Barriers to adopting large biomass systems in the NWT

A community perspective

January 2025 – Biomass Week

Kakisa

Introduction

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Yellowknife

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nwtac
NWT Association of Communities
Connecting Community Governments Since 1966

Supporting
NWT communities

in navigating
energy transitions

Today's Objectives

I. Analysis of community-owned systems: preliminary findings

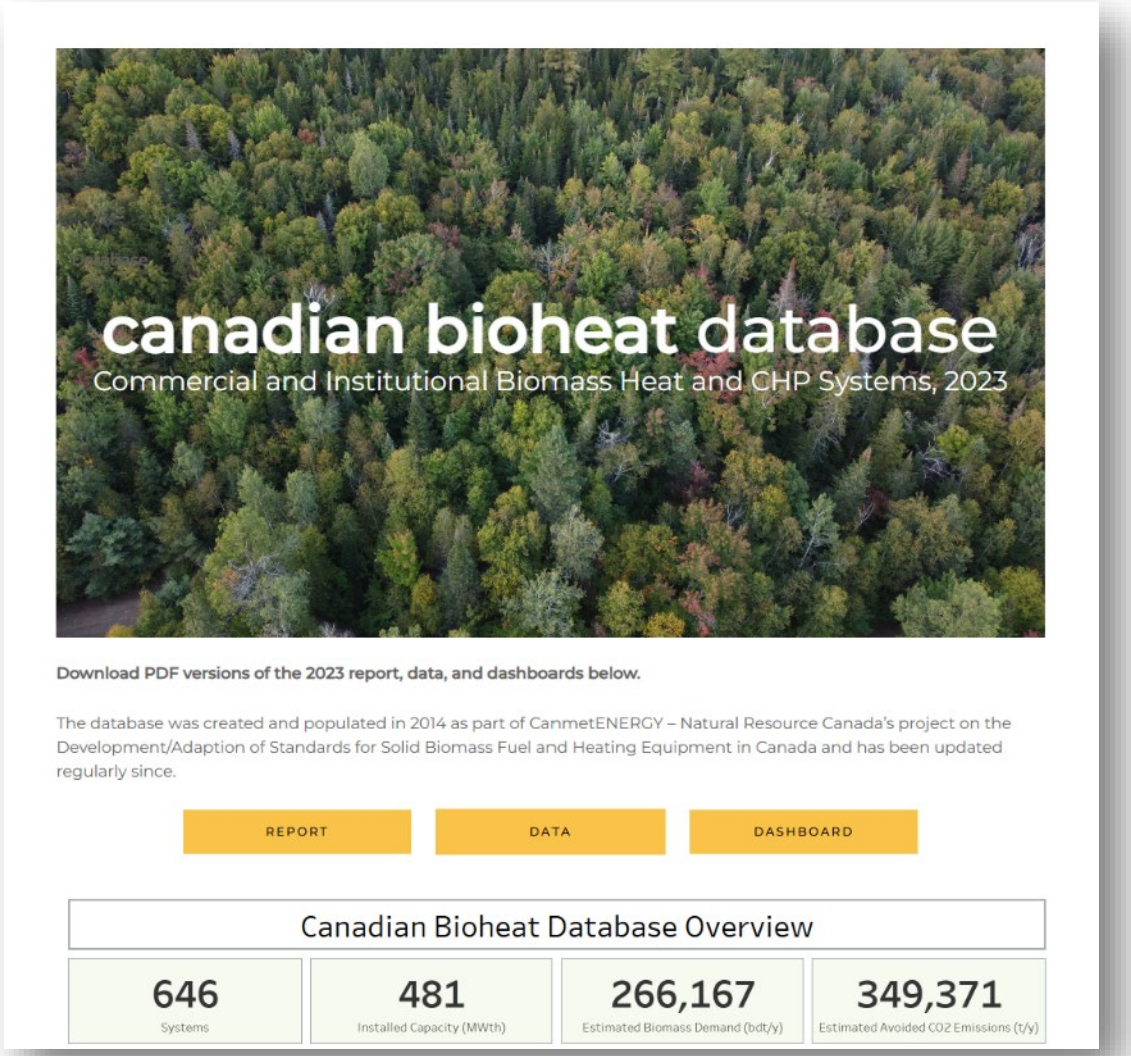
II. Circuit Rider Program: an **inspirational model**

