

# Rural Drinking Water in Newfoundland and Labrador

## Exploring Solutions for Sustainable Rural Drinking Water Systems

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Principal Investigator

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# Outline

- ◆ Introduction to project
- ◆ Findings thus far with discussion
- ◆ Next steps for the project

# About the Project

What are we trying to do and why?



# Our Research Project



- 💧 Risks and challenges influencing drinking water quality and availability
- 💧 Emphasis on communities of 1,000 residents or less in NL
- 💧 What is working, factors for success, possible solutions and future research



# Major Components of Research



- ◆ Source water quality and quantity
- ◆ Infrastructure and operations
- ◆ Policies and governance
- ◆ Public perception, awareness, and demand

(Annual Report, 2012)

# How?

- 💧 Literature Review
- 💧 Legislation and Policy Review (DPSIR)
  - 💧 Policy Workshop
- 💧 Media Scan
- 💧 Municipal Surveys and Consultations
- 💧 Case Studies

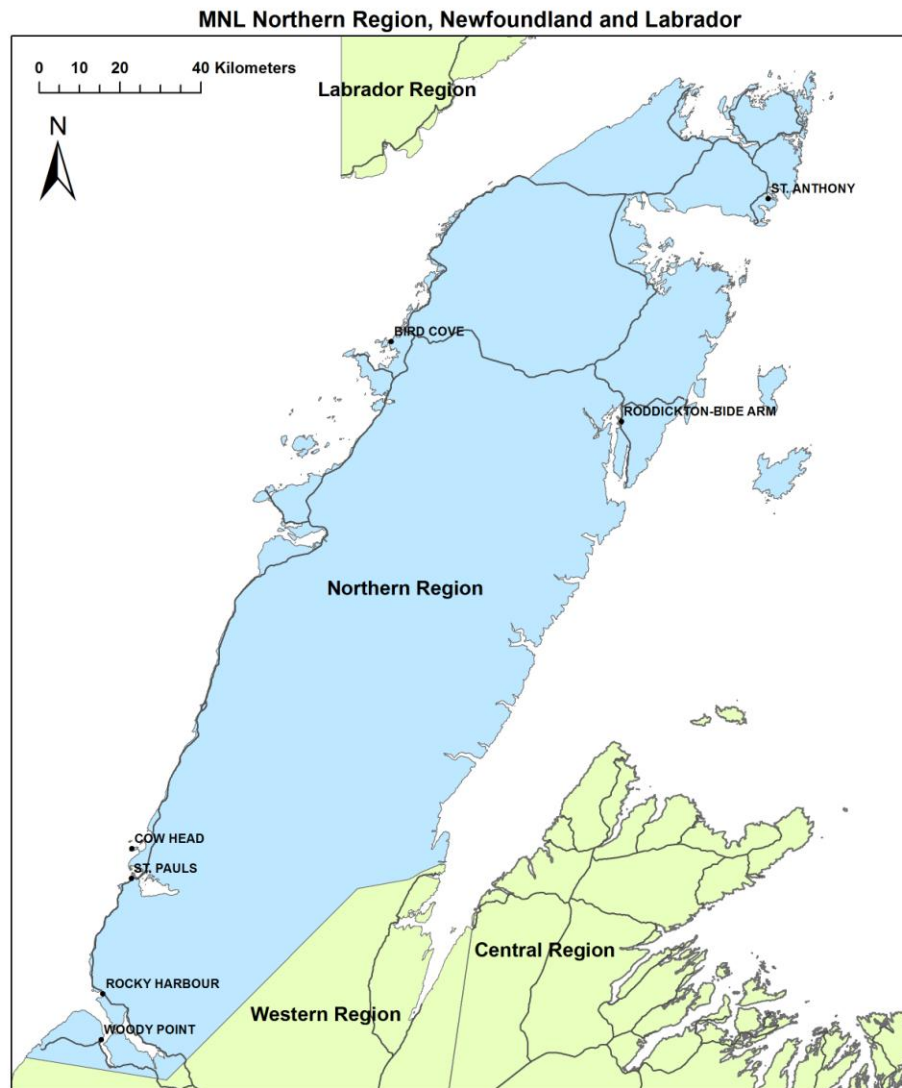


# Survey Results and Discussion

Northern Highlights



# MNL Northern Region



Data Sources:  
Government of Newfoundland and Labrador,  
Department of Municipal and Intergovernmental Affairs  
Geobase National Road Network, Government of Canada,  
Natural Resources Canada, Centre for Topographic Information

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# Respondents - Administrators Survey

