

Rural Drinking Water in Newfoundland and Labrador

Exploring Solutions for Sustainable Rural Drinking Water Systems

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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)
- 💧 Media Scan
- 💧 Municipal Surveys and Consultations
- 💧 Case Studies

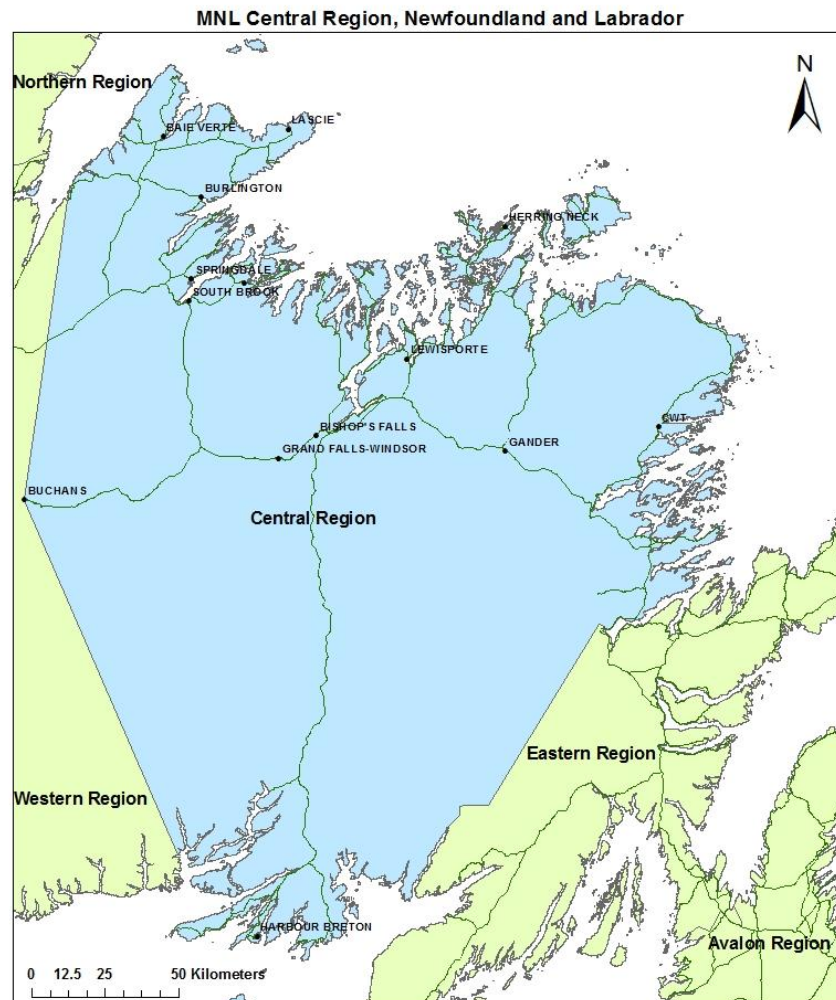


Survey Results and Discussion

Central Highlights



MNL Central 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

Prepared by:
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Respondents- Administrators Survey

- 209 Respondents- **46%** Response Rate
 - 119** - Municipalities
 - 48** - LSDs
 - 42** - anonymous / did not answer question
- 80 municipalities and **42%** of all communities of 1000 or less
- Regional coverage of municipalities:
 - Avalon 17%
 - Eastern 21%
 - Central 28%**
 - Western 21%
 - Northern 8%
 - Labrador 6%
- Central
 - 58/134 (43%)** municipalities/LSDs
 - 31%** under 1,000

Respondents- Water Operators Survey

- 💧 71 Respondents
 - 💧 53 - Municipalities
 - 💧 15 - LSDs
 - 💧 3 - anonymous / did not specify
- 💧 14 Central Municipalities
- 💧 6 Central LSDs

Water Services



Water Service- All Municipalities (Administrators)



Question	1000 or less	1000 +	Central Municipalities
Operate a water system for residents?	83%- Yes 18%- No	95%- Yes 5%- No	91% - Yes 9%- No
If no, why not?	60%- Not a priority	64%- Not a priority	67%- No \$ to install
% of households on water system?	45% -76-99% 37% -100%	45% -76-99% 37% -100%	53% -76-99% 40% -100%