III. Discussion and next steps

I. Analysis of community-owned systems

Preliminary findings

Starting with the Canadian Bioheat Database

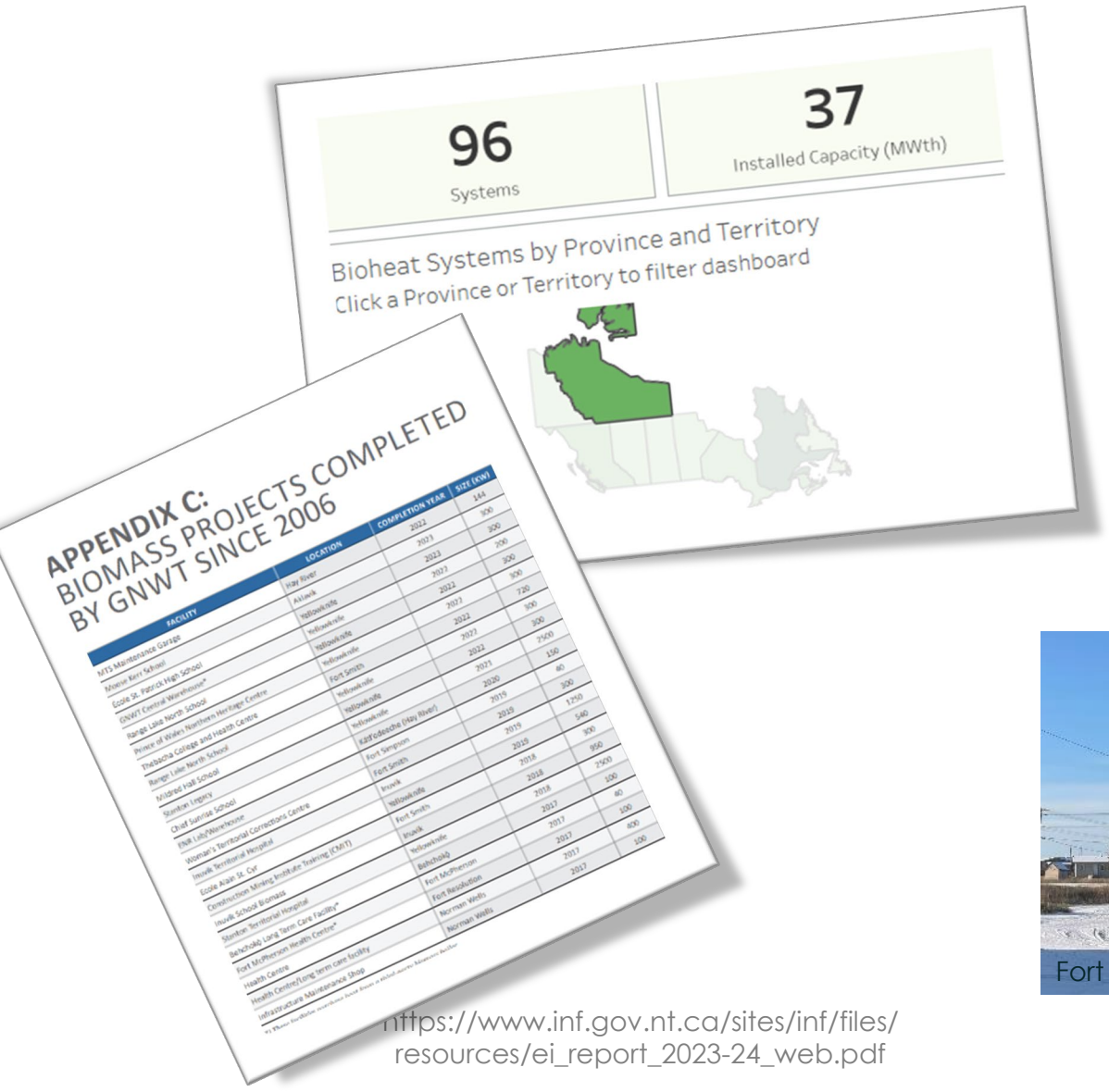


https://torchlightbioresources.com/canadian-bioheat-database

- Acknowledgement: Credit to the Government of Canada for creating and updating the tool

- A valuable resource for understanding bioheat system adoption trends across Canada

NWT: a leader in biomass adoption



- The database shows that after Quebec, the NWT is a leader in bioheat installations - an impressive feat given population size and geography.
- Credit to GNWT for pioneering the adoption of biomass boilers and driving progress.


