

The Need for Safe Potable Water

Public Meeting – RM of Alexander
November 17, 2008

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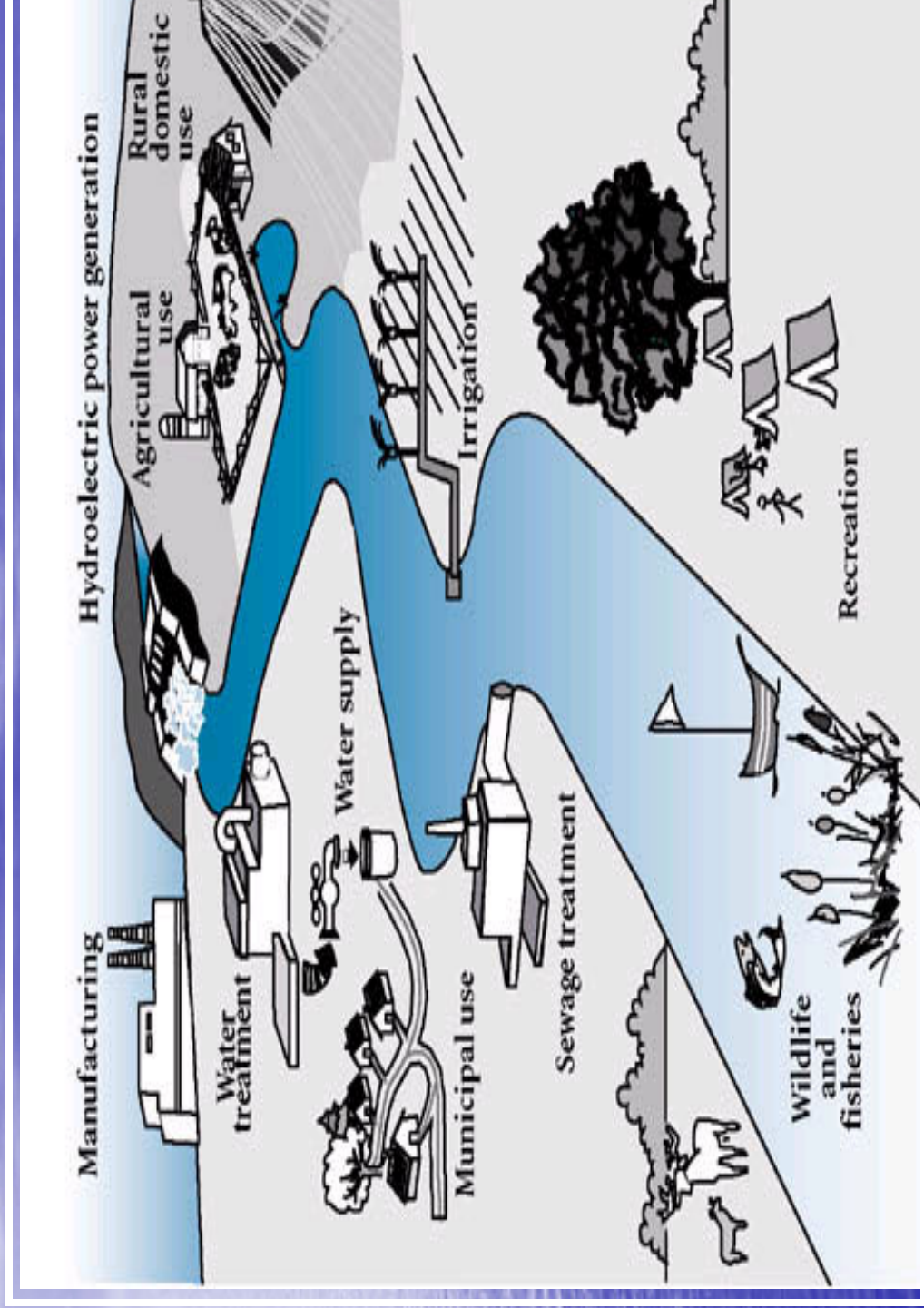
Global Water Supply

- *74 % of the earths surface is covered by water: however, 97% of this is salt water while only 3 % is fresh water.*
- *Of this 3%:*
 - *77% is ice*
 - *22% is ground water and soil moisture*
 - *1% is surface water*

The importance of water

- Use in its natural state – recreation, wildlife, hydroelectric
- Use via withdrawal – industry, municipality (residential), agriculture, mining

Water Use



Source: <http://res2.agr.gc.ca/publications/hw/graphics/ep14.jpg>

What is the risk?

- Short term /Acute – microbial contamination with bacterial, viruses or protozoan's e.g. cryptosporidium and giardia.
- Illness is rapid
- May result from a single exposure
- In severe cases with some organisms, death may occur especially in susceptible populations such as children, elderly or immunocompromised.

What is the risk

- Long term – usually by chemical contamination
- Exposure is for longer duration
- Low levels of contaminant
- Health outcomes such as cancer

- *Chemicals:*
 - *Lead*
 - *Fluoride*
 - *Arsenic*
 - *Nitrate*
 - *Pesticides*
 - ****Disinfection By Products***

Burden of illness

- *WHO: 2.2 million people in developing countries (most of them children) die every year from diseases associated with lack of safe drinking-water and inadequate sanitation.*

- Transmission : contaminated surface water sources and poorly functioning water systems contribute to these diseases
- Risk groups: people living in remote rural areas with poor water treatment and delivery systems, people living in poverty, very young, elderly and immune compromised

Walkerton 2000

- E coli O157/H7
- Other bacteria detected - campylobacter
- 7 deaths, 2 300 ill.
- Concerns with water treatment system, water treatment staff operational issues/ regulation
- Poor communication
- Environmental condition – heavy rainfall

North Battleford 2001

- Cryptosporidium outbreak affecting 6 - 7 000 of 14 000 residents
- Contributed further support to the importance of a multi-barrier approach.
- One of the initial signs: elevated turbidity.

How do we know our water is safe

- We use indicator organisms as surrogates for potential pathogen presence.
- E coli, total coliform
- Their presence does not mean the water is absolutely contaminated with pathogen nor does the absence indicate the water is free of pathogen

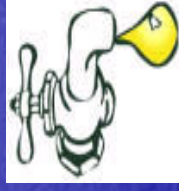
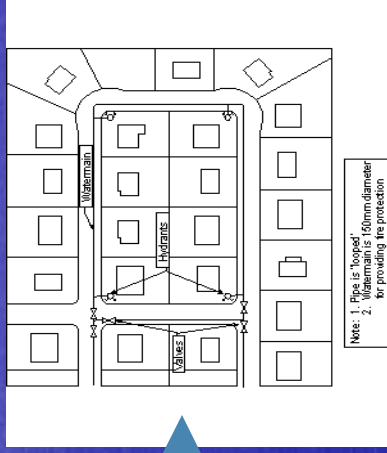
How do we know our water is safe

- Measures of adequate treatment such as disinfection residual and or turbidity.
- Once the water leaves the plant we cannot recall it as we do with food items
- Testing is not real time – by the time the water test result is received the water is already consumed.

What can we do?

- We need a water system that is robust
- A robust system is one that performs well under normal conditions and maintains an acceptable level of performance under adverse conditions.
- Any type of change or challenge to the system e.g. heavy rainfalls resulting in flooding

Source-to-tap water system



What can we do

- Safe drinking water is everyone's business
- Shared responsibility
- Proactive vs. reactive

THANK YOU

Questions?