



What's New with the Water Resources Management Division: Making your Life Harder and Easier

Drinking Water Safety Workshop, Gander

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Role of WRMD

- WRMD is the regulator for drinking water systems > 4546 L/d in the province
 - Authority under the *Water Resources Act* (S37 and S38) to oversee design, construction and operation of drinking water systems
 - Permits to Construct
 - Permits to Operate
- Lead government department on drinking water





So, What's New with WRMD?

1. Development of Standard Operating Procedures (SOPs) to Remove Boil Water Advisories (BWAs)
2. 2015 Drinking Water System Report Form
3. Very Small Drinking Water System and PWDU certification
4. Other Developments



SOPs to Remove BWAs

- Hired consultant Big East Engineering Ltd. to undertake work
- SOPs outline the various steps communities must take to have a BWA lifted
 1. Identify BWA Cause
 2. Steps to address BWA
 3. BWA preventative measures
- BWA System Assessment Form developed
- Set of 18 SOP flowcharts have been developed for each BWA reason code used in the province
- Set of 13 checklist and log forms developed
 - Supplement Maintenance Assurance Manual (MAM) forms
 - <http://www.miga.gov.nl.ca/for/mam.html>
- BWA SOPs available from WRMD website:
 - <http://www.env.gov.nl.ca/env/waterres/quality/drinkingwater/advisories.html>



BWA System Assessment

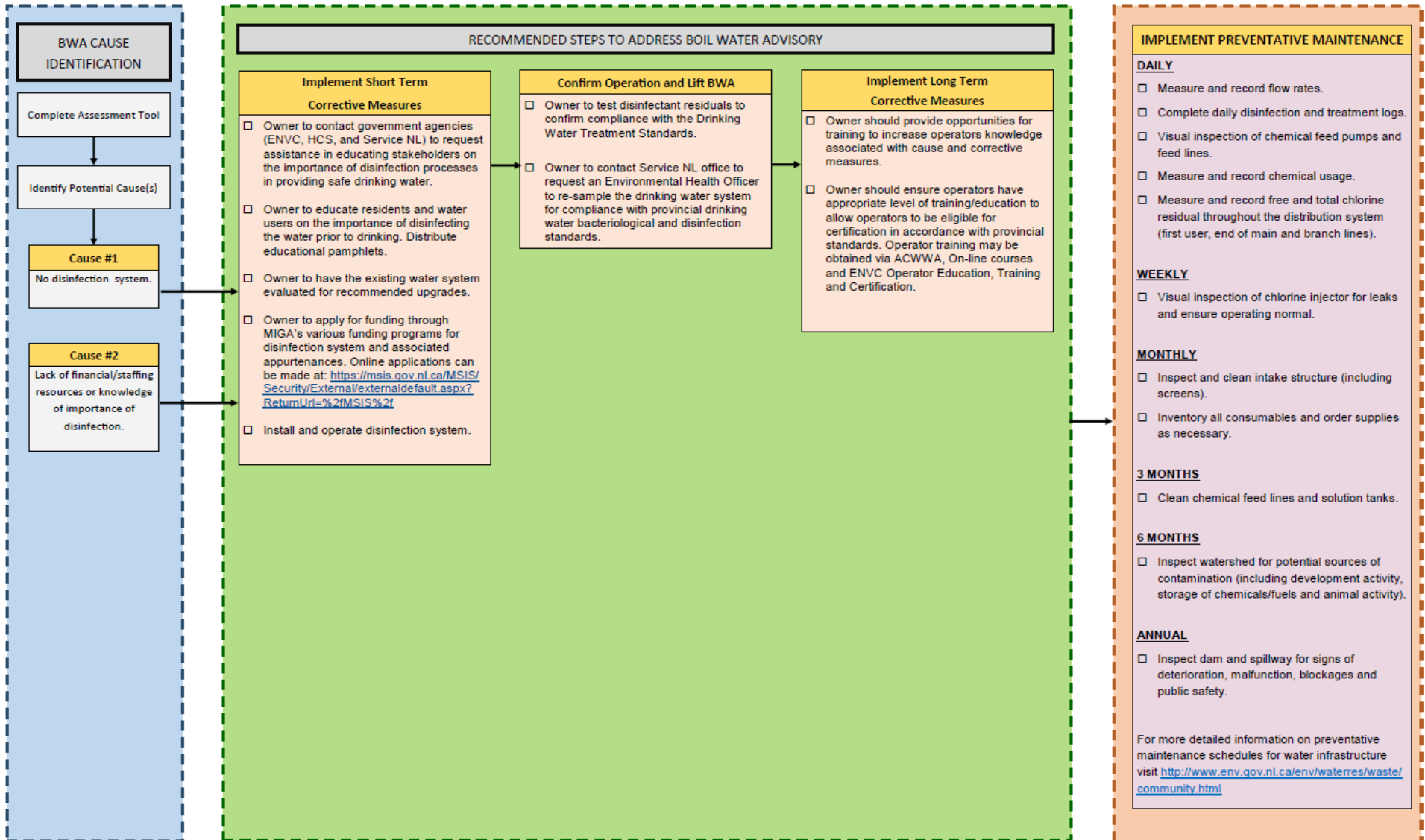
- Form examines all aspects of drinking water system for probable causes of BWA
- Critical and serious issues that may be causing the BWA are highlighted as part of assessment

Code	System Aspects	CR - Critical Issue SR - Serious Issue	
		Response Yes/No/NA	Result CR / SR /OK
Drinking Water System Facility Events			
F-1	Has there been recent operations or maintenance that could introduce bacteria into the system? <i>Notes: Many leaks in two sections of old mains and when completing repairs shut down whole system which results in pressure loss in system.</i>	Yes	CR
F-2	Has system pressures dropped below 20psi recently? <i>Notes: Yes pressure drops when system shut down for repairs, which reportedly is required monthly.</i>	Yes	CR
F-3	Has there been a recent fire fighting, hydrant flushing or other high-flow event? <i>Notes: No hydrants however they have a flushing device on end of main and have started to use it this summer.</i>	Yes	OK