Fort Resolution


YZF

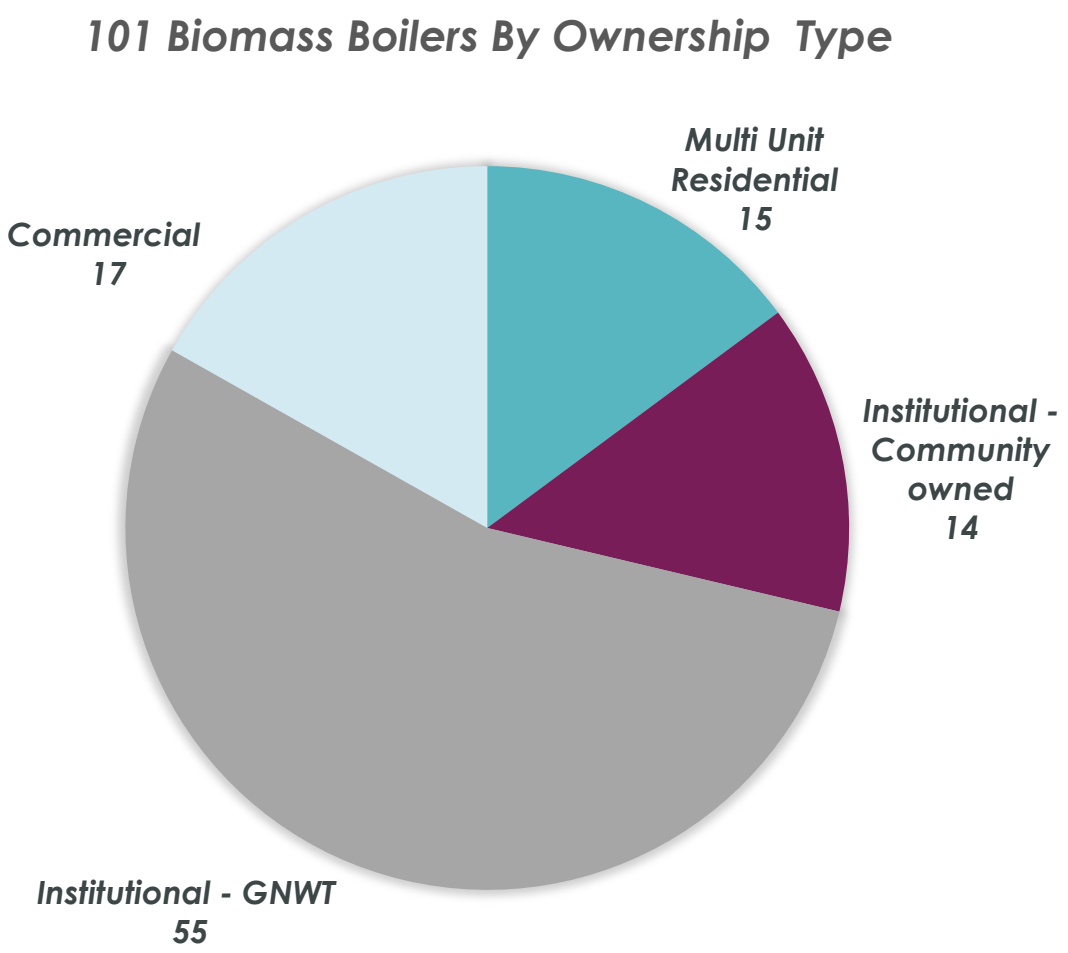
https://www.inf.gov.nt.ca/sites/inf/files/resources/ei_report_2023-24_web.pdf

Code name BBOT: **an energizing partnership**

- Acknowledgement: Credit to the Arctic Energy Alliance for securing funding (Northern REACHE) to **revive** a training offered in 2018 and **extend** it to a wider range of stakeholders!

