



# Region of Waterloo 2018 Biosolids Strategy at a Glance

April 2018

**BIOSOLIDS**  
Strategy 



# Welcome to the 2018 Biosolids Master Plan

The Master Plan, driven by input from the community and stakeholders on the issues that matter most to them, creates a biosolids management strategy for the Region of Waterloo.

To complement the Master Plan's technical documentation, this summary was prepared to outline the strategy at a glance. If during your reading of the summary document, you require further information, look to the blue dots at the start of each chapter heading, indicating where in the report you can find the technical breakdown related to the section.

The steps undertaken during the study to develop the Biosolids Master Plan are outlined in this document, along with the resulting recommendation to develop storage facilities to support current operations in the short term, and a new processing facility to be located in the Region to produce dried, low volume fertilizer in the long term. The Master Plan sets the stage for community engagement in future Class Environmental Assessments to site this long term facility.

It is hoped the information provided here helps you understand the issues considered in developing the biosolids strategy, and the Region of Waterloo's plan to manage this material to 2051.

April 2018

# Table of contents



<b>1</b>	What is this master plan? .....	1
<b>2</b>	Biosolids management in Waterloo Region today ....	3
<b>3</b>	The making of a strategy .....	5
<b>4</b>	Community engagement.....	7
<b>5</b>	Methodology .....	9
<b>6</b>	The long list of alternatives .....	11
<b>7</b>	The short list of alternatives .....	13
<b>8</b>	Evaluating the short list .....	16
<b>9</b>	The preferred alternative.....	22
<b>10</b>	What is the process to implement this strategy? ....	23
<b>11</b>	Stay involved .....	24



# What is this master plan?

Looking for more information?  
Refer to Tech Memo #1

## Introduction

The **Region of Waterloo Strategic Plan (2015-2018)** has identified the **Biosolids Master Plan** as a key component of its Environment and Sustainable Growth Focus Area.

The Region has embarked on a comprehensive process to develop a new Biosolids Master Plan, taking the interests of key stakeholders and the public to heart in order to identify the most suitable solutions for the whole community. The resulting Biosolids Strategy takes a critical look at today's practices, considers all applicable technologies, and develops a way to manage biosolids within the Region to the year 2051.

## What are biosolids?

**Biosolids are the processed organic material that remains after the treatment of our wastewater.**

Wastewater we generate is transported through a series of pipelines to a sewage treatment plants across the Region. Inside each plant, a series of processes are performed.

Water is separated and treated, and the clean water is returned to the environment.

The separated material is also treated; biosolids are the remaining product.

Biosolids can be applied to a range of uses, or disposed of as described on the following page.



## What can we do with biosolids?

Biosolids can be used for a range of purposes, as described below. Generally, biosolids are added to soil or used as an energy source. Otherwise, they are disposed of in a licensed landfill. Uses resulting in direct economic or environmental benefit are common and can include:

Use in Soil



### Agricultural

**Biosolids that meet Provincial and Federal quality standards can be applied to crop lands as a nutrient source.** Key considerations include the quality of the biosolids produced, available lands for application, potential presence of substances of concern, trucking, the need to store biosolids in the winter, and application limits and restrictions.



### Non-agricultural

**This use includes biosolids application to forested areas to improve nutrient supply to the soil, enhancing degraded lands such as on mine tailings areas, and use as daily cover material for landfills.** Key considerations include the quantity of biosolids produced, the availability of suitable sites for application, trucking, and the need to store biosolids awaiting transport.

Energy



### Energy recovery

**Energy can be recovered by burning biosolids or burning biogas generated from biosolids processing. The energy recovered depends on many factors including the processing method and the biosolids dryness.** Key considerations include facility specifications, the cost of additional fuel to burn the product, and potential for air quality impacts.

**Disposal** resulting in no direct economic or environmental benefit can also occur, including by way of:

Disposal



### Incineration

**Biosolids can be reduced to ash by incineration, which generates the smallest amount of material for disposal.** Key considerations include the approvals associated with an incineration facility, the cost of fuel, and potential for air quality impacts.



### Landfill

**Biosolids can be disposed of in landfills that are allowed to accept this material. Landfilling has historically been used for managing biosolids when other end uses and disposal options are not available.** Key considerations include the possibility that existing facilities, or MOECC, will restrict landfilling biosolids in the future, costs associated with trucking biosolids to distant sites, and tipping fees.



