

OCWA will ensure that future fixed-price contracts include provisions for significant changes in costs.

4.11 Use of Profits and Loans to Clients

4.11.1 OCWA Does Not Transfer Surplus Funds to the Province

OCWA generates income and has an accumulated surplus. In 2020, OCWA generated \$10 million in income and had an accumulated surplus (net assets) of \$233 million at December 31, 2020. The *Capital Investment Plan Act, 1993* that created and governs OCWA does not require the agency to pay a dividend to the Province. However, under section 17(1) of the Act, if ordered to do so by the Minister of Finance, OCWA would have to pay an amount from its surplus funds (as determined by the Minister of Finance) into the Consolidated Revenue Fund. As of October 2021, the Ministry had no plans to request a stipend or profits from OCWA.

4.11.2 Seed Funding Provided by the Province No Longer Needed to Sustain OCWA

In the last 10 years, OCWA has been generating income from its drinking-water and wastewater treatment operations since 2015 (see **Figure 19**). Prior to 2015, OCWA generated income primarily from financing and investment activity—in particular, a single loan to another government entity.

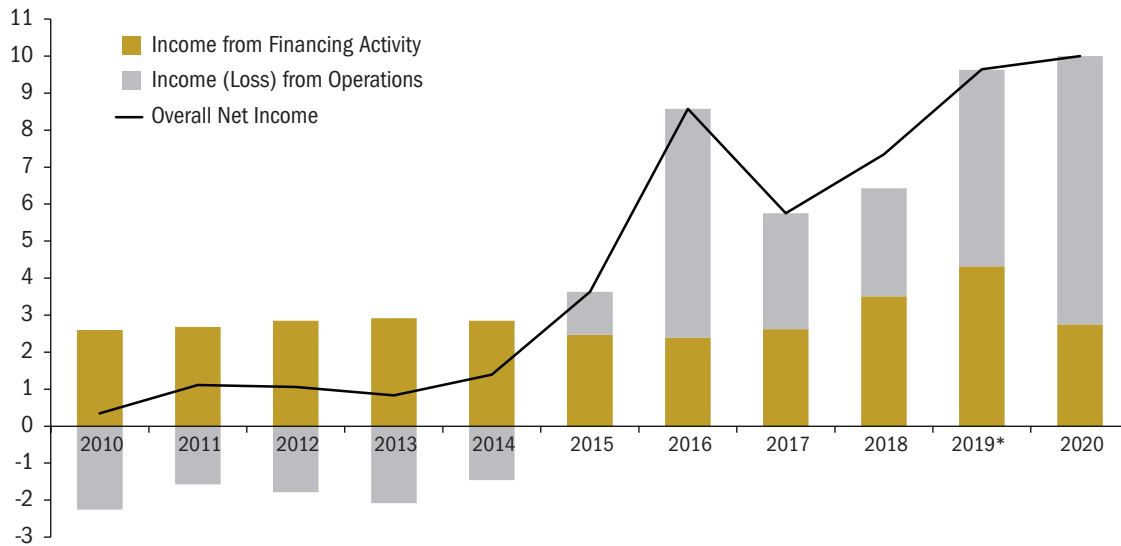
In 2003, OCWA made a \$120 million loan to the Ontario Infrastructure and Land Corporation. This loan matures in March 2023. According to OCWA, the source of the \$120 million was seed money it received from the Province around the time it was created to help it sustain its operations.

Also, at the time of our audit, several municipalities owed OCWA \$1.19 million in total for capital expenditures the agency undertook on behalf of these clients. In 2020, OCWA earned interest income of \$1.05 million and \$7,000 on loans it provided to the Ontario Infrastructure and Land Corporation and municipalities, respectively.

Before 2015, the interest generated from loans covered the losses from OCWA's operations. Since OCWA has been generating a profit from its

Figure 19: Ontario Clean Water Agency's Net Income by Activity and Overall, 2010–2020 (\$ million)

Source of data: Ontario Clean Water Agency



operations for the last six years, however, it no longer needs the interest income from the \$120 million loan to sustain its operations.

In addition, at the end of 2020, OCWA had \$75.1 million invested in bank balances, term deposits and other notes. Although it is permitted to make loans to municipalities for drinking-water and wastewater infrastructure projects, the current value of loans provided to municipalities is relatively small (\$1.19 million). Municipalities can obtain infrastructure loans from Infrastructure Ontario, as discussed in **Section 4.11.3**. As the province has a dedicated agency (Ontario Financing Authority) with a mandate to conduct borrowing and investments for the Province of Ontario, OCWA can better focus its efforts on its core business of operating drinking-water and wastewater treatment facilities.

