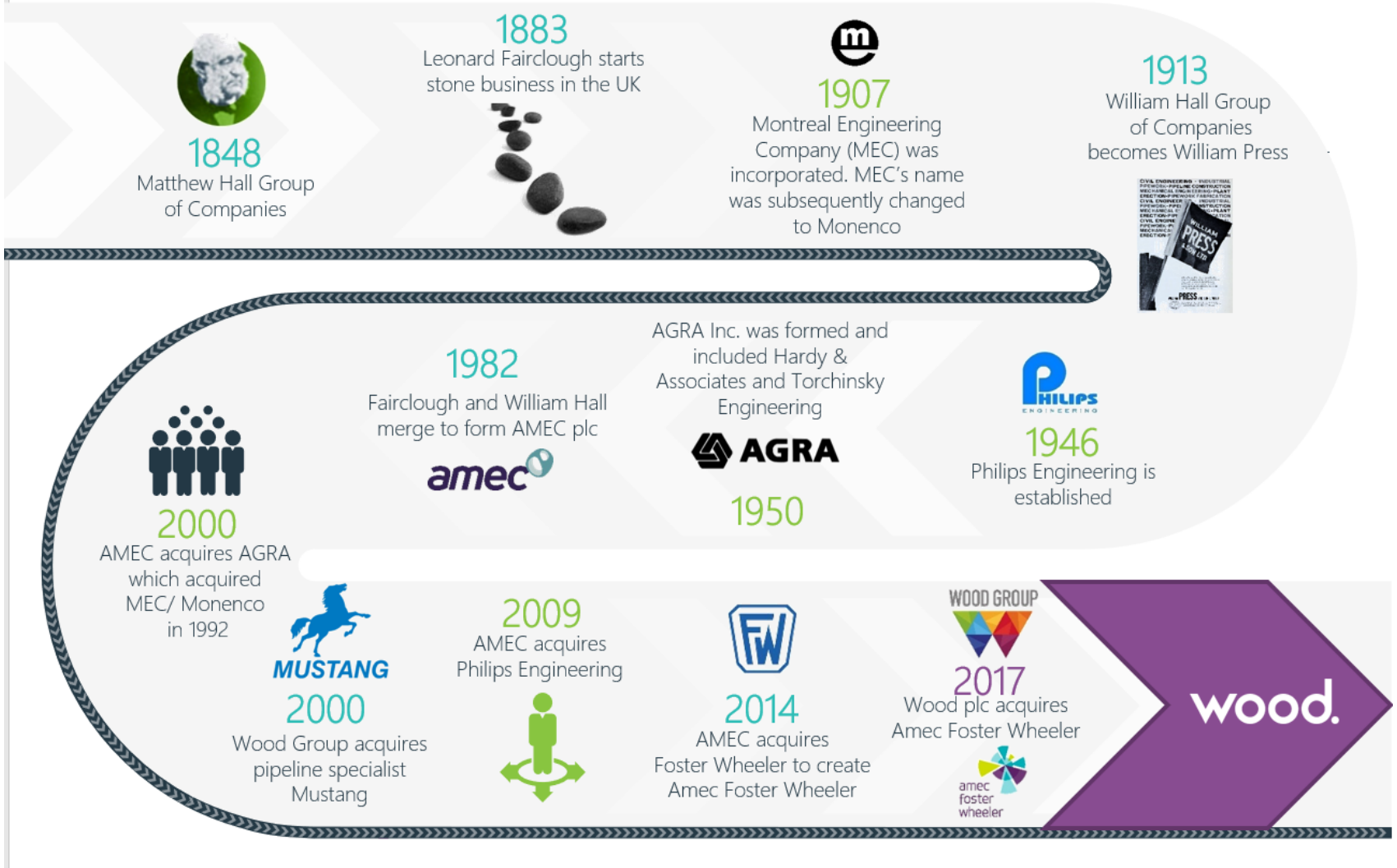
A Regional Approach to Boil Water Advisory Reduction

Susann Hickey, P.Eng.

WSP E&I Canada Limited



September 2022

Overview

- Boil Water Advisory Reduction initiative
  - Boil Water Advisories in NL
  - Past Studies
- 2022 Regional Options Study
  - Existing Regional Systems
  - Regional Operators
  - Procurement and Service Agreements
  - Community Survey

Boil Water Advisories in Newfoundland and Labrador

What is a BWA?


BWA is issued when there is a risk or know contamination of drinking water.

How long should the water be boiled?

All drinking water must be brought to a rigorous rolling boil for one (1) minute. Boiling for one minute will kill any disease-causing organisms in your water.

