Potable Water Dispensing Units:
Experience in NL

Paula Dawe, P.Eng
Dept of Environment and Conservation
Water Resources Management Division
pauladawe@gov.nl.ca

Presentation Overview

- Comparison of WTPs and PWDUs
- Jurisdictions that use PWDUs
- Advantages of PWDUs
- Justification and tradeoffs of using PWDUs
- Examples of PWDUs in NL
- PWDUs as a sustainable options for DWQ management of small systems

What is a Water Treatment Plant (WTP)?

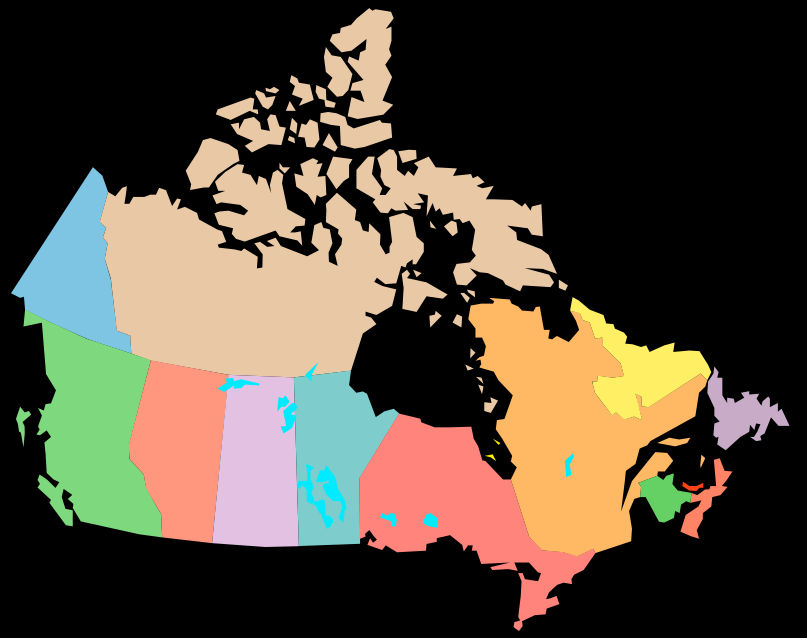
- A WTP is a facility that treats all water entering a distribution system at a centralized location through a combination of different water treatment processes providing the consumer with potable water direct from the tap
- At least 14 communities in NL with WTPs
- Average capital cost: $1.5-$8 million
- Average O&M costs: $15,000-$500,000

What is a Potable Water Dispensing Unit (PWDU)?

- A PWDU is a small scale water treatment system that treats only a fraction of total water demand on a distribution system through a combination of different water treatment processes
- Uses many of the same treatment process found in large scale water treatment plants
- Intended to treat only drinking water portion of total water demand- 0.5-3 Liters/person/day
- Water is stored on-site at a centralized location for manual collection by users, or could be delivered to consumers in water coolers

Jurisdictions in Canada to Use PWDUs

- Saskatchewan
- Newfoundland and Labrador
- Territorial governments
  - Using centralized PWDU to deal with drinking water quality issues in small, rural communities



Reasons for Installing a PWDU

- Drinking water quality issues:
  - BWAs, pathogens, turbidity, THMs, HAAs, colour, pH, iron, manganese
- A full scale water treatment plant is beyond the resource capacity of the community
  - Financial, technical (know-how), human
- Advanced treatment technology on a scale affordable to small rural communities

Advantages of PWDUs

- Safe source of potable drinking water
- Makes advanced water treatment technology available to small/rural communities at a suitable scale
- Successfully piloted in 5 communities in NL
- Easy access
- Non-consumptive uses still met by tap water (wash cars, water lawns, fight fires, flush toilets)

Justification of PWDU

- Practice of collecting drinking water from roadside springs common in NL
- Typically 20-30% of residents in Western Newfoundland use spring water as main source of drinking water
- Of 83 tests on 37 springs used for drinking water in Western and Central NL, 28% of tests indicated springs were contaminated with E.coli and/or had coliform counts above provincial guidelines
- Guideline for coliforms and E.coli is 0/100 mL
- One spring had E.coli of +60/100mL
- Springs tested fine one week, but two weeks later tested unsafe