4.11.3 Other Parties Exist to Provide Loans to Municipalities for Water Treatment Infrastructure

Under the *Capital Investment Plan Act, 1993*, S.56.1 (4), OCWA is permitted to provide loans to municipalities to build drinking-water and wastewater infrastructure; it was also directed to do so in a recent mandate letter sent by the Minister of the Environment, Conservation and Parks.

We noted that other government entities provide loans to municipalities to build drinking-water and wastewater infrastructure. We spoke with the Ministry of Infrastructure, which told us that, although it does not have overall responsibility for Ontario's drinking-water and wastewater infrastructure, it provides direct funding, through its various funding programs, to municipalities and First Nation communities to maintain their drinking-water and wastewater infrastructure.

In addition, Infrastructure Ontario, a Crown agency of the Province that provides long-term financing for public infrastructure development and renewal projects, has provided loans to municipalities for various infrastructure projects including drinking-water and wastewater systems. Loans to municipalities, municipal corporations and housing providers take up almost 90% of Infrastructure Ontario's loan volume by value. As a recent example, on July 23, 2021, Ontario announced that Infrastructure Ontario's Loan Program provided the Township of Fauquier-Strickland with a \$95,000 loan for a water treatment plant upgrade.

As of March 31, 2021, Infrastructure Ontario's loan program had total outstanding loans of \$6.2 billion and the agency specializes in providing infrastructure loans to public sector clients.

RECOMMENDATION 16

When the loan to the Ontario Infrastructure and Land Corporation matures in 2023, we recommend that the Ministry of the Environment, Conservation and Parks recover the \$120 million from the Ontario Clean Water Agency and work with OCWA on the future use of the funds for OCWA-related purposes.

MINISTRY RESPONSE

The Ministry and OCWA will work with Infrastructure Ontario, Ontario Financing Authority and the Ministry of Finance to determine the disposition of the outstanding loan of \$120 million.

RECOMMENDATION 17

In order to maximize income from provincial assets and minimize the risk of loss from financing activities, we recommend that the Ontario Clean Water Agency:

- develop a cash management plan and timeline for appropriate use of the funds or transfer its investment assets to the Province so that the funds can be invested centrally by an investment agency such as the Ontario Financing Authority; and
- refer municipalities to Infrastructure Ontario if they require financing for drinking-water and wastewater projects.

OCWA RESPONSE

It is imperative that OCWA maintain control of its financial assets to be able to continue to operate as a viable business enterprise. OCWA recognizes the need to minimize risk and maximize income from its financial assets. To that end, OCWA is currently investigating working with Investment Management Corporation of Ontario to manage the Agency's investment assets.

OCWA is currently exploring partnership opportunities with Infrastructure Ontario in order to provide one-stop shop/concierge services to the

municipality clients to address their financing and operation needs related to water and wastewater capital/infrastructure projects.

4.12 Staff Related Matters

4.12.1 OCWA Operational Staff Mostly Assigned Using Historical Numbers

We reviewed the regional staffing allocation in 2020 and found significant differences in the number of full-time employees (FTEs) assigned per facility in each region (see **Figure 20**). For example, OCWA manages five facilities in the South Peel region, and has assigned 178 staff at a ratio of over 35 staff per facility. The Peel facilities are staffed 24 hours a day, seven days a week. According to OCWA, the region of Peel wants operators to be onsite at all times to quickly resolve any compliance issues and reduce the risk of equipment failures or other emergencies from impacting its water and wastewater services. In comparison, some smaller clients only have operators onsite on weekdays during normal business hours or only receive remote monitoring. Six other regions, however, had a ratio of less than one staff per facility. When we followed up with OCWA on the staffing allocation, they responded that generally the FTE count has been determined based on historical staffing levels and based on the request for proposals submitted to the client. OCWA stated that many municipal partners renew operating contracts based on existing service levels or negotiated adjustments. If there are changes required due to capital or demand increases, these additional FTEs will be negotiated. According to OCWA, contracts in the regions of Essex and Eastern have been in place for almost a decade, and the clients are satisfied with the level of service. For the majority of these contracts, OCWA or the Ministry have been operating the facilities since they came into operation.

Although OCWA noted that the level of automation and complexity at the facilities, as well as their age, will determine the level of coverage and the support staff needed, OCWA could not produce supporting documents to show how staffing for each

Figure 20: Number of Full-Time Employees (FTEs) Per Facility by Region, 2020

Source of data: Ontario Clean Water Agency

Regional Hubs	# of Facilities	# of OCWA FTEs	Average # of FTEs per Facility	# of Work Orders	Average # of Work Orders per FTE
1 South Peel	5	178	35.60	18,995	107
2 Huron Elgin	6	37	6.17	19,508	527
3 Waterloo	17	43	2.53	10,335	240
4 Midwest	19	38	2.00	5,448	143
5 Essex	50	67	1.34	9,960	149
6 Kawartha Trent	93	67	0.72	13,992	209
7 Southwest	65	46	0.71	6,296	137
8 Georgian Highlands	105	70	0.67	13,263	189
9 Northeastern	103	62	0.60	12,319	199
10 Eastern	129	77	0.60	18,430	239
11 Northwestern	146	66	0.45	12,416	188

region was determined. In its response, OCWA stated that “due to the vast range of client expectations and facility types spanning decades of technology and design, there is no one answer that determines FTE allocation.”