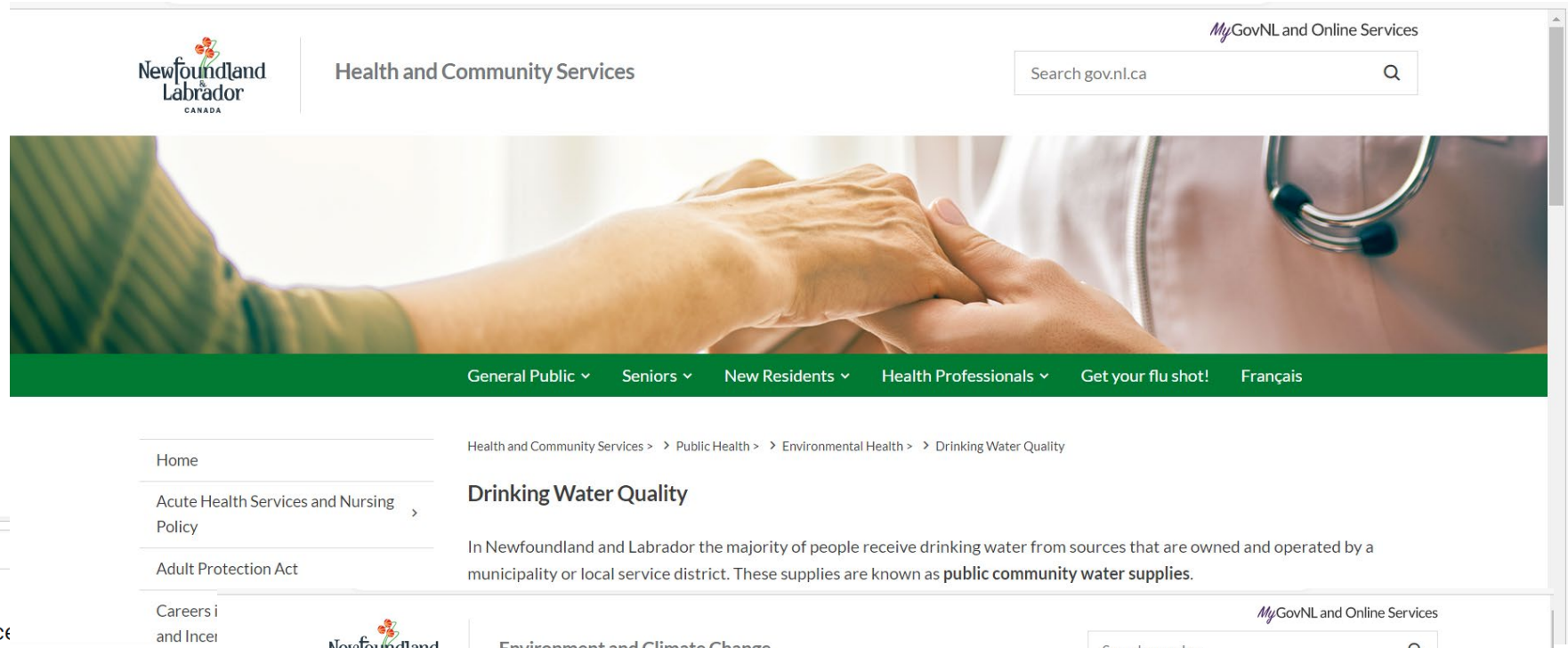
Should water used for additional purposes be boiled?

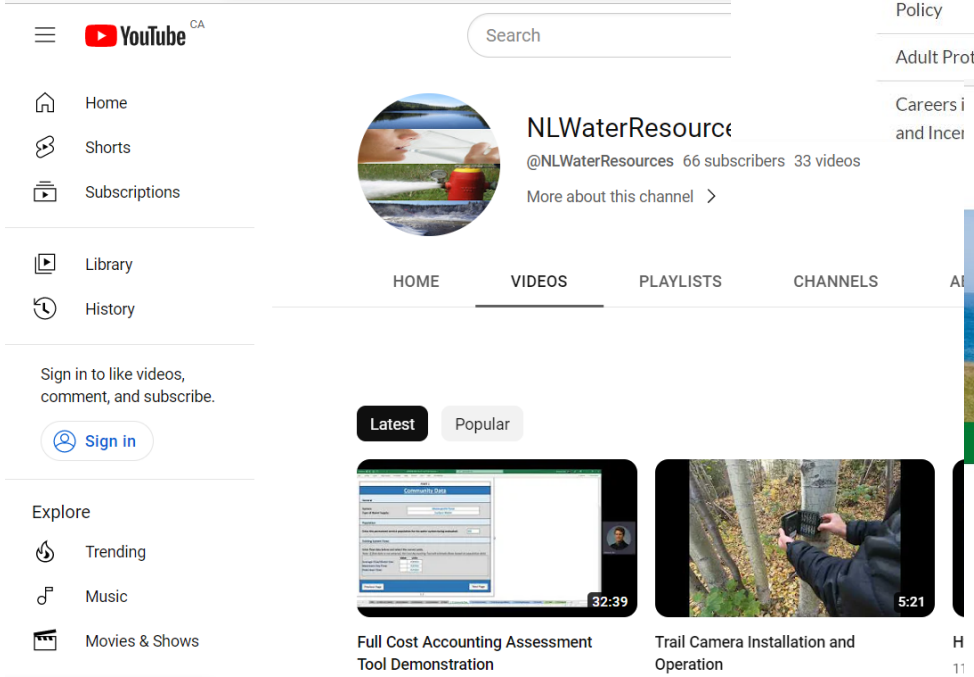
Boil water used for any activity where you might ingest the water, such as:

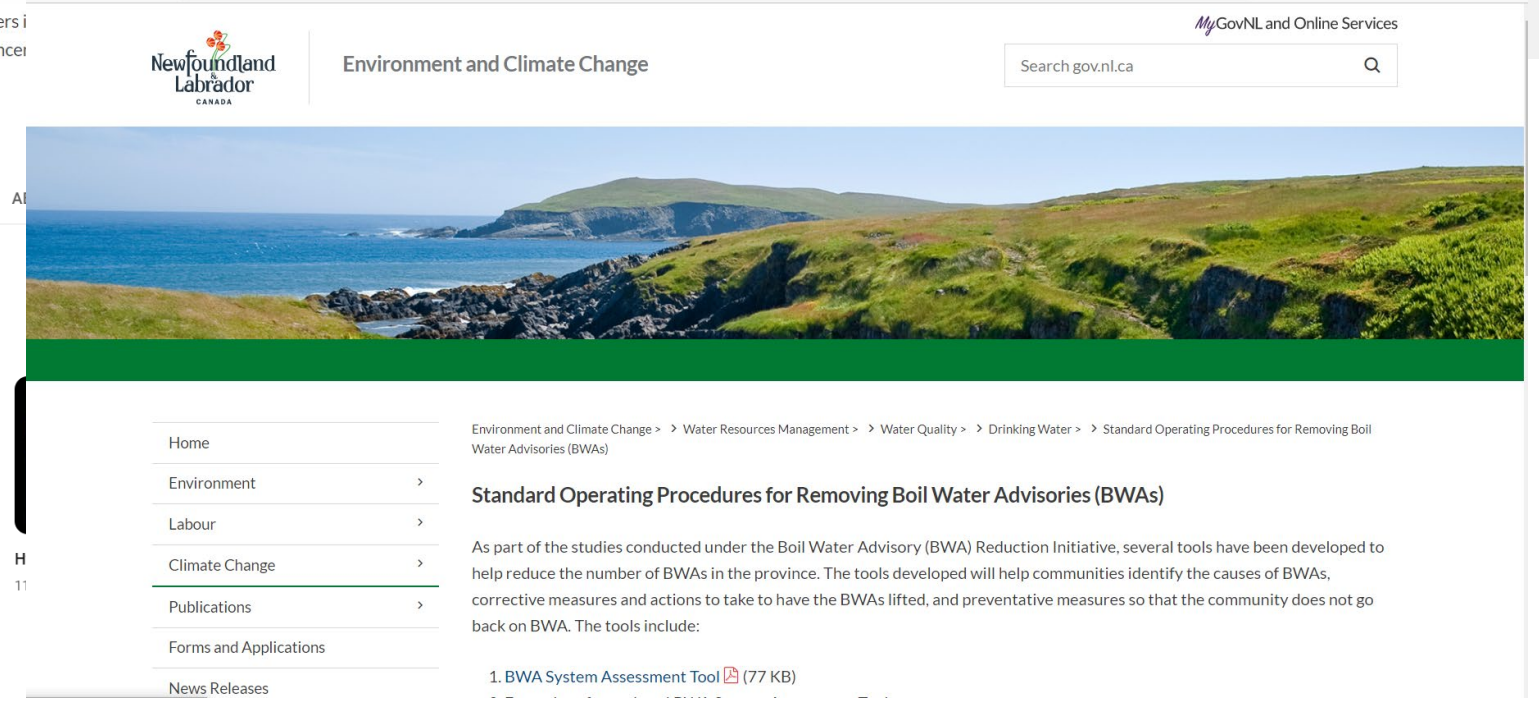
- drinking
- brushing teeth
- cooking
- washing fruits and vegetables
- making ice
- making coffee/tea
- making infant formula and cereal
- making juices and other drinks from concentrate or powders