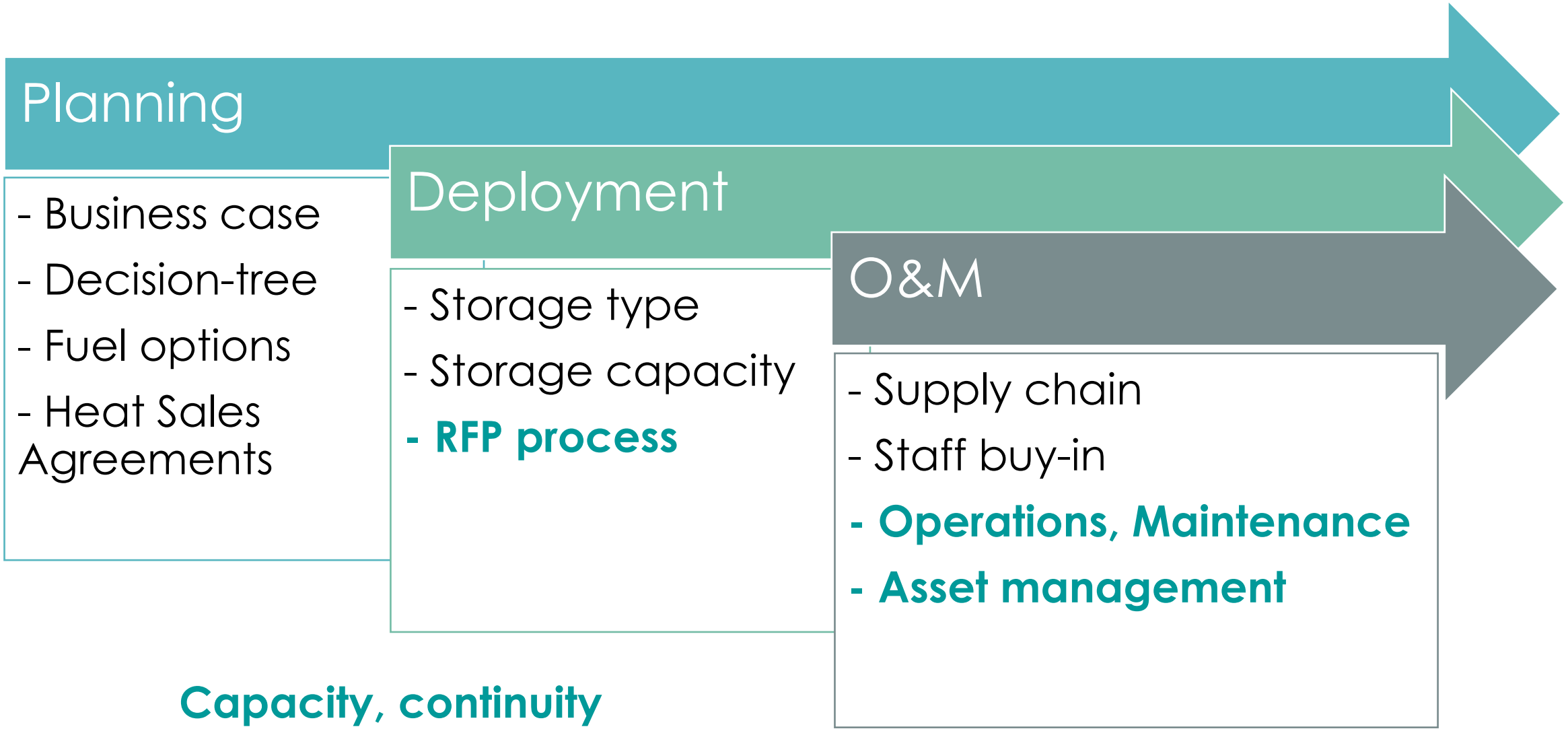
- Database proved useful for the "community government" stream of the November 5-6 issue
  - informal discussions
  - common barriers emerged

Analysis work on Community-owned systems



- Bulk analysis ensures confidentiality
- 14 out of 101 installations in the NWT are community-owned
- Spread across 10 communities, ranging from 60kWth to 950kWth
- **Key Finding**: 9 out of 14 systems are currently non-operational (2024)