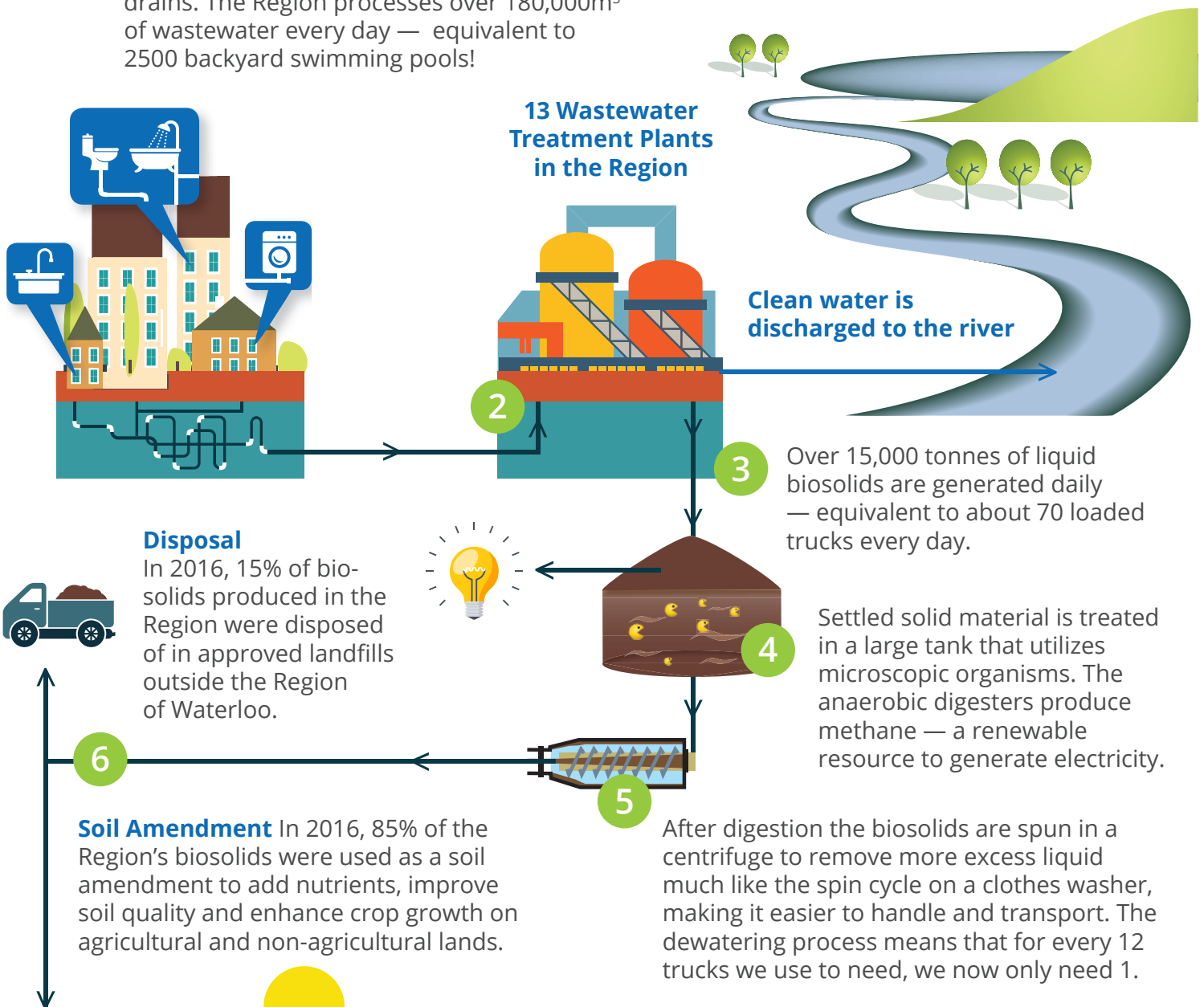
# Biosolids management in Waterloo Region today

Looking for more information?  
Refer to Tech Memo #2

The diagram below illustrates how biosolids are currently managed in the Region.

- 1** The City's underground sewer pipes collect the water and waste material we pour down our drains. The Region processes over 180,000m<sup>3</sup> of wastewater every day — equivalent to 2500 backyard swimming pools!

## 13 Wastewater Treatment Plants in the Region



## Transporting biosolids in the Region

Trucking is an important part of biosolids management in the Region today. There are two types of trips: trips between wastewater treatment plants for further processing of biosolids, and trips out of the Region for end use or disposal of processed biosolids.



### Types of Wastewater Treatment Plants:

**No Biosolids Digestion**

Biosolids are processed at another plant

**Aerobic Digestion of Biosolids**

Biosolids created in presence of air

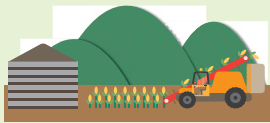
**Anaerobic Digestion of Biosolids**

Biosolids created in absence of air



Currently, most biosolids are transported out of the Region for end use or disposal.

In 2016, biosolids were transported outside of the Region for use or disposal as:



**45%**

Agricultural soil amendment



**40%**

Non-agricultural soil amendment



**15%**

Landfill

# The making of a strategy

Looking for more information?  
Refer to Tech Memo #1

## Why do we need a strategy?



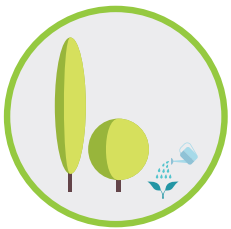
### Growth

The Region of Waterloo is expected to grow and this means more biosolids.



### Security

The Region needs flexibility and adaptability to plan for emergencies, manage risk, and tackle mid- to long-term biosolids storage needs.



### Environmental Constraints

Environmental and social constraints must be considered, including land availability, possible uses, climate change, and transportation routes.



### Regulatory Changes

Updates to regulations can restrict how we use biosolids.



### Innovation

The Region should consider feasible new technologies and scientific advances that present opportunities for innovation.



### Increasing Costs

As the costs associated with trucking, storage and disposal of biosolids will continue to rise, it is important to consider the best value to the Region.

## Region of Waterloo's approach

The Biosolids Strategy follows the Municipal Class Environmental Assessment process for master plans, to develop the most suitable biosolids management approach for the Region.

### Guiding Principles

Emphasize public engagement and participation from the community.

Identify a long-term, flexible, secure, and sustainable strategy for the Region.

Broadly consider all possible alternatives in developing the strategy.

### Project Organization

The strategy has been developed by the Region's Water Services division, along with an external consultant team. Committees supporting the development of the strategy include the Steering, Stakeholder, and Project Technical Advisory Committees.

## Spotlight on **Security** for the Biosolids Strategy: The need for storage

The Region currently does not have storage facilities for biosolids. There are two key types of storage needed:

### 1) Operational Storage: **More Immediate Need**

- Provides security during short-term emergencies
- Located at or near existing treatment plants, to hold up to 10 days' worth of dewatered biosolids
- Holds material awaiting final processing or end use/disposal

### 2) Product Storage: **Future Long-Term Need**

- Provides security if inclement weather results in transportation challenges
- Located along with a new processing facility to hold approximately four months' worth of processed biosolids
- Holds material awaiting transportation to the final end use or disposal destination

**In the future, the way we store biosolids will depend on how much water is contained in the material.**

The type of processing can reduce or increase the quantity of liquid by different amounts. However, reducing the amount of biosolids is a key part of the Region's management approach. Depending on how much liquid the biosolids contains, the volume of material would vary, and so would the type of **product storage** needed.