Existing beverages and ice cubes made from water of questionable quality should be discarded. Ice cube trays and beverage containers should be sanitized before using again.

Where is Information Available?

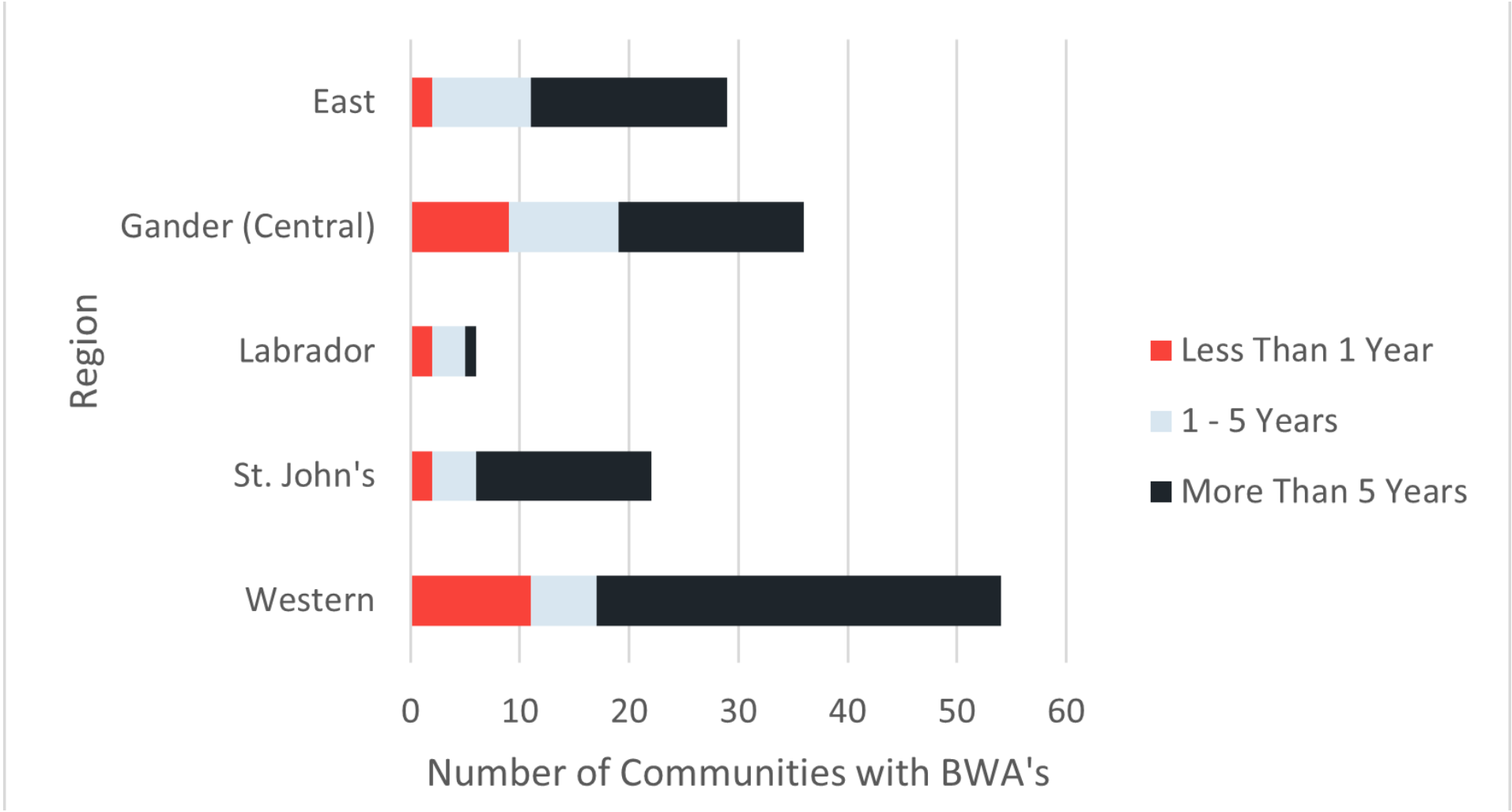






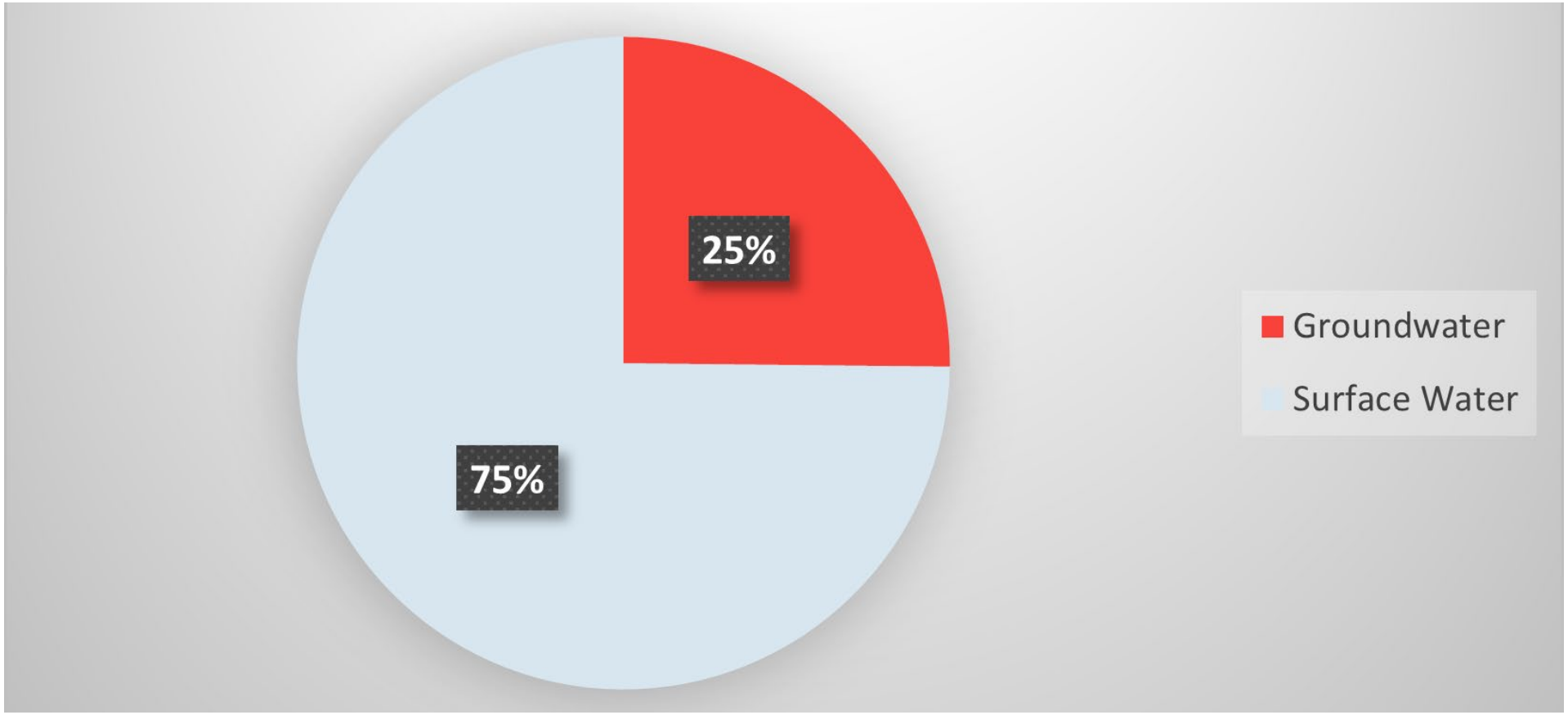
BWA's By Region

(March 17, 2023)



BWA's by Source Type

(March 17, 2023)



BWA's by Reason Code

(March 17, 2023)