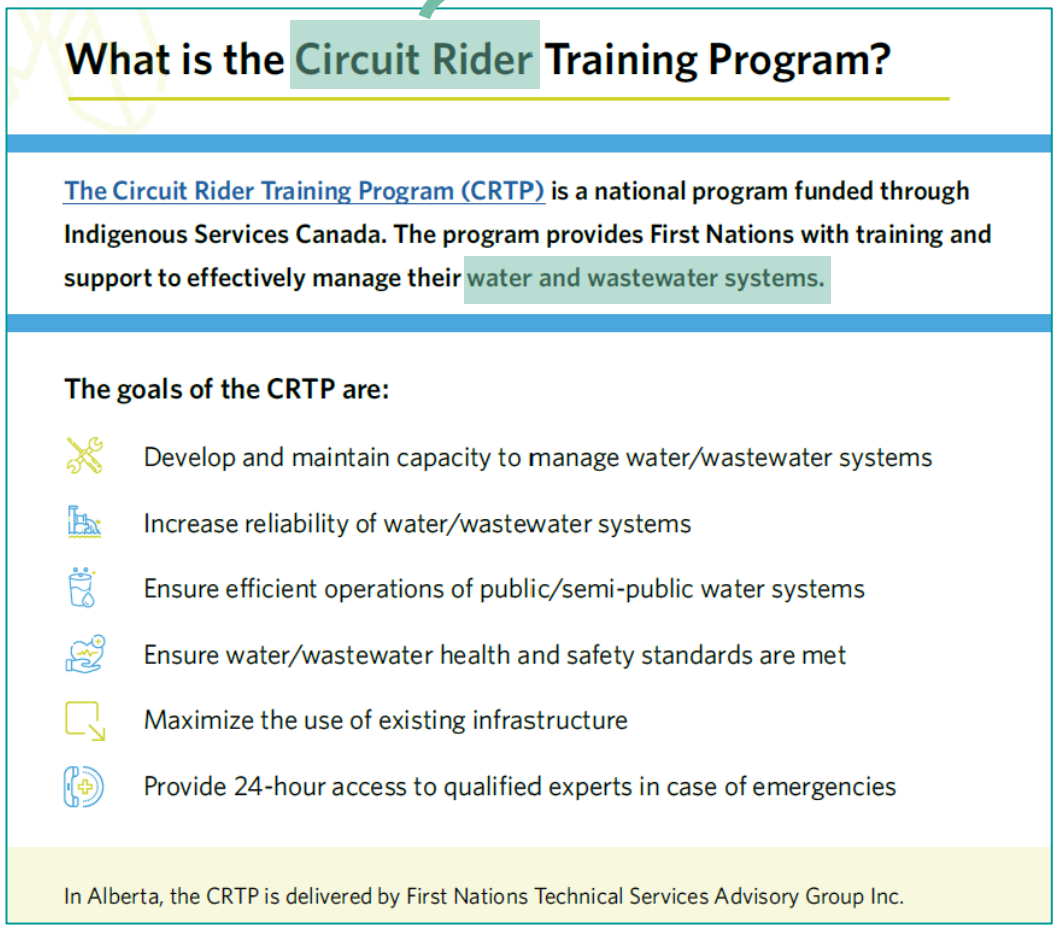
Barriers to adopting large biomass systems: A community perspective



II. The Circuit Rider Program

An inspirational model

Introducing the CRTP Model



What is the Circuit Rider Training Program?

The Circuit Rider Training Program (CRTP) is a national program funded through Indigenous Services Canada. The program provides First Nations with training and support to effectively manage their water and wastewater systems.

The goals of the CRTP are:

- Develop and maintain capacity to manage water/wastewater systems
- Increase reliability of water/wastewater systems
- Ensure efficient operations of public/semi-public water systems
- Ensure water/wastewater health and safety standards are met
- Maximize the use of existing infrastructure
- Provide 24-hour access to qualified experts in case of emergencies

In Alberta, the CRTP is delivered by First Nations Technical Services Advisory Group Inc.

https://tsag.net/wp-content/uploads/2022/01/TSAG-Infographic-For-Distribution.pdf

Circuit Rider Trainers are experts that rotate through a circuit of indigenous communities, training the people responsible for operating, monitoring and maintaining water treatment plants (WTP).

CRTP delivery models vary across provinces and territories.

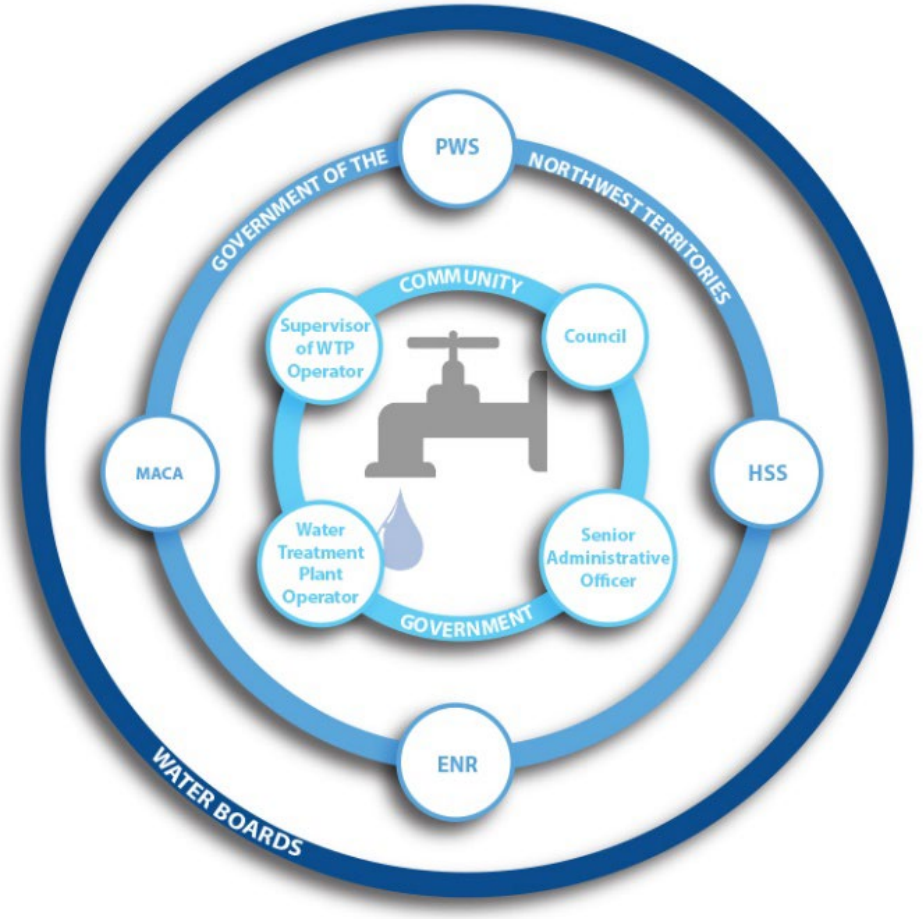
The NWT drew inspiration from the Technical Services Advisory Group (TSAG), an indigenous non-profit in Alberta.