### Types of storage facilities

#### Outdoor Facility

If more than 75% liquid



For very wet material, an outdoor facility could be used, such as a tank with a flexible covering or lagoon with protective berms and liners to prevent biosolids from leaking out.

#### Indoor Facility

If less than 75% Liquid



For drier material, an indoor facility could be used, such as a shed or tension-fabric storage unit.

**“We are all involved in creating biosolids, so we should all be involved in determining what we do with them as a community. The most suitable strategies take the whole community’s interests to heart and we need the public to help us identify the solutions that fit.”**

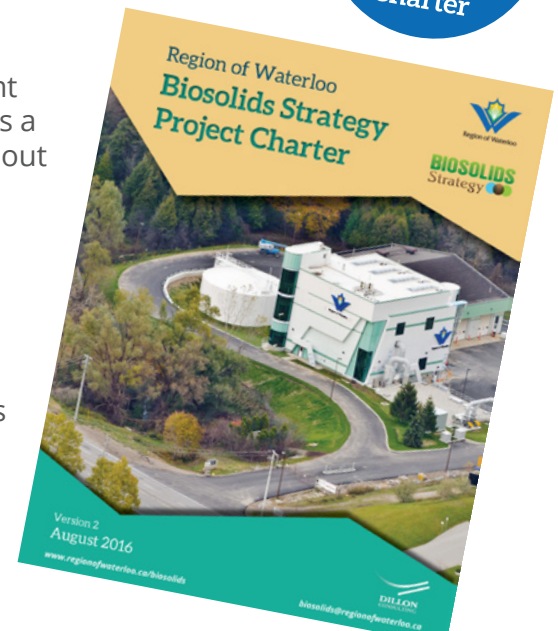
— Kaoru Yajima, Water Services Project Manager at the Region of Waterloo

# Community engagement

Looking for more information?  
Refer to the Project Charter

## Biosolids Strategy Project Charter

The **Project Charter** was developed to act as a guiding document for the project. It provides background information and serves as a reference tool for project team members and the public throughout the process, describing the scope and intent of the project.



## Principles of Engagement

The Region of Waterloo is committed to engaging citizens and collaborating with community partners to foster a meaningful and open conversation. The Biosolids Strategy Guiding Principles for engagement are:

- Accountability
- Responsiveness
- Inclusivity and accessibility
- Respect
- Transparency
- Clarity and simplicity

## Extensive Community Engagement

The Strategy development process emphasized community input and participation at multiple points to help identify values important to the public. Early and intensive engagement fundamentally shaped the course of the strategy and contributed to the development of the **Issues that Matter**, which became the **Strategy Objectives** and **Evaluation Criteria**.



Launch Event, November 17, 2015

## Key stakeholders in the consultation process

Groups invited to provide input, feedback, and direction on the Biosolids Strategy include:

- Community members
- Elected officials
- Regulatory bodies
- Technical experts
- Academic advisors
- Indigenous communities
- Community-based organizations
- Business and industry experts
- Agricultural groups
- Health, environmental, and scientific experts
- Municipal staff
- Students and youth

## Public engagement at a glance

### Engagement Opportunities

-  Biosolids Bulletin email updates
-  Biosolids Project website
-  Public consultation events & workshops
-  Surveys  
Online, in-person & telephone
-  Online/multimedia  
Open Town Hall Tool, videos, webinar & educational materials
-  Social Media  
Facebook, Twitter

**865**  
Colouring  
Books  
handed out to  
Children



 **502** Responses in a  
Telephone Survey



Public Consultation Centre, March 23, 2017

**Four**  
Online  
Surveys  
With almost  
**500**  
Responses

 **300** attendees at  
**Eight** Public  
Consultation  
Centres



Science Fair, April 4, 2017

**13** Pop-up  
Events  
with over  
**1,650**  
Interactions

Engagement with  
**400+**  
Grade 7 & 8 students  
through an activity presented at a  
**Science Fair**



Bob McDonald at Launch Event encouraging the audience to get involved, November 17, 2015

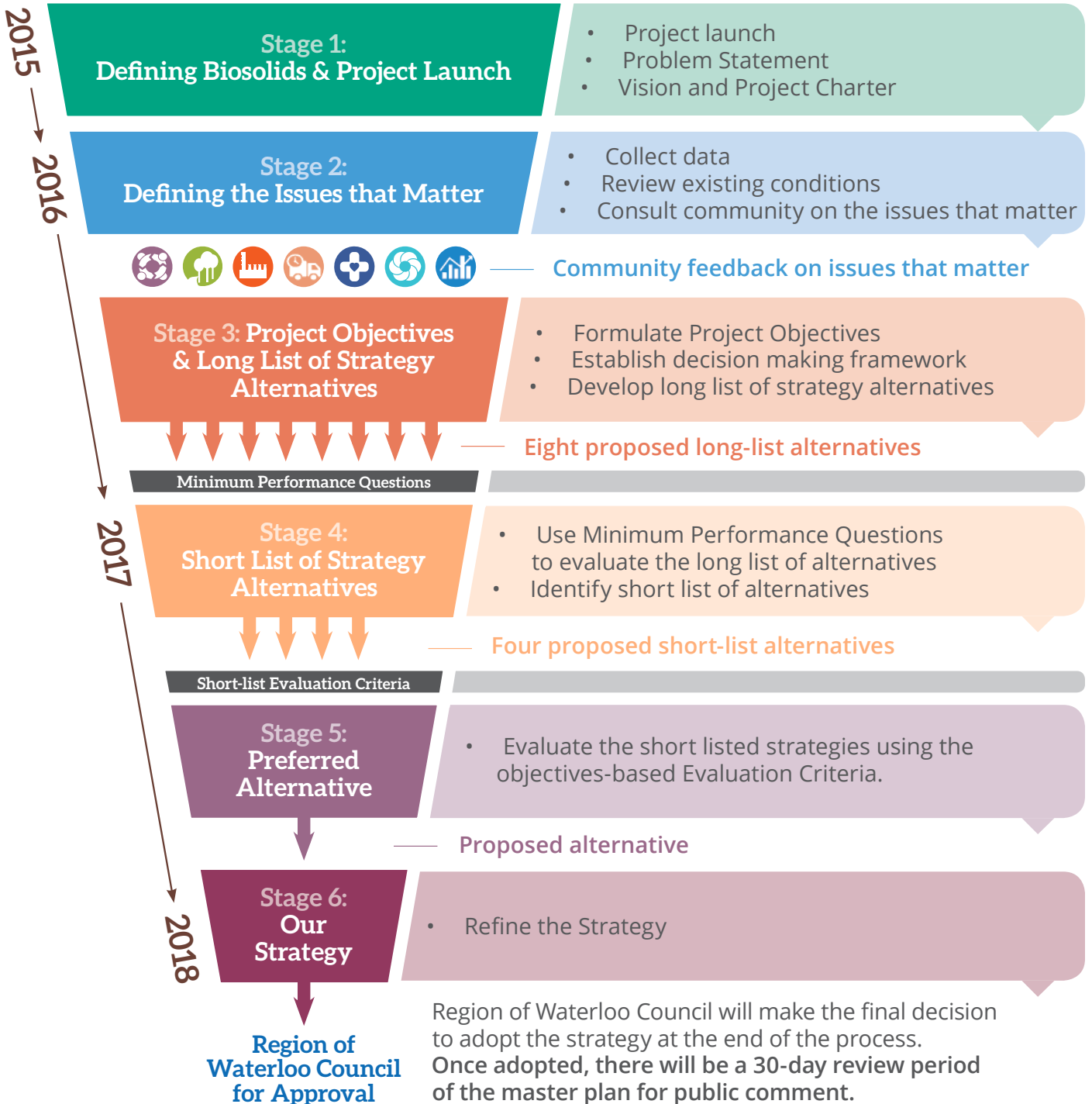
Insightful & knowledgeable  
**Keynote Speakers:**  
**CBC's Bob McDonald**  
Author David Waltner-Toews  
& **The Water Brothers**