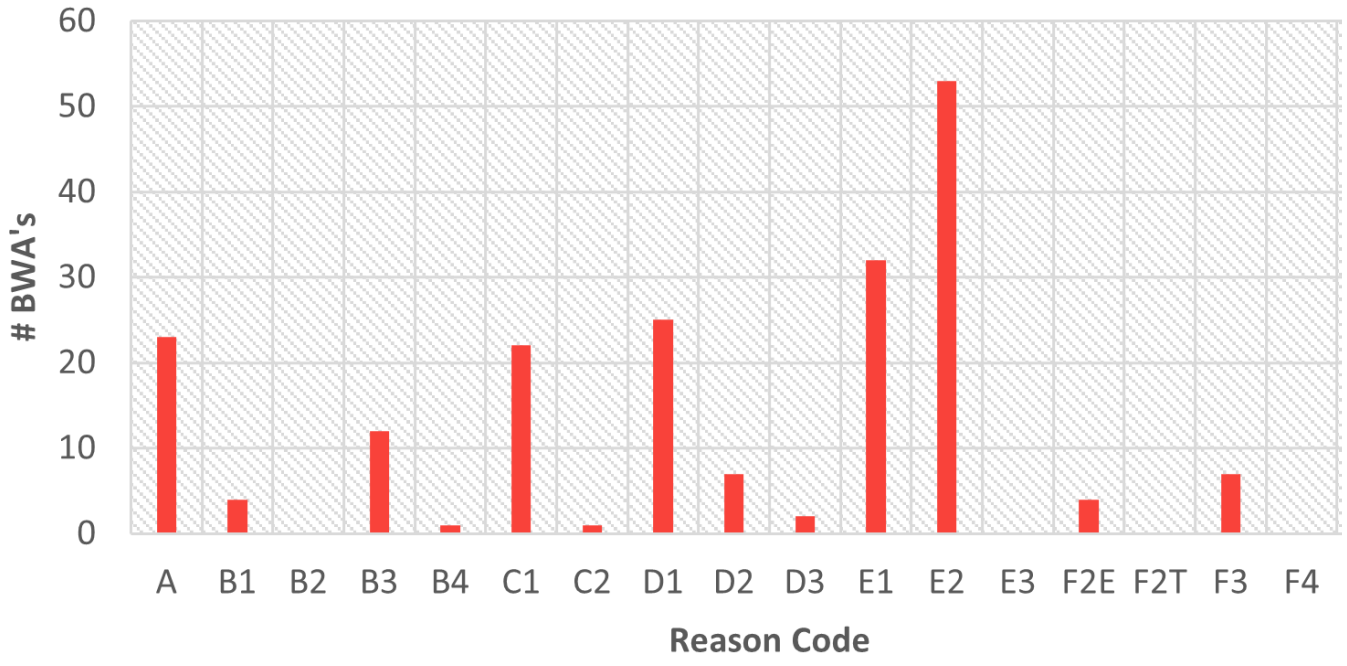


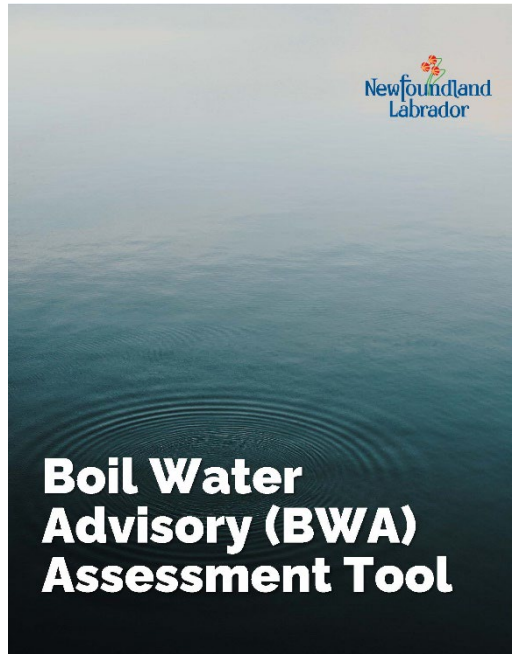
Table 1: Standard Reasons for Issuing BWAs in NL

Code	Standard Reason for Issuing BWAs
A	Water supply has no disinfection system
B1	Chlorination system is turned off by the operator, due to taste or other aesthetic conditions
B2	Chlorination system is turned off by the operator, due to perceived health risks
B3	Chlorination system is turned off by the operator, due to lack of funds to operate
C1	Disinfection system is off due to maintenance or mechanical failure
C2	Disinfection system is off due to lack of chlorine or other disinfectant
D1	Water distribution system is undergoing maintenance or repairs and bacteriological water quality is compromised
D2	A cross connection is discovered in the distribution system
D3	Inadequately treated water was introduced into the system due to fire flows, flushing operations, interconnections, minor power outage or other pressure loss
E1	Water entering the distribution system or facility, after a minimum 20 minute contact time does not have a free chlorine residual of at least 0.3 mg/L or equivalent CT value
E2	No free chlorine residual detected in the water distribution system
E3	Insufficient residual disinfectant in water system with secondary disinfection by means other than chlorination
F2E	*Escherichia coli* (*E.coli*) detected and repeat samples cannot be taken as required
F3	Total coliforms detected, confirmed in repeat sample and remedial measures implemented but not effective
F4	*Escherichia coli* (*E.coli*) detected in more than one sample of a set of samples and water system has other known problems
F5	*Escherichia coli* (*E.coli*) detected and confirmed in repeat sample
F6	Viruses detected (ex. Hepatitis A, Norwalk)
F7	Protozoa detected (ex. *Giardia*, *Cryptosporidium*)
G	Water supply system integrity compromised due to disaster (ex. Contamination of water source from flooding, gross contamination, major power failures, etc.)
H	Waterborne disease outbreak in the community
Z	None Listed

Past Boil Water Advisory Reduction Initiative Projects

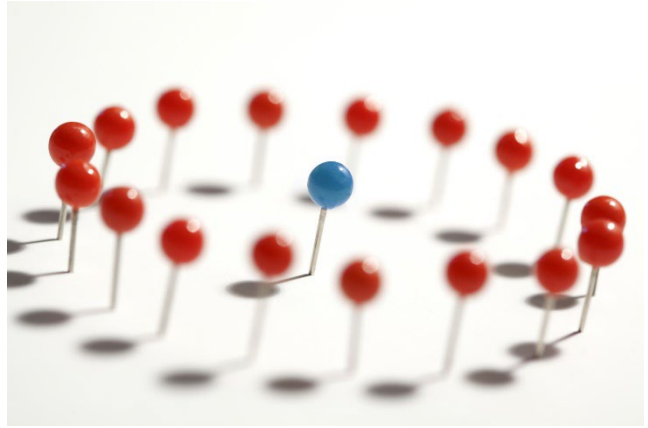
Boil Water Advisory Reduction Initiative Projects

- 2017 Pilot Study Implementing SOPs to reduce BWAs
  - Conducted 1-on-1 mentoring with 10 communities in Newfoundland and Labrador
  - Pilot use of Full Cost Accounting Tool and Boil Water Advisory Assessment Tool
  - Aided in the lifting of 4 BWAs.
- 2018-2019 Mentoring Program
  - Conducted 1-on-1 mentoring with 15 communities in Newfoundland and Labrador
  - Conducted 3 regional workshops in areas that expressed interest in the BWA reduction initiative
  - Aided in the lifting of 5 BWAs.
- 2019-2020 Mentoring Program
  - Conducted 1-on-1 mentoring with 18 communities in Newfoundland and Labrador
  - Despite challenges surrounding the emergence of COVID-19, 4 BWAs and 1 partial BWA were lifted