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



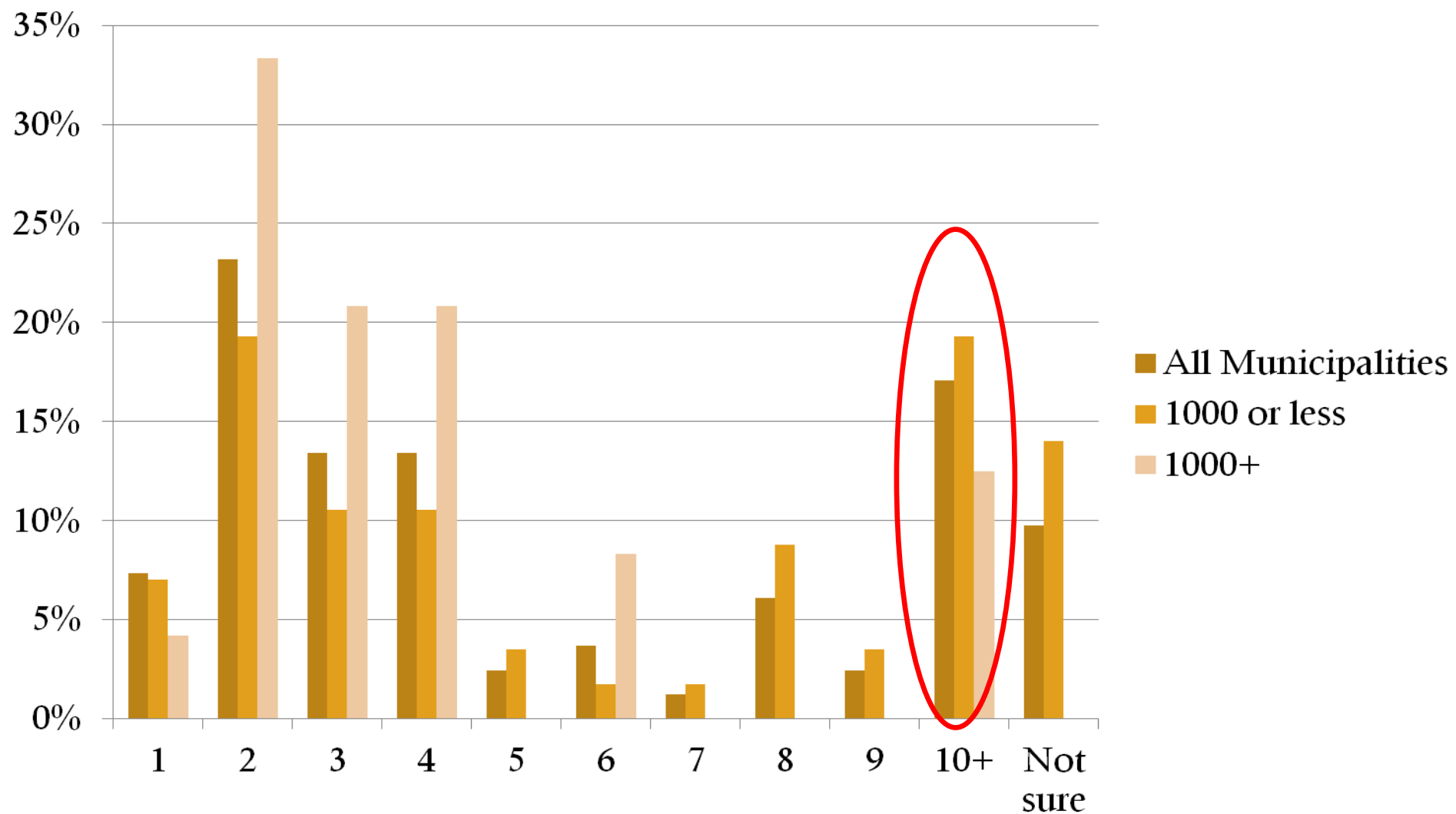
Boil Water Advisories – DOEC Data

Boil Water Advisories (BWAs)

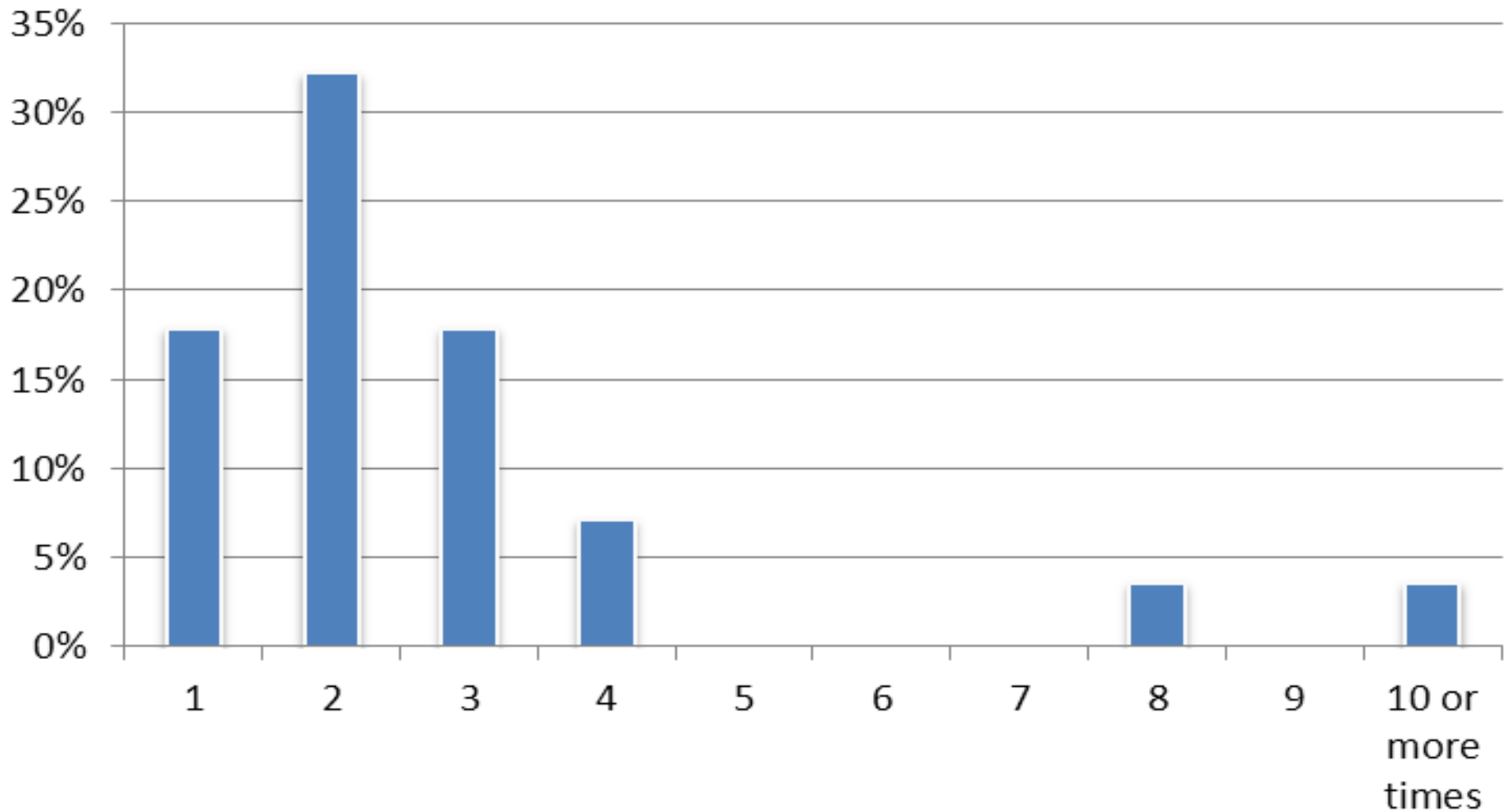
- July 29, 2013 - **256** BWAs affecting 184 communities in NL (Gov't of NL, 2013c)
- 96%** communities 1,000 or less
- 55%** of BWAs for communities 1,000 or less have been in place for 5+ years



How many times has your municipality been on a BWA in the last 4 years?- All Municipalities (Administrators)



How many times has your municipality been on BWA in the last 4 years?- Central Municipalities (Administrators)



BWA Reasons

Central Municipalities/LSDs (Water Operators)