In addition, OCWA does not assess staffing levels based on workload, such as through work orders, and has no workload stats to measure the efficiency and effectiveness of staff.

of assets per facility, required preventative maintenance, requested level of service and type of services defined in the contract between OCWA and the municipality/owner. To do this, OCWA will develop and populate its facility database and refine its asset registry and work order information in the Workplace Management System (Maximo).

RECOMMENDATION 18

In order to ensure staff resources are used effectively and efficiently, we recommend that the Ontario Clean Water Agency:

- develop and use workload measures to assess the effectiveness and efficiency of staff; and
- assess staffing allocations annually based on workload.

OCWA RESPONSE

OCWA agrees that it is important to assess the effectiveness and efficiency of staff. OCWA also understands that workload allocations also need to consider the class of the facility, the number

4.12.2 Other Provinces Require Key Onsite Operators Have Same Level of Certification as Facility, or Higher

The certification and licensing requirements in the regulations to the *Safe Drinking Water Act* (which governs drinking-water systems) and the *Ontario Water Resources Act* (which governs wastewater systems), respectively, were established to help ensure that facilities are operated by knowledgeable and experienced staff. Operators of drinking-water systems must be certified, and operators of wastewater systems must be licensed. There are four levels of classification for each type of certificate and licence. Operators of either type of system are required to renew their certificates and/or licences every three years.

There are generally two types of drinking-water subsystems—treatment plants and distribution systems; and there are two types of wastewater subsystems—treatment plants and collection systems. Each type of subsystem is classified on a scale from one to four, four being the highest level, according to operational complexity and population served.

We obtained the training database for OCWA operators for 2020 and the listing of all certified/licensed OCWA operators as of July 2021. We assessed whether these operators had completed their training requirements. For the 513 operators with an active wastewater treatment licence, 416 (81%) had completed the wastewater training hours required for 2020 (10 hours minimum). For the other 97 operators, 55 operators had not completed the mandatory minimum 10 training hours, while 42 had no training records in the database.

According to *O. Reg. 129/04* under the *Ontario Water Resources Act*, each facility should have designated an overall responsible operator and an operator-in-charge. The overall responsible operator must hold a certificate/licence that is of the same class as or higher than the class of the facility or subsystem, but is not required to be on site. However, they must be available and able to act in the event of an operational emergency. The operator-in-charge typically works on site given the nature of their responsibilities and is responsible for the day-to-day operations. The operator-in-charge and all other operators working at a plant or other subsystem can hold a certificate/licence that is of a lower level than the level of the facility or subsystem.

We contacted three other jurisdictions in Canada. All three had required that the operator responsible for the site have a licence at a level equal to or higher than that of the facility, and required them to be on site regularly. Saskatchewan requires all owners of a municipal waterworks or wastewater works to place responsibility for the overall day-to-day operation of the works on an operator with a licence level that matches or is higher than the facility's level. In Manitoba, an operator-in-charge must hold a

licence of the same class as, or higher than, the class of the facility; be responsible for the overall operation of the facility; and be working every shift of the facility's operation. In British Columbia, a Chief Operator (who has overall accountability for a site, as well as responsibility for active, daily on-site operation or a major segment of it) should hold certification at the class of the facility/system or higher.

Currently, all operator log information is kept onsite by each facility. In order to assess whether an overall responsible operator was designated with the appropriate level of licence/certificate and an operator-in-charge was assigned for each facility, we requested a sample of operator logs from four regions (South Peel, Georgian Highlands, Eastern and North-east) for eight facilities (one drinking-water and one wastewater treatment facility from each region) for a period of one month. For all eight facilities, the overall responsible operator assigned had a certificate or licence at the level that was appropriate for the level of the facility. However, the overall responsible operator visited five of the eight facilities less than five times during the month, and two facilities were not visited at all. For seven of the eight facilities we tested, we noted instances where the operator-in-charge held a licence or certificate that was a lower level than the level of the facility he/she was in charge of.

RECOMMENDATION 19

In order to ensure that effective drinking-water and wastewater treatment services are provided by operators that hold licences appropriate for the facilities being operated, we recommend that the Ministry of the Environment, Conservation and Parks:

- require operators-in-charge to hold a licence or certificate of the same class as, or higher than, the class of the facility they are overseeing; and
- clarify the expectations of the overall responsible operator, with respect to frequency and type of contact they should have with the facilities they are responsible for.

