Welcome!

Biosolids Strategy & Wastewater Treatment Master Plan

Public Consultation Event

Fall 2017

December 5th: Region of Waterloo Museum, 5PM - 7:30PM
December 7th: Waterloo Memorial Recreational Complex, 5PM - 7:30PM
December 14th: Cambridge City Hall, 5PM - 7:30PM

www.regionofwaterloo.ca/biosolids
Help the Region of Waterloo develop its Biosolids Strategy and Wastewater Treatment Master Plan.

Tonight’s Agenda

Open House

• Have a look at the project information on display and chat with the Project Team
• Review what we do with wastewater and biosolids today
• Provide input on the evaluation of the short-listed alternatives
• Review how the recommendations in both studies will be developed and implemented

Work will be completed to meet the requirements of the Environmental Assessment Act as outlined by the Municipal Engineers Association Municipal Class Environmental Assessment (Oct 2000, as amended in 2007, 2011 and 2015) process.
Wastewater Treatment in Waterloo Region Today

LARGE TREATMENT PLANTS
Processing Capacity > 50 Million Litres/day
1. Kitchener
2. Waterloo
3. Galt

MID-SIZED TREATMENT PLANTS
Processing Capacity 5 to 20 Million Litres/day
4. Preston
5. Hespeler
6. Elmira
7. New Hamburg

SMALL TREATMENT PLANTS
Processing Capacity < 5 Million Litres/day
8. Ayr
9. St. Jacobs
10. Wellesley
11. Heidelberg
12. Conestogo
13. Foxboro Green

- 3 Cities
- 4 Townships
- Population serviced 535,000...and growing!
- 13 treatment plants
- 6 pump stations
- 2 Regional collection systems
- 5 receiving streams
- Targets for higher quality treated wastewater
- 10 Year Capital Budget (2017-2026) of $618 million
- Annual wastewater treatment operating budget of $25.6 million
Growth

We are planning for the growth in Waterloo Region to the year 2051. Many treatment plants will need extra capacity to treat the additional wastewater.

Level of Treatment Needs

The Region is committed to improving the water quality of the rivers that it discharges to.

Higher levels of treatment are expected to be required for the Waterloo, Preston, Hespeler, St Jacobs, Elmira and Wellesley plants before 2051.

Sustainability and Innovation

The Region wants to be leaders in using innovative technologies to improve the sustainability of its wastewater treatment plants. New technologies can help with:
Collect data, review existing conditions, and develop flow projections for future treatment needs.

Develop a decision making framework, and a long list of wastewater treatment alternatives.

Identify and short-list alternatives that would work at each treatment plant based on constraints and opportunities for that plant.

Evaluate the short-listed strategies using detailed evaluation criteria to determine preferred alternatives for each treatment plant.

Refine the preferred alternatives resulting from the detailed evaluation, and develop triggers for implementation.

Region of Waterloo Council will make the final decision to adopt the strategy at the end of the process. *Once adopted, there will be a 30-day review period for public comment.*
Important Considerations for the Wastewater Treatment Master Plan

Here are a few of the considerations for updating the Region’s Wastewater Treatment Master Plan.

**Growth**
Waterloo Region is expected to grow significantly in the years ahead. This means additional wastewater to be treated.

**Environmental & Social Constraints**
Environmental and social constraints must be considered, including protection of receiving waters, climate change, energy efficiency, greenhouse gas reductions, and potential impacts on the community.

**Regulatory Changes**
Updates to regulations can dictate how wastewater must be treated to meet Provincial and Federal standards.

**Optimization**
The Region has invested in existing infrastructure and optimizing this infrastructure is critical in maintaining cost-effective treatment.

**Innovation**
The Region should consider feasible new technologies that present opportunities for innovation.

**Increasing Costs**
As the costs associated with wastewater treatment will continue to rise, it is important to consider the best value to the Region.

Addressing these aligns with the Region’s 2015-2018 Strategic Plan.
How Were Alternatives Evaluated?

**Technical**
- Compatibility with existing Regional infrastructure
- Reliability to treat wastewater
- Innovative technologies to enhance the level of treatment and reduce greenhouse gas emissions

**Environmental**
- Environmental effects of the facility
- Climate change impacts (extreme high and low temperatures and weather events)
- Protection of natural features (woodlots, wetlands, vegetation and natural habitats) and the Region's surface water and ground water resources

**Social**
- Community impacts (odour, noise, truck traffic) and relative health risks posed to the public
- Accommodate future population growth
- Impacts to cultural or archaeological heritage features and First Nations Communities

**Legal and Jurisdictional**
- Approval requirements and risk to implement
- Land acquisition requirements

**Financial**
- Relative life cycle cost
- Economic benefit
- Cost impact on rates

Identify advantages and disadvantages
Assign a score
Determine best overall options
What Alternatives Were Evaluated?