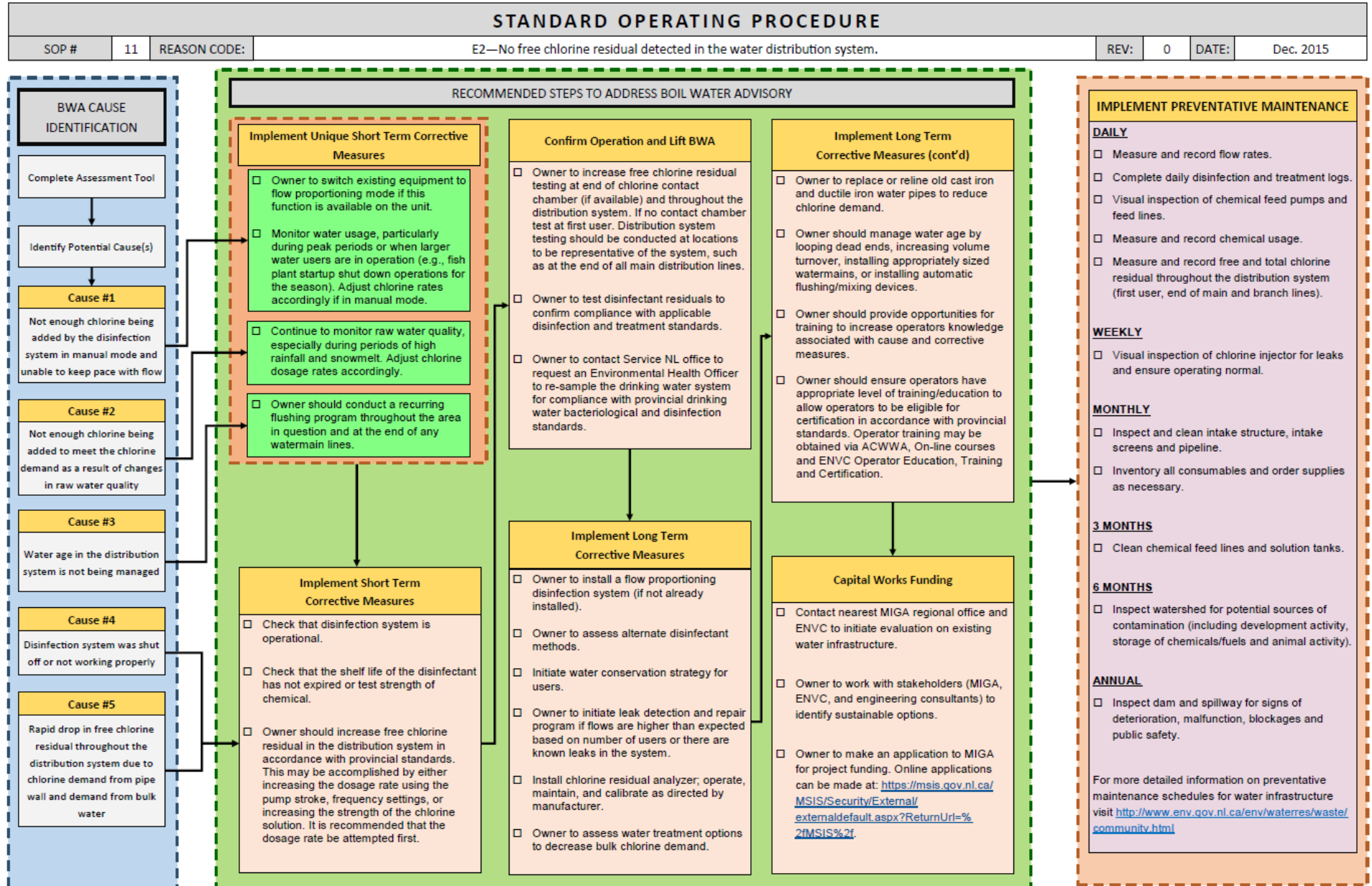
BWA SOP: Reason Code A

STANDARD OPERATING PROCEDURE

SOP # 1 REASON CODE: A — Water supply has no disinfection system REV: 0 DATE: Dec. 2015