- 💧 15/20 respondents indicated they have had a BWA in last 4 years
- 💧 50%- **Total coliforms** detected and confirmed in repeat sample
- 💧 50%- Disinfection system is off due to maintenance or **mechanical failure**
- 💧 Other answers indicated as well as additional reasons in the same communities that they had been on BWA

Discussion:

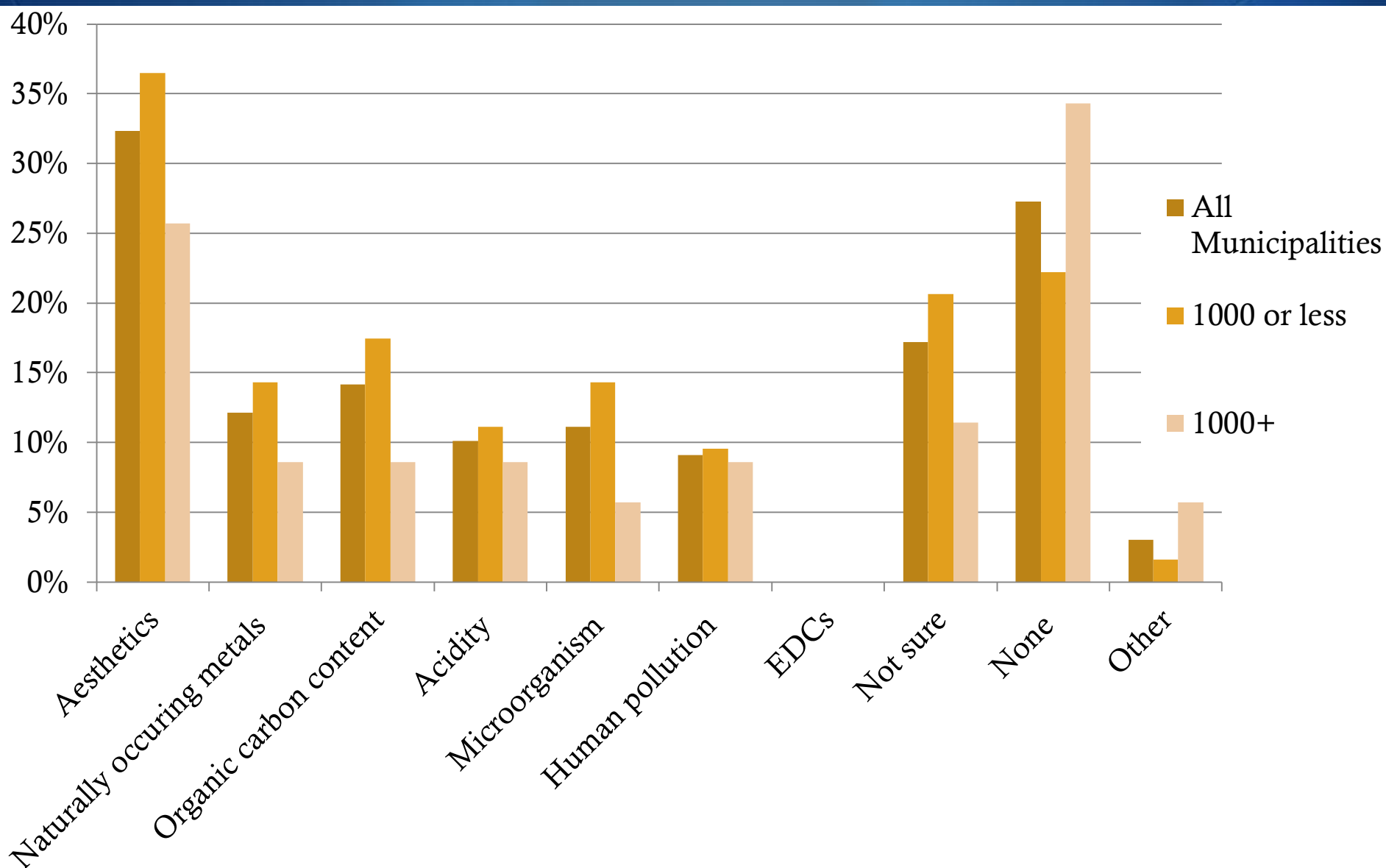
Boil Water Advisories

- ◆ Do BWAs impact 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?