- ◆ **46%** response rate (Municipalities & LSDs)
  - ◆ 7% in the Northern region
  - ◆ 42% of all communities 1000 or less
  - ◆ 74% of respondents from communities of 1,000 or less
    - ◆ 19% of Northern respondents from COTOLs
- ◆ 14/48 (**29%**) Municipalities/LSDs in the Northern region responded to the survey

# Respondents - Water Operators Survey

- ◆ 84 respondents as of March 27, 2014
- ◆ 5 **Northern** communities: 4 Municipalities; 1 LSDs

# Water Services



# Municipal Water Service (Administrators)

Question	1000 or less	1000 +	Northern Municipalities
Operate a water system for residents?	83%- Yes 18%- No	95%- Yes 5%- No	92%- Yes 8%- No
If no, why not?	60%- Not a priority	64%- Not a priority	Not answered





# Discussion:

## Water Services

- ◆ Do you have houses in your municipality that are not hooked up to the municipal system?
  - ◆ Is this a problem?
  - ◆ Why aren't they hooked up?
- ◆ What would it take to increase the percentage of households hooked up to the municipal water supply?

# Boil Water Advisories



# Boil Water Advisories – DOEC Data

## Boil Water Advisories (BWAs)

- July 29, 2013 - **256** BWAs affecting 184 communities in NL (Gov't of NL, 2013c)
- 96%** communities 1,000 or less
- 55%** of BWAs for communities 1,000 or less have been in place for 5+ years



# BWA Reasons

## Northern Municipalities/LSDs (Water Operators)

- ◆ 5/5 of respondents from Northern indicated BWA in last 4 years
- ◆ Reasons included:
  - ◆ Inadequately treated water was introduced into the system
  - ◆ Water entering the distribution system did not meet minimum free chlorine residual
  - ◆ No free chlorine residual detected in the water distribution system