The NWT version: **A partnership approach**

The Circuit Rider Program:

- was launched in October 2006 in the NWT
- is administered by MACA, although assets and staff are with communities
- aligns with different frameworks and strategies as water quality involves multiple partners
- is tailored to ensure all NWT communities are eligible
- counts 17 communities participating to date

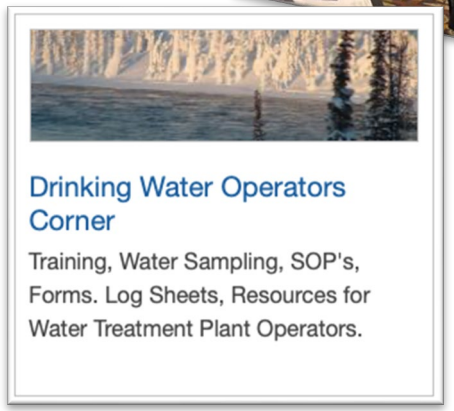
Inspirational success: The CRTP contributes to one of the lowest number of communities under boil water advisories in Canada.

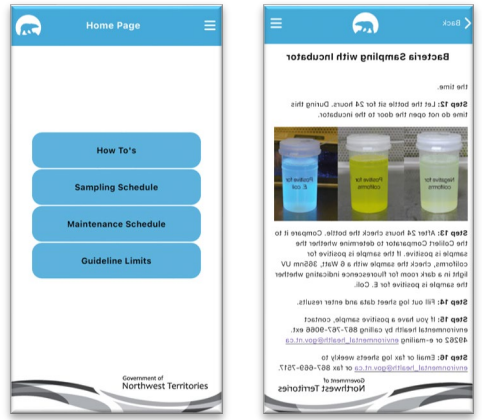


Key components of the CRTP

- **3 Full-Time Circuit Riders**
  - ✓ On-site support: Regular visits, scheduled and on-demand
  - ✓ 24/7 remote support
  - ✓ Emphasis on building trust and cultural sensitivity

- **Tools, Templates, Rosters**
  - ✓ Tailored resources available online and on site
  - ✓ Smartphone app: NWT Water Operator
  - ✓ Curated list of contractors and suppliers





- **1 Training Centre**
  - ✓ Tailored training programs
  - ✓ Developing an Occupational Certification program