# Methodology

Looking for more information?  
Refer to Tech Memo #3

The following roadmap outlines key phases in developing the Biosolids Strategy:



## Objectives from issues that matter

Issues that matter were identified through public consultations and helped establish seven objectives that all alternatives must align with, through an **objectives-based evaluation** process. These project objectives include:



### Work collaboratively with the community to find solutions.

Provide multiple opportunities for public engagement and input in the decision-making process.



### Align with existing biosolids infrastructure and management.

The Region has significant investment in infrastructure and a strategy that maximizes this investment is preferred.



### Protect the natural environment.

The preferred strategy should minimize impacts to the environment and surroundings.



### Protect health and safety.

The strategy should support healthy living for both workers and the public.



### Minimize and manage operational risk.

The preferred strategy must allow the Region to provide continual, uninterrupted biosolids management service to the public.



### Protect quality of life.

Maintaining the existing quality of life for citizens should be considered when planning for biosolids infrastructure.



### Be cost effective and provide value.

The cost of the preferred strategy must be reasonable to the Region, both now and in the future.



## What is an objectives-based evaluation?

An objectives-based evaluation approach reflects a desire to achieve a particular vision or outcome defined by integrated environmental, social and economic objectives.

In the case of the Biosolids Strategy, alternatives are evaluated according to objectives, outlined on the left. The alternative with the closest alignment will be recommended for the Region's preferred strategy.



# The long list of alternatives

Looking for more information? Refer to Tech Memo #5

After a review of all available technological options, and with input received directly from biosolids technology providers through a Request for Information process, the Region developed the following eight alternatives for managing biosolids:

## Current approach with expanded capacity

The current approach provides stable biosolids management. Biosolids are used for their nutrient value on fields or used for land reclamation, or landfilled when these options are not available.

- **Solids preparation/modification:** Current dewatering (expansion with population growth)
- **Biosolids processing:** Current digestion (expansion with population growth)
- **New product storage facility size\*:** Large
- **Change in output volume from current dewatering process:** No change
- **End Uses & Disposal:** Agricultural soil amendment, non-agricultural soil amendment, landfill

## Current approach with solids preparation before digestion

This alternative can reduce the total solids by generating more biogas, and reduce the amount of liquid in the dewatered biosolids, with a similar end product.

- **Solids preparation/modification:** Thickening technology (new infrastructure)
- **Biosolids processing:** Current digestion (less expansion with population growth)
- **New product storage facility size\*:** Large
- **Change in output volume from current dewatering process:** No change
- **End Uses & Disposal:** Agricultural soil amendment, non-agricultural soil amendment, landfill

## Produce fertilizer

This alternative would make a fertilizer product that could be sold. Different technologies produce fertilizer products with varying volumes.

- **Solids preparation/modification:** Current dewatering (expansion with population growth)
- **Biosolids processing:** Stabilization or hydrolysis technologies (new infrastructure)
- **New product storage facility size\*:** Medium
- **Change in output volume from current dewatering process:** Ranges between 66% more to 33% depending on technology used
- **End Uses & Disposal:** Agricultural soil amendment, non-agricultural soil amendment, landfill

## Produce compost

This alternative would add composting to the current process.

- **Solids preparation/modification:** Current dewatering (expansion with population growth)
- **Biosolids processing:** Composting technology + associated buildings (new infrastructure)
- **New product storage facility size\*:** Medium
- **Change in output volume from current dewatering process:** 60% less, however the bulking amendment used in the process increases the volume of material to be handled by three times
- **End Uses & Disposal:** Agricultural soil amendment, non-agricultural soil amendment, landfill

### Produce dried, low volume fertilizer

This alternative would add further drying to the current process to substantially reduce the total amount of product. The product is a fertilizer that could be sold or used as renewable fuel in certain applications.