# Discussion:

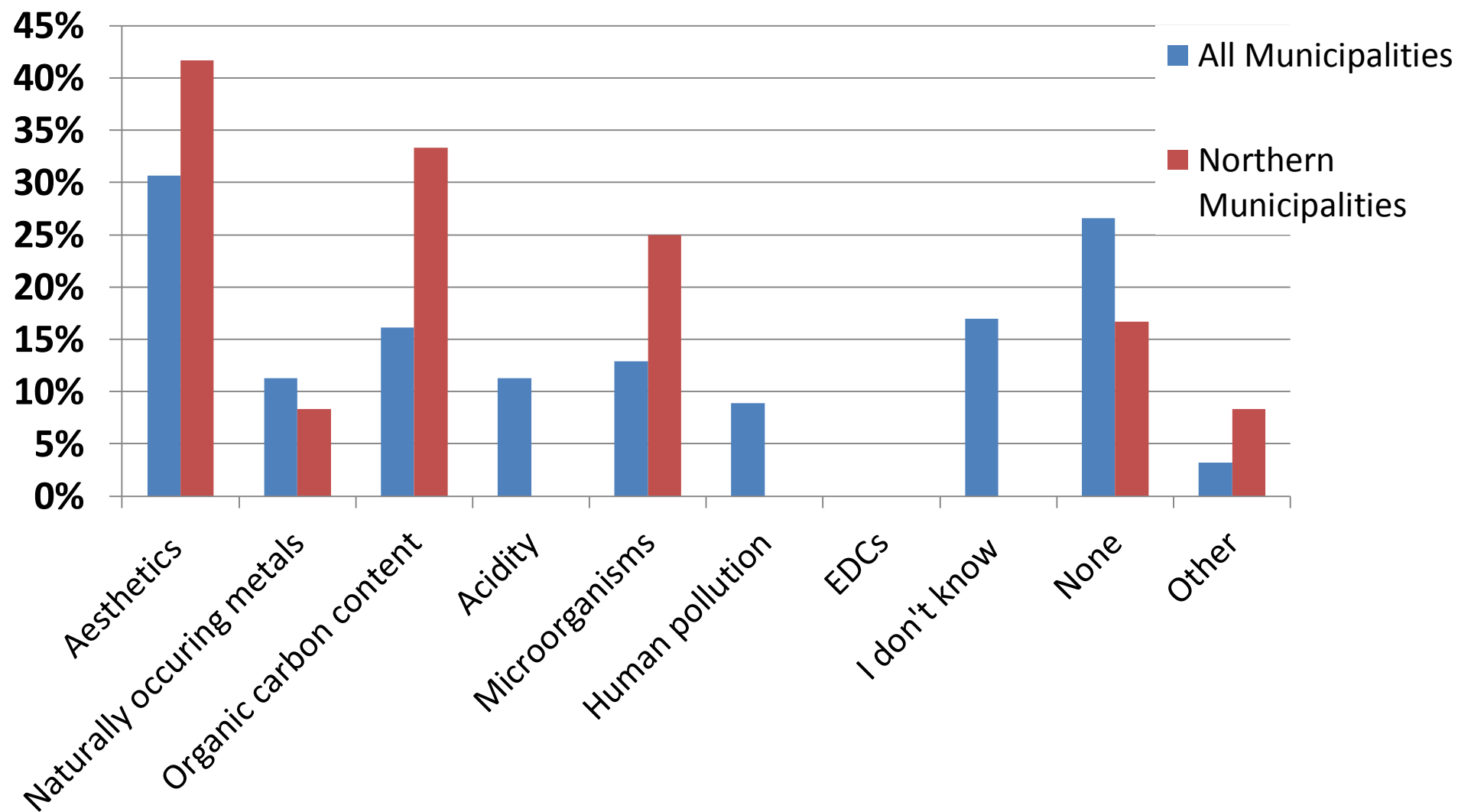
## Boil Water Advisories

- ◆ How have BWAs impacted your community?
  - ◆ Safety?
  - ◆ Economically?
  - ◆ Public trust issues?
  - ◆ Other?
- ◆ Once on a BWA what are the barriers to getting off the designation?
- ◆ Do you think the BWA system is working well?