MINISTRY RESPONSE

The Ministry agrees to review the recommendation to require operators-in-charge to hold a licence or certificate of the same class as, or higher than, the class of the facility they are overseeing, and will assess whether there are additional benefits compared with potential operational impacts to facilities.

The Ministry agrees with the recommendation to clarify the expectations of the overall responsible operator, with respect to frequency and type of contact they should have with the facilities they are responsible for. In consultation with stakeholders, the Ministry will review the ministry guidance for necessary changes to clarify the roles, responsibilities and accountabilities of Overall Responsible Operators and Operators-in-Charge.

4.12.3 OCWA Employees Do Not Undergo Regular CPIC Checks

OCWA staff are not required to undergo Canadian Police Information Centre (CPIC) checks. We were told that it is only done if the client requests it and for staff working in federal facilities. Similarly, CPIC checks are not required for contract staff. For the three jurisdictions (British Columbia, Saskatchewan, Manitoba) we contacted, all three noted that no CPIC check is required for the employees, but all mentioned that CPIC checks are at the discretion of each municipality. The operators have access to water and wastewater systems that can significantly impact human health and the environment. Without a CPIC check, the risk of an individual with a criminal background having the ability to negatively impact water quality and human health increases.

RECOMMENDATION 20

In order to provide safe and reliable water to clients, we recommend that the Ministry of the Environment, Conservation and Parks require

Ontario operators of drinking-water and wastewater systems perform regular CPIC checks on employees that have access to critical assets and IT systems used for facility operations.

MINISTRY RESPONSE

The Ministry disagrees with this recommendation as decisions to require CPIC checks for employees should be determined by system owners or operating authorities. Municipalities or system owners are better able to assess risks and determine if CPIC checks are required.

AUDITOR GENERAL RESPONSE

The Auditor General continues to support this recommendation. The treatment of drinking water and wastewater is an essential service. CPIC checks on employees who have access to critical assets and IT systems used for facility operations mitigate the risk of these systems being sabotaged.

4.13 Vendors Used for Major IT Project Not Procured According to Government Procurement Directive

In 2012, OCWA began an IT transformation project called the OCWA Tools Evolution Program (OTEP). This project ran from 2012 to 2017 and cost a total of \$12.8 million. The goal of the project was to transform the tools used by OCWA's operational employees. In 2018, OCWA began another IT project called the Business Transformation Plan (BTP) project. The purpose of this project is to improve business processes. Initially this project was expected to cost \$27.8 million and be completed by 2023. However, in April 2021, the project budget was increased to \$33.83 million and the year of completion was extended to the end of 2025. We noted similarities between the objectives of both projects, as listed below. Given the short time period between the completion of the first IT project and the start of the second IT project, it is unclear why the program objectives would overlap. According to OCWA, some

of these objectives are an extension of the ongoing improvements being made to the IT systems.

The following were noted as objectives for both projects:

- To implement an integrated asset, work and maintenance management solution (Work Management System - Maximo) to maintain and manage all client assets and facilities and to ensure that historical asset records can be maintained from establishment to retirement.
- To implement an IT management improvement and sustainment program to improve the overall resiliency, efficiency and security of OCWA's IT infrastructure.
- To implement a SCADA process monitoring and improvement solution that modernizes and extends the agency's existing SCADA systems and services. The upgrade will provide coverage across all OCWA clients, supporting regulatory requirements and use the latest advancements in sensor/monitoring, storage and network technologies.

We also noticed that several of the same vendors were used for both projects. One of the repeat vendors (KPMG) was invited to compete on the second IT project, and was awarded a \$900,000 contract. Another vendor (Beacon 2020 Inc.) had its contract from the first IT project

extended by \$720,000. The second vendor's contract was extended because, according to OCWA, it provides specialized management services customized to OCWA's business model. However, since private operators and some municipalities provide similar services, there is likely more than one vendor that can provide management consulting services of a similar nature. Since each of these contract values exceeded \$100,000, an open competitive process should have been undertaken, in accordance with the government's Procurement Directive.

RECOMMENDATION 21

To ensure goods and services are purchased at a competitive price, we recommend that the Ontario Clean Water Agency follow the government procurement directive on the type of competitive process required based on the type of service and amounts procured.

OCWA RESPONSE

OCWA agrees that the Agency will follow the Ontario Public Service Procurement Directive. OCWA will ensure the Directive is followed for all future procurements.