Justification of PWDU

- Citizens are paying excessive amounts for bottled or jugged water
- $3 for 1L of bottled water verses $0.004 for 1L of treated municipal tap water (water rate of $500/year and water use of 350 L/p/d)
- PWDUs should not be viewed as a step backwards to the days of manual collection of drinking water
- PWDUs provide safe, affordable, accessible, high quality drinking water to the community without drastically changing existing practices for the procurement of potable water already common in many rural communities

Tradeoffs between PWDU and WTP

- Cost
  - PWDU are affordable for small towns
  - WTP are expensive
- Convenience
  - PWDU- Manual collection of drinking water
  - WTP- High quality drinking water available right from the tap

Treatment Units Part of the PWDUs

- Multi-media filtration
- Activated carbon filtration
- Reverse osmosis
- Ozone disinfection
- UV disinfection
- Chlorine disinfection

Communities with PWDU in NL

- Communities have expressed high levels of satisfaction with their PWDUs

Community	Population	Year Installed
St. Lawrence (E)	1349	2007
Buchans (C)	761	2004
Howley (W)	241	2007
Burnt Islands (W)	703	2005
Black Tickle-Domino (L)	201	2003/04

Cost of PWDU in NL

Community	Capital Costs ($)	Approximate Annual O&M Costs ($)
St. Lawrence*	46,575	4000
Buchans	47,000	1500
Howley*	27,000	N/A
Burnt Islands	26,000	600
Black Tickle-Domino	40,000	25,000

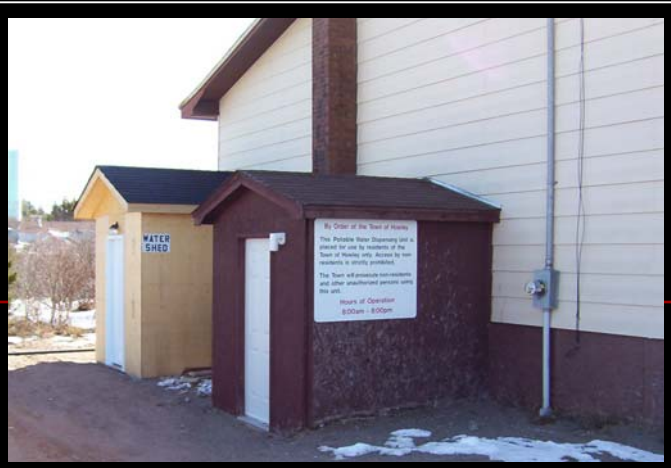
* Still under 1 year warranty

St. Lawrence


ST. LAWRENCE
FILTRATION FACILITY
NOTICE
RESIDENTIAL
WATER SUPPLY
St. Lawrence Residents Only

Buchans

Howley



Burnt Islands

Black Tickle-Domino

PWDU

Results of Pilot PWDUs

- No major issues with existing PWDUs once commissioned
- Units working effectively to provide safe, affordable, accessible, high quality drinking water to public in response to drinking water quality issues experienced in respective communities
- Communities very satisfied with PWDUs

Parameter	Buchans		St. Lawrence	
	Before	After	Before	After
Colour (TCU)	31	5	47	7
pH	6.44	6.33	4.55	5.12
Turbidity (NTU)	0.6	0.3	1.1	0.7
DOC (mg/L)	5.6	1.1	6.2	2.4
Copper (mg/L)	0.347	0.002	0.756	0.267
Aluminum (mg/L)	0.01	0.12	0.15	0.22
Iron (mg/L)	0.03	0.13	0.37	0.19
TDS (mg/L)	8	9	32	26

Sustainable Options for DWQ Management of Small Systems

- 447 water systems with some kind of drinking water quality issue
- For the majority of very small drinking water systems with significant water quality management issues, PWDU are the only feasible mitigative option
- PWDU could be suitable for over 100 small water systems in NL
- PWDU have low resource intensity level— they are economical and sustainable
- Government should play an active role in the operation and maintenance of PWDUs

Key Message

- PWDUs could be a viable and sustainable option to deal with multiple drinking water quality issues in small and remote communities in Newfoundland and Labrador

Thank You