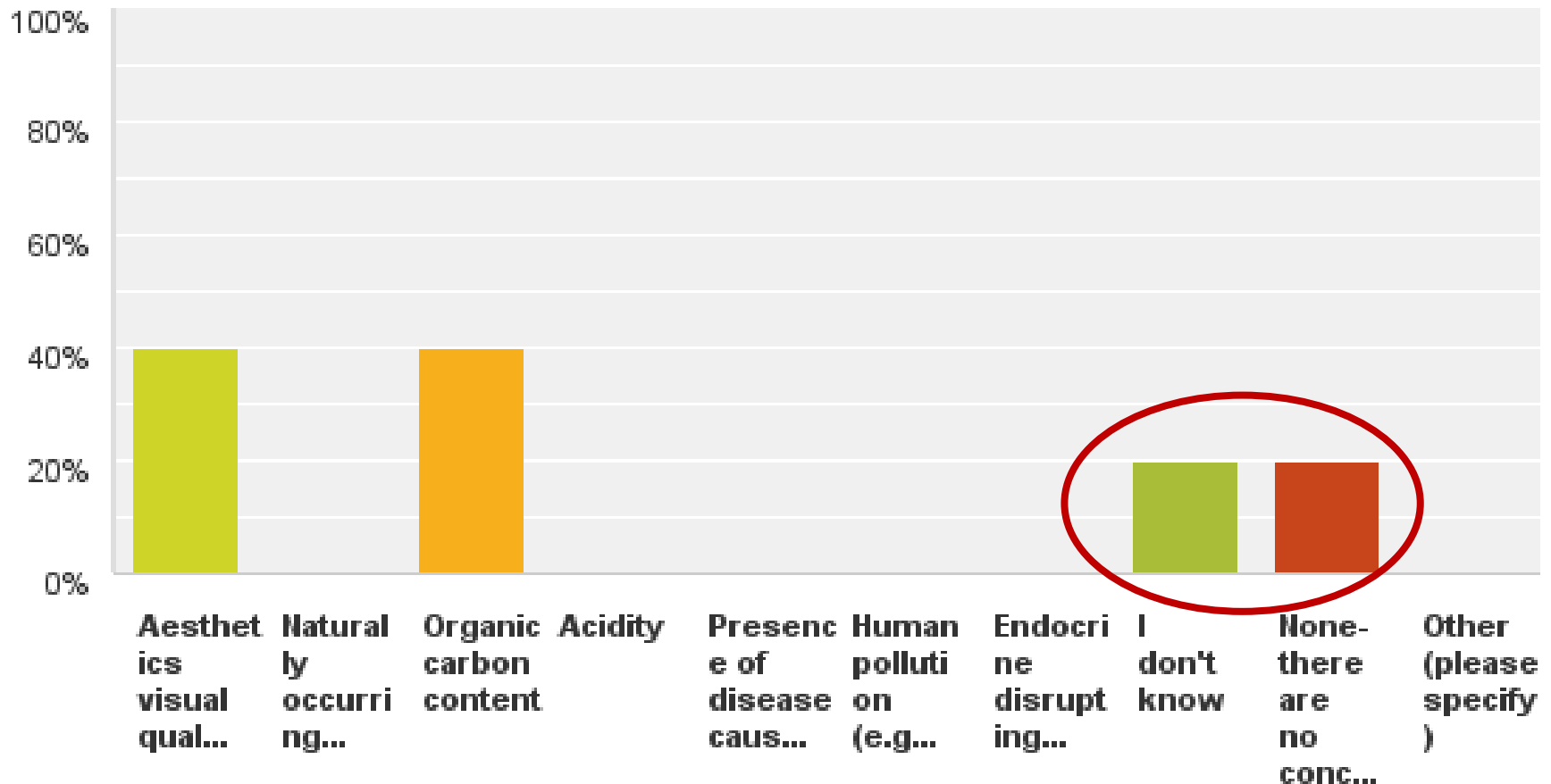
# Concerns for Water System



# Which of the following are concerns for your municipality's water system? (Administrators)



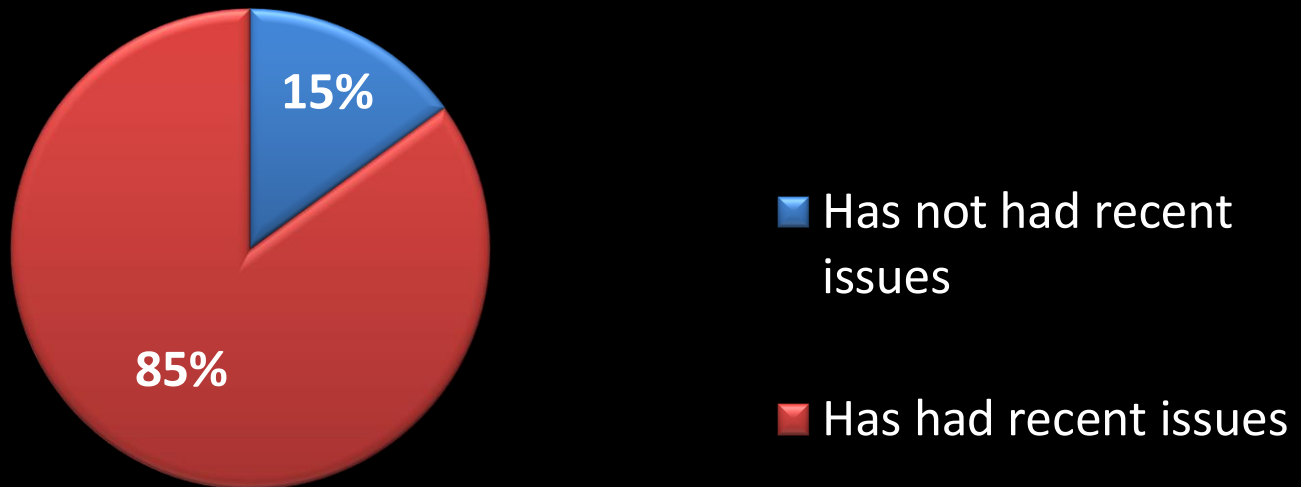
# Concerns for your municipality's water system? – Northern Municipalities/LSDs (Water Operators)