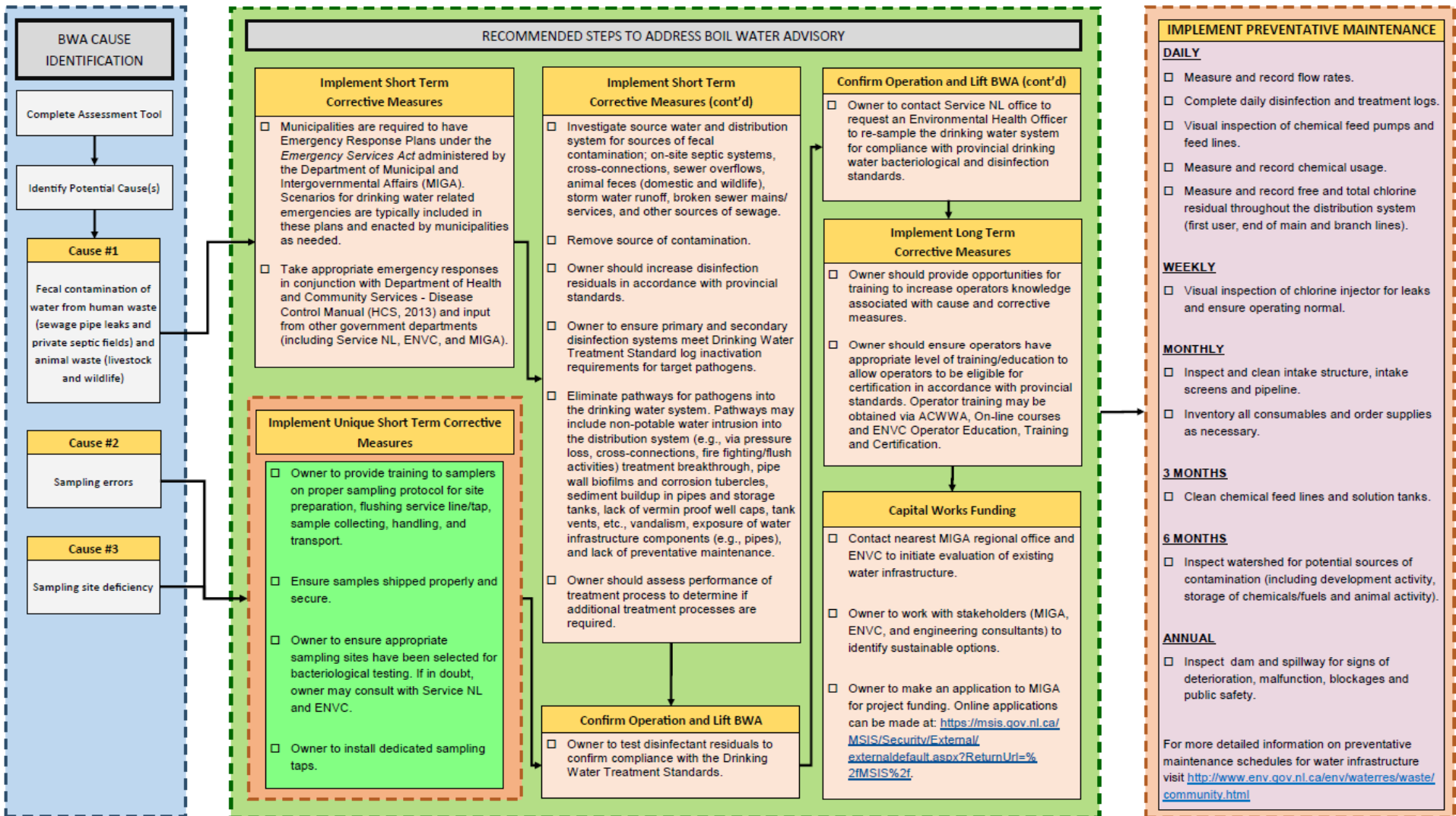
BWA SOP: Reason Code E2



BWA SOP: Reason Code F

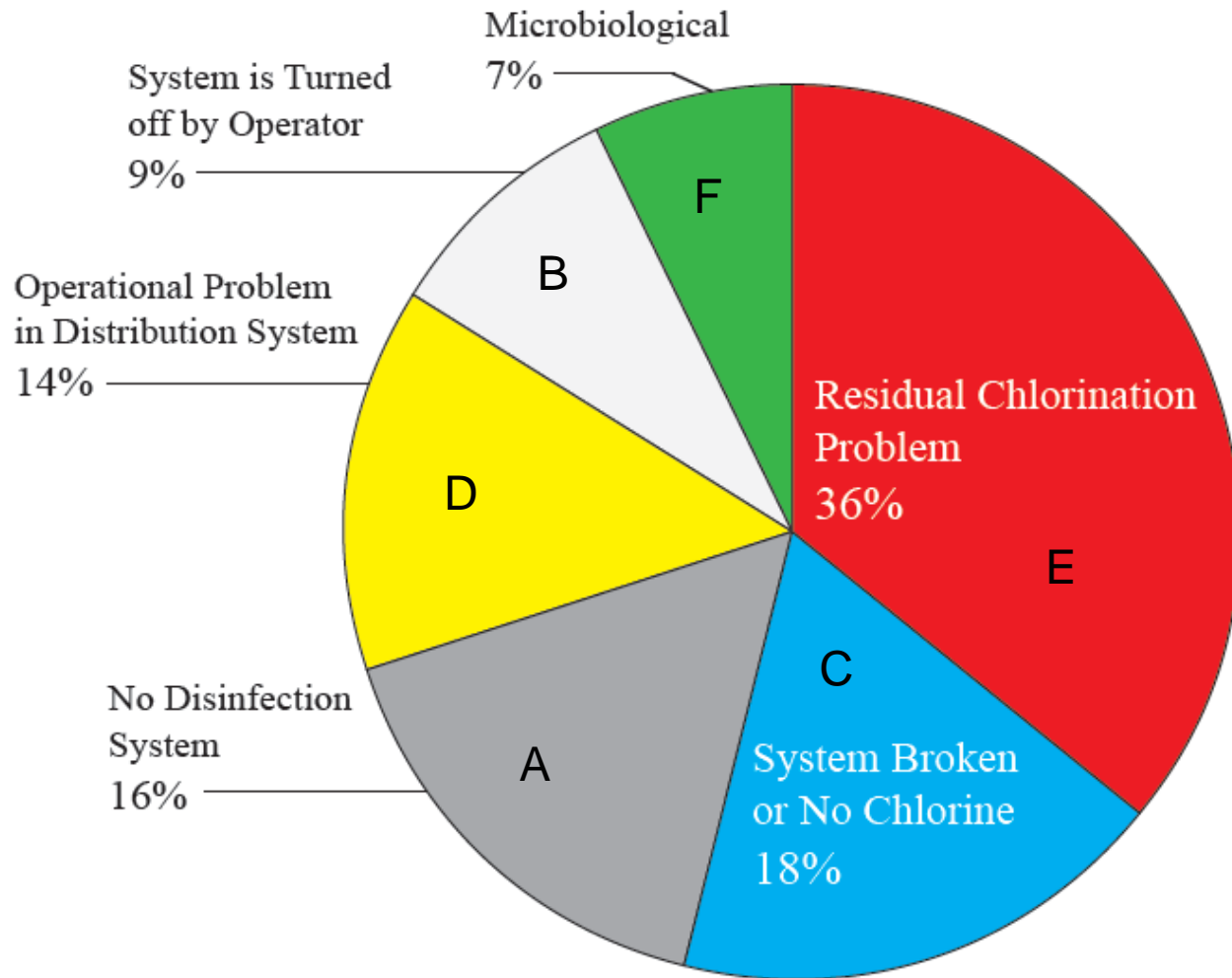
STANDARD OPERATING PROCEDURE

SOP #	14	REASON CODE:	F2—Escherichia coli (E. coli) detected AND repeat samples can not be taken as required	REV:	0	DATE:	Dec. 2015
			F4—Escherichia coli (E.coli) detected in an initial sample(s) is considered extensive and the water system has other known problems.				
			F5—Escherichia coli (E.coli) detected and confirmed in repeat sample.				





Reasons for BWAs





Why do we never hear from you?

50. The Owner shall produce an annual summary report documenting the operation and maintenance of the drinking water system, including as a minimum: daily water production, daily disinfectant residuals, amount of chemicals used, and any issues experienced with the distribution system (heavy rainfall, major leaks, water shortages, algae blooms, beavers in the water source, shutdown of water treatment equipment, etc.).



2015 Drinking Water Report Form

BY JANUARY 31, 2016, COMPLETED FORM MUST BE SUBMITTED TO:

By Mail: Drinking Water and Wastewater Section, Water Resources Management Division
Department of Environment and Conservation, PO Box 8700, St. John's, NL, A1B 4J6

By Fax: 709-729-0320

By email: WaterAndSewer@gov.nl.ca

*A digital copy of this form can be found at: <http://www.env.gov.nl.ca/env/waterres/waste/index.html>

Please fill in a form for each public drinking water system your community owns and operates.

