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WSER 101: COMPLIANCE WITH THE *WASTEWATER SYSTEMS EFFLUENT REGULATIONS*

2023 Water and Wastewater Workshop

Gander, NL

March 2023



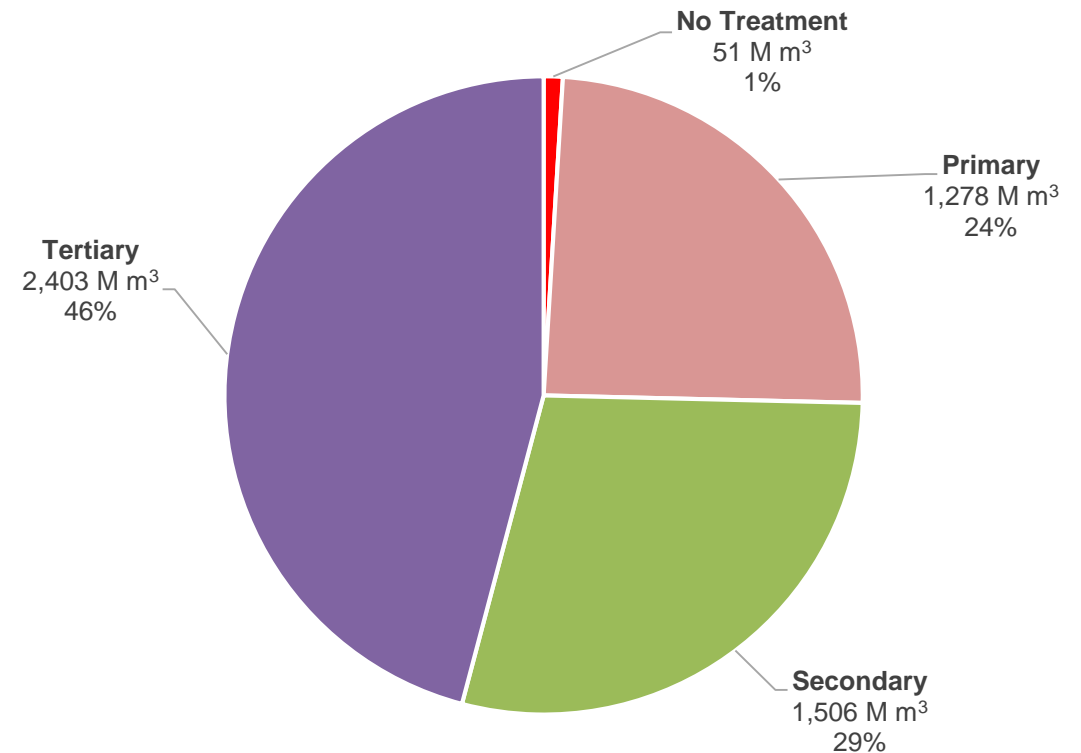
Canada 

PRESENTATION OVERVIEW

- Wastewater Management in Canada
- *Wastewater Systems Effluent Regulations*
 - Regulated Systems
 - Monitoring (sampling)
 - Reporting
 - Authorizations
- Update on proposed amendments

WASTEWATER IN CANADA

- Wastewater is the largest source of pollution to water by volume in Canada (≈ 6 billion m^3/year)
 - Composed of a blend of domestic and industrial / commercial / institutional wastewaters
 - Known to have environmental, ecosystem, and human health impacts
- Level of treatment varies significantly across Canada, from no treatment, mostly in coastal areas, to advanced treatment
- All wastewater effluent (treated, undertreated or untreated) is subject to the *Fisheries Act* pollution prevention provisions
 - Subsection 36(3) prohibits the deposit of deleterious substances into waters frequented by fish, unless authorized by regulation



Source: *Wastewater Systems Effluent Regulations* data and Quebec provincial data for 2021. Wastewater volumes with no treatment does not include systems in Quebec as data is not reported to ECCC

WASTEWATER MANAGEMENT IN CANADA

Federal Jurisdiction

- *Wastewater Systems Effluent Regulations (WSER)* made pursuant to the *Fisheries Act*
 - Establishment of national effluent quality standards
 - Part of a federal commitment in the 2009 Canadian Council of Ministers of the Environment (CCME) Canada-wide Strategy for Wastewater