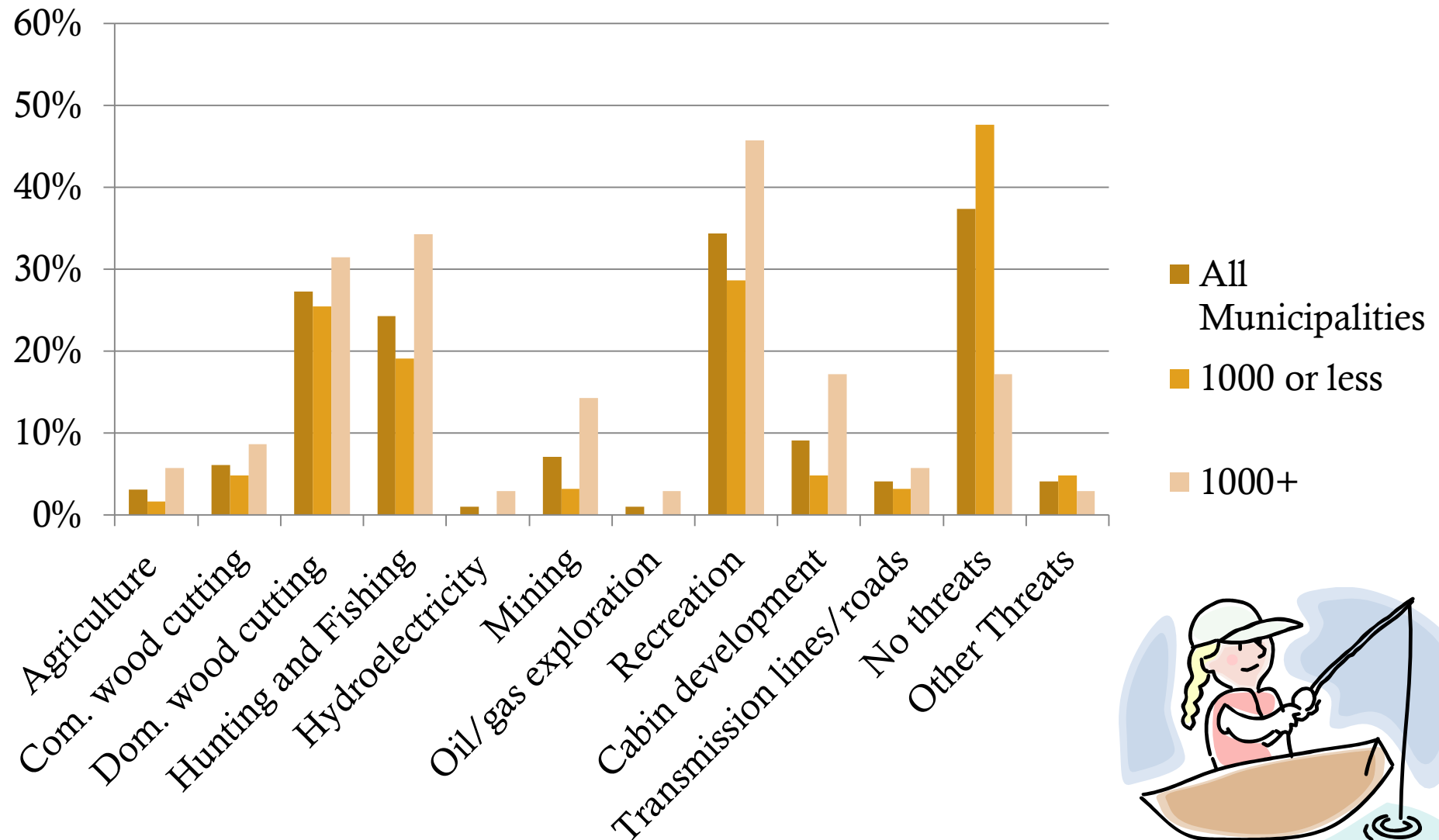
# Comparison with DOEC Data

## Communities Reporting "No Concerns" Regarding Drinking Water System



Another question asked if they have had HAAs or THMs in the past 4 years  
➤ **59%** of those who said NO had exceeded the HAA or THM in the last 4 years

# Land Use Activities- All Municipalities (Administrators)



# Discussion:

## Concerns for Water System

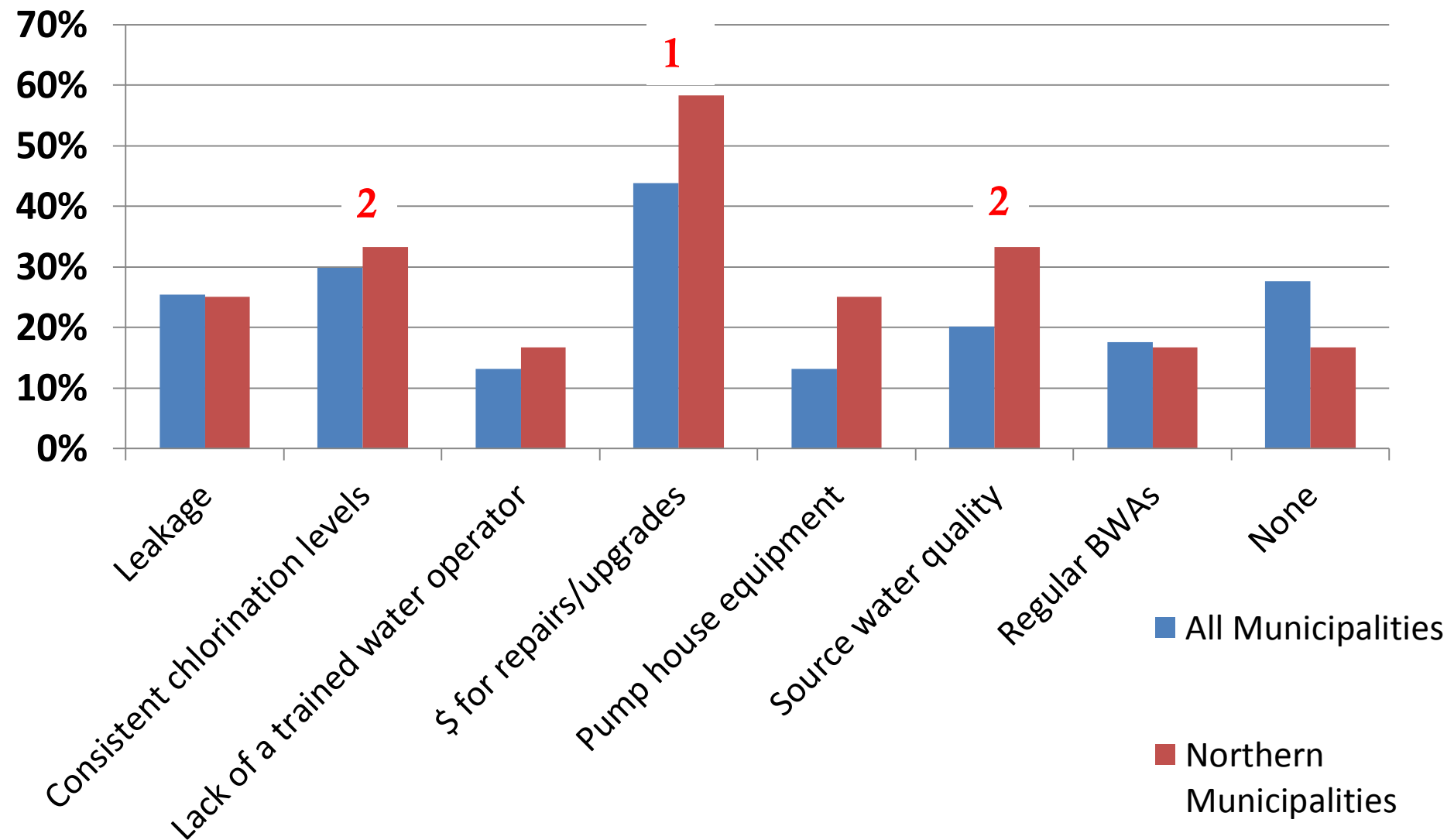
- ◆ What kind of concerns (if any) are there for your water system?
  - ◆ Any contaminants in your Drinking Water Quality reports?
- ◆ Have you done anything to combat aesthetics issues?
  - ◆ Taste?
- ◆ Have THMs, HAAs or any other disinfectant byproducts been an issue?
  - ◆ Have you taken steps to reduce disinfectant byproduct levels?
- ◆ Is there something not discussed that is a major concern for your municipality?