Appendix 1: General Description of Treatment Processes*

Source of data: Ontario Clean Water Agency

Drinking Water Treatment Process

1. **Water intake:** water enters the treatment plant through a large intake pipe with a screen that removes objects such as weeds and fish.
2. **Coagulation:** a chemical is added to the water to mix any solids in the raw water.
3. **Flocculation:** the flocculation tanks provide the energy that is needed to encourage flocculation (i.e., solids) to clump together and separate from the intake water.
4. **Sedimentation:** the water is put into a tank to allow the solids to sink to the bottom of the sedimentation tanks and clear water is collected from the top.
5. **Filtration:** the water flows through several filters to remove fine particles.
6. **Chlorination and Fluoridation:** chlorine and fluoride are added to the water, as required under Ontario drinking water legislation.
7. **Testing:** water quality is tested for several contaminants by accredited laboratories.
8. **Distribution:** clean drinking water is distributed for use to the end consumer and also tested throughout the distribution system.

Wastewater Treatment Process

1. **Water intake:** incoming wastewater passes through screening equipment where objects, such as rags, wood fragments, plastics, and grease, are removed. The material removed is washed and pressed and disposed of in a landfill.
2. **Grit Removal:** fine materials, such as sand and gravel, are removed from the wastewater, and also disposed of in a landfill.
3. **Primary Settling:** settled material, called primary sludge, is pumped off the bottom and the wastewater exits the tank from the top. Floating debris such as grease is skimmed off the top and sent with the settled material to digestors. In this step, chemicals are also added to remove phosphorus.
4. **Aeration/Activated Sludge:** through biological degradation, the pollutants are consumed by microorganisms and transformed into cell tissue, water, and nitrogen. The biological activity occurring in this step is very similar to what naturally occurs at the bottom of lakes and rivers; however, the natural degradation takes years to accomplish.
5. **Secondary Settling:** large circular tanks called secondary clarifiers allow the treated wastewater to separate the activated sludge from the aeration tanks at this step, yielding an effluent (outflowing water), which is now over 90% treated.
6. **Filtration:** the clarified effluent (outflowing water) is filtered through various filters.
7. **Disinfection:** ultraviolet disinfection is used after filtration to ensure the treated wastewater is free of bacteria. Treated water is discharged back into lakes or rivers.
8. **Testing:** treated water (effluent) quality is tested for several contaminants by accredited laboratories.
9. **Disposal of biosolids:** biosolids can either be used for agricultural purposes or incinerated and dumped into a biosolids landfill.

* Actual treatment processes may vary slightly depending on the various types of treatment plants.

Appendix 2: Audit Criteria

Prepared by the Office of the Auditor General of Ontario

1. Effective governance and accountability structures are in place to oversee OCWA's strategic plans and operations.
2. Adequate monitoring procedures are in place to ensure that the drinking water and wastewater systems OCWA operates meet provincial standards and a process is in place to routinely inspect facilities to ensure compliance with applicable legislation, policies, and procedures. Results are communicated to management to ensure that corrective action is taken on a timely basis.
3. Effective procedures are in place to ensure that only accredited laboratories test drinking water and wastewater samples. Lab results are received in a timely manner and adverse results are reported immediately to the Ministry of the Environment, Conservation and Parks (Ministry), facility owners, and local health authorities as required. Prompt corrective action is taken to address any adverse water-quality incidents.
4. Effective procedures are in place to ensure that all client assets are maintained in good working condition, and major repairs or replacements are recommended/completed in a timely manner when issues are identified.
5. Treatment facilities and associated collection/distribution systems are staffed with the appropriate number of individuals needed to maintain operations. All staff involved in operating and monitoring drinking water and wastewater systems are properly trained and certified in accordance with legislation and best practices.
6. Adequate processes are in place to ensure that goods and services, including information technology, consultant services, and employee expenses, are acquired in an efficient and cost-effective manner in accordance with government guidelines and directives.
7. Management information systems provide timely, accurate, and relevant information to support the effective operation and maintenance of treatment facilities and distribution systems.
8. Contracts are priced and established with the intent to recover all relevant expenditures. All costs are properly tracked and allocated to the appropriate client.
9. OCWA has clearly defined objectives and performance measures for its key activities, with established targets for internally monitoring performance and results and publicly reporting on results.

Appendix 3: Glossary of Key Terms

Source: OCWA Wastewater Annual Reports; Ministry of the Environment, Conservation and Parks, Canadian Biogas Association, United States Environmental Protection Agency and Environment and Energy Study Institute