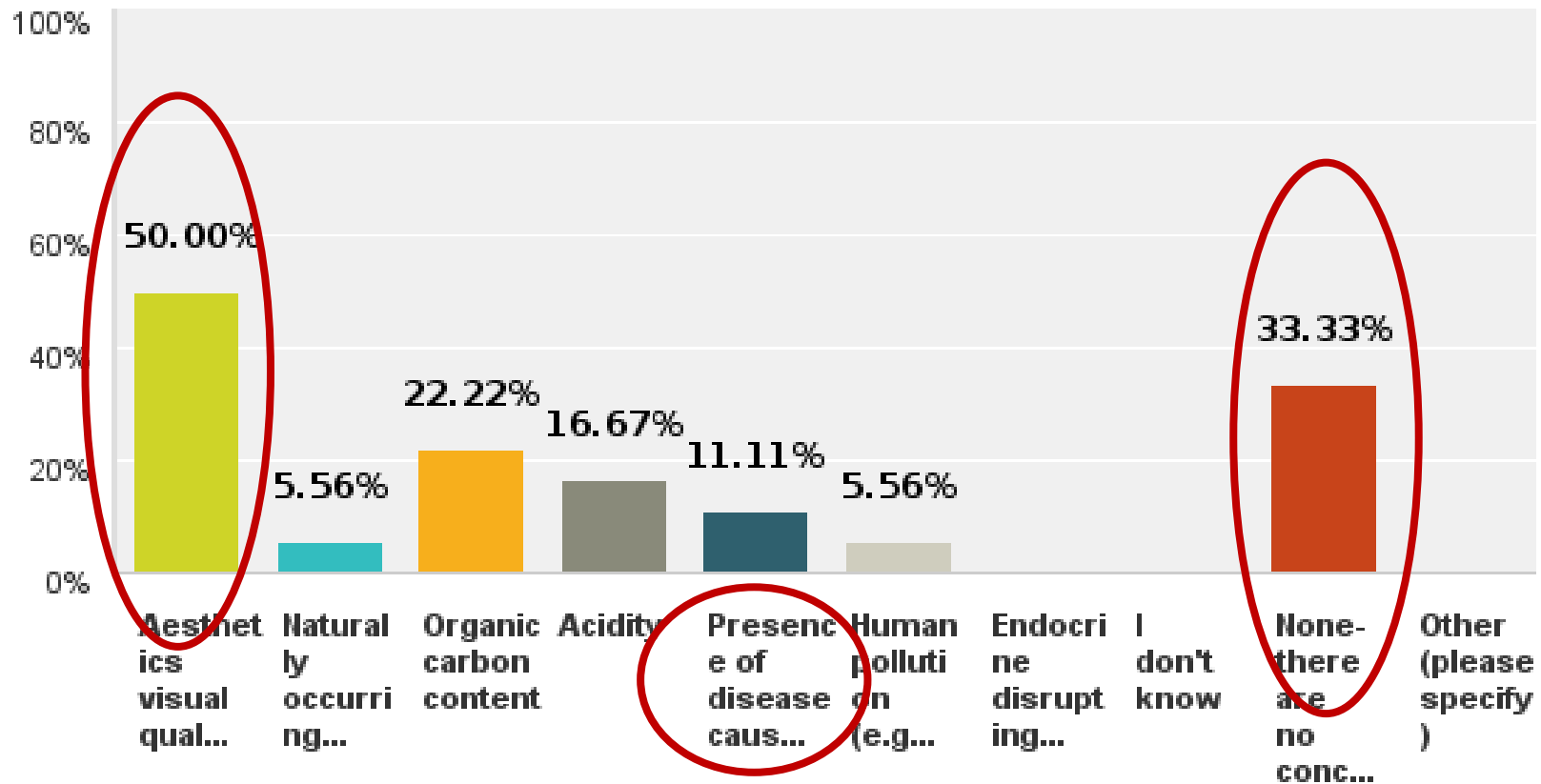
Concerns for Water System



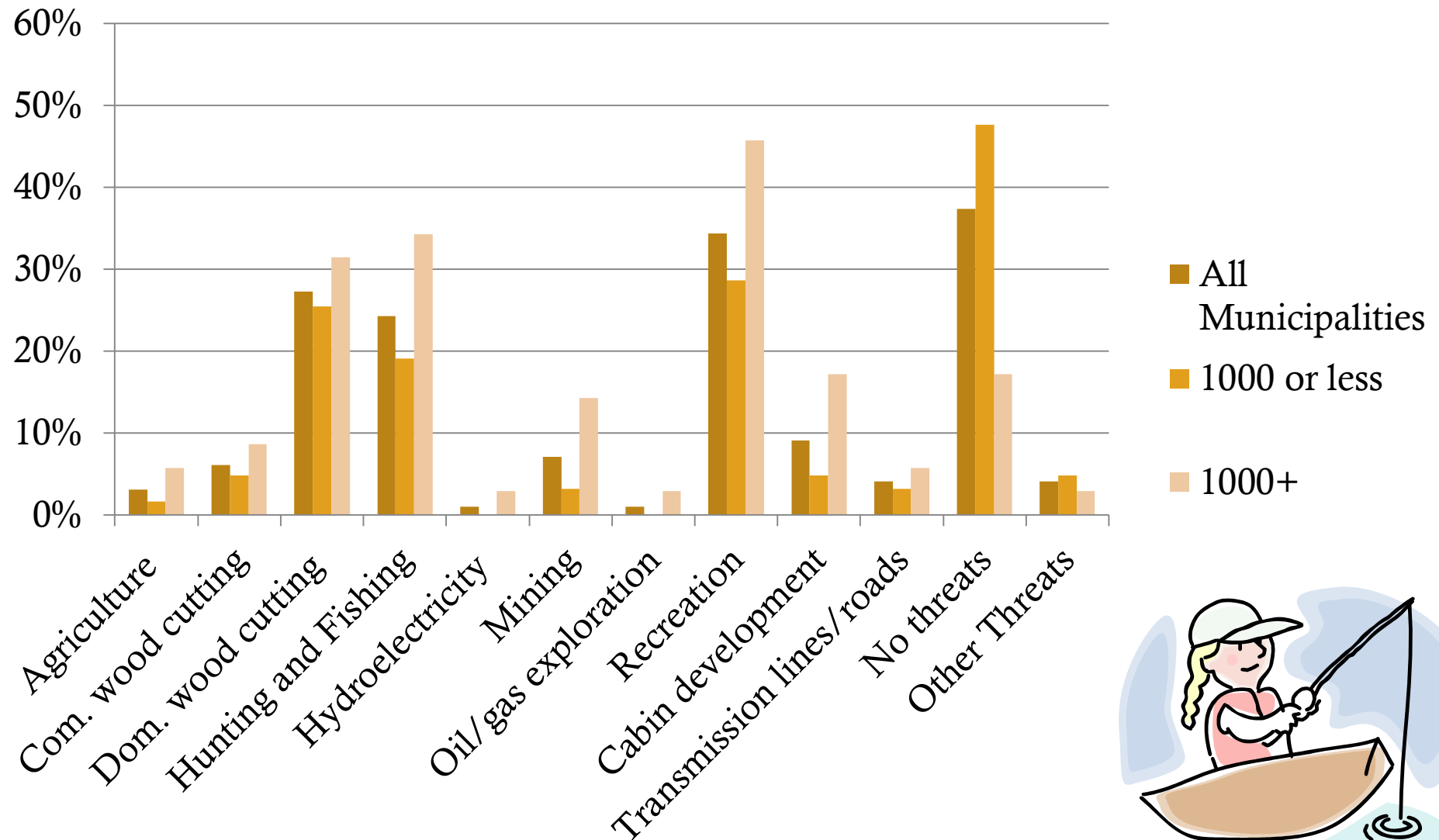
Which of the following are concerns for your municipality's water system?- All Municipalities (Administrators)