- **Solids preparation/modification:** Current dewatering (expansion with population growth)
- **Biosolids processing:** Drying technology + potential associated buildings (new infrastructure)
- **New product storage facility size\*:** Small
- **Change in output volume from current dewatering process:** 85% less
- **End Uses & Disposal:** Agricultural soil amendment, non-agricultural soil amendment, landfill, energy from solids, incineration

### Thermal reduction with energy recovery

This alternative would 'burn' biosolids to ash and generate energy. Ash can be used as an industrial input, or disposed in landfill. This option requires enhanced dewatering that removes more water than the current approach and cannot be used in series with other energy recovery methods such as the existing anaerobic digesters that generate biogas used to produce heat and electricity for use at WWTPs.

- **Solids preparation/modification:** Current dewatering (expansion with population growth)
- **Biosolids processing:** Thermal reduction process + associated buildings (new infrastructure)
- **New product storage facility size\*:** No new storage needed
- **Change in output volume from current dewatering process:** 90% less
- **End Uses & Disposal:** Energy from solids, landfill

### Thermal reduction to ash (no energy recovery)

This alternative could use the current digested and dewatered biosolids as input and burn this to ash for use as an industrial input, or disposal in landfill.

- **Solids preparation/modification:** Thickening (new infrastructure)
- **Biosolids processing:** Incinerator + associated buildings (new infrastructure)
- **New product storage facility size\*:** No new storage needed
- **Change in output volume from current dewatering process:** 90% less
- **End Uses & Disposal:** Incineration, landfill

### Landfill all biosolids

This alternative would send all biosolids produced in the Region to a Provincially approved landfill. Existing infrastructure such as dewatering and digestion would need to be expanded with population growth.

- **Solids preparation/modification:** Current dewatering (expansion with population growth)
- **Biosolids processing:** Current digestion (expansion with population growth)
- **New product storage facility size\*:** No new storage needed
- **Change in output volume from current dewatering process:** No change
- **End Uses & Disposal:** Landfill

\* All alternatives require operational storage (see page 6) to be implemented for contingency purposes.



# The short list of alternatives

Looking for more information? Refer to Tech Memos #7

To narrow down the long list of eight alternatives to a short list, the Region of Waterloo applied a series of **Minimum Performance Questions** to each alternative based on the project objectives. The questions were built from the issues that matter, as described on Page 10. For an alternative to pass this screening step and become part of the short list of alternatives, it had to provide a 'yes' to all the questions below:



## Community Impact & Values

No specific evaluation criteria applied. This objective is addressed through the development of the strategy and is integrated into each stage of the screening process.



## Infrastructure Needs

- Is it compatible with the Region's existing wastewater treatment infrastructure?
- Is it based on commercially proven technology that provides a long term solution?



## Environment

- Does it meet current environmental regulations and is it capable of meeting permitting requirements?
- Does it align with best practices in the field of biosolids management?



## Health & Safety

- Does it meet current health and safety regulations?
- Does it align with best practices in the field of biosolids management?



## Operational Risk

- Can the Region control all the necessary elements of implementation?
- Can the storage requirements be permitted in the Region?



## Quality of Life

- Does it protect the quality of life for citizens regardless of where it is built?