Community Name:

Water Supply Name:

Population Served:

LGP #:

Water Supply Number:

Serviced Area Number:

Serviced Area Name:

*To be filled in by ENVC

1. Is your water supply a designated protected area? Yes No

2. Do you undertake any monitoring or inspections of your protected water supply area? Yes No

3. What type of disinfection system is used? (Select those that apply)

- Chlorine gas
- Sodium hypochlorite (liquid)
- Calcium hypochlorite (powder)
- Mixed oxidants (MIOX, on-site generation)

- UV
- Ozone
- Chloramines
- Other- Details:

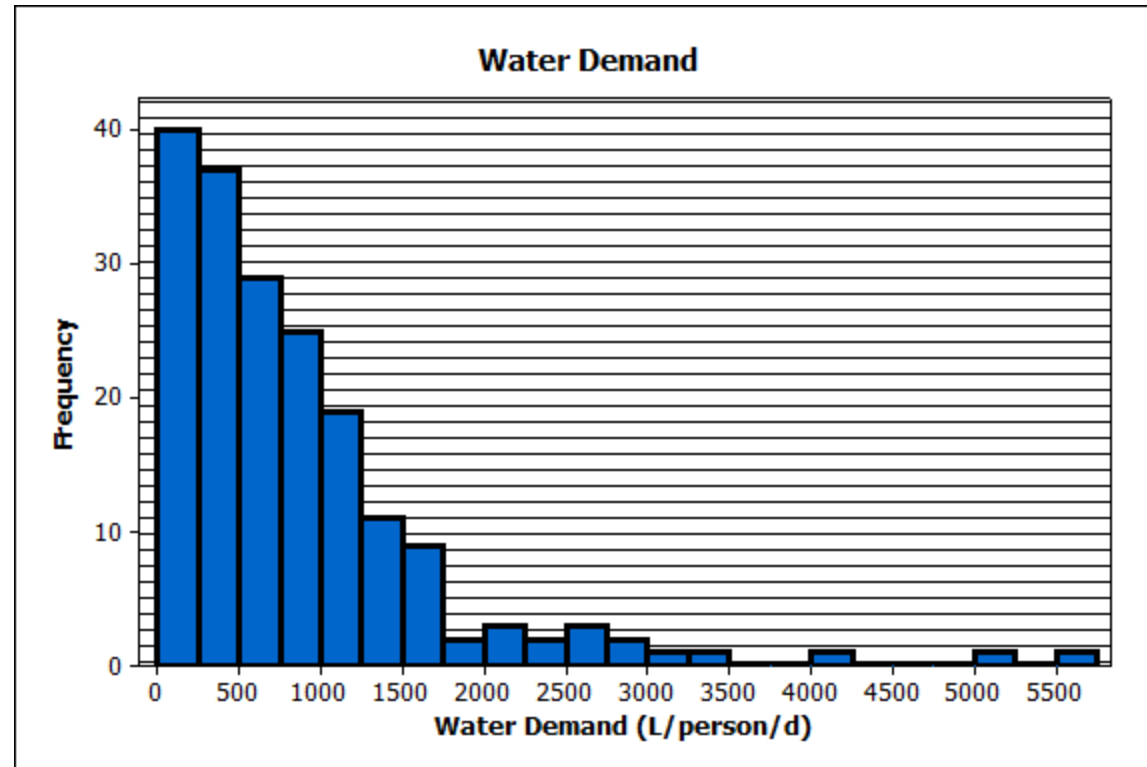


Highlights from 2015 Drinking Water Reports

- Reports submitted for:
 - 61% of public drinking water systems
 - 66% of communities with public drinking water systems
- 30+ new water system operators identified
- Discovered Cat Box Pond water supply is actually called Cabbox Pond
- Only 57% of systems taking both free and total chlorine residual readings
- 66 communities reported no flow data- lack flow meters
 - 18% of submitted reports
- More water shortages and chemical leaks than expected
 - 24 reports of water shortages (various reasons)
 - 7 chlorine leaks in 2015
- Some communities on long-term BWAs charge higher water & sewer rates than communities operating disinfection and treatment systems and not on BWAs



Other Highlights- Water Demand

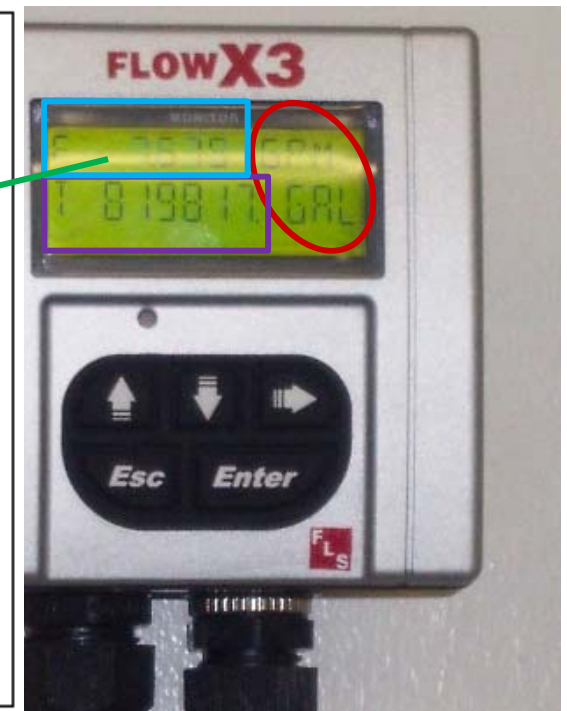
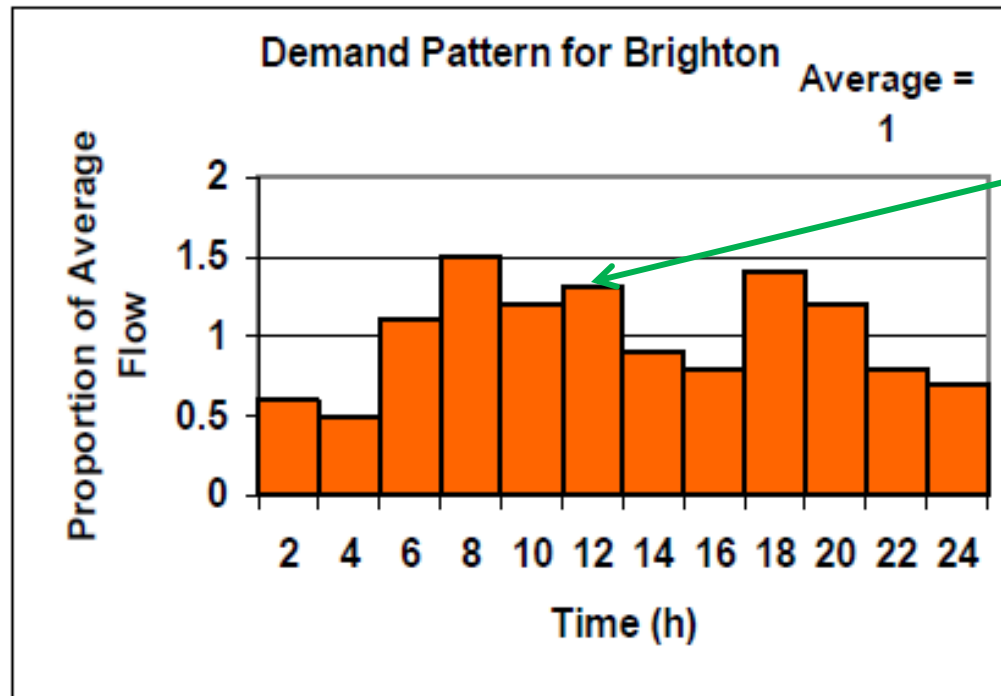