Provincial/Territorial Jurisdiction

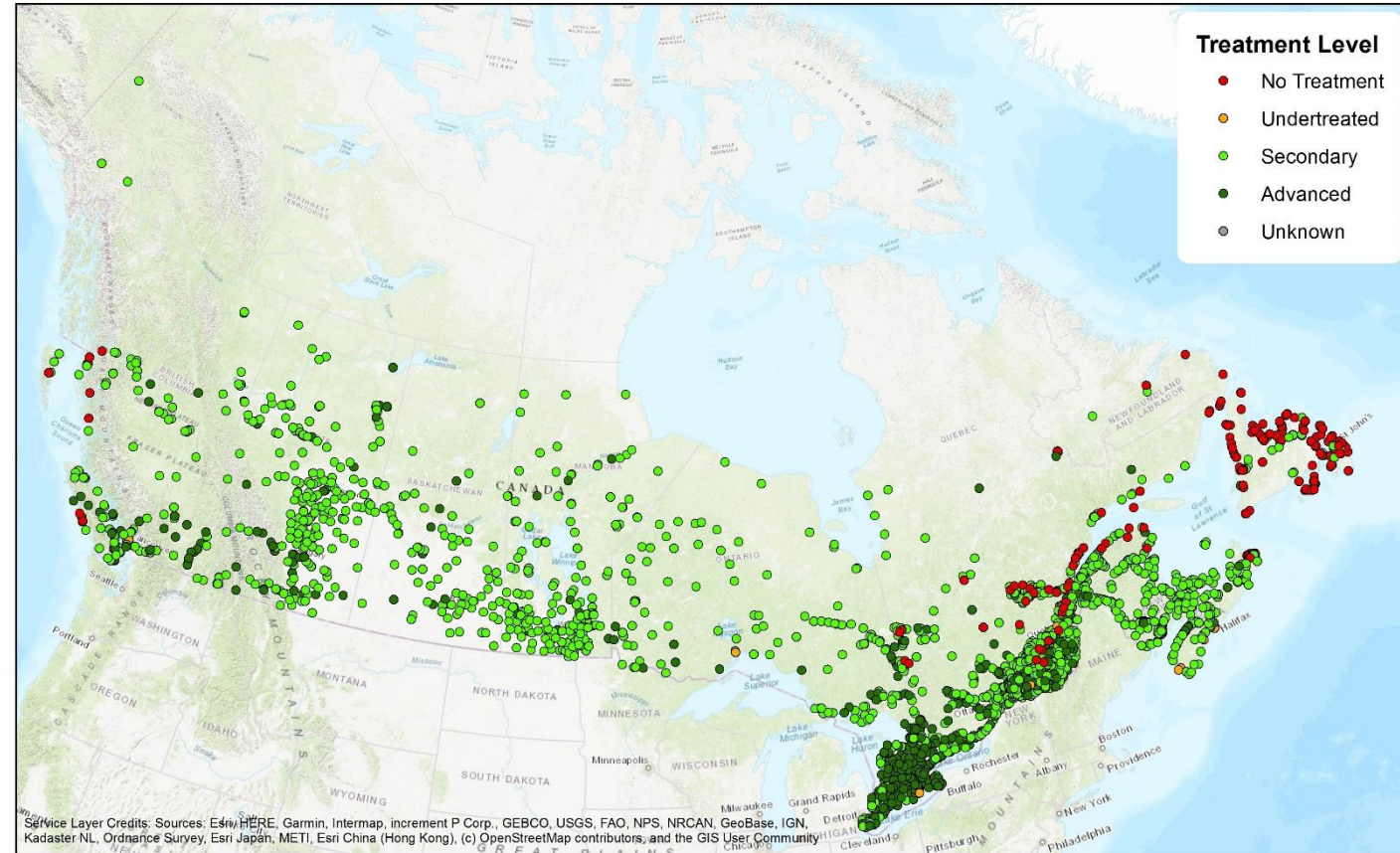
- All provinces/territories have their own regulations for effluent quality standards and/or issue permits for wastewater facilities; it is not consistent across provinces/territories

Municipal Jurisdiction

- Responsible for the construction and operation of the collection and treatment facilities
- Municipalities form the majority of owners/operators of wastewater systems
- Some have sewer use by-laws

WASTEWATER SYSTEMS EFFLUENT REGULATIONS

- Came into force in 2012
 - National effluent quality standards came into effect in 2015
 - Bring systems to secondary treatment level
- ~1,700 wastewater systems regulated under the Regulations
 - Collect an average daily wastewater volume of 100 m³/day or more (≈ 200-250 people)
 - Any system that deposits to water frequented by fish or a place that can reach such waters
- The Regulations do not apply to:
 - Very small systems
 - NWT, NU, and north of the 54th parallel in QC and NL due to Arctic climatic conditions
 - Municipal and provincial systems in Yukon and Quebec which have equivalency agreements