Boil Water Advisory Reduction Initiative Projects

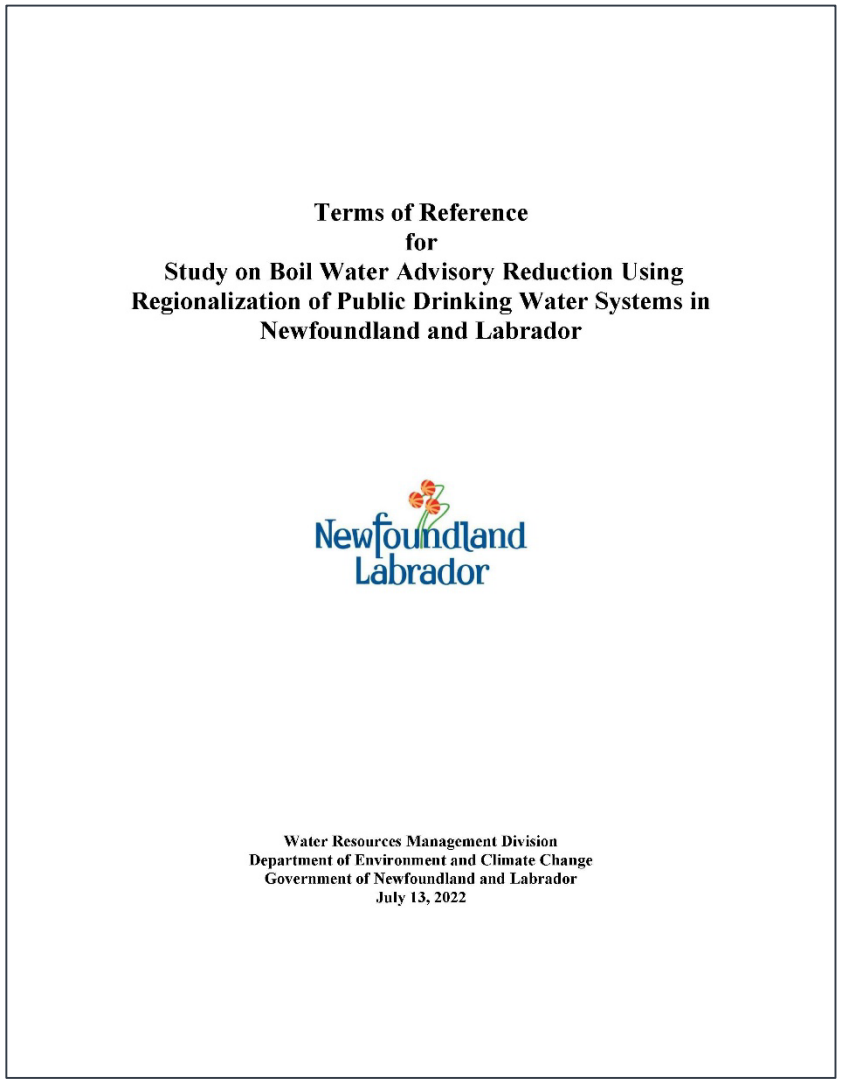
- 2020-2021 Mentoring Program
  - Conducted 1-on-1 mentoring with 16 communities in Newfoundland and Labrador
  - Despite challenges due to COVID-19 restrictions, 2 BWAs were lifted
- 2021-2022 Mentoring Program
  - Conducted 1-on-1 with 17 communities in Newfoundland and Labrador, including 5 returning from the previous year
  - Developed and oversaw production of 3 training videos
  - Despite challenges due to COVID-19 restrictions, 2 BWAs were lifted



2022 BWA Reduction Initiative Project: Regional Collaboration

2022 Regional Options Study

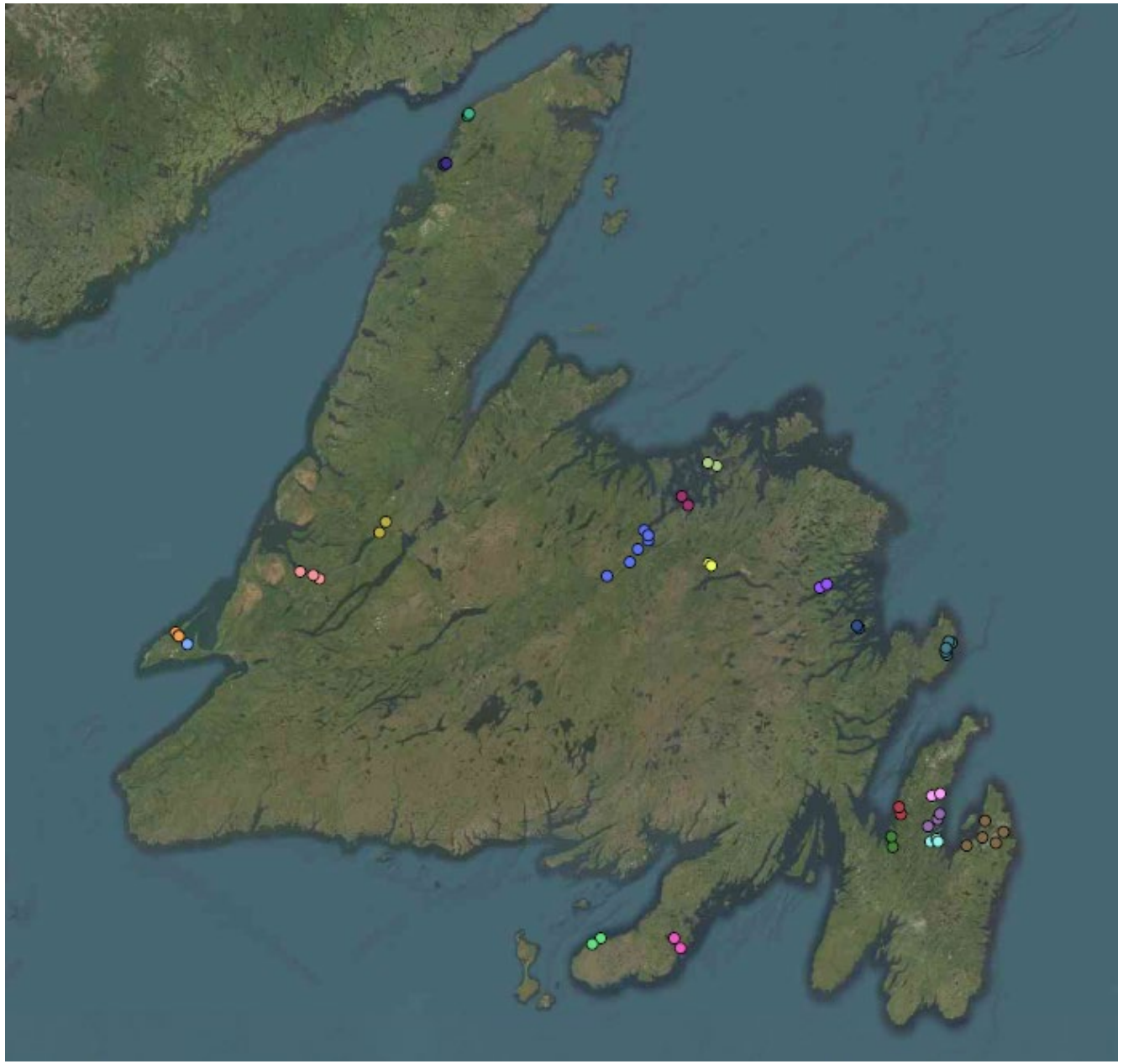
- WSP was retained in 2022 with project scope including:
  - Review characteristics of existing regional systems and identify other locations that could benefit from shared services.
  - High Level cost assessment including capital cost for system upgrades and water tax rates..
  - Regional Operator Program
  - Bulk procurement and joint service agreements
  - Community Survey (locations with public drinking water systems)



Terms of Reference
for
Study on Boil Water Advisory Reduction Using Regionalization of Public Drinking Water Systems in Newfoundland and Labrador

Newfoundland Labrador

Water Resources Management Division
Department of Environment and Climate Change
Government of Newfoundland and Labrador
July 13, 2022


LEGEND:
Current Regional DW Systems
Bay Bulls Big Pond
Big Pond
Brigus Long Pond
Broad Cove Pond
Dug Well
French Island Pond
Gander Lake
Hare Bay Pond
Horse Brook
Humber Canal
Inner Gilmour Pond
Kelly's Pond
Long Pond
Northern Arm Lake
Rocky Pond
Rushy Cove Pond
Troke's Pond
Trout Pond
Unnamed Brook
Victor's Brook
Whirl Pond

Existing Regional Drinking Water Systems In Newfoundland and Labrador

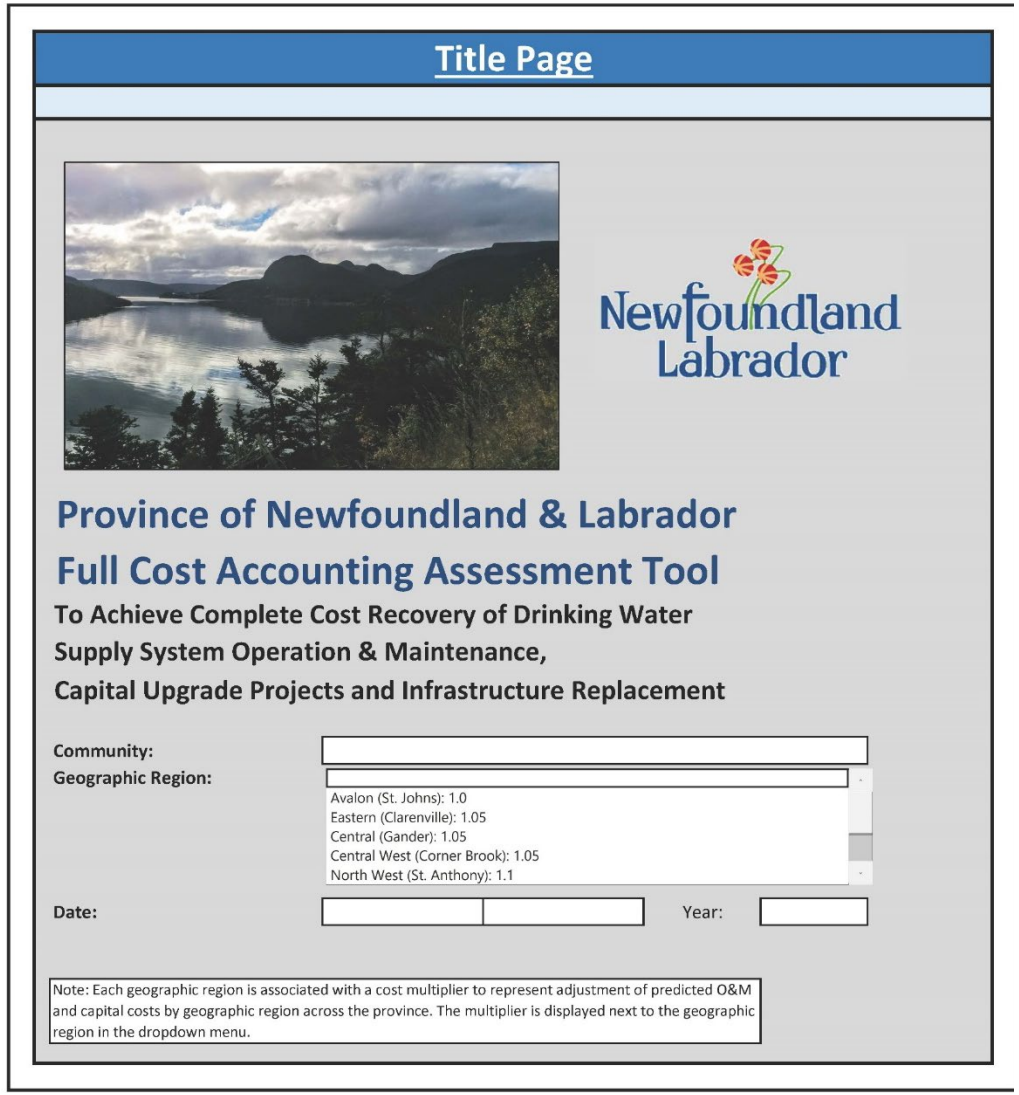
One system that supplies public drinking water to two or more communities.

Characteristics:

- Distance Between Communities
- Population Serviced
- Existing Treatment
- Source Type
- Available Yield of Source
- Community Resources
- Source Water Quality

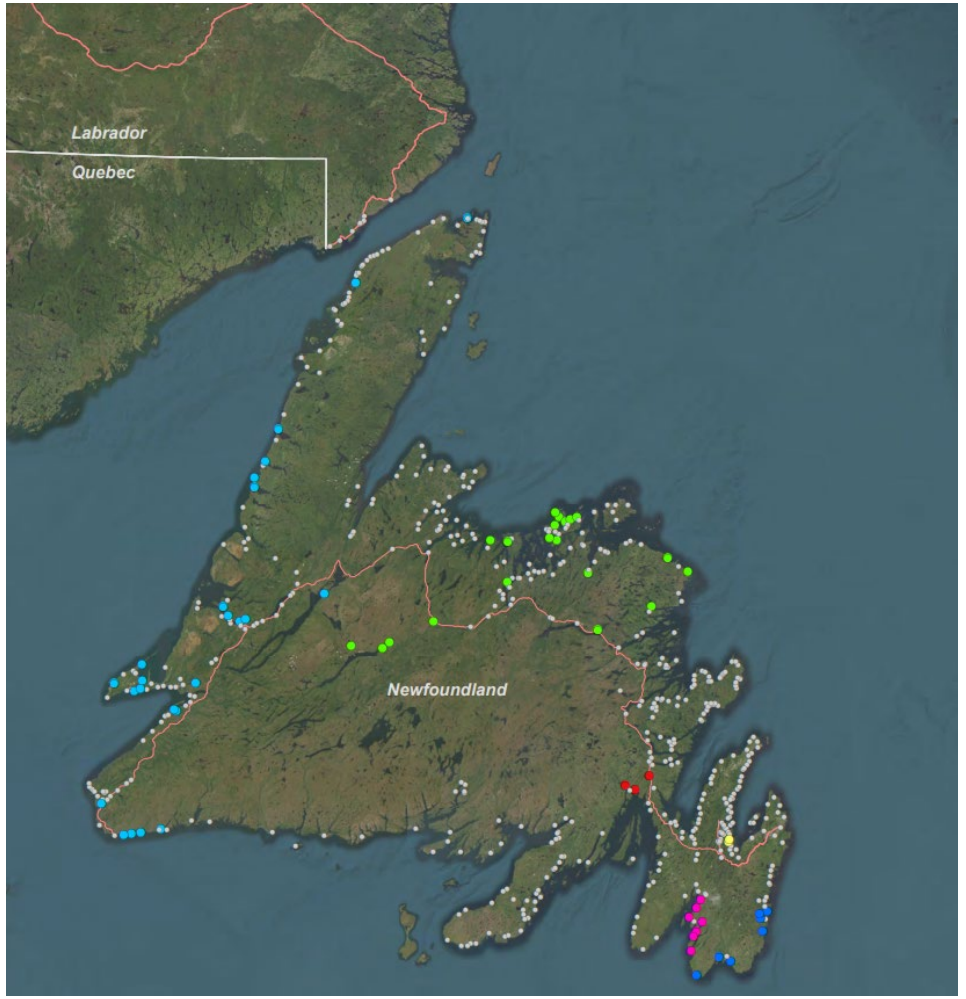
FCAT –Full Cost Accounting Assessment Tool

- Spreadsheet Tool
- Available Online
- Sections
  - Instructions
  - Part 1 – Existing System
  - Part 2 – System Upgrades
  - Part 3 – Infrastructure Replacement Costs



Regional Operator Program

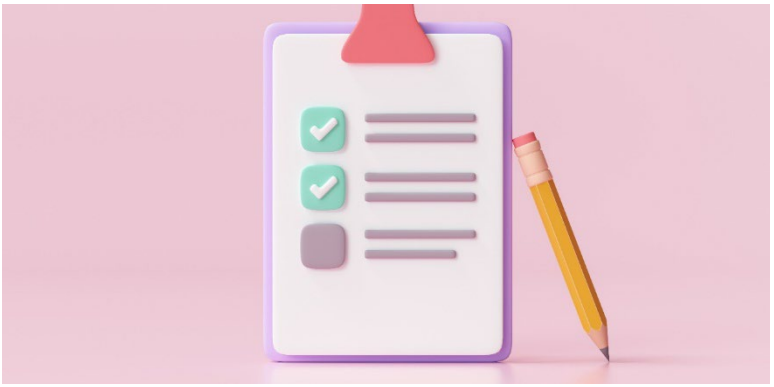
- Pilot program initiated in 2015.
- Regional Operators currently in Eastern, Western and Central, under regional service boards.
- Outside the regional operator pilot program
  - one area (Northern Peninsula) currently has an operator that is hired to work for multiple (4) communities.
  - Similar pilot projects have been conducted elsewhere in the province, in past.



Regional Service Agreements and Bulk Purchasing

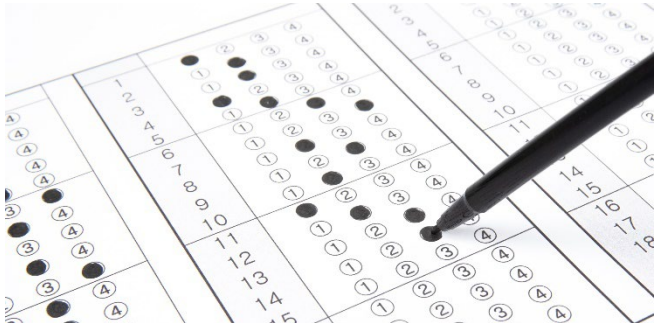
- There are existing service agreements between communities for things like: firefighting, garbage collection, backup staffing, animal control, etc.
- Newfoundland and Labrador Public Procurement Act
- Other jurisdictions
  - Other Canadian Provinces
  - Federally – CANOE procurement system
  - AFNWA – Atlantic First Nations Water Authority
  - OCWA – Ontario Clean Water Agency

Community Survey



- Issued in January 2023 to communities with public drinking water systems.
- Online and mail-out where needed.
- 24 total questions, including fill in the blank, multiple choice and open text responses.
- Questions related to general community information, drinking water system and water tax details, O&M costs, system operational challenges, opinions related to regional collaboration.
- Results are currently being reviewed and summarized.

Community Survey - Feedback



- 118 responses from 112 communities
- Challenges identified include (but are not limited to):
  - Cost of chemicals and supply chain issues
  - Aging infrastructure / system repairs
  - Resources to operate and maintain systems
  - System capacity issues
  - Water quality challenges

Thank you

wsp.com