# Infrastructure Issues

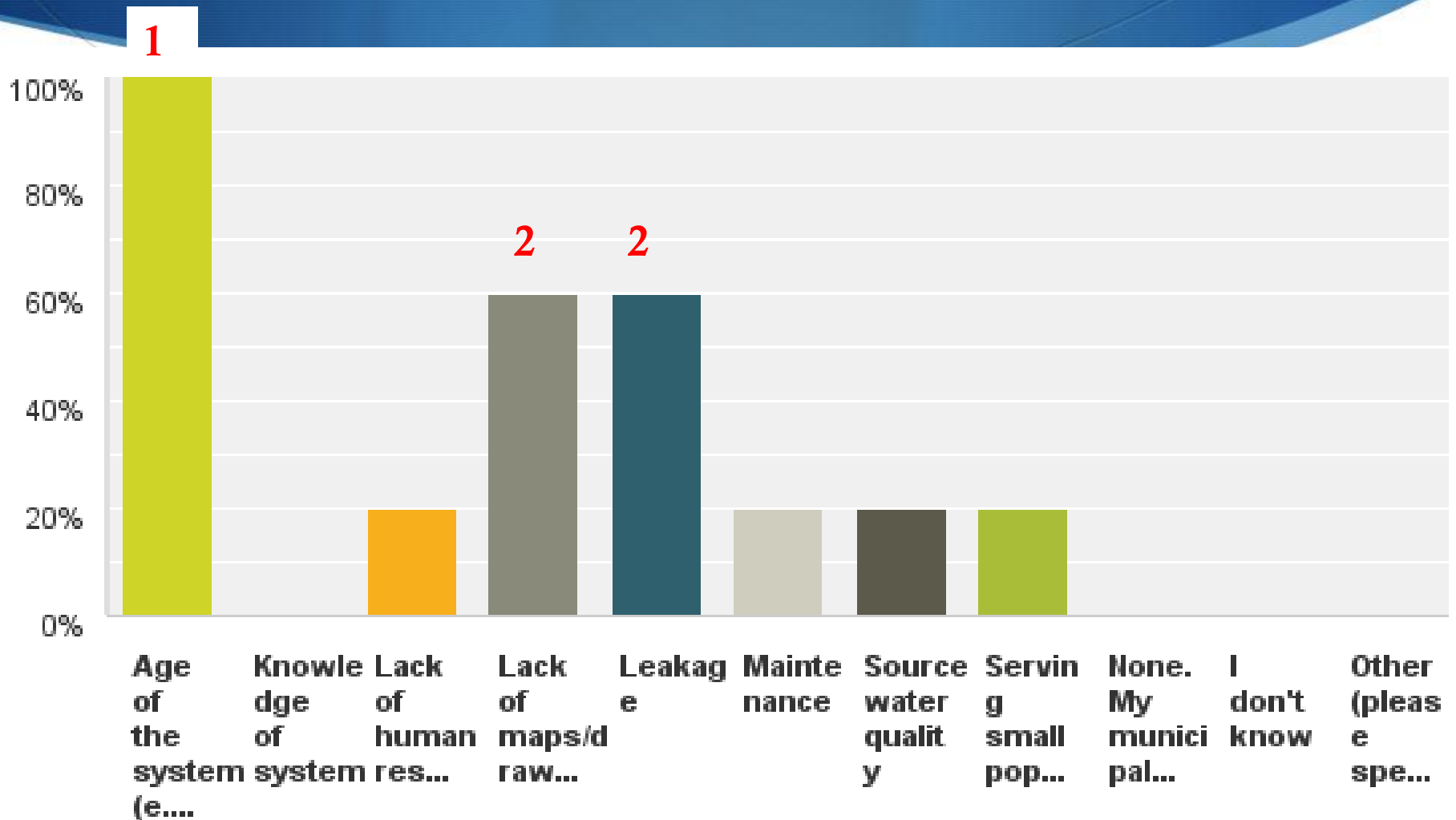




# What challenges does your water system currently face? (Administrators)



# Biggest issues other than financial constraints? Northern Municipalities/ LSDs (Water Operators)



# Infrastructure- All Municipalities (Administrators)

- ◆ Aging infrastructure
  - ◆ 19% of all municipalities completed work in the 1970's or earlier
  - ◆ 20% of responding Northern municipalities completed work in 1970's or earlier
- ◆ Need for repairs and upgrades
  - ◆ 68% with 1,000 or less
  - ◆ 79% with 1,000+
- ◆ Financial barriers to upgrades



Source: Paula Dawe, P. Eng

[http://www.env.gov.nl.ca/env/waterres/training/adwww/ruralreactions/11\\_paula\\_dawe\\_bmps\\_for\\_dbps.pdf](http://www.env.gov.nl.ca/env/waterres/training/adwww/ruralreactions/11_paula_dawe_bmps_for_dbps.pdf)

# Discussion:

## Infrastructure Issues

- ◆ What are the major barriers to repairing water infrastructure?
- ◆ Has your municipality applied for any sort of infrastructure funding for your water system(s)?
  - ◆ If yes, how was your experience?

# Water Operator Education, Training and Certification



# Municipal Water Operator Training (Administrators)

Question	1000 or less	1000 +	Northern Municipalities
Position of Water Operator	<b>50%</b> - Paid Full Time	<b>89%</b> - Paid Full Time	<b>33%</b> - Paid Full Time
Operators highest level of training	<b>22%</b> - None	<b>0%</b> - None	<b>25%</b> - None
Is the level of training an issue?	<b>33%</b> - Yes	<b>17%</b> - Yes	<b>8%</b> - Yes
Maps (of all)?	<b>56%</b> - Yes	<b>48%</b> - Yes	<b>25%</b> - Yes

