Comparison of Treatment Technologies In Full Scale

OWWA Annual Conference 2000 Windsor, Ontario



Outline

Comparison of Treatment Technologies In Full Scale

OWWA Annual Conference Windsor 2000 Technologies available for water treatment

- Pre-Screening to identify appropriate technologies
 - Selection of the most appropriate technology
- Four case studies
 - Summary

Projects

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OWWA Annual Conference Windsor 2000 1998 to 1999 four package plants designed by TSH

– South River WTP

1,600 m³/day, Forest Lake

- Fenelon Falls WTP
 - 3,906 m³/day, Cameron Lake
- Port Carling WTP
 - 2,784 m³/day, Lake Roseau
- Lancaster WTP

Michael Gundry TSH • 1,370 m³/day, St. Lawrence River

Available Treatment Technologies



Process To Select Treatment Technology



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Short List Criteria

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Based on Process RequirementsODWOs & SDWAFuture Anticipated Water Quality

Future Anticipate Guidelines

Paramter	South River Lancaster Port Carling	Fenelon Falls
Turbidity (ntu)	< 0 . 1	< 0 . 1
Colour (tcu)	< 5	< 5
Taste & Odour	Yes	Yes
Crypto. & Giardia	>3 log	>4 log

Short Listed Technologies

Conventional

(Coagulation/Flocculation/Sedimentation /Dual & GAC Media Filtration)

- Ballast Assisted Floc Reactor with Dual & GAC Media Filtration
- Pulsating Upflow Clarifier with Dual & GAC Media Filtration
- Microfiltration
- Ultrafiltration

Michael Gundry TSH

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Evaluation of Short Listed Technologies

Costs (Capital, **Treatment** Efficiency Const, (M&O) **Operating Experience** & **Residuals Process** Experience Operating & Location For **Philosophies Tech. Support**

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Evaluation of Technologies

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OWWA Annual Conference Windsor 2000 Preselection to obtain accurate capital costs

Plant footprints & layouts developed to determine construction costs

Operating costs

- Electricity
- Chemical Usage
- Heating, Ventilating & Lighting
- Operations Staff

Evaluation of Technologies

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OWWA Annual Conference Windsor 2000 Expected treatment efficiencies

- Weighting developed for treatment results
- Operating experience with similar waters
- Process stability
 - Fully automated plants/part time attendance
- Residuals Management/Sludge Generation

Evaluation of Technologies

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OWWA Annual Conference Windsor 2000 Operations staff experience with process

Operational philosophies

Proximity for technical support & spare parts

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OWWA Annual Conference Windsor 2000 South River WTP (1,600 m³/day)

- Existing wells (iron 8 mg/L)
- Forest Lake
- Typical "Shield" Type Water
 - Turbidity 2 ntu
 - Colour 50 tcu
 - pH 6.1
 - Alkalinity 6.1 mg/L

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OWWA Annual Conference Windsor 2000 Fenelon Falls WTP (3,906 m³/day)

- Existing direct filtration with pressure filters
- Cameron Lake
- Kawartha Lake System
 - Turbidity 1 ntu
 - Colour 14 tcu
 - 7.9 pH
 - Alkalinity 8 mg/L

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Michael Gundry TSH

Port Carling WTP (2,784 m³/day)

- Existing plant chlorination as only treatment
- Lake Rosseau
- Typical "Shield Water"
 - Turbidity 0.4 ntu
 - Colour 9 tcu
 - pH 7.2
 - Alakalinity 8 mg/L

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Lancaster WTP (1,370 m³/day)

- Existing groundwater based system servicing part of community
- St. Lawrence River
- Great Lakes water
 - Turbidity 0.2 ntu
 - Colour 5 tcu
 - pH 8.2
 - Alkalinity 92 mg/L

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OWWA Annual Conference Windsor 2000 **Selected Technologies**

South River WTP

- Conventional
 - Coagulation/Flocculation, sedimentation, dual and GAC media filtration

Fenelon Falls WTP

- Immersed microfiltration membranes
 - with enhanced coagulation

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Selected Technologies

Port Carling WTP

- Conventional
 - Coagulation/Flocculation, sedimentation, dual media filtration, PAC for T&O

Lancaster WTP

- High rate tube settler
 - Coagulation/Flocculation, high rate 7.5° tube settlers, dual and GAC media filtration



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Summary

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There are many technologies available

- Meet current and future Water Quality Guidelines
- Selection of a technology should be based on a holistic evaluation
- Selection of a preferred technology is site specific
- No "one type" fits all