- 187 responses
- Mean water demand: 858 L/p/d (2.5 x design demand)
- Min water demand: 9.8 L/p/d
- Max water demand: 5709 L/p/d (16.8 x design demand)
- Design demand: 340 L/p/d



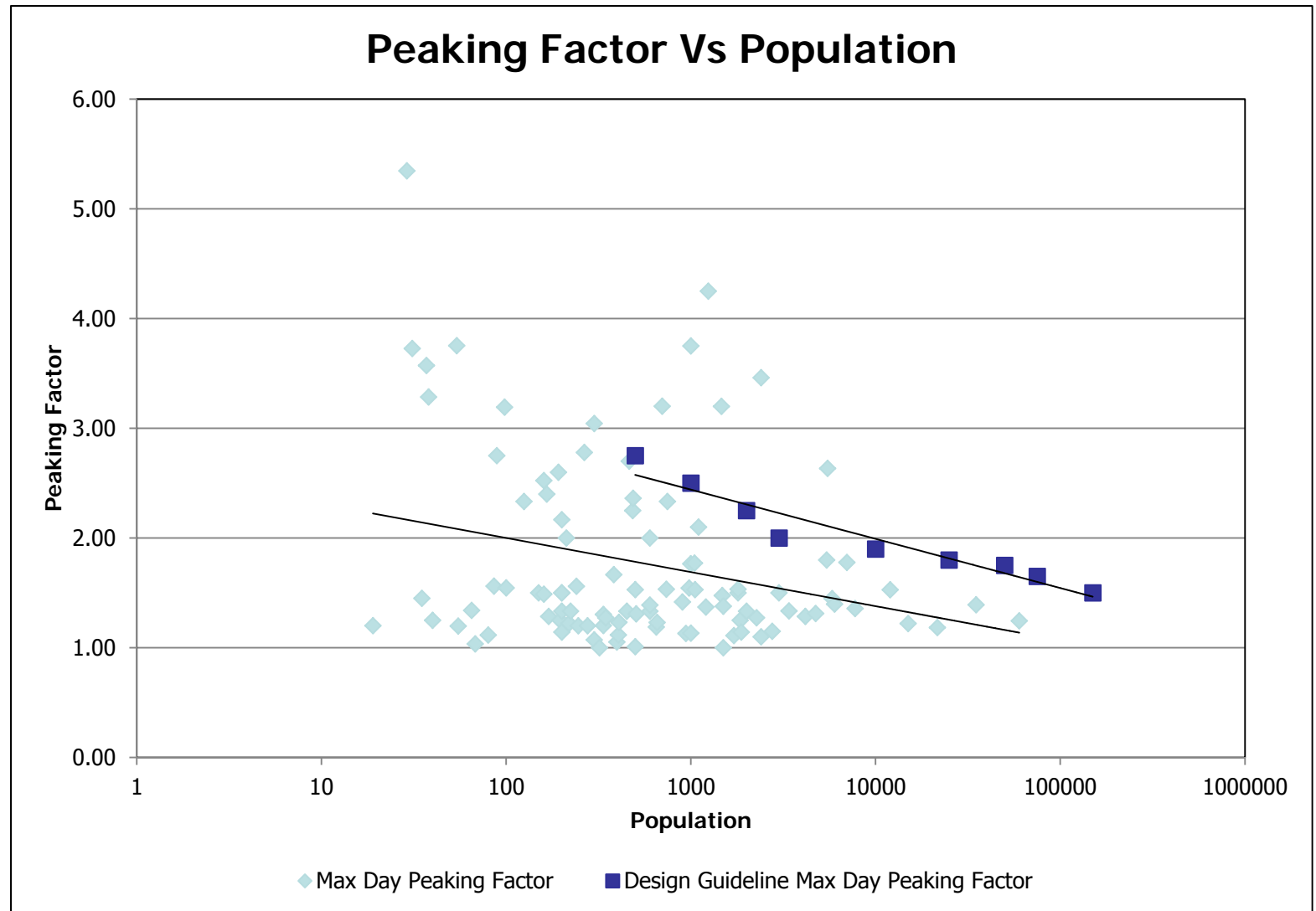
Flow Readings

- Monday at noon: 819817 Gal
- Tuesday at noon: 820670 Gal
- Daily water use: 853 Gal/day
- Instantaneous flow at noon: 7.675 GPM