A dual-focus on **technical support** and **capacity building**

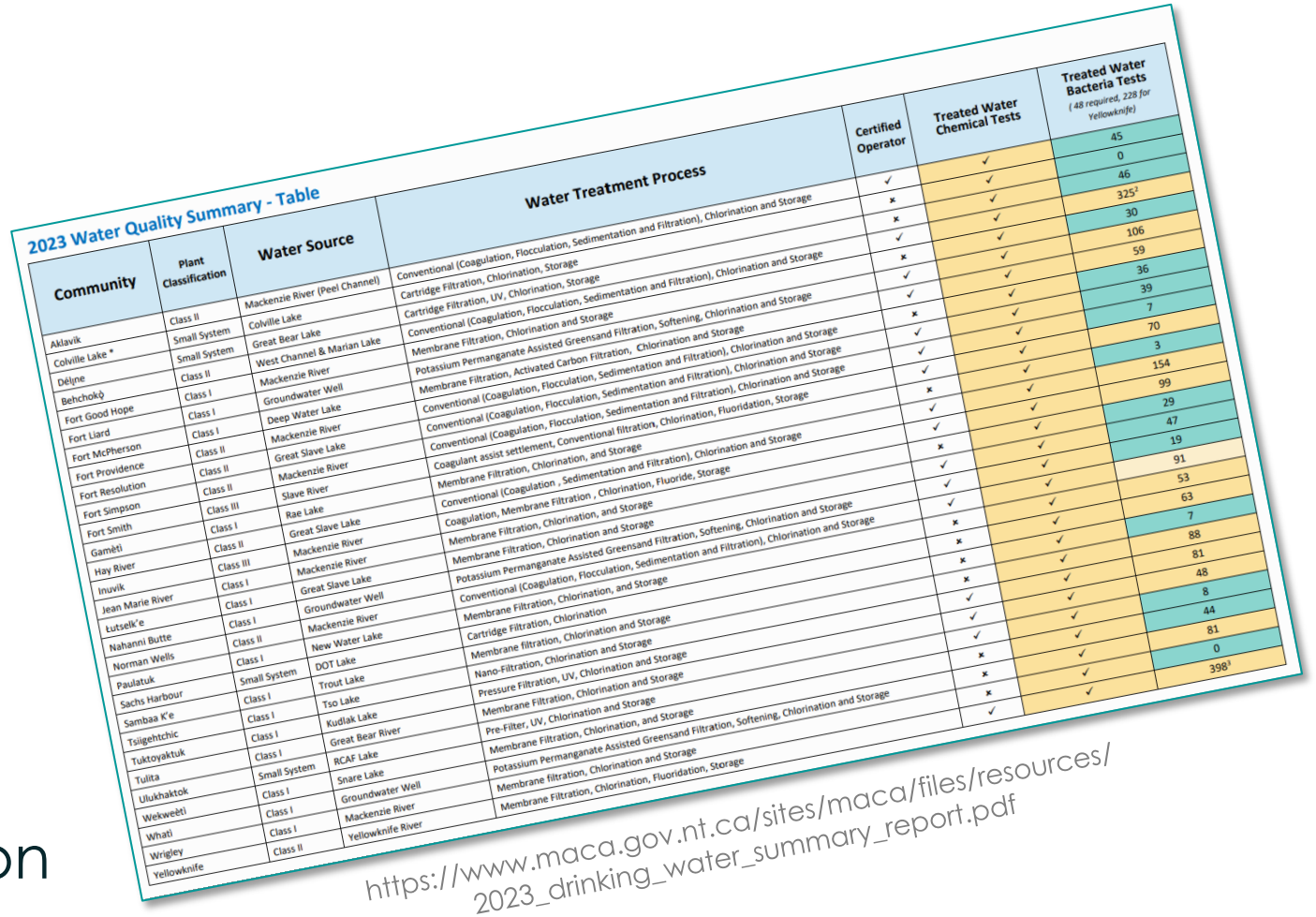
+ Beyond the training program: Design review, RFP templates, liaison with other departments, etc.

Applicability Considerations

Aspect	Water Treatment Plants	Large Biomass Systems
Profile of service	Mandatory service Regulatory driven	Optional service Driven by emission reduction, cost stabilization, energy diversification, etc.
Operational Purpose	WTPs are primary installations	Biomass boilers are added installations to existing heating systems
Health Responsibility	Critical with direct impact on public health	No immediate health risk from low-quality fuel or abandoned systems.
Operator Certification	Mandatory certification for operators	Best practices can suffice No mandated certification (except for Łiwegǫatì and Fort Simpson)
Community Exposure	30 communities exposed to WTP frameworks in the past 20 years minimum.	Biomass systems are still developing in the NWT, with fewer installations

Inspirational features

- An intentional service, responsive to community needs
- Federally supported with local delivery models
- Dedicated staff, lean organization
- Integrated approach along the asset life cycle
- community-centric, action-oriented, long-term thinking



