Engineering for **people**

## Schedule ‘C’ Class Environmental Assessment Study

# Palgrave 4 Supply Well Capacity Upgrades

## Public Information Centre No. 2

Thursday, October 27, 2022
4:00 pm to 7:00 pm
Palgrave Equestrian Facility – Palgrave Community Room
200 Pine Ave, Caledon

Region of Peel
working with you

# WELCOME!

Region of Peel
working with you

## Schedule ‘C’ Class Environmental Assessment Study Palgrave 4 Supply Well Capacity Upgrades

**1**

### Please Sign in

Meeting is a “Drop-in” format.

**2**

### Review Display Materials

Our representatives will be pleased to discuss the study with you, or any questions or concerns that you may have.

**3**

### Complete a Comment Sheet

Drop off your completed Comment Sheet in the Box tonight or return to the contact people shown on the Comment Sheet by **November 11, 2022.**

# Why Are We Here?

Region of Peel
working with you

- The Region of Peel is undertaking a **Municipal Class Environmental Assessment Study** to identify infrastructure upgrades required to the existing Palgrave – Caledon East Drinking Water System.
- The objectives of **Public Information Centre No. 2** are:

Present the study recommendations: Preliminary Preferred Design Concept

Receive your feedback on the Preliminary Preferred Design Concept

Identify the next steps in the study

# Overview of Municipal Class EA Process and Consultation

Region of Peel
working with you

## Getting Started

- Review available information / data
- Identify Problem / Opportunity Statement

**NOTICE OF COMMENCEMENT**

April 2021

## Exploring Options

- Consider ways to address existing concerns
- Identify potential impacts
- Evaluate options and select the recommended **Preliminary Preferred Solution**

**VIRTUAL PUBLIC INFORMATION CENTRE #1**

February 2022

## Conceptualizing the Preferred Solution

- Develop design concepts to implement the Preferred Solution
- Identify impacts and mitigation measures
- Evaluate, select the recommended **Preliminary Preferred Design Concept**

**PUBLIC INFORMATION CENTRE #2**

October 26, 2022

WE ARE HERE

## Documenting the Process

- Prepare a report and satisfy the documentation requirements of the Class Environmental Assessment process
- Make report available for **public review**

**NOTICE OF COMPLETION**

Early Winter 2023

## Implementing Recommendations

- Complete detailed design of the recommended solution
- Initiate construction

**DETAILED DESIGN / CONSTRUCTION**

2023/2024

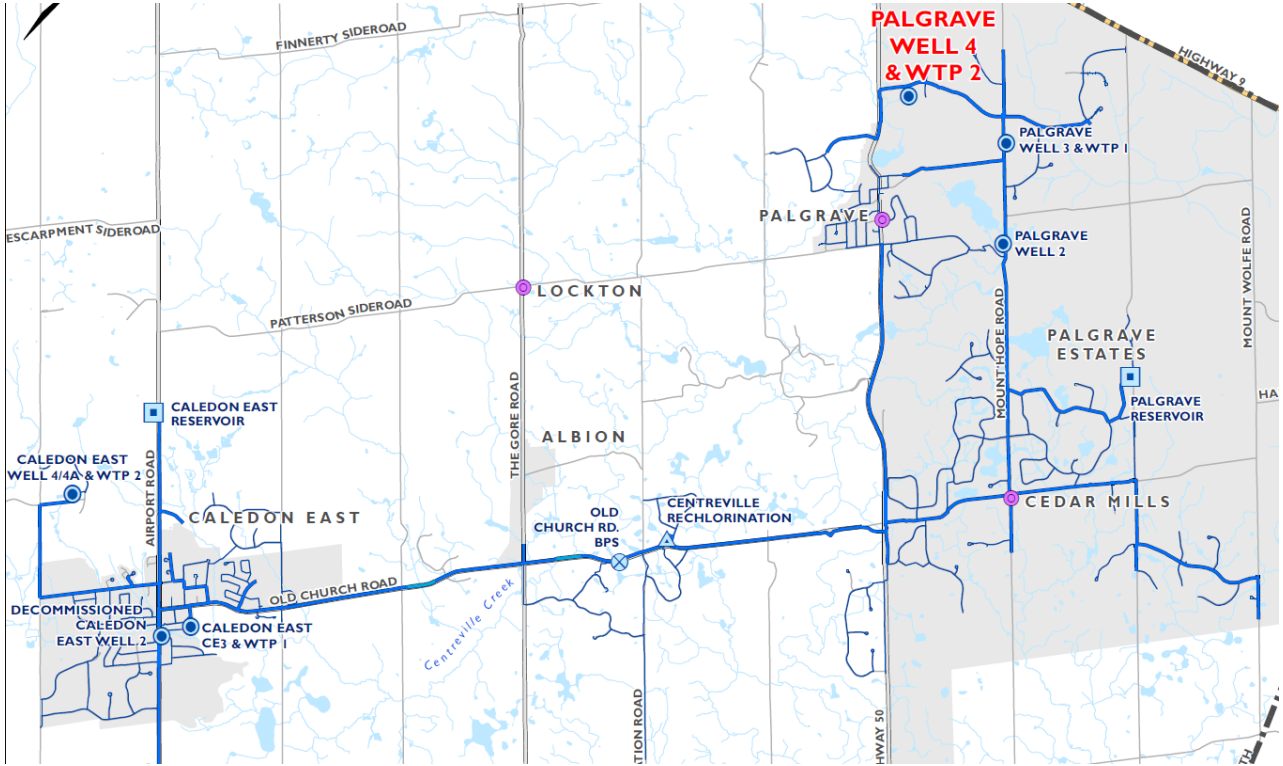
# Overview of Palgrave – Caledon East Drinking Water System

Region of Peel
working with you

**Groundwater-based system supplying drinking** water to the communities of Caledon East, Palgrave, Palgrave Estates, Mono Road, Albion, Centreville, and Cedar Mills.