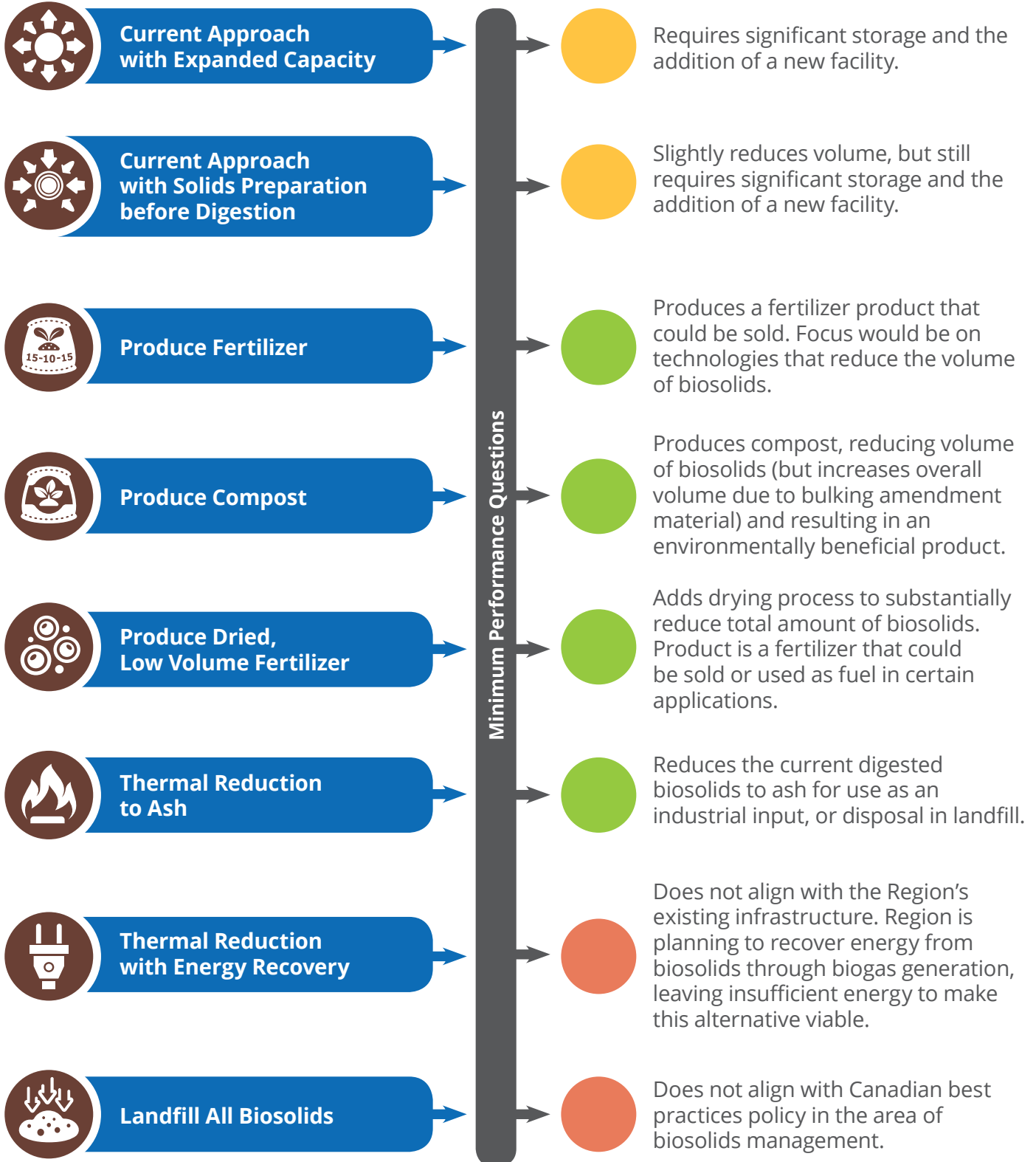


## Cost & Value

No specific evaluation criteria applied. This objective will be addressed through specific criteria for the short-listed strategies.

## Evaluation of alternatives using minimum performance questions

● Short listed    
 ● Continue in immediate future    
 ● Not short listed



## The short list at a glance



### Produce Fertilizer

This alternative would make a fertilizer product. Different technologies produce fertilizer products of varying volumes and quality. The focus will be on technologies that reduce the volume of biosolids, such as stabilization or hydrolysis. The facility would have space to store 4 months' of finished fertilizer product. This alternative could be built as either a single larger centralized facility (Option A) or four smaller decentralized facilities (Option B).



### Produce Compost

This alternative would transform biosolids into a Category A compost that consists of 25% biosolids mixed with other organic material such as wood chips. Different technologies can produce compost products of slightly varying volumes and quality. The facility would have a compost processing and curing area. The facility would have space to store four months' of compost product.



### Produce Dried, Low Volume Fertilizer

This alternative would add further drying to the Region's current biosolids management process to substantially reduce the total amount of product. The product would be a dried product that could be used as a fertilizer or fuel in certain applications. The facility would have space to store 4 months' of dried product. This alternative could be built as either a single larger centralized facility (Option A) or four smaller decentralized facilities (Option B).



### Thermal Reduction to Ash (No Energy Recovery)

This alternative would reduce the current digested and dewatered biosolids to ash for use as an industrial input such as in cement, or disposal in landfill. A limited amount of storage would be needed for this alternative. In the Region of Waterloo, there is no current industrial use for the ash so the product would likely be landfilled.



# Evaluating the short list

Looking  
for more  
information?  
Refer to Tech  
Memos  
#3 & 8

The alternatives that satisfied the Minimum Performance Questions on Page 13 were assessed using a series of **Short List Evaluation Criteria**, which were also developed from the issues that matter and with community input.



## Community Impact & Values

Working with the community to find solutions is a guiding principle of the project, and is addressed through the development of the strategy and integrated into each stage of the screening process.

## Short list evaluation criteria



### Infrastructure Needs

- Compatibility with existing Regional wastewater and biosolids processing infrastructure
- Requirements for new supporting municipal infrastructure (e.g., roads, power, water, etc.)
- Alignment with future municipal initiatives
- Adaptability to changing government regulations, policies, market demands, and population growth



### Operational Risk

- Potential for delivery disruption of processed biosolids to end use or disposal site
- Reduction of volume/mass of end product to be managed
- Susceptibility to operational disruption (e.g., maintenance, labour supply, and end product quality, management or storage)



### Quality of Life

- Management of odour, dust (from process or transport), noise, visual effects, trucking
- Source water protection impacts
- Degree of likelihood that components of biosolids management can be done within Waterloo Region



### Environment

- Environmental impacts of the facility and potential end uses
- Likelihood of energy recovery
- Adaptability to climate change impacts
- Level of greenhouse gas emissions



### Cost & Value

- Relative life cycle cost<sup>1</sup>
- Carbon credit opportunities
- Local economic benefit (job creation)
- Value of biosolids end product
- Level of innovation in approach, demonstrating leadership in the area of biosolids management



### Health & Safety

- Potential for health risks to public and workers
- Reduction or elimination levels of undesirable biosolids components
- Potential of an accident or adverse effect

<sup>1</sup> Life Cycle Cost includes the cost of construction, commissioning, and operations to the year 2051



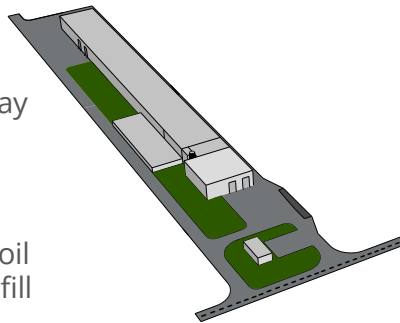
# Produce fertilizer

## Option A: Centralized facility

**Lifecycle cost:**  
\$187-241 million

**Conceptual Facility Layout:**

**Trucking:**  
6 trucks in and approximately 7 trucks out per day



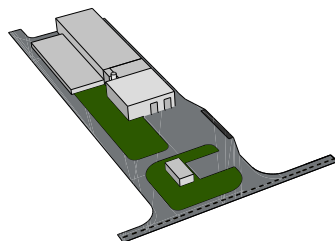
**End uses:**  
Agricultural soil amendment, non-agricultural soil amendment, landfill

## Option B: Four decentralized facilities

**Lifecycle cost:**  
\$285-336 million

**Conceptual Facility Layout (One of Four Facilities shown):**

**Trucking:**  
Approximately 13 trucks in and 7 trucks out per day



**End uses:**  
Agricultural soil amendment, non-agricultural soil amendment, landfill

### Evaluating the Alternative



- Some alignment with current Regional infrastructure, with some flexibility to adapt to future change
- May result in increased volume in final biosolids product, depending on technology
- Low potential to align with other Regional management initiatives
- Option A allows for better utilization of existing infrastructure



- Identified potential risks of contamination to the surrounding environment (air, water, groundwater) that can be mitigated
- Option B may have greater environmental effects depending on the locations of the facilities
- Fairly high greenhouse gas emissions