2023 Water Quality Summary - Table

Community	Plant Classification	Water Source	Water Treatment Process	Certified Operator	Treated Water Chemical Tests	Treated Water Bacteria Tests (48 required, 228 for Yellowknife)
Aklavik	Class II	Mackenzie River (Peel Channel)	Conventional (Coagulation, Flocculation, Sedimentation and Filtration), Chlorination and Storage	✓	✓	45
Colville Lake *	Small System	Colville Lake	Cartridge Filtration, Chlorination, Storage	×	✓	0
Délı̨ne	Class II	Great Bear Lake	Cartridge Filtration, UV, Chlorination, Storage	×	✓	46
Behchokǫ̀	Class I	West Channel & Marian Lake	Conventional (Coagulation, Flocculation, Sedimentation and Filtration), Chlorination and Storage	✓	✓	325[2]
Fort Good Hope	Class I	Mackenzie River	Membrane Filtration, Chlorination and Storage	×	✓	30
Fort Liard	Class I	Groundwater Well	Potassium Permanganate Assisted Greensand Filtration, Softening, Chlorination and Storage	✓	✓	106
Fort McPherson	Class II	Deep Water Lake	Membrane Filtration, Activated Carbon Filtration, Chlorination and Storage	✓	✓	59
Fort Providence	Class II	Mackenzie River	Conventional (Coagulation, Flocculation, Sedimentation and Filtration), Chlorination and Storage	✓	✓	36
Fort Resolution	Class II	Great Slave Lake	Conventional (Coagulation, Flocculation, Sedimentation and Filtration), Chlorination and Storage	✓	✓	39
Fort Simpson	Class III	Mackenzie River	Conventional (Coagulation, Flocculation, Sedimentation and Filtration), Chlorination, Fluoridation, Storage	×	✓	7
Fort Smith	Class I	Slave River	Coagulant assist settlement, Conventional filtration, Chlorination and Storage	✓	✓	70
Gamèti	Class II	Rae Lake	Membrane Filtration, Chlorination, and Storage	✓	✓	3
Hay River	Class III	Great Slave Lake	Conventional (Coagulation , Sedimentation and Filtration), Chlorination and Storage	×	✓	154
Inuvik	Class I	Mackenzie River	Coagulation, Membrane Filtration , Chlorination, Fluoride, Storage	✓	✓	99
Jean Marie River	Class I	Mackenzie River	Membrane Filtration, Chlorination, and Storage	✓	✓	29
Łutselk'e	Class I	Great Slave Lake	Membrane Filtration, Chlorination and Storage	✓	✓	47
Nahanni Butte	Class II	Groundwater Well	Potassium Permanganate Assisted Greensand Filtration, Softening, Chlorination and Storage	×	✓	19
Norman Wells	Class I	Mackenzie River	Conventional (Coagulation, Flocculation, Sedimentation and Filtration), Chlorination and Storage	✓	✓	91
Paulatuk	Small System	New Water Lake	Membrane Filtration, Chlorination, and Storage	✓	✓	53
Sachs Harbour	Class I	DOT Lake	Cartridge Filtration, Chlorination	✓	✓	63
Sambaa K'e	Class I	Trout Lake	Membrane filtration, Chlorination and Storage	×	✓	7
Tsiigehtchic	Class I	Tso Lake	Nano-Filtration, Chlorination and Storage	×	✓	88
Tuktoyaktuk	Class I	Kudlak Lake	Pressure Filtration, UV, Chlorination and Storage	×	✓	81
Tulita	Small System	Great Bear River	Membrane Filtration, Chlorination and Storage	✓	✓	48
Ulukhaktok	Class I	RCAF Lake	Pre-Filter, UV, Chlorination and Storage	✓	✓	8
Wekweètì	Class I	Snare Lake	Membrane Filtration, Chlorination, and Storage	✓	✓	44
Whatì	Class I	Groundwater Well	Potassium Permanganate Assisted Greensand Filtration, Softening, Chlorination and Storage	×	✓	81
Wrigley	Class I	Mackenzie River	Membrane filtration, Chlorination and Storage	×	✓	0
Yellowknife	Class II	Yellowknife River	Membrane Filtration, Chlorination, Fluoridation, Storage	✓	✓	398[3]

https://www.maca.gov.nt.ca/sites/maca/files/resources/2023_drinking_water_summary_report.pdf

III. Next steps

And open discussion

Next steps

- **NWT Bioheat Database: 2024-2025 update**
  - ➢Continue to work with NRCan and partners to update the database

- **Summer 2025: Observation report**
  - ➢Formalize a gap analysis regarding community-owned boilers

- **Moving toward a partnership?**
  - ➢Explore and develop solutions so that the NWT keep leading the trend!

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Open discussion

- What stood out to you from these observations?
- Are there any relatable stories you'd like to share?
- What is the potential for a technical support network?
- Which next step can catalyze collective efforts?

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