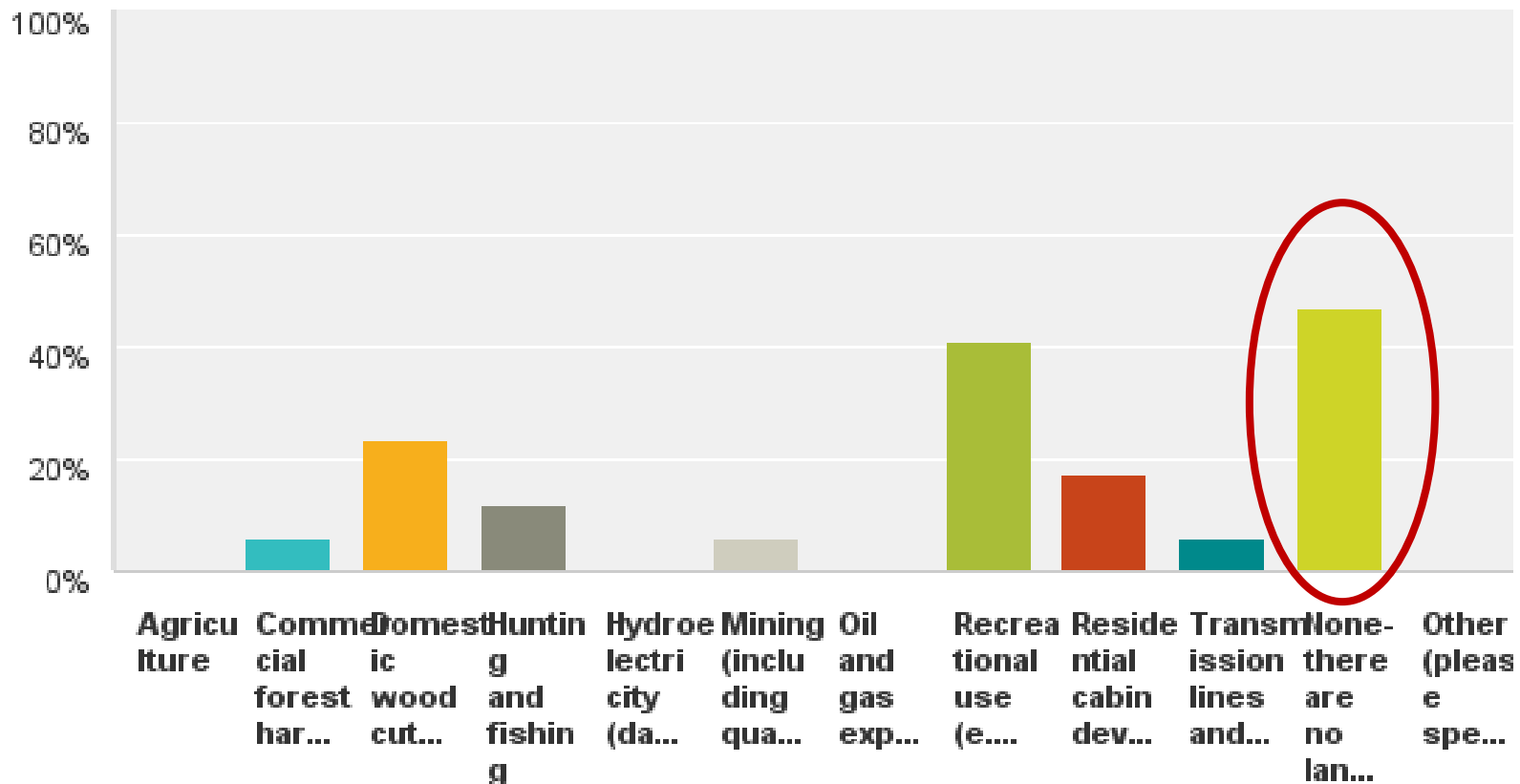
Concerns for your municipality's water system? - Central Municipalities/LSDs (Water Operators)



Land Use Activities- All Municipalities (Administrators)



Land Activities – Central Municipalities/LSDs (Water Operators)



Discussion:

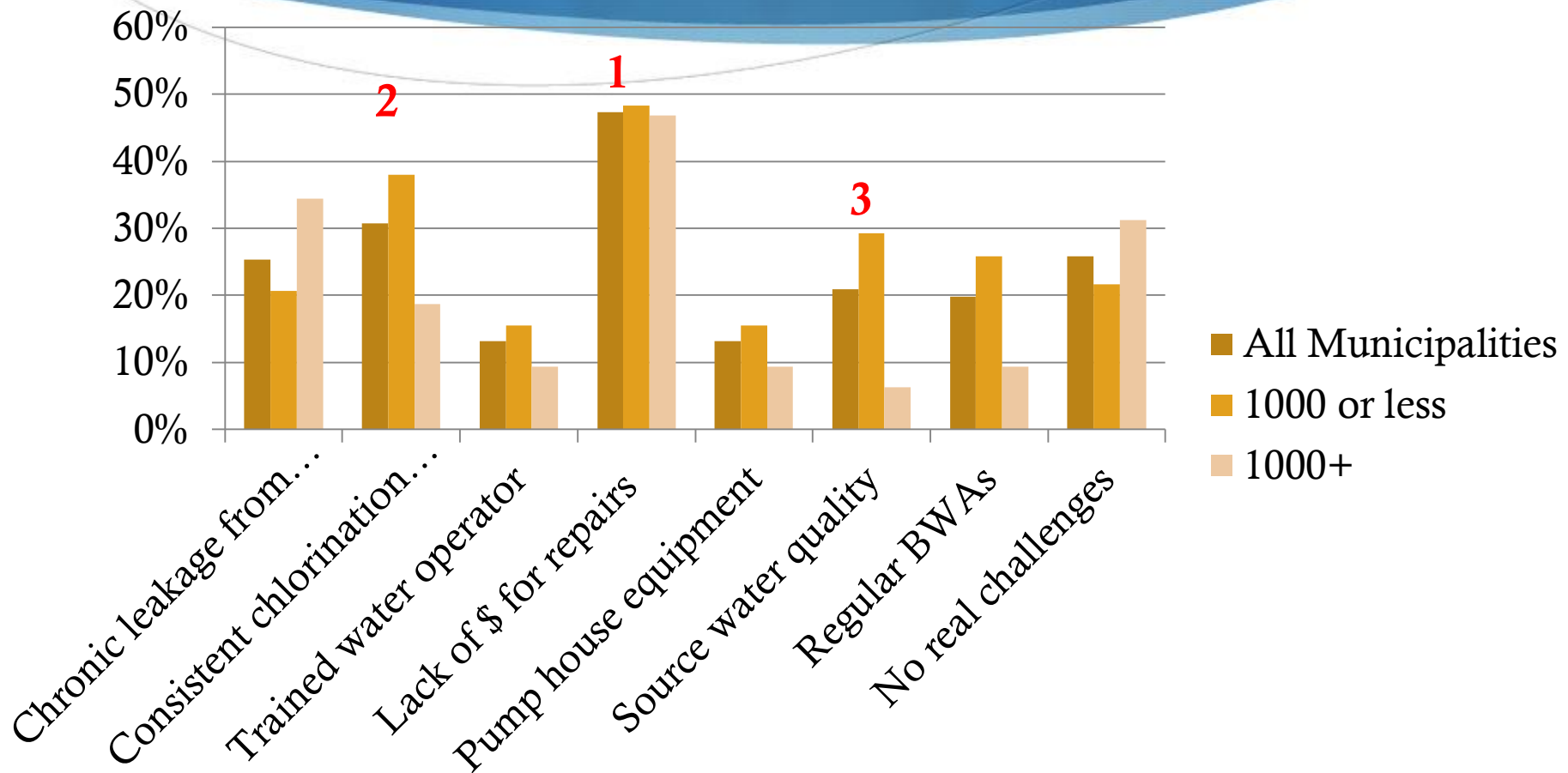
Concerns for Water System

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

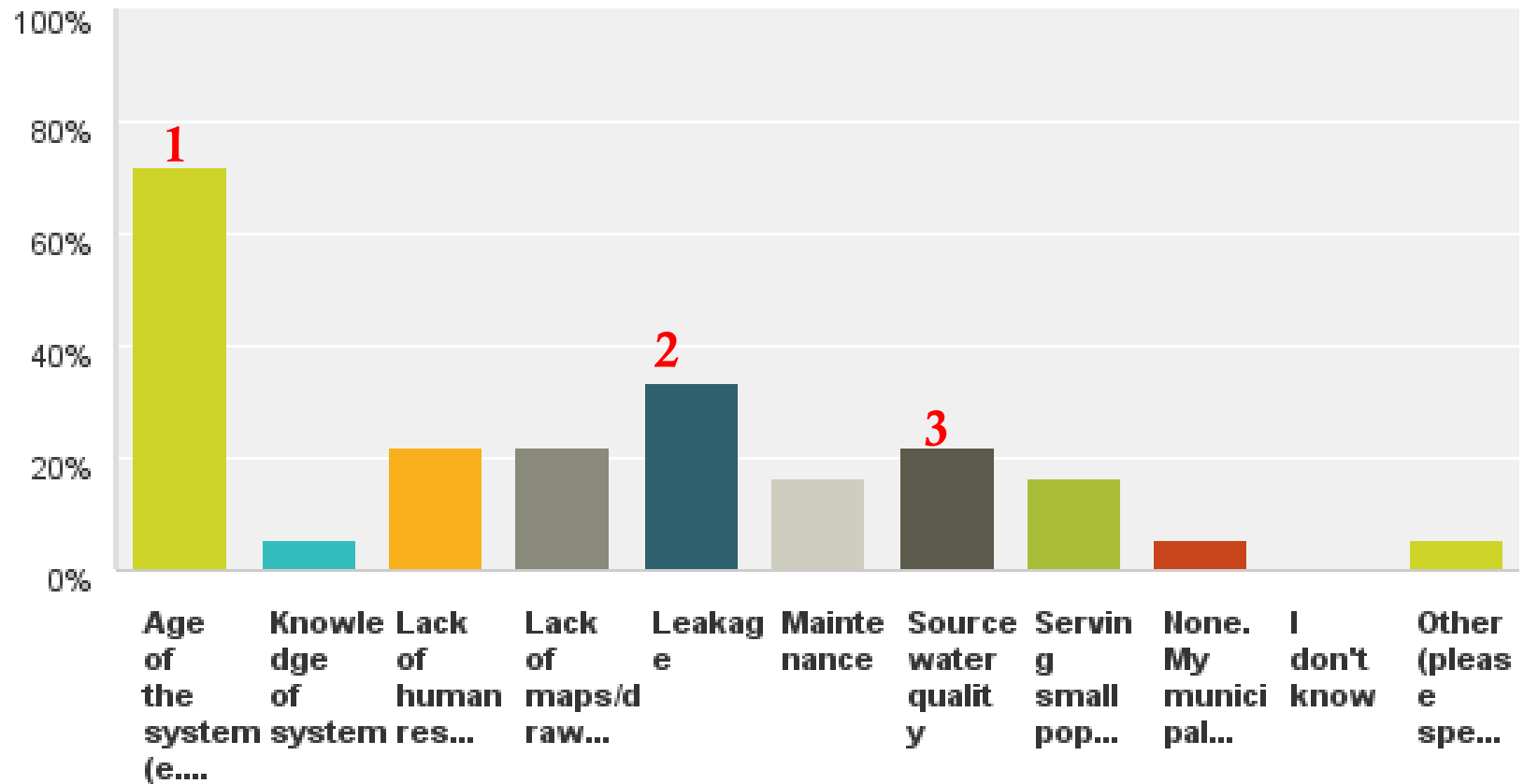
Infrastructure Issues



What challenges does your water system currently face? – All Municipalities (Administrators)



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



Infrastructure- All Municipalities (Administrators)

- ◆ Aging infrastructure
 - ◆ 51% with 1,000 or less- system completed 1970's or earlier
 - ◆ 30% in Central completed 1970's or earlier
- ◆ Need for repairs and upgrades
 - ◆ 68% with 1,000 or less
 - ◆ 79% with 1,000+
- ◆ Financial barriers to upgrades