- Good operational flexibility to manage risks related to disruptions in ability to process or manage biosolids



- Greater potential impacts to the surrounding community resulting from odour and trucking
- Noise, dust, and other nuisances can be well managed



- Well established management of any potential health and safety concerns for workers and the public
- Limited levels of risk with respect to adverse events



- Relatively high life cycle cost to implement and operate as a result of the facility size, with a higher cost associated with Option B
- Fertilizer product may be sold to generate revenue for the Region



# Produce compost

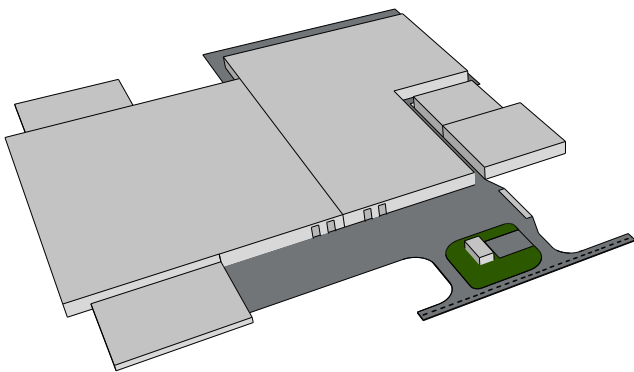
## Centralized facility

**Lifecycle cost:**  
\$291-342 million

**Trucking:**  
14 trucks in and 5 trucks out per day

**End uses:**  
Agricultural soil amendment,  
non-agricultural soil amendment, landfill

**Conceptual Facility Layout:**



### Evaluating the Alternative



- Some alignment with current Regional infrastructure, however would require sourcing, management and transport of a new stream of organic bulking amendment material
- Large volume of final compost product, requiring significant storage space
- Potential to align with other Regional management initiatives
- Limited new processing equipment needed



- Large facility footprint with identified potential risks of contamination to the surrounding environment (air, water, groundwater) that can be mitigated
- Potential positive benefits in moisture and organic matter addition to soil where compost is applied
- Low levels of greenhouse gas emissions associated with processing, but high levels associated with trucking



- Large facility footprint required resulting in challenges to siting the facility



- Greater potential impacts to the surrounding community resulting from odour and trucking
- Noise, dust, and other nuisances can be well managed



- Potential for some flammability risk of the compost product
- Limited levels of risk with respect to adverse events



- Life cycle cost could range significantly depending on processing system
- Compost product may be sold to generate revenue for the Region



# Produce dried, low volume fertilizer

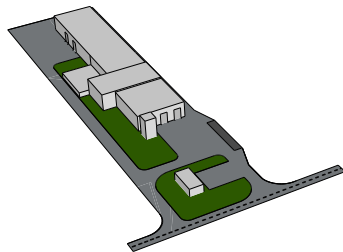
## Option A: Centralized facility

**Lifecycle cost:**  
\$155 million

**Trucking:**  
6 trucks in and  
2 trucks out per day

**End uses:**  
Agricultural soil amendment,  
non-agricultural soil amendment, landfill,  
energy from solids,  
incineration

**Conceptual Facility Layout:**



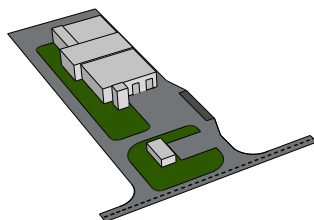
## Option B: Four decentralized facilities

**Lifecycle cost:**  
\$334 million

**Trucking:**  
13 trucks in and  
approximately  
2 trucks out per day

**End uses:**  
Agricultural soil amendment,  
non-agricultural soil amendment, landfill,  
energy from solids,  
incineration

**Conceptual Facility Layout (One of Four Facilities shown):**



### Evaluating the Alternative



- Alignment with current Regional infrastructure, with some flexibility to adapt to future change
- Potential to align with other Regional management initiatives



- Identified lower potential risks of contamination to the surrounding environment (air, water, groundwater) that can be mitigated
- Option B may have greater effects and be more impacted by climate change depending on siting
- High levels of greenhouse gas emissions



- Operational flexibility to manage risks related to disruptions in ability to process or manage biosolids



- Potential impacts to the surrounding community resulting from odour and trucking
- Noise, dust, and other nuisances can be well managed



- More sophisticated technical process, requiring greater operating skill
- Limited levels of risk with respect to adverse events



- Life cycle cost is reasonable
- Dry fertilizer product may be sold to generate revenue for the Region



# Thermal reduction to ash

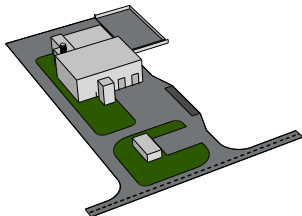
## Centralized facility

**Lifecycle cost:**  
\$279 million

**Trucking:**  
6 trucks in and 2 trucks out per day

**End uses:**  
Landfill

### Conceptual Facility Layout:



### Evaluating the Alternative



- Alignment with current Regional infrastructure, with some flexibility to adapt to future change
- Potential to align with other Regional management initiatives in the future



- Identified lower potential risks of contamination to the surrounding environment (air, water, groundwater) that can be mitigated
- High level of energy demand and greenhouse gas emissions
- End product goes directly to landfill



- Low volume of end product that is easy to manage



- Lower impacts to the surrounding community resulting from odour and trucking
- Noise, dust, and other nuisances can be well managed



- More sophisticated technical process, requiring greater operating skill
- Limited levels of risk with respect to adverse events



- Life cycle cost is reasonable
- Final ash product does not have market value and would have a cost associated with landfilling

## Overall Evaluation Summary

The following is a summary of each of the four alternatives when assessed using the Short List Evaluation Criteria that are based on the Objectives-Based Evaluation approach explained on page 10.