**50%** of LSDs have a volunteer water operator vs. **4%** for municipalities



# Discussion:

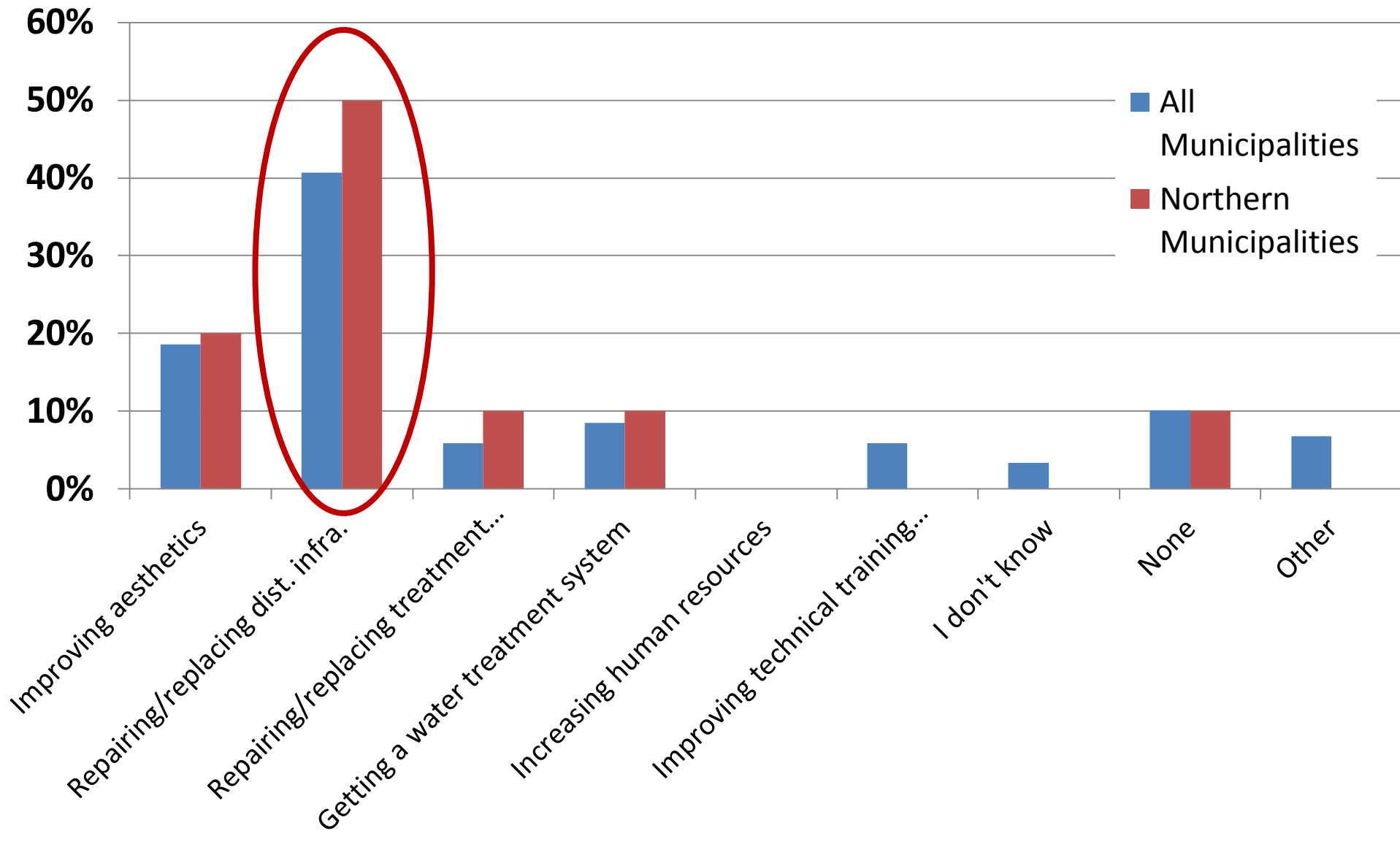
## Operator Training

- ◆ What are barriers to operator training in your community?
- ◆ How can the Operator Education, Training and Certification program improve?
- ◆ Is finding a certified water operator difficult in your municipality?
- ◆ Do you have someone who can cover water operations at all times?

# Moving Forward



# What should be the highest priority for improving drinking water quality in your community? (Administrators)



# Solutions Undertaken



- ◆ **Source:** New wells; Dams; Moving intake; Regional approach
- ◆ **Filtration:** Sand screen at inlet in pond; Water filtration gallery
- ◆ **Treatment:** PWDU; MIOX; New/upgraded chlorination/booster systems
- ◆ **Pump upgrades**
- ◆ **Management and Operations:** Proactive leak detection; Automated monitoring systems (e.g. SCADA); Studies

## New things that haven't worked...

- ◆ System treatment options too complex for operators to maintain/poor maintenance
- ◆ Poor production from drilled wells
- ◆ New chlorine system didn't work because of mud deposits in the regulator
- ◆ New equipment not working
- ◆ Lack of monitoring to ensure proper installation and testing

# Discussion:

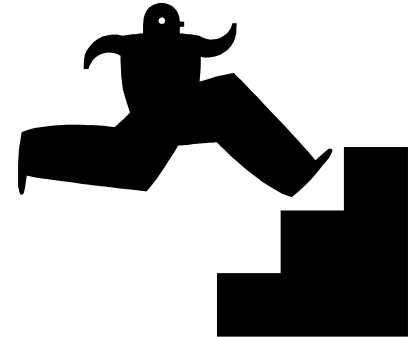
## Moving Forward

- ◆ What kinds of solutions has your municipality explored?
  - ◆ What's worked?
  - ◆ What hasn't?
  - ◆ Advice?
- ◆ What kind of support is there for you when you are looking for solutions for your water challenges?
  - ◆ What kinds of support do you need?



# Next Steps

- 💧 Water Operators Survey analysis
- 💧 Further investigation of key issues and solutions
- 💧 Case study reports
- 💧 Regional approaches focus group - MNL Symposium
- 💧 Reporting back



# Closing Discussion

- ◆ Any questions?  
Comments? Concerns?
- ◆ What kind of information  
would you like to see  
from us?
- ◆ How would you like  
information compiled,  
displayed and distributed?

# Thank you!

And stay in touch!

- Visit our website:  
<http://nlwater.ruralresilience.ca>
- Contact Sarah Minnes,  
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