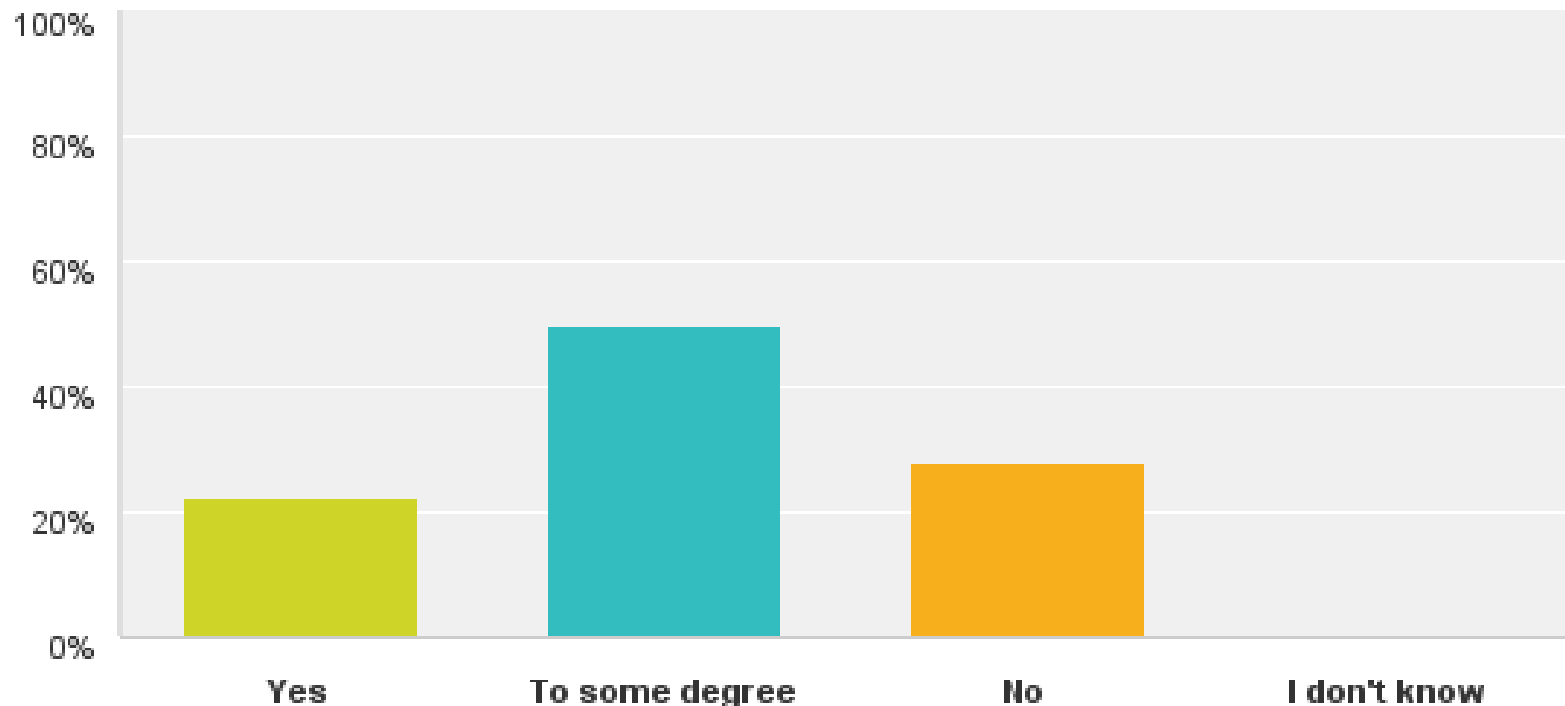


Source: Paula Dawe, P. Eng

http://www.env.gov.nl.ca/env/waterres/training/adwww/ruralreactions/11_paula_dawe_bmps_for_dbps.pdf

Do you think you have sufficient resources (e.g. financial, human or infrastructure resources) to operate the water system in your municipality/LSD effectively?

Water Operators Survey- Central Answers



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)?
 - ◆ Was the process easy to navigate?
 - ◆ Was it approved?
 - ◆ Why or why not?

Water Operator Education, Training and Certification

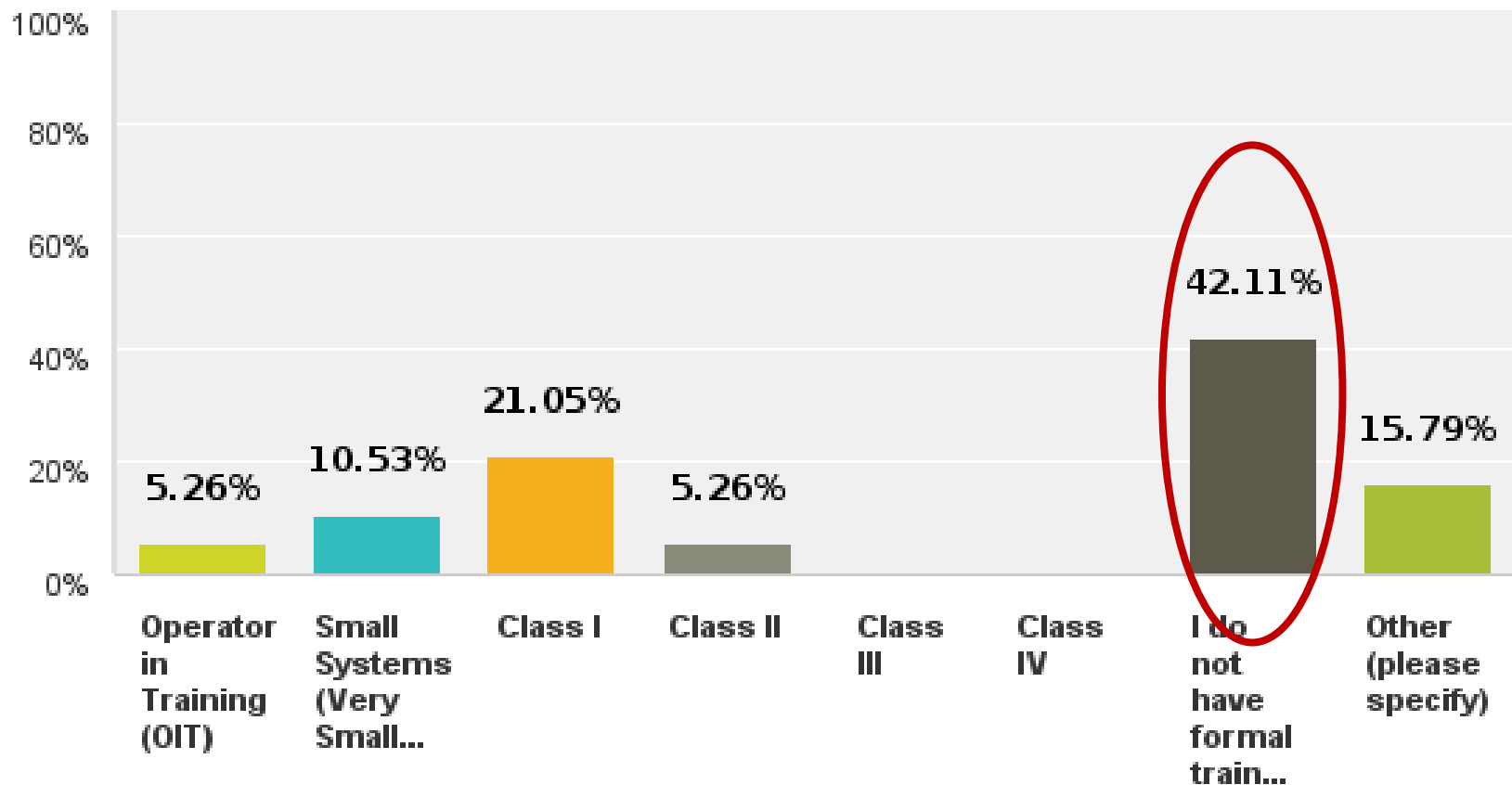


Water Operator Training – All Municipalities (Administrators)