Objective	Produce Fertilizer		Produce Compost	Produce Dried Low Volume Fertilizer		Thermal Reduction to Ash
	Centralized	Decentralized		Centralized	Decentralized	
 <b>Align with existing infrastructure</b>						
 <b>Protect the natural environment</b>						
 <b>Protect health and safety</b>						
 <b>Minimize and manage operational risk</b>						
 <b>Protect quality of life</b>						
 <b>Be cost effective and provide value</b>						

 Not Well Aligned

 Somewhat Aligned

 Well Aligned

 Very Well Aligned

# The preferred alternative

Looking  
for more  
information?  
Refer to Tech  
Memo #9



The alternative to **Produce Dried, Low Volume Fertilizer** emerged as having the strongest alignment with the Strategy objectives.

The results of the detailed evaluation were presented to the community, and the feedback received was integrated with input from technical experts and Region staff. Based on the input obtained through the public engagement and consultation process and the results of the life cycle cost assessment, it was concluded that a centralized configuration for a new facility to produce dried, low volume fertilizer would be the preferred solution for managing biosolids in the Region in the long term. The end uses of this material would be agricultural and non-agricultural land application.

The Preferred Strategy therefore consists of this alternative as the primary component. The Region may also consider adopting other technologies to manage biosolids at the smaller wastewater treatment plants on-site in order to reduce trucking requirements to a centralized facility.

The life cycle cost of implementing this alternative is very similar to the cost of continuing with the current approach to 2051, so the Region has the flexibility to move forward with implementation at any point in the future.



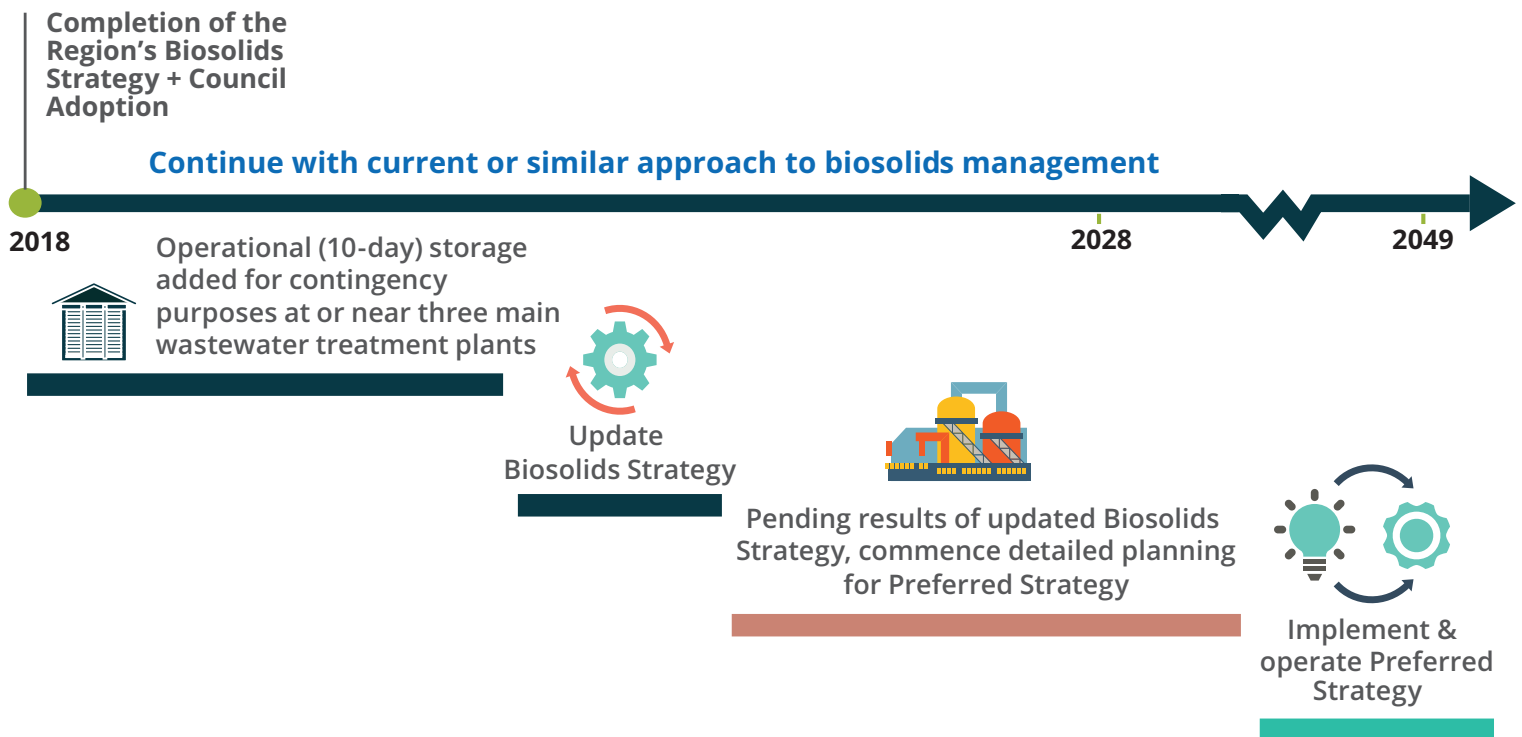
# What is the process to implement the strategy?

Looking for more information?  
Refer to Tech Memo #9

The Region's current biosolids management approach is considered a best practice and can be continued for several years. Implementation will therefore take place in two phases:

**Phase 1 (Immediate Term):** Implementation of storage at existing Regional wastewater treatment facilities, within the footprint of the existing sites. This will reduce the amount of biosolids currently going to landfill, by creating space to store biosolids during winter storm events that make trucking difficult.

**Phase 2 (Mid to Long Term):** The Biosolids Strategy to be updated again in five to ten years to confirm that the Preferred Strategy is still the best route forward. Detailed planning for the preferred strategy would then proceed through the Municipal Class Environmental Assessment process, and the community engaged in future steps including site selection for the new facility.



Phase 2 implementation timing would be dependent on a range of factors, including (but not limited to):



# Stay involved

[www.regionofwaterloo.ca/biosolids](http://www.regionofwaterloo.ca/biosolids)

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