**Growth**
Alternatives that can provide additional wastewater treatment capacity to service Waterloo Region's growing population.

- **Expansion with Existing Technology**
  The plants can be expanded using the same technologies currently in use.

- **Optimization/Re-Rating**
  Make changes to the way the plant is run to get a small amount of extra capacity.

- **Diversion**
  Send wastewater from one plant to another that has capacity.

- **Expansion with New Technology**
  Innovative new technologies can be used to provide additional capacity.

**Level of Treatment**
Alternatives that improve the quality of the water discharged to the river. An important consideration for the level of treatment is removal of phosphorus.

- **Treatment at Plant for Phosphorus Removal**
  Install filters or equivalent technology at plant to remove phosphorus prior to discharge to River.

- **Phosphorus Trading**
  Improve treatment at one plant that has filters to lower overall phosphorus to river.

- **Phosphorus Off-Setting**
  Remove phosphorus from agricultural or other non-wastewater sources to ‘off-set’ phosphorus from plant.

A - Industry accepted approaches for expansion and upgrades
B - Opportunities for new approaches that require further studies or consultation to confirm
Preferred Wastewater Treatment Alternatives For Growth and Level of Treatment

**St Jacobs WWTP** *(Before 2030)*
- A Expansion with new technology
- B Opportunity for Optimization Re-Rating

**Elmira WWTP** *(Before 2030)*
- A Expansion with new technology
- A Optimize existing tertiary treatment

**Waterloo WWTP** *(Before 2030)*
- A Expansion with new technology
- B Opportunity for Optimization Re-Rating

**Hespeler WWTP** *(Before 2040)*
- A Expansion with new technology
- A Optimize existing phosphorus removal process

**Wellesley WWTP** *(Before 2040)*
- A Expansion with new technology
- A Optimize existing tertiary treatment
- B Opportunity for Phosphorus offsetting with other sources

**Preston WWTP** *(Before 2030)*
- No growth upgrades required
- A Optimize existing phosphorus removal process

**Note:**
All treatment plants identified with green dots do not require any upgrades within the planning period.
These include:

1. Kitchener WWTP
2. Galt WWTP
3. New Hamburg WWTP
4. Ayr WWTP
5. Heidelberg WWTP
6. Conestogo WWTP
7. Foxboro Green WWTP

A - Industry accepted approaches for expansion and upgrades
B - Opportunities for new approaches that require further studies or consultation to confirm
Waterloo Wastewater Treatment Plant Preferred Strategy

**Growth**

**A - Expansion with New Technology**
- Uses innovative technology
- Smaller footprint provides space for future needs
- Provides energy savings and greenhouse gas reductions
- More rigorous approvals

Estimated Capital Cost: $30 Million

**B - Opportunity for Optimization/Re-Rating**
- Lowest cost alternative
- Makes good use of existing infrastructure
- Requires testing and further consultation to confirm

Estimated Capital Cost: $1 Million

**Level of Treatment**

**A - New Tertiary Treatment Process**
- Reliability in meeting level of treatment needed
- Protects water quality at the downstream Mannheim Water Treatment Plant intake
- Higher capital cost

Estimated Capital Cost: $30 Million

**A - Industry accepted approaches for expansion and upgrades**
**B - Opportunities for new approaches that require further studies or consultation to confirm**
Preston Wastewater Treatment Plant Preferred Strategy

Growth

No Growth Upgrades Required

Level of Treatment

A - Optimize Existing Secondary Treatment Process
- Reliability in meeting level of treatment needed
- Optimizes and utilizes existing infrastructure
- Lowest capital cost

No Capital Cost (Optimization Uses Existing Infrastructure)

A - Industry accepted approaches for expansion and upgrades
B - Opportunities for new approaches that require further studies or consultation to confirm
Hespeler Wastewater Treatment Plant Preferred Strategy

**Growth**

**A - Expansion with New Technology**
- Uses innovative technology
- Smaller footprint provides space for future needs
- Provides energy savings and greenhouse gas reductions
- More rigorous approvals