Question	1000 or less	1000 +
Position of Water Operator	50%- Paid Full Time	89%- Paid Full Time
Operators highest level of training	22%- None 13%- OIT 18%- Class 1 8%- Class 2	0%- None 11%- OIT 25%- Class 1 22%- Class 2
Is the level of training an issue?	33%- Yes	17%- Yes
Maps?	56%- Yes of all	48%- Yes of all

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

Water Operator Training- Central Municipalities/LSDs (Water Operators)



Discussion:

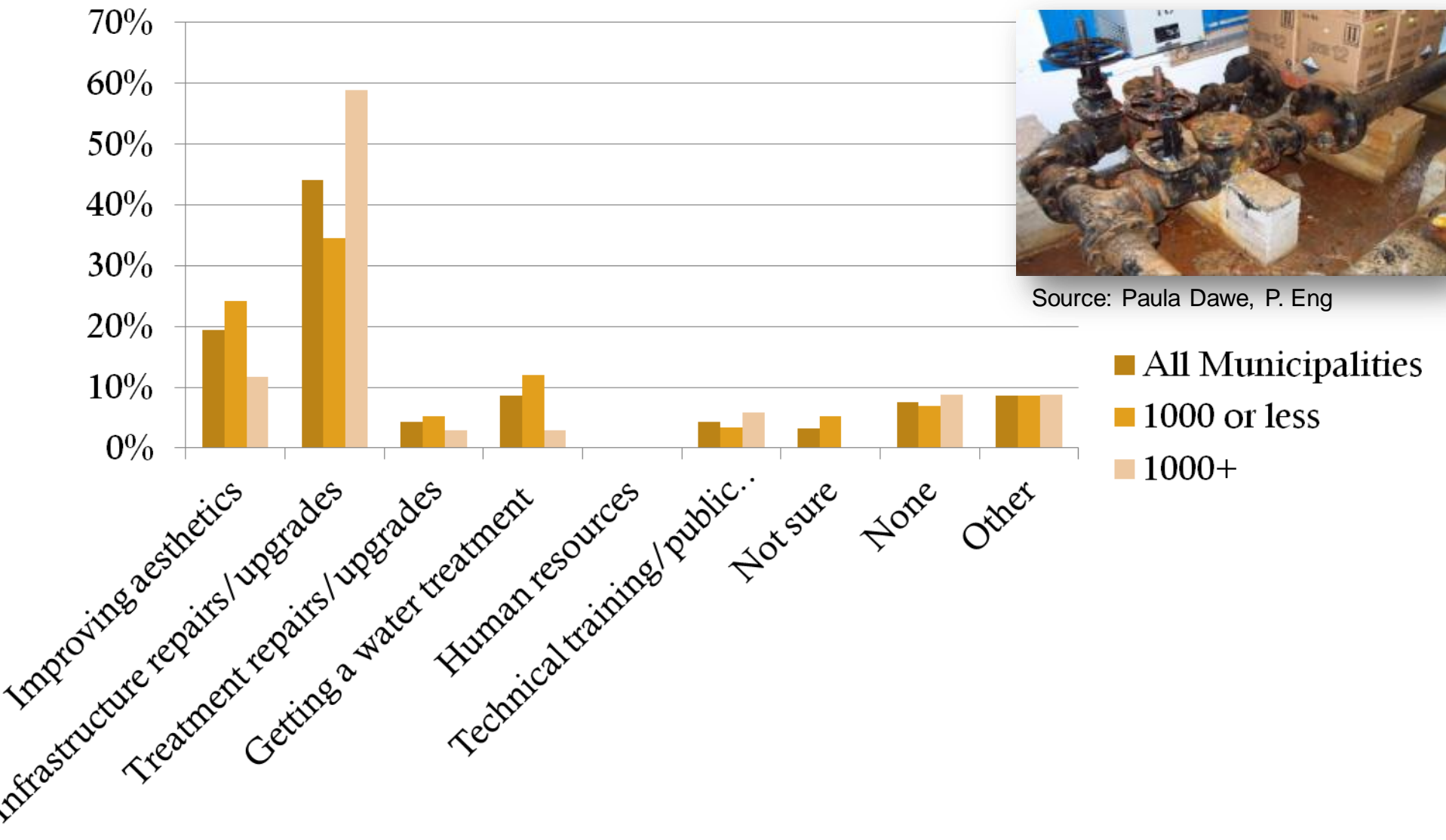
Operator Training

- ◆ 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?
 - ◆ What happens when your water operator goes on vacation?

Moving Forward



What should be the highest priority for improving drinking water quality in your community?- All Municipalities (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 worked?
 - ◆ 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?

Impacts

- ◆ Reduced access to a basic necessity of life
- ◆ Unhealthy communities: Health Canada promotes water as needed daily
- ◆ Potential short and long-term health effects
- ◆ Lack of trust in municipal system
- ◆ Potential liability
- ◆ Stress for municipal leaders
- ◆ Economic development and resident retention

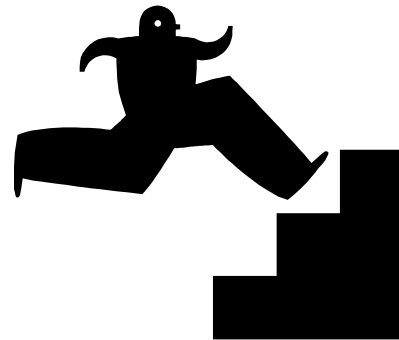


Closing Discussion

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

Next Steps

- 💧 Water Operators Survey closing and analysis
- 💧 Further investigation of key issues and solutions
- 💧 Case studies
- 💧 NL/BC comparative project
- 💧 Reporting back



Thank you!

And stay in touch!

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