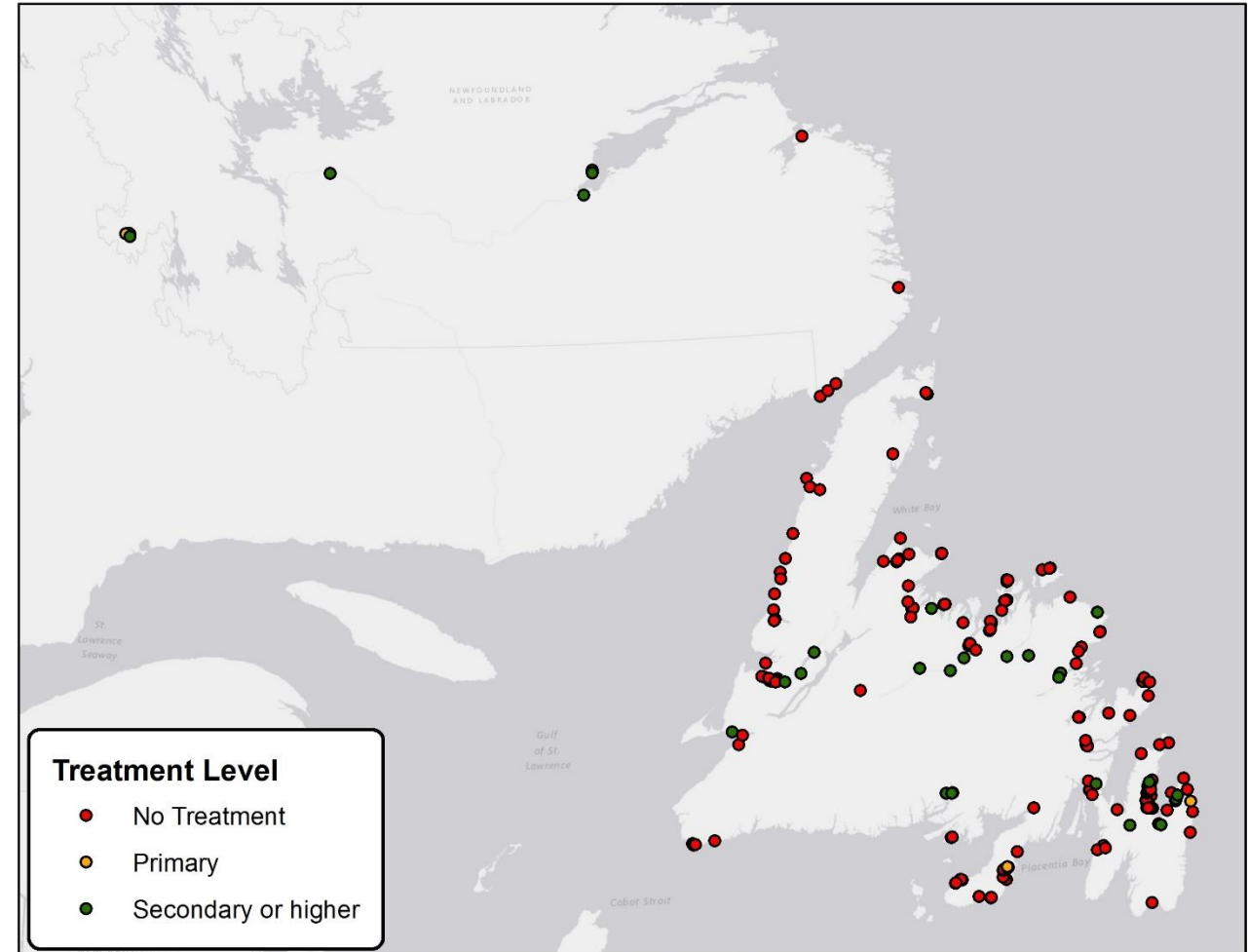


Map includes wastewater systems covered under the QC and YK equivalency agreements

If your system is not subject to the WSER, the deposit of effluent is subject to the *Fisheries Act*

WASTEWATER IN NEWFOUNDLAND AND LABRADOR

- 212 wastewater discharge points
 - 207 points are owned by 116 municipalities
 - 5 points owned by federal, aboriginal or other types of owners
- Of those, it is believed:
 - 186 have no or partial/primary treatment
 - 26 have secondary treatment or greater



Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

NATIONAL EFFLUENT QUALITY STANDARDS

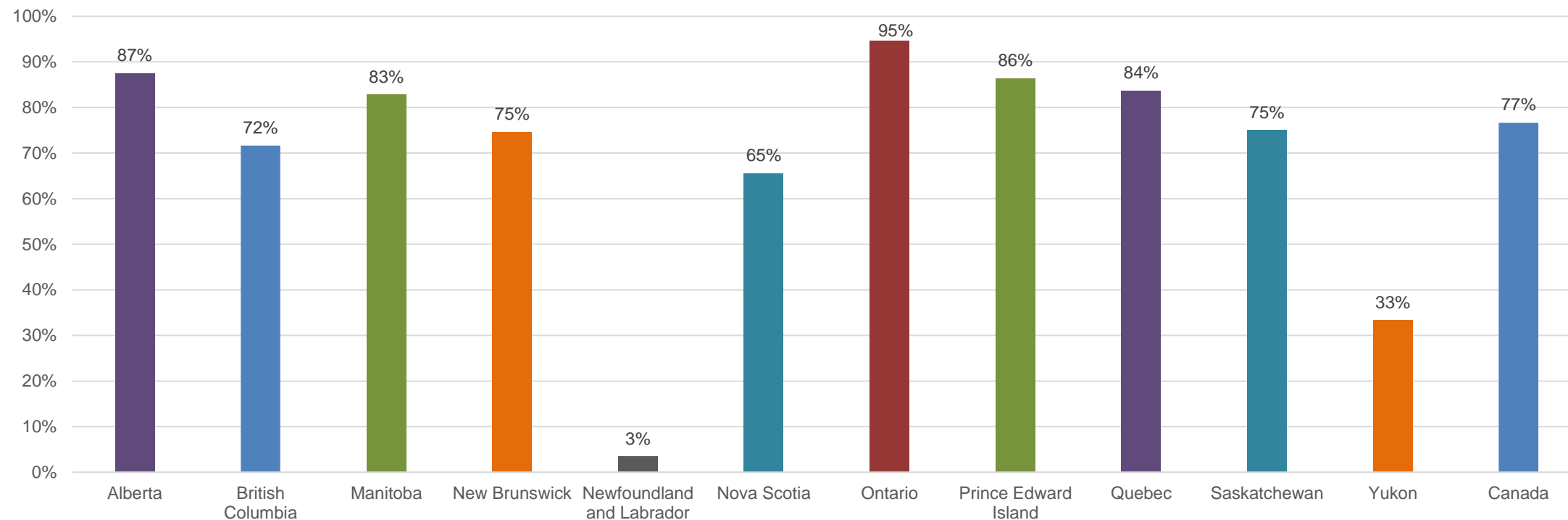
To comply with the WSER, there are specific conditions for the discharge of wastewater:

- Limits on certain conventional pollutants
- Effluent deposited cannot be acutely lethal to fish
 - Acute lethality testing required for systems with volumes greater than 2,500 m³
- Requirements for monitoring, record keeping, and reporting

Pollutants	Limits	Sampling	Reporting results
Carbonaceous biochemical oxygen demand (CBOD)	Average \leq 25 mg/L	Yes	Yes
Suspended solids (TSS)	Average \leq 25 mg/L	Yes	Yes
Total residual chlorine	Average \leq 0.02 mg/L	Not required	Not required
Unionized ammonia	Maximum $<$ 1.25 mg/L	Not required	Not required

COMPLIANCE WITH EFFLUENT LIMITS

Percentage of systems in 2021 complying with the effluent quality standards for CBOD and SS by province



National compliance with the effluent limits is 77%

REGULATORY REQUIREMENTS

Depending on the type of treatment and/or average daily effluent volume:

Monitoring Requirements:

- Final Discharge Point
 - Average daily volume
 - Composition of the effluent
 - Toxicity of the effluent*
- Combined Sewer Overflow Points (because of precipitation)
 - Volumes

Reporting Requirements: (electronic submission in ERRIS)

- Identification report
 - Update contact information and operation details as needed
- Monitoring reports
- Combined sewer overflow (CSO) reports

*only required for systems depositing more than 2,500 m³/day

VOLUME DETERMINATION

Average daily volume must be calculated for each monitoring period

Continuous Systems

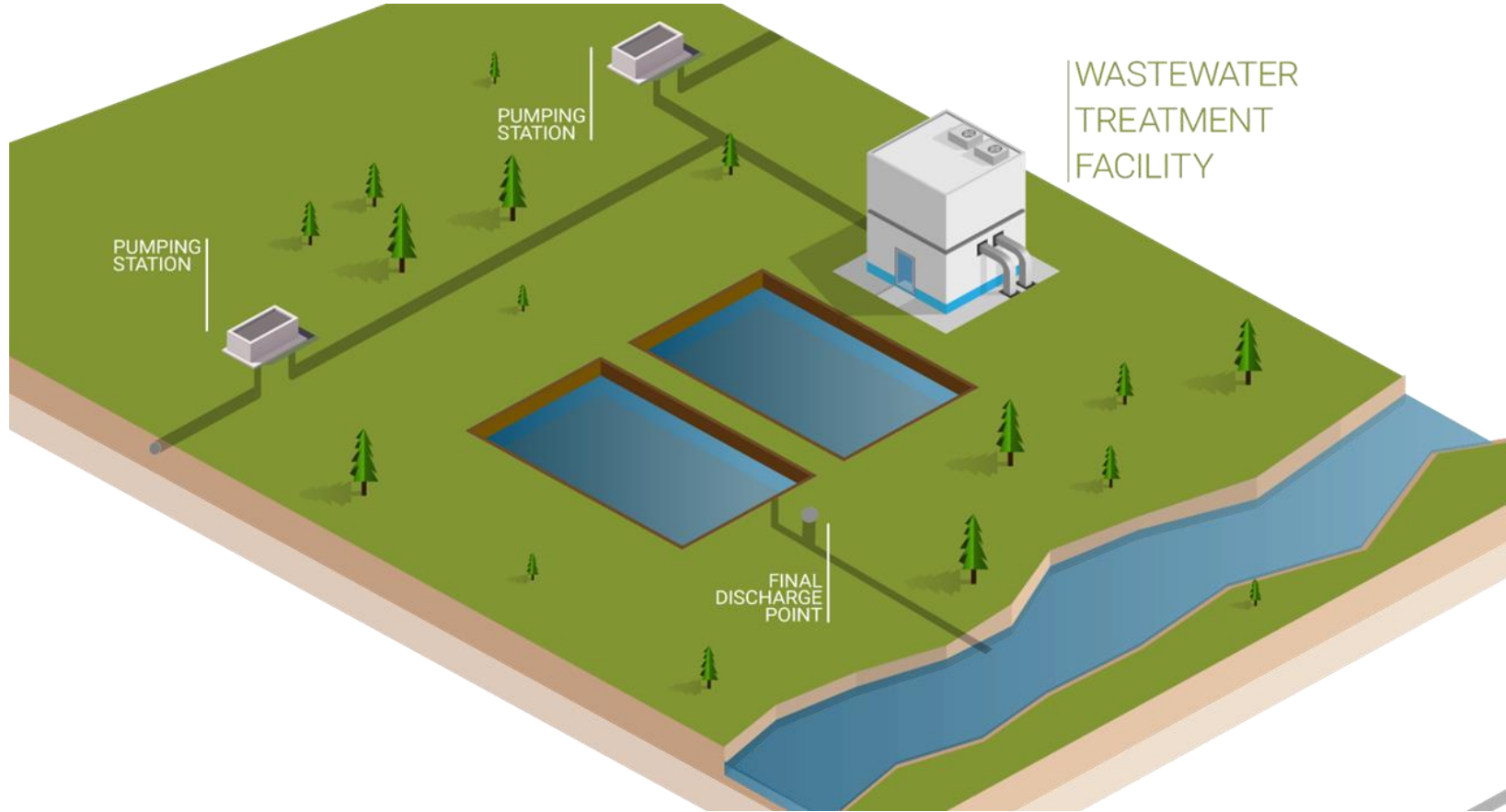
- Continuous measure of influent or effluent (i.e. flow meter)
- Daily measure of rate of flow can be used to estimate daily volume (systems >2,500 m³/day)

Intermittent Systems

- Continuous measure of influent or effluent (i.e. flow meter)
- Daily measure of rate of flow
- Estimation based on accepted engineering practices (within a margin of error of ± 15)

For more information, ECCC has published a [factsheet](#)

SAMPLING – FINAL DISCHARGE POINT



SAMPLING – INTERMITTENT SYSTEM

Annual Average Daily Volume (m ³)	100 to ≤ 2,500	> 2,500 to ≤ 17,500	> 17,500 to ≤ 50,000	> 50,000
CBOD/SS* (mg/L)	annual average ≤ 25	annual average ≤ 25	monthly average ≤ 25	monthly average ≤ 25
Sampling frequency**	•once per discharge period	•once per discharge period	•once per discharge period	•once per discharge period
Reporting Frequency	•annually	•annually	•quarterly	•quarterly

* A SS exemption is in place for results exceeding 25 mg/L in warmer months to account for algae

**If discharge period > 30 days: every 2 weeks but at least 7 days after any other sample

SAMPLING – CONTINUOUS HRT \geq 5 DAYS

Annual Average Daily Volume (m ³)	100 to \leq 2,500	> 2,500 to \leq 17,500	> 17,500 to \leq 50,000	> 50,000
CBOD/SS* (mg/L)	annual average \leq 25	quarterly average \leq 25	monthly average \leq 25	monthly average \leq 25
Sampling frequency	•quarterly	•every two weeks	•weekly	•3 days per week
Reporting Frequency	•annually	•annually	•quarterly	•quarterly

* A SS exemption is in place for results exceeding 25 mg/L in warmer months to account for algae

SAMPLING – CONTINUOUS SYSTEM*

Annual Average Daily Volume (m ³)	100 to ≤ 2,500	> 2,500 to ≤ 17,500	> 17,500 to ≤ 50,000	> 50,000
CBOD/SS (mg/L)	quarterly average ≤ 25	quarterly average ≤ 25	monthly average ≤ 25	monthly average ≤ 25
Sampling frequency	monthly	every 2 weeks	weekly	3 days per week
Reporting Frequency	quarterly	quarterly	quarterly	quarterly

* Includes raw sewage outfalls

HOW TO SAMPLE

- Who can sample ?
 - Regulatees can sample or hire external support (often \$\$)
 - If using external support, please ensure you have copies of all certified results
- How to sample ?
 - WSER only defines the type (composite vs grab) and frequency of sampling
 - Training:
 - ECCC recently published a [Sample Guidance Toolkit](#)
 - Provincial government and environmental firms can offer training on demand
- Analytical tests must be performed by an accredited laboratory
 - Holding time for samples varies from 3 to 28 days depending on the parameter and the preservation procedure
 - [CALA-Accrediated Labs](#)

ACUTE LETHALITY TESTING

	Average Daily Volume Deposited Annually (m ³)	Minimum Sampling Frequency
1	< 2 500	No minimum sampling frequency
2	2 500 and ≤ 50 000	Quarterly but at least 60 days after any other sample
3	> 50 000	Monthly but at least 21 days after any other sample

All test results must be recorded in ERRIS

Any sample that is acutely lethal is considered an [unauthorized deposit](#) under the Fisheries Act
More sampling is also required under the Regulations

Refer to [Acute Lethality factsheet](#) for more information



REPORTING DEADLINE

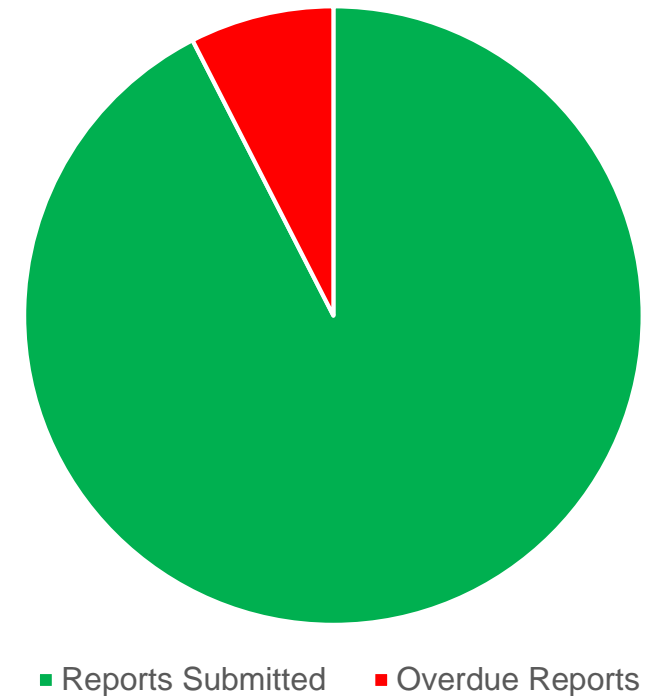
Quarterly reports are due:

- January 1 to March 31 - **May 15**
- April 1 to June 30 - **August 14**
- July 1 to September 30 - **November 14**
- October 1 to December 31 - **February 14**

Annual reports are due **February 14**

SUMMARY OF WSER REPORTING IN NEWFOUNDLAND AND LABRADOR

- As of 2022, there are 212 wastewater systems in Newfoundland and Labrador that identified themselves to be subject to the WSER
- 8 wastewater systems report to ECCC on an annual basis, while 204 systems submitted quarterly monitoring reports
- 92% of wastewater systems submitted the required monitoring reports in 2022



TRANSITIONAL AND TEMPORARY AUTHORIZATIONS

- The Regulations provide a mechanism to apply for authorizations for systems to deposit effluent that does not meet the quality standards

Transitional Authorization	Allowed for extended compliance timelines for systems not designed to meet the standards; to provide time to plan and finance wastewater system upgrades
Temporary Bypass Authorization	Allows for a temporary exceedance of effluent quality limits to undertake maintenance, repairs and upgrades to wastewater treatment plants; to ensure the longevity and proper functioning of wastewater infrastructure
Temporary Authorization to Deposit Un-ionized Ammonia	Issued for systems discharging acutely lethal effluent due to un-ionized ammonia, but otherwise compliant with TSS/CBOD effluent quality standards

TRANSITIONAL AUTHORIZATION

- Regulatees could apply for a transitional authorization (TA) before June 2014 to provide an extension to meet effluent quality standards to account for wastewater system upgrades if:
 - System could not meet effluent standards, and
 - System was not designed to meet the standards
 - Could apply if the average concentration of CBOD or TSS exceed 25 mg/L, depending on the type of treatment and average daily volume
 - Extended timelines to 2020, 2030, or 2040 were issued based on environmental risk: current effluent quality, volume, and receiving environment
 - Out of 65 TA issued in 2014, 5 were in Newfoundland and Labrador
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TA CONDITIONS AND COMPLIANCE OBLIGATIONS

- Effluent must contain less than 1.25 times the average concentrations of deleterious substance presented in the TA application:
 - CBOD
 - TSS
 - Un-ionized ammonia
- Similar monitoring, reporting and record keeping requirements at final discharge point
 - Exception: no acute lethality testing required
- Progress reports submitted to ECCC on a regular reporting schedule

PROPOSED AMENDMENTS

- ECCC published in 2021 [discussion paper](#) on possible amendments to the WSER:
 - Transitional Authorizations: Reopening provisions to allow eligible regulatees to apply for a transitional authorization
 - Temporary Bypass Authorizations: Expand the scope to all parts of the wastewater infrastructure and create a risk-based approach for all planned releases
 - Administrative and Operational Improvements: Simplify requirements and provide greater clarity and flexibility
- Feedback was generally supportive of proposed amendments
- The Regulatory proposal is currently under review

If you would like to be kept informed of possible amendments to the Regs,
please contact us to be added to the distribution list:

eu-ww@ec.gc.ca

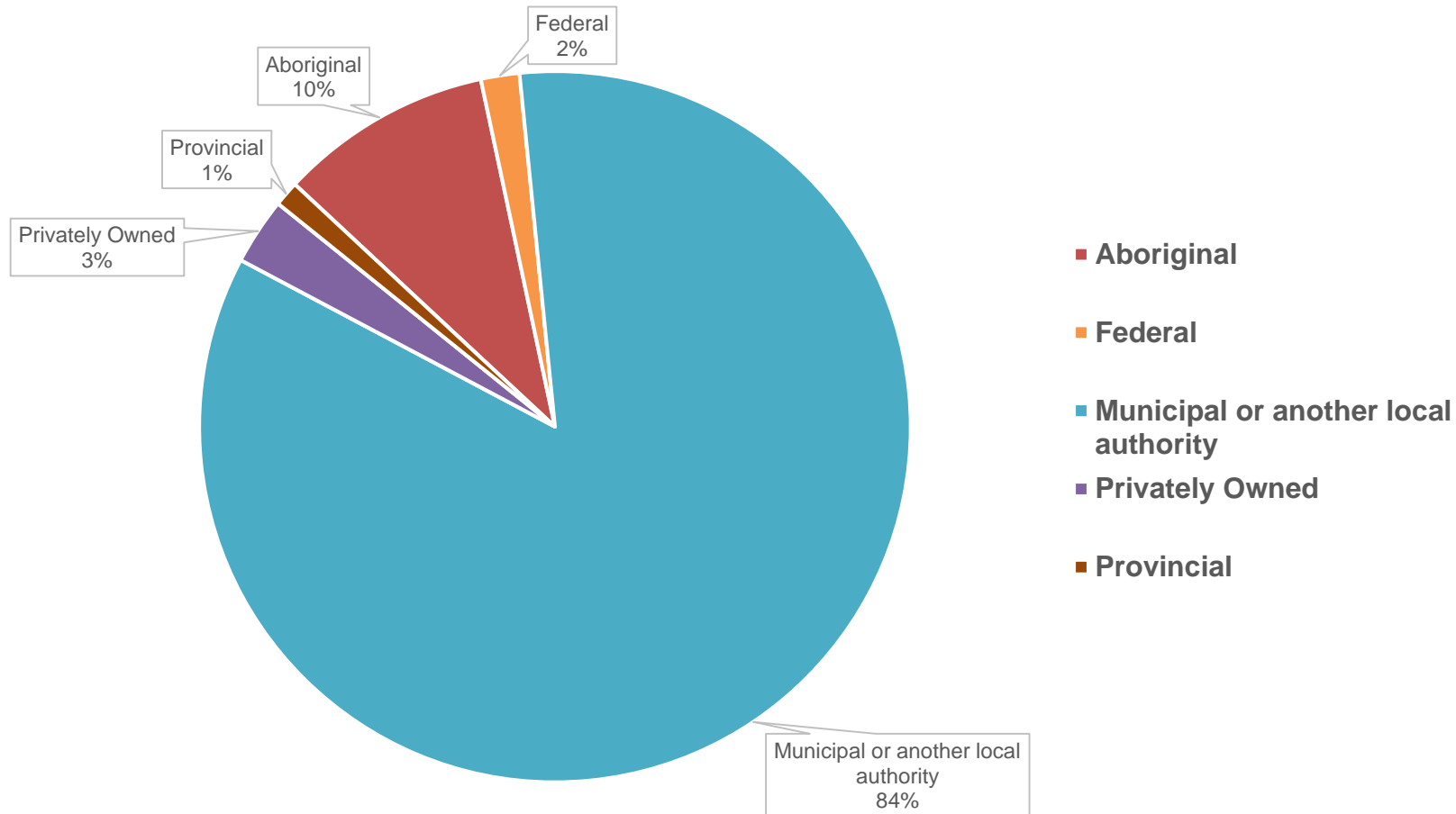
ADDITIONAL INFORMATION

- [Wastewater data, annual reports and maps - Canada.ca](#)
- Additional factsheets available here: [Wastewater Systems Effluent Regulations: reporting - Canada.ca](#)
- YouTube videos that walk through the reporting process: [Wastewater Systems Effluent Regulations – YouTube](#)
- [Effluent Regulatory Reporting Information System user guide - Canada.ca](#)
- Contact eu-ww@ec.gc.ca with any questions

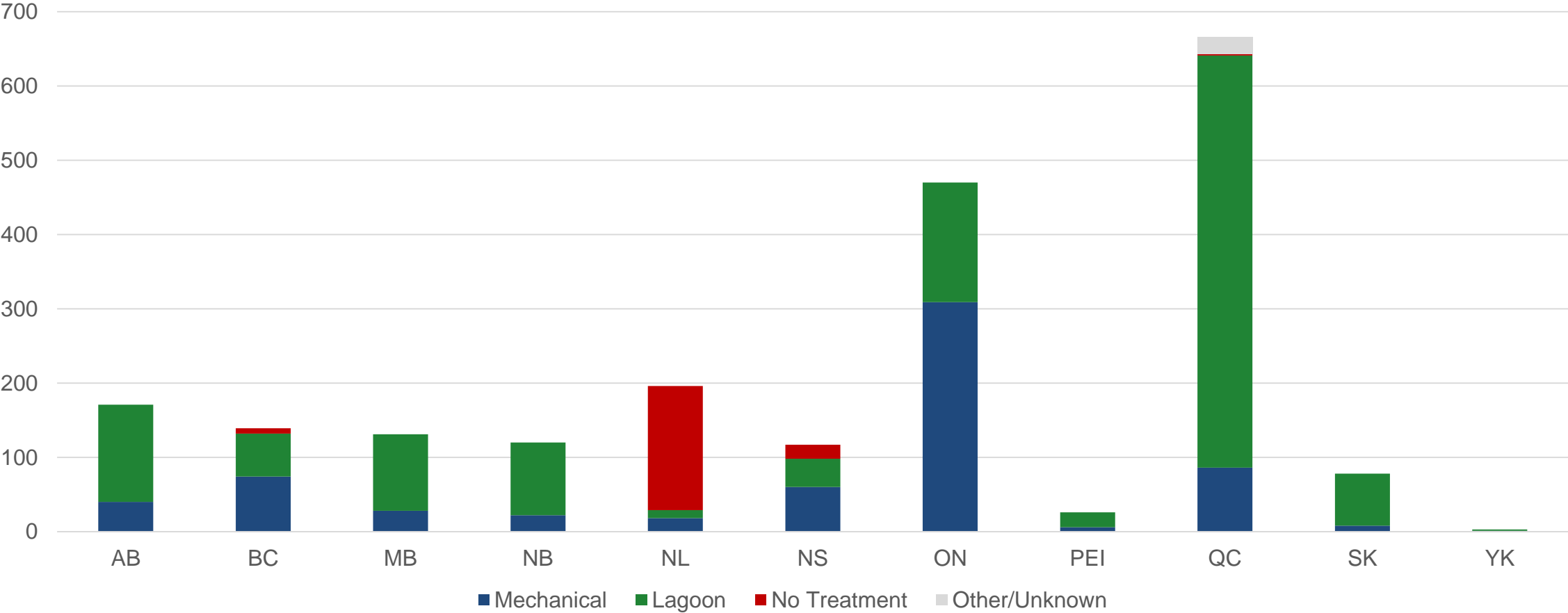
QUESTIONS?

REGULATED SYSTEMS ACROSS CANADA

+1,600 wastewater systems
subject to the Regulations



WASTEWATER SYSTEMS BY TREATMENT TYPE IN EACH PROVINCE AND TERRITORY



SUSPENDED SOLIDS EXEMPTION

Applies to lagoon systems only

Any SS test result that exceeds a concentration of 25 mg/L should not be included in the average if the sample was taken during the months of July, August, September or October.

This is to account for algae growth that can happen in lagoons in warmer months.

UPGRADING YOUR WWTP

When upgrading your WWTP, take the following steps:

- Review your Identification report to update any operational details and contact information (including contact name, email address and phone number)
- At the beginning of each reporting year, review your required sampling frequency based on your type of treatment system and the volume deposited and adjust your monitoring and sampling accordingly
- Apply for a temporary bypass authorization at least 45 days in advance if construction will require a release of undertreated effluent at the final discharge point
- If there is not enough time to apply for a temporary bypass authorization, or if there is a release outside of the final discharge point, follow the procedures for an unauthorized deposit

TEMPORARY BYPASS AUTHORIZATIONS

- Temporary bypass authorizations may be issued by the authorization officer if:
 - Release occurs at the wastewater system's final discharge point
 - Required for construction, maintenance or repairs
 - Designed to minimize volume of effluent deposited and concentration of deleterious substances
 - Made at least 45 days in advance
 - Communities must mitigate environment impacts to whatever extent is possible
 - ECCC may refuse to issue these authorizations if there is reasonable grounds to believe that the authorization would result in adverse effects on fish, fish habitat or the use by man of fish that cannot be mitigated
 - Factsheet with more information available [here](#)
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TEMPORARY AUTHORIZATION TO DEPOSIT UN-IONIZED AMMONIA

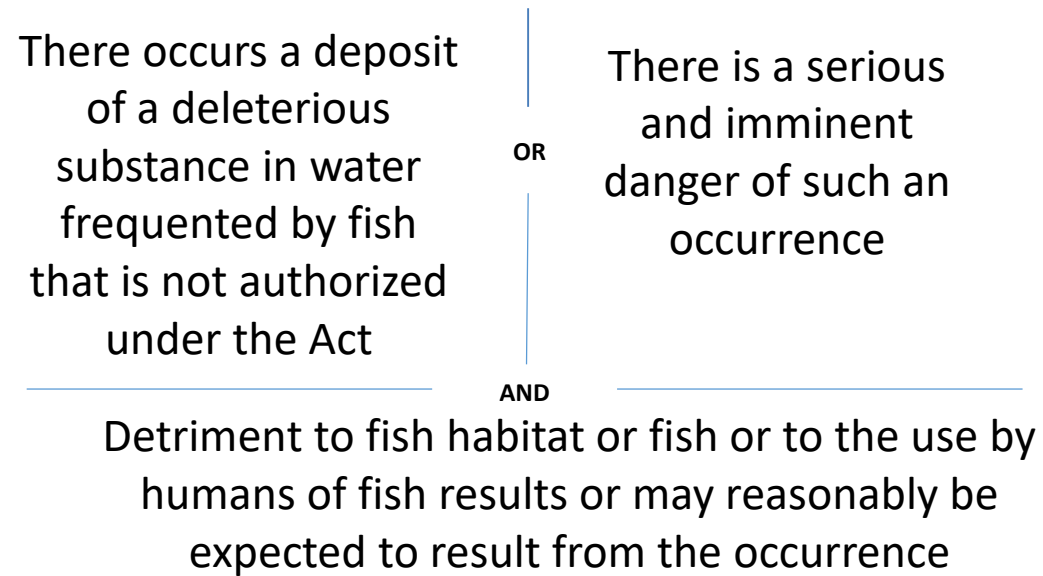
- A wastewater system may apply for a temporary authorization to deposit un-ionized ammonia if the effluent from the system is acutely lethal due to the presence of un-ionized ammonia.
 - Temporary authorizations to deposit un-ionized ammonia may be issued by the authorization officer if:
 - It is determined that the effluent was acutely lethal due to concentration of un-ionized ammonia, and
 - The concentration of un-ionized ammonia in the receiving water at any point that is 100 m from the point of entry where the effluent is deposited must be less than or equal to 0.016 mg/L, expressed as nitrogen
 - Authorizations for un-ionized ammonia are granted for a period of three years and can be extended
 - Factsheet with more information available [here](#)
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UNAUTHORIZED WASTEWATER DISCHARGES

Combined Sewer Overflows (CSOs)	Planned Discharges	Wastewater Spills	Exceedances
<ul style="list-style-type: none">• Overflows in combined sewer systems that collect stormwater and domestic wastewater in the same pipe• Occur due to heavy rainfall or snowmelt where volume exceeds system capacity	<ul style="list-style-type: none">• Releases from any overflow point of a wastewater collection system, other than final discharge point• Scheduled to conduct construction, repair or maintenance work (e.g. Montreal 2015)	<ul style="list-style-type: none">• Spills in the wastewater collection systems• Resulted from system failures, negligence, or unforeseen circumstances	<ul style="list-style-type: none">• Wastewater deposits from the final discharge point that do not meet the effluent quality standards.

Wastewater effluent discharge from small systems and northern systems are subject to the *Fisheries Act* general prohibition

PROCEDURE FOR UNAUTHORIZED DEPOSITS



Notify an inspector without delay of a unauthorized deposit, as required by [subsection 38\(5\)](#) of the Act, by calling the appropriate 24-hour [Environmental emergency contacts](#)

Take all reasonable measures to prevent, or to counteract, mitigate or remedy any damages that result from such a deposit or that might reasonably be expected to result from [subsection 38\(6\)](#)

Submit a written report describing the deposit and send to inspector as soon as feasible after the occurrence or after learning of the danger of the occurrence [subsection 38\(7\)](#)

For more information, see this [unauthorized deposit factsheet](#)