Estimated Capital Cost: $20 Million

**Level of Treatment**

**A - Optimize Existing Secondary Treatment Process**
- Reliability in meeting level of treatment needed
- Optimizes and utilizes existing infrastructure
- Lowest capital cost
- Treatment to remove ammonia (referred to as nitrification) will be included in the expansion with new technology to accommodate growth

No Capital Cost (Optimization Uses Existing Infrastructure)

A - Industry accepted approaches for expansion and upgrades
B - Opportunities for new approaches that require further studies or consultation to confirm
**Wellesley Wastewater Treatment Plant Preferred Strategy**

**Growth**

**A - Expansion with New Technology**
- Uses innovative technology
- Smaller footprint provides space for future needs
- Provides energy savings and greenhouse gas reductions
- More rigorous approvals

Estimated Capital Cost: $6 Million

**Level of Treatment**

**A – Expand Existing Tertiary Treatment Process**
- Reliability in meeting level of treatment needed
- Expansion of existing infrastructure
- Higher capital cost

Estimated Capital Cost: $2 Million

**B - Opportunity for Phosphorus Off-Setting**
- Lowest cost alternative
- Innovative method to achieve overall watershed improvements
- More rigorous approvals

Estimated Capital Cost: $100,000

**A - Industry accepted approaches for expansion and upgrades**

**B - Opportunities for new approaches that require further studies or consultation to confirm**
**St Jacobs Wastewater Treatment Plant Preferred Strategy**

**Growth**

**A - Expansion with Conventional Technology**
- Well understood treatment technology
- Utilizes existing infrastructure with some upgraded components
- Higher capital cost

Estimated Capital Cost: $9 Million

**B - Opportunity for Optimization/Re-Rating**
- Lowest cost alternative
- Makes good use of existing infrastructure
- Requires testing and further consultation to confirm

Estimated Capital Cost: $2 Million

**Level of Treatment**

**A – Expand Existing Tertiary Treatment Process**
- Reliability in meeting level of treatment needed
- Expansion of existing infrastructure
- Higher capital cost

Estimated Capital Cost: $3 Million

**B - Opportunity for Phosphorus Off-Setting**
- Lowest cost alternative
- Innovative method to achieve overall watershed improvements
- More rigorous approvals

Estimated Capital Cost: $100,000

**A - Industry accepted approaches for expansion and upgrades**
**B - Opportunities for new approaches that require further studies or consultation to confirm**
Elmira Wastewater Treatment Plant
Preferred Strategy

**Growth**

**A - Expansion with New Technology**
- Uses innovative technology
- Smaller footprint provides space for future needs
- Provides energy savings and greenhouse gas reductions
- More rigorous approvals

Estimated Capital Cost: $15 Million

**Level of Treatment**

**A – Expand Existing Tertiary Treatment Process**
- Reliability in meeting level of treatment needed
- Expansion of existing infrastructure
- Slightly larger footprint requirements

Estimated Capital Cost: $3 Million

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A - Industry accepted approaches for expansion and upgrades
B - Opportunities for new approaches that require further studies or consultation to confirm
The Region is also Looking into Many Options for Sustainability and Innovation

Innovative technologies can provide many benefits

**CO₂**

**Greenhouse Gas Reduction**
- Upgrade automation to better control process
- Change process configuration to use less energy and reduce greenhouse gas emissions

**Energy Efficiency**
- Reduced aeration energy through automation upgrades
- Modify process configuration to improve treatment
- Import oil and grease to increase gas production

**Reducing Biosolids Production**
- Change process configuration
- Add innovative treatment steps to further reduce biosolids and pathogens

**Improving Level of Treatment**
- Automation upgrades to improve how wastewater treatment is controlled
- Changes to chemical dosing amounts and locations

**Short-term opportunities for implementation**

**Long-term opportunities that require further studies or consultation to confirm benefits**
Next Steps

Upcoming Schedule

WINTER 2018

• Finalize the Preferred Wastewater Treatment Strategy for all Regional wastewater treatment facilities
• Presentation of the Draft Wastewater Treatment Master Plan to Region Council
• 30-Day Public review period for the Draft Master Plan document

How You Can Help...

Give us your feedback on the project objectives, evaluation criteria, and strategy alternatives, to help us as we finalize the plan.

Ask questions today

Fill out the comment sheet and leave it here today or send it back to the contact below

Sign up for our contact list

Visit www.regionofwaterloo.ca/wastewater

And if you have questions or comments below, please do not hesitate to contact:

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