Term	Definition
Anaerobic Digestors	Sealed tanks that provide an oxygen-free controlled environment for the decomposition of organic waste by microorganisms and bacteria to produce biogas.
Biochemical Oxygen Demand	Amount of dissolved oxygen used by microorganisms to break down organic material present in wastewater.
Biogas	Is a renewable source of energy, created when organic matter breaks down in an oxygen-free environment.
Boil Water Advisory	Warns the public that water is unsafe for consumption unless boiled because it has viruses, bacteria or parasites.
Bypass	Is an intentional diversion of excess wastewater around one or more wastewater treatment process(es). Bypassed wastewater undergoes part of the treatment process and gets re-combined with the fully treated water prior to its release into the receiving body of water at the approved discharge location.
Carbonaceous Biochemical Oxygen Demand	Amount of dissolved oxygen needed by microorganisms to break down carbonaceous (carbon-rich) organic material in wastewater.
Co-digestion	Is the simultaneous digestion of multiple organic wastes such as municipal waste and livestock waste in one digester. By mixing different types of biodegradable waste together higher yields of biogas are produced.
E. coli	Common bacterium that lives in human and animal intestines. E. coli is used as the most widely adopted indicator of faecal pollution in water and wastewater.
Effluent	Wastewater discharged to the environment after undergoing treatment.
Environmental Compliance Approval	A facility-specific document issued by the Ministry which sets wastewater discharge limits for applicable contaminants. Issued under the <i>Environmental Protection Act</i> .
Influent	Raw or untreated wastewater that enters the sewage treatment plant from the collection system.
Overflow	Is an intentional diversion of excess wastewater into the receiving water body through another designed location in the facility, but not through the approved discharge location for treated wastewater.
pH	A measure of the alkalinity or acidity in water; measured on a scale of 0 to 14.
Storm Water	Rainwater and melting snow that enters the sewer system.
Total Ammonia Nitrogen	The amount of ammonia in wastewater. Sources of ammonia include domestic, industrial or agricultural pollution from fertilizers, animal and plant decomposition, and animal waste. High levels of ammonia nitrogen can be toxic to aquatic life.
Total Kjeldahl Nitrogen	Nitrogen content in the form of organic proteins or their decomposition product ammonia. High levels can be toxic to aquatic life.
Total Phosphorus	Total phosphorus comes from a variety of sources including fertilizers, detergents, domestic wastewater, and wastewater from industrial processes. Phosphorus is a nutrient that contributes to plant productivity, but excess phosphorus in waterbodies can promote the growth of algae.
Total Suspended Solids	Suspended particles present in water that can include sediment, sand, silt, plankton and algae.
Wastewater	Water discharged by homes, businesses and industries, and includes everything that is flushed down a toilet or poured down a drain. This water enters the sanitary sewer system.

Appendix 4: Sludge/Biosolids Produced by OCWA's Top 20 Wastewater Treatment Facilities and Method of Disposal, 2020

Source of data: Ontario Clean Water Agency

Sludge Disposed of in Solid Form											
Region	Wastewater Treatment Facility/Plant	Service Population	Total Liquid Sludge Produced (cubic meters)	Biosolids Received From Other Sites (tonnes)	Total Biosolids (tonnes)	Method of Disposal					
						Incinerated	Applied to Farmland	Sent to Another Site	Mine Reclamation*	Sent to Landfills	Sent to Storage Lagoons
South Peel	G.E. Booth	1,100,000	1,048,447	9,139	39,557	39,557	-	-	-	-	-
South Peel	Clarkson	800,000	459,945	-	8,531	-	-	8,102	-	430	-
Waterloo	Kitchener	253,621	216,439	67,424*	16,411	-	11,903	-	3,086	1,422	-
Waterloo	Waterloo	153,271	100,554	-	8,457	-	7,274	-	762	1,170	-
Waterloo	Galt	86,716	103,453	23,584*	7,681	-	6,100	-	1,149	432	-
Essex	Essex	12,600	-	-	339	-	-	-	-	339	-
Southwest	Paris	11,177	-	3	1,548	-	1,289	-	-	259	-
Total	2,417,385	1,928,838	100,150	82,525	39,557	26,566	8,102	4,997	4,052	0	0
%					48	32	10	5	5	0	0

*These biosolids were received in liquid form and measured in cubic meters.

Sludge Disposed of in Liquid Form											
Total Liquid Sludge Produced (cubic meters)						Method of Disposal					
Region	Wastewater Treatment Facility/Plant	Service Population	Received From Other Sites	Total Biosolids (cubic meters)		Incinerated	Applied to Farmland	Sent to Another Site	Mine Reclamation*	Sent to Landfills	Sent to Storage Lagoons
Kawartha Trent	Belleville	49,000	-	23,408		-	23,408	-	-	-	-
Midwest	Stratford	29,000	-	16,267		-	16,267	-	-	-	-
Waterloo	Hespeler	25,991	-	67,424		-	-	67,424	-	-	-
Kawartha Trent	Lindsay	23,000	-	151,786		-	-	-	-	-	151,786
Waterloo	Preston	22,517	-	23,584		-	-	23,584	-	-	-
Georgian Highlands	Wasaga Beach	17,537	-	18,985		-	18,985	-	-	-	-
Eastern	Petawawa	16,173	-	10,304		-	10,304	-	-	-	-
Southwest	Thorndale	14,650	-	1,335		-	-	1,335	-	-	-
Essex	Denis St Pierre	14,300	-	3,292		-	3,292	-	-	-	-
Waterloo	New Hamburg	14,043	-	40,529		-	-	-	-	-	40,529
Eastern	Rockland	14,000	-	10,590		-	2,250	-	-	615	7,725
Georgian Highlands	Angus	11,966	-	12,168		-	7,238	-	-	-	4,930
Waterloo	Elmira	10,962	-	14,005		-	-	-	-	14,005	-
Total		263,139	-	393,677		0	81,744	92,343	0	14,620	204,970
%						0	21	23	0	4	52

* Mine reclamation is the process of restoring land that has been mined to a natural or economically usable state.

Appendix 5: Sample of Reported Spills at OCWA Facilities, 2020*

Source of data: Ontario Clean Water Agency

Cause of Spill	Type of Spill	Duration (hours)	Estimated Volume of Spill (m³)	Corrective Action Taken by OCWA
Kirkland Lake				
Equipment Failure	Sewage water	8	950	Spill entered a nearby creek. The equipment was repaired.
Maintenance	Sewage water	1.5	124	Spill entered a nearby creek. The equipment was repaired.
Rockland				
Equipment Failure	Sewage water	48	0.4	The equipment was repaired.
Belleville				
Chemical reaction	Chemical	Unknown	Unknown	OCWA is working with the City of Belleville and local industries on monitoring discharge into the collection system to prevent future incidents.
Chemical reaction	Chemical	Unknown	Unknown	
Wasaga Beach				
Odour discharge	Air	Unknown	Unknown	Continuous monitoring of treatment plant.
Potential fuel spill event	Oil/Diesel/Gas	Unknown	0.4	Spill was contained and cleaned at the facility. Continuous monitoring of treatment plant.
Smooth Rock Falls				
Weather Conditions	Sewage water	22.75	148	Sewage water was transferred from the collection system to the storm water system to relieve the flow.
Weather Conditions	Sewage water	25	Unknown	Unknown.
Kitchener				
Equipment Failure	Sewage water	2	530	Spill entered a swale next to the plant and was cleaned up; a small amount entered a nearby river. Maintenance was alerted for repairs.
Wendover				
Operator/Human Error	Sewage water	7.5	98	Spill was contained on site and cleaned up.
Operator/Human Error	Sewage water	6	2	Spill was contained to the small area surrounding the standpost and was cleaned up.

* We reviewed seven facilities that reported a total of 12 spills in 2020.

Appendix 6: Top 10 Non-Compliance Incidents* for Drinking-Water Systems Operated by Ontario Clean Water Agency, 2016–2020

Source of data: Ontario Clean Water Agency

Non-Compliance Item	# of Incidents Identified					Five-Year Total
	2016	2017	2018	2019	2020	
1. Records did not indicate that the treatment equipment was operated in a manner that achieved the design capabilities at all times that water was being supplied to consumers.	1	7	8	6	4	26
2. Continuous monitoring equipment that was being utilized was not performing tests for the parameters with at least the minimum frequency specified and/or was not recording data with the prescribed format.	3	3	4	6	5	21
3. The owner was not in compliance with all conditions of the Permit to Take Water.	2	3	3	4	4	16
4. All continuous monitoring equipment utilized for sampling and testing was not equipped with alarms or shut-off mechanisms that satisfy the standards.	2	3	4	3	3	15
5. Operators were not examining continuous monitoring test results or they were not examining the results within 72 hours of the test.	2	4	2	4	3	15
6. Where an activity has occurred that could introduce contamination, all parts of the drinking water system were not disinfected.	–	–	–	7	7	14
7. The secondary disinfectant residual was not measured as required for the distribution system.	2	4	1	3	3	13
8. The owner/operating authority was not in compliance with the requirement to prepare Form 2 (Record of minor modifications or replacement to the system).	–	1	3	6	3	13
9. All continuous analyzers were not calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation.	4	4	1	1	3	13
10. All changes to the system registration information were not provided within ten (10) days of the change.	4	3	2	1	3	13

* Incidents of non-compliance were Identified through inspections by the Ministry of the Environment, Conservation and Parks and recorded in the Ontario Clean Water Agency's database of inspection results.