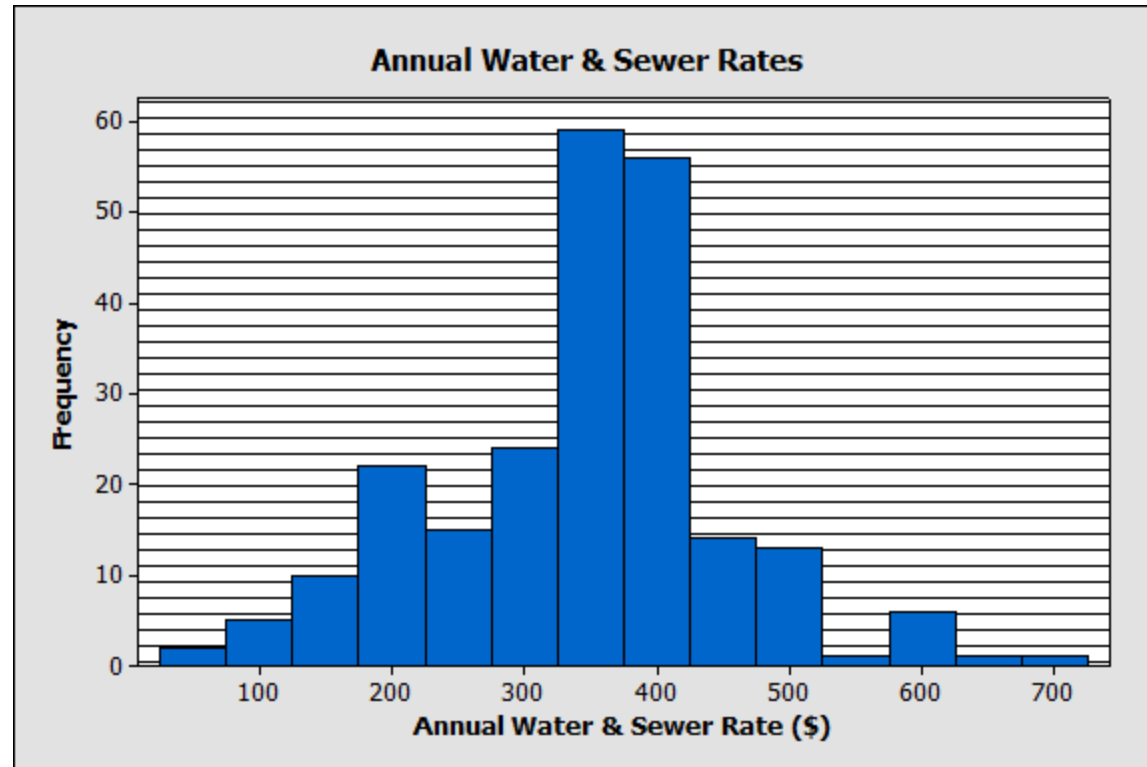


Other Highlights- Max Day Peaking Factor





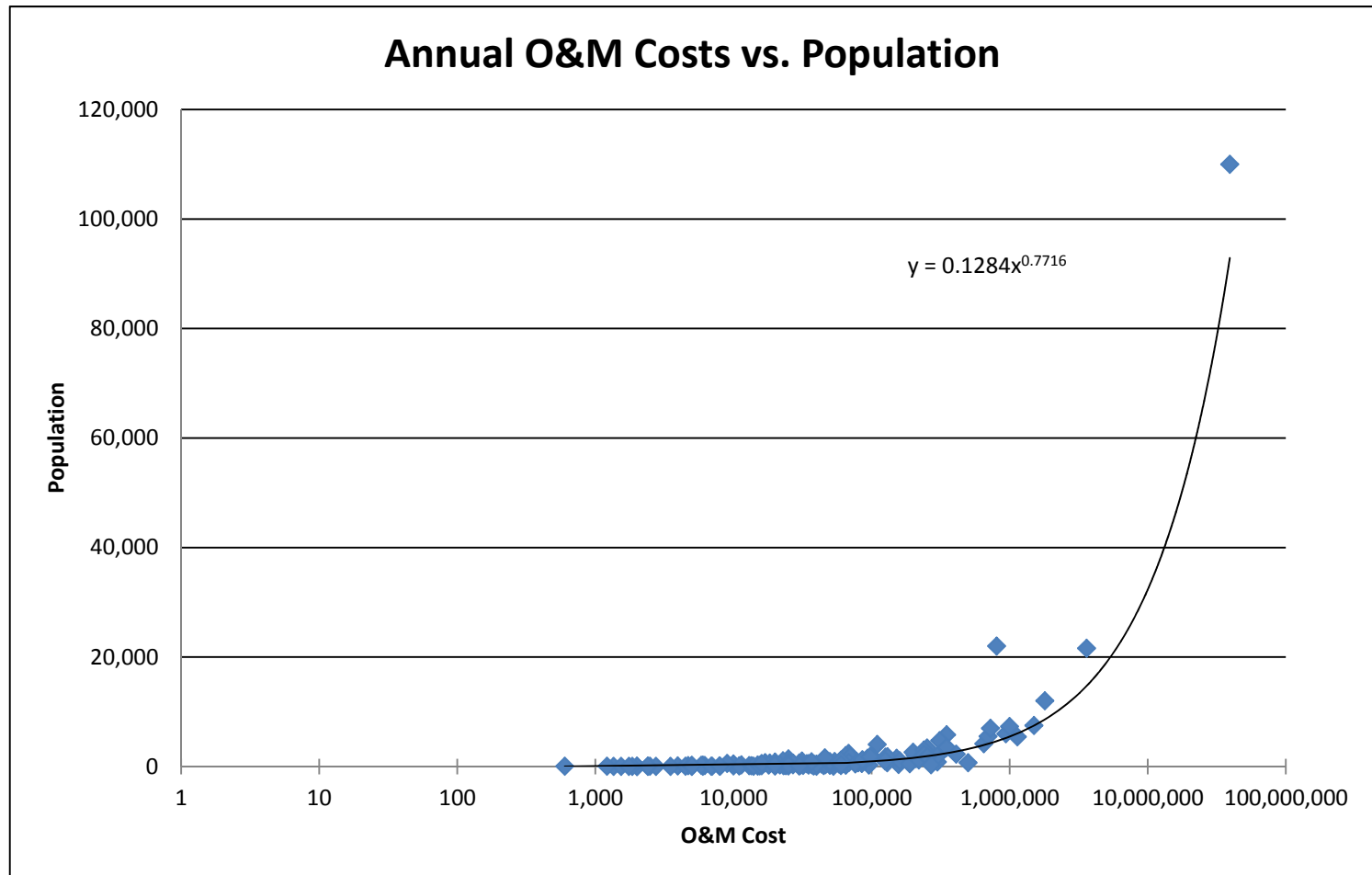
Other Highlights- Water & Sewer Rates



- 282 responses
- Mean water & sewer rate: \$345
- Min water & sewer rate: \$65
- Max water & sewer rate: \$690

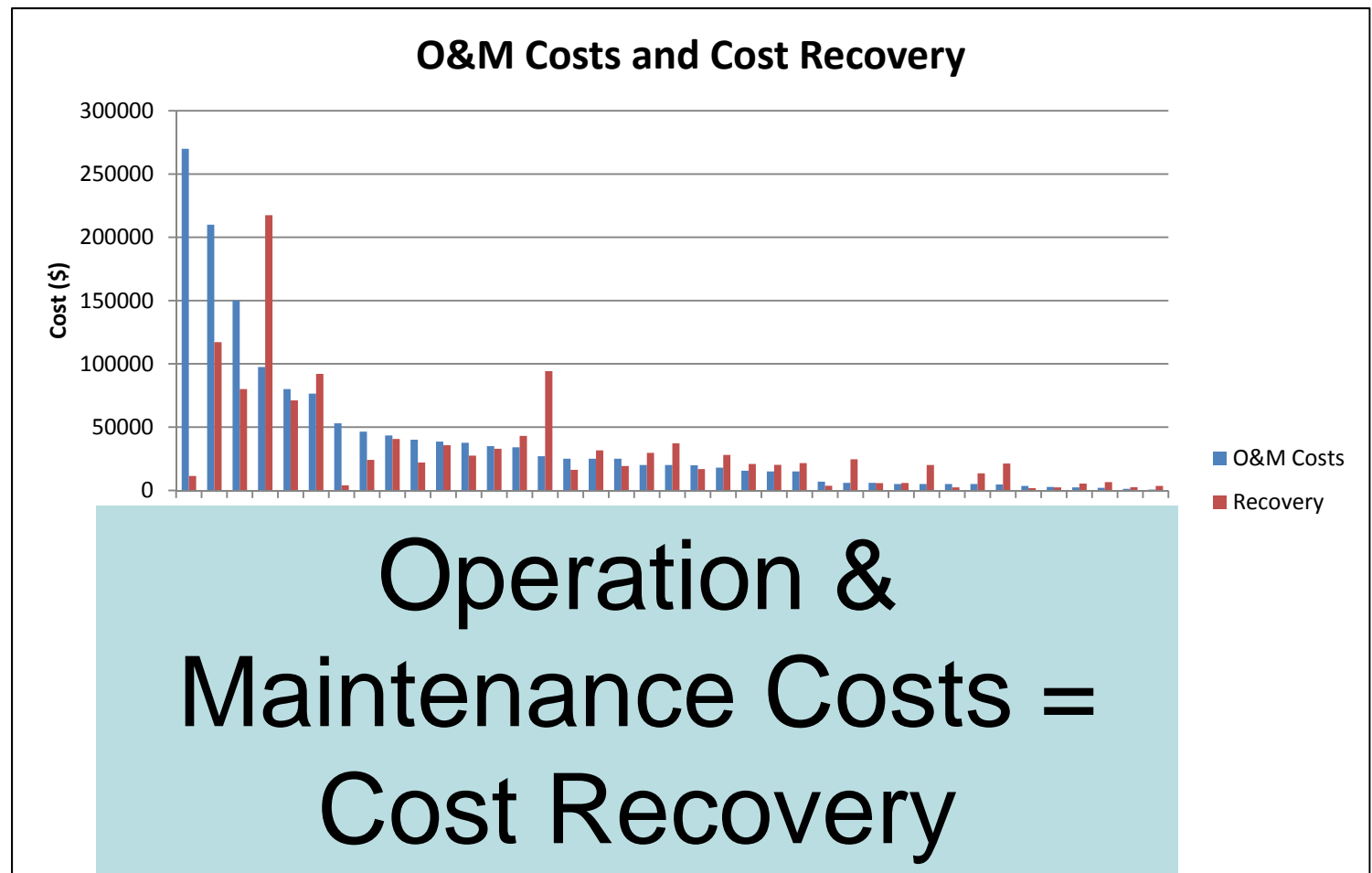


Other Highlights- O&M Costs





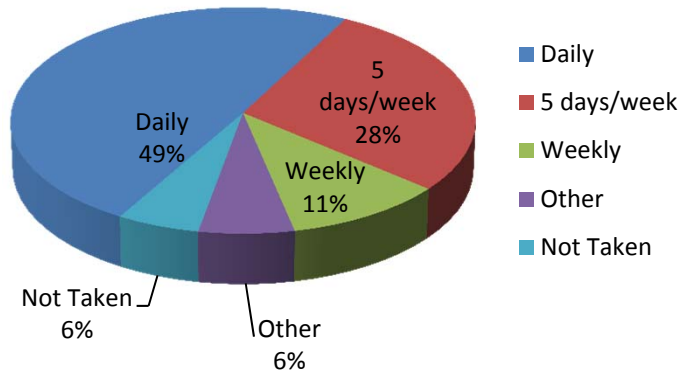
Other Highlights- O&M Costs vs. Cost Recovery



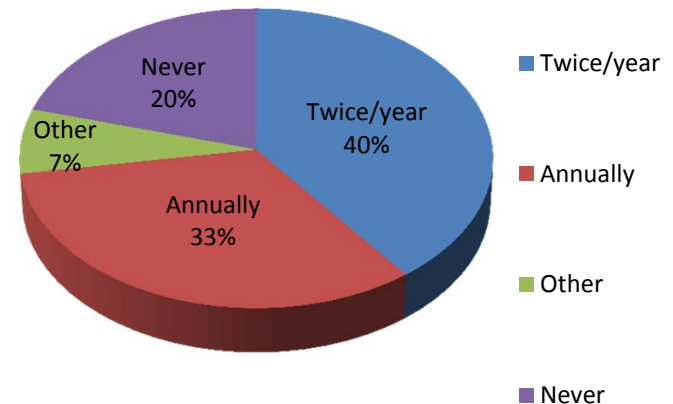


Other Highlights- Chlorine Readings and Flushing

Frequency of Chlorine Readings



Frequency of Flushing



Certification News

- New certification categories launched in 2015/16:
 - Very Small Water System Operator
 - Potable Water Dispensing Unit Operator
- Certification fees will change as of April 1st
 - Certification exam - \$75 + HST
 - Transfer of certification - \$75 + HST



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New Certification Categories

Very Small Water System (VSWS)

- Available as of April 1, 2016 for water systems with a service population ≤ 500
- Certification Eligibility Requirements
 - Experience – 6 months VSWS operating experience
 - Education – completion of the 3-day Water Distribution course delivered by the Department
- VSWS certification exam includes 50 multiple choice questions

Next WD courses are
scheduled for St. John's (April
19-21, 2016) and Deer Lake
(May 10-12, 2016)





New Certification Categories

Potable Water Dispensing Unit (PWDU)

- A new course and certification category was launched in June 2015 for PWDU operators
- Certification Eligibility
 - Experience – 6 months PWDU operational experience
 - Education – completion of PWDU (2-day) course offered by the Department
- PWDU exam includes 70 multiple choice questions
 - 50 from the VSWS exam
 - 20 specifically about the PWDU system



Next PWDU course is scheduled for June 14-15, 2016 in
Happy Valley-Goose Bay



Operator Education News

- A new course on Protected Public Water Supply Areas is under development & will be launched in Fall 2016




- Spring/Summer 2016 Operator Education Schedule, and a description of all courses, can be found on our website:

http://www.env.gov.nl.ca/env/waterres/training/operator_education/index.html



Other Developments



CT Factor Calculation Guidelines

What is a CT Factor?

- CT factor is a value derived to ensure drinking water is disinfected effectively
- CT is the product of Disinfectant Concentration (mg/L) & Contact Time (minutes)
- Disinfection standards require a disinfectant concentration of 0.3 mg/L and a contact time of 20 minutes at the first user, or an equivalent CT of 6
- Each water system will have a unique CT, therefore it is important to know how to perform the calculation

CT Calculation Procedure

Step 1: Determine C (Concentration)

- Test free chlorine residual (C) at the first user on the system

Step 2: Calculate T (Contact Time)

- Determine the contact volume (m³) in the distribution system up to the first user; include volume of transmission mains, clearwells & storage tanks after disinfection
- Determine the average daily flow (m³/h) for the community from water meter records, or use theoretical value (340 L/person/day x population serviced x 4.17 x 10⁻²)
- Calculate the peaking factor:
$$\text{Peaking Factor} = 2.50 + \frac{2.18}{\sqrt{\frac{\text{Population}}{1000}}}$$
- Multiply the average daily flow and calculated peaking factor to determine the peak flow rate (m³/h)
- Use the peak flow rate and contact volume to calculate T (Contact Time)


$$\text{Contact Time (min)} = \frac{\text{Contact Volume (m}^3\text{)} \times 60 \left(\frac{\text{min}}{\text{h}}\right)}{\text{Peak Flow Rate} \left(\frac{\text{m}^3}{\text{h}}\right)}$$

Step 3: Calculate CT

- Determine the Baffling Factor (BF) based on type of contact tank or transmission main (values can be found on reverse side)
- Multiply C (Concentration), T (Contact Time), and Baffling Factor (BF) to calculate the CT factor

$$\text{CT} = \text{C} \times \text{T} \times \text{BF}$$

Digital tool and user's guide for calculating CT are available on our website:
www.env.gov.nl.ca/env/waterres/waste/community



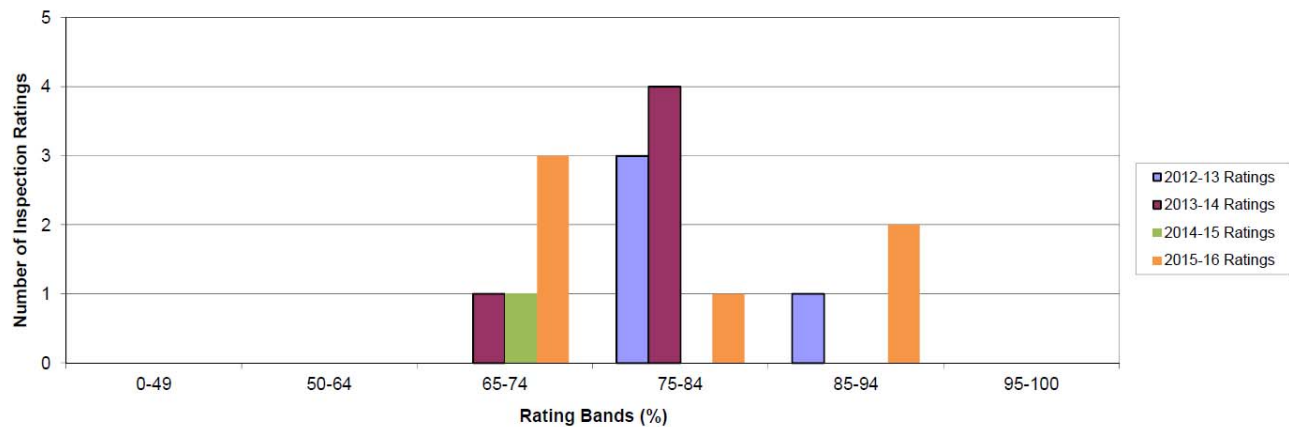
Department of Environment and Conservation
Water Resources Management Division
Community Water and Wastewater

- http://www.env.gov.nl.ca/env/waterres/training/operator_onsite_training/CT_calc_bf.pdf

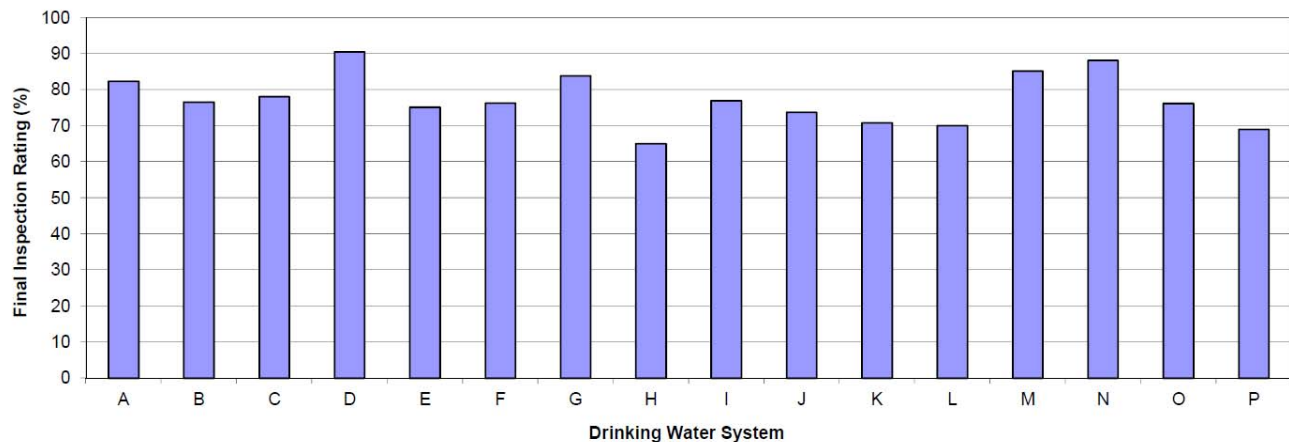
- Other guidance material
 - Monitoring of PPWSAs
 - Hydrant maintenance
- Drinking Water Treatment Standards for NL
- Audits of drinking water systems servicing >1000 people



Permit to Operate Drinking Water System Inspection Ratings



Permit to Operate Drinking Water System Inspection Ratings



Rating Category	Rating Bands (%)
Poor	0-49
Marginal	50-64
Fair	65-74
Good	75-84
Very Good	85-94
Excellent	95-100



Path Forward



- Implementation of BWA SOPs
- Future Drinking Water System Reports
 - Every 2 years
- Small system courses starting in April 2016

- Identifying and addressing gaps in the NL Drinking Water Safety Program

Questions?



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