

The background of the slide is a faded, high-angle photograph of several rolled-up architectural blueprints. The blueprints show various technical drawings, including floor plans, sections, and elevations, with lines, circles, and text visible. The rolls are stacked and slightly overlapping, creating a sense of depth and professional context.

# Generic Terms of Reference for Water Treatment

## What are Terms of Reference?

Terms of reference are instructions for carrying out a study.

For example, if council was deciding on whether to build a new municipal building.

You could ask the consultant to provide you with an estimate to build a new building versus renovating the old building.

In addition, you may ask the engineering consultant to review what size of building is needed to provide services.

These would be your terms of reference, in other words they are instructions to the consultant to prepare answers to questions to help you make informed decisions.



# Generic Terms of Reference for Water Treatment

## Why Treat The Water?

- < Common reasons for water treatment
  - < Known waterborne disease outbreak
  - < Chemical / Physical parameters exceed safe levels as set by CDWG
  - < Aesthetics (Taste, Iron, manganese, color, turbidity)



# Generic Terms of Reference for Water Treatment

## Costs of Water Treatment

Municipality	Capital Cost	Primary Reason for Treatment
Ramea	~ \$2.0 Million	Aesthetics and THM concerns
Isle aux Morts	~ \$1.5 Million	Aesthetics and THM concerns
Deer Lake	~ \$2.5 Million	Giardiasis Outbreak waterborne
Pasadena	~ \$2.5 Million	Giardiasis Outbreak waterborne
Corner Brook	~ \$36 Million	Aesthetics originally driven by Giardiasis Outbreak
Gander	~ 9 Million	Aesthetics and THM concerns

Sometimes new supply development is used to avoid the costs of water treatment or risks associated with the water supply that could not easily be treated. Such as:

Stephenville/ Kippens

St. George's

Fox Roost - Margaree

Numerous groundwater supplies abandoned due to arsenic or lead



# Generic Terms of Reference for Water Treatment

## Why have a Generic Terms of Reference?

- < The province has estimated it would cost in excess of One Billion dollars to provide traditional water treatment to all water systems in Newfoundland and Labrador.
  - < Greater than 20 Million spent on Chlorination alone.
- < In anticipation of more requests for Water Treatment the province issued the Generic Terms of Reference for Water Treatment to ensure appropriate water treatment was being selected and all alternatives were being examined.
- < If a municipality is proposing treatment above the following levels than they must follow the GTORWT
  - < Filtration below 50 Microns
  - < Color or THM precursor reduction
  - < Inactivation or removal of Giardia/ Cryptosporidium Cysts



# Generic Terms of Reference for Water Treatment

## Highlights of Terms of Reference

- < Must establish a working committee to administer study
  - < The working committee will consist of:
    - < Representatives of council
    - < Technical representatives of council either from their consultants and/or from their own staff
    - < Administration representatives of council (IE. Town Manager)
    - < Representatives of Department of Environment, Department of Municipal and Provincial Affairs and Department of Government Services and Lands
- < The Terms of Reference require the study to cover three main areas.
  - < ***Water Usage and Design Flows***
  - < ***Selection of Best Available Technology***
  - < ***Impact on Municipal Budget***



# Generic Terms of Reference for Water Treatment

## *Water Usage and Design Flows*

- < Existing water usage must be known and categorized
  - < Commercial Use
  - < Domestic Use
  - < Lost water from Leaks or freeze prevention
- < Review methods of water conservation and reduction of peak flows.  
Some examples
  - < Supply heavy commercial users with untreated water
  - < Installation of water conservation equipment in individual homes
  - < Freeze protection of service lines
  - < Leak detection and repair
  - < Waterline replacement
  - < Separate treatment systems for drinking water distribution
  - < Point of use / centrally managed water treatment systems
  - < All other feasible strategies
  - < Water storage tanks
- < Design flow to be approved by Municipal and Provincial Affairs





# **Generic Terms of Reference for Water Treatment**

## ***Selection of Best Available Technology***

- < Water quality objectives must be approved by the Department of Environment.
- < Feasibility of regional water systems must be analyzed.
- < Consultants must prepare a review of at least 6 (six) available water treatment technologies that are appropriate to accomplish the goals of water treatment.
- < A preliminary selection process on the 6 available water treatment technologies will be carried out without the benefit of bench or pilot testing. ( $\pm$  50% Estimates)
- < From this analysis three methods will be further investigated through bench top testing to more accurately estimate capital and operating costs.
- < One or more treatment technologies may require more thorough pilot testing to determine the design of the treatment plant.





# **Generic Terms of Reference for Water Treatment**

## ***Impact on Municipal Budget***

- < Construction and operation of a water treatment system will require a significant commitment of funding from both the municipal and provincial governments. Therefore, a full review of the financial impact on the municipal budget is required. The consultant may retain the services of a financial specialist to assist with the budgetary analysis
  - < Prepare a seven (7) year budget submission using the current budget policies of the Department of Municipal and Provincial Affairs assuming appropriate costs for operation, maintenance and capital repayment.
  - < The Seven Year Budget will be submitted to the Department of Municipal and Provincial Affairs for approval.



# Generic Terms of Reference for Water Treatment

## Conclusion

- < There issues addressed in these Terms of Reference which may already have been studied in some municipalities and would simply require a review by the working group.
- < The department will be flexible with consultants and towns who wish to use an alternative selection method. (IE. Public proposal call, Design Build) Care must be taken to ensure compliance to the public tendering act.
- < Expected to take two years.
- < Expected costs will run from \$100,000 to \$500,000 to carry out studies in accordance with the Terms of Reference