Appendix 7: Top 10 Non-Compliance Incidents for Wastewater Treatment Systems Operated by Ontario Clean Water Agency, 2016–2020

Source of data: Ontario Clean Water Agency

Non-Compliance Item	# of Incidents Identified					Five-Year Total
	2016	2017	2018	2019	2020	
1. The sewage works effluent sample results did not demonstrate compliance with total suspended solids limits prescribed by the Environmental Compliance Approval.	4	1	5	7	0	17
2. The sewage works effluent sample results did not demonstrate compliance with total phosphorous limits prescribed by the Environmental Compliance Approval.	4	0	2	7	1	14
3. total ammonia/total ammonia nitrogen/un-ionized ammonia limits prescribed by the Environmental Compliance Approval.	2	3	3	4	1	13
4. The owner of the sewage works had not prepared a written statement certified by a Professional Engineer confirming that the proposed works were constructed in accordance with the Environmental Compliance Approval.	4	5	1	³	0	13
5. All annual performance reports did not meet the submission and contents requirements of the Environmental Compliance Approval.	5	2	0	5	0	12
6. All sewage works effluent sampling requirements prescribed by the Environmental Compliance Approval were not met.	4	2	0	5	0	11
7. The operations and maintenance manuals did not meet the requirements of the Environmental Compliance Approval.	4	3	1	3	0	11
8. The operations and maintenance manuals did not contain up-to-date plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.	2	3	1	3	1	10
9. The sewage works effluent sample results did not demonstrate compliance with microbiological parameter limits prescribed by the Environmental Compliance Approval.	3	0	0	6	1	10
10. All exceedances of any parameters were not reported in accordance with the Environmental Compliance Approval.	5	3	0	0	0	8

* Incidents of non-compliance were Identified through inspections by the Ministry of the Environment, Conservation and Parks and recorded in the Ontario Clean Water Agency's database of inspection results.

Appendix 8: Performance Results Presented to the OCWA Board, 2016–2020

Source of data: Ontario Clean Water Agency

Key Performance Indicators	Target	2016	2017	2018	2019	2020	Reported Publicly in 2020
Water Indices							
Product Quality (Adverse Water Quality Incidents)							
Inadequate Disinfection	2016–2017: ≤ 25/yr. 2018–2020: ≤ 20/yr.	23	13	24	41	16	No
Turbidity/Water Clarity	2016–2017: ≤ 15/yr. 2018–2020: ≤ 10/yr.	12	10	1	4	7	No
Product Quality (Adverse Water Quality Incidents)							
Due to microbiological incident or inadequate disinfection	2016–2017: ≤ 6/yr. 2018–2020: ≤ 4/yr.	1	4	4	10	5	No
Due to other reasons (e.g., water main breaks, repairs, installations, etc.)	2016: ≤ 110/yr. 2017–2020: ≤ 75/yr.	55	60	44	48	30	No
Inspection Results							
% of inspections with a rating of 100%	2016–2017: 75%/yr. 2018–2020: 78%/yr.	66.5	75.4	76.7	69.1	67.6	No
# of Ministry inspections with a rating <90%	2016–2020: <2/yr.	11	4	6	5	7	No
Wastewater Indices							
Product Quality and Wastewater Effluent Limits Met							
# of facilities with <90% compliance in limits for phosphorus, total suspended solids (TSS), E.Coli, and biochemical oxygen demand	2016–2020: ≤3/yr.	1	2	2	3	2	No
# of bypassing events due to reasons other than hydraulic load (e.g., power outages, equipment issues, but not planned bypasses for maintenance activity)	2016: ≤37/yr. 2017–2020: ≤30/yr.	17	47	26	15	21	No
# of inspections by the Ministry of the Environment, Conservation and Parks with >5 non- compliance items (excluding effluent exceedances)	2016–2017: ≤7/yr. 2018–2020: ≤5/yr.	7	0	0	6	0	No

Key Performance Indicators	Target	2016	2017	2018	2019	2020	Reported Publicly in 2020
Health & Safety							
Lost-Time Incidents ¹	2016: ≤5 2017: ≤4 2018: ≤3 2019-2020: ≤2	5	2	2	1	3	No
Lost-Time Injury Rate ²	2016: ≤0.58 2017: ≤0.52 2018: ≤0.49 2019: ≤0.44 2020: ≤0.40	0.58	0.23	0.33	0.11	0.33	Yes
Recordable Incident Rate ³	2016: ≤2.5 2017: ≤2.1 2018: ≤1.89 2019: ≤1.70 2020: ≤1.53	2.09	0.8	1.09	0.77	0.67	Yes
Near Miss Reporting ⁴	2016-2017: ≥50/yr. 2018: ≥70/yr. 2019: ≥80 2020: ≥75	61	76	104	92	39	No
Workplace Inspection Completed	2016-2018: N/A 2019-2020: ≥95%	N/A	N/A	N/A	98.7%	98.7%	No
Health and Safety Training Hrs/Ops Employee	2016-2020: 12 hrs/yr.	25.3	25.6	24	23.1	17.0	No

Grey shading denotes instances where the target is not met.

1. Lost-time incidents is a metric that calculates the number of incidents that result in an interruption of work.

2. Lost-time injury refers to incidents that result in an employee's disability or an employee missing work due to an injury.

3. This is a mathematical calculation that describes the number of employees per 100 full-time employees that have been involved in a recordable injury or illness.

4. Reporting of an unplanned event that did not result in injury, illness or damage, but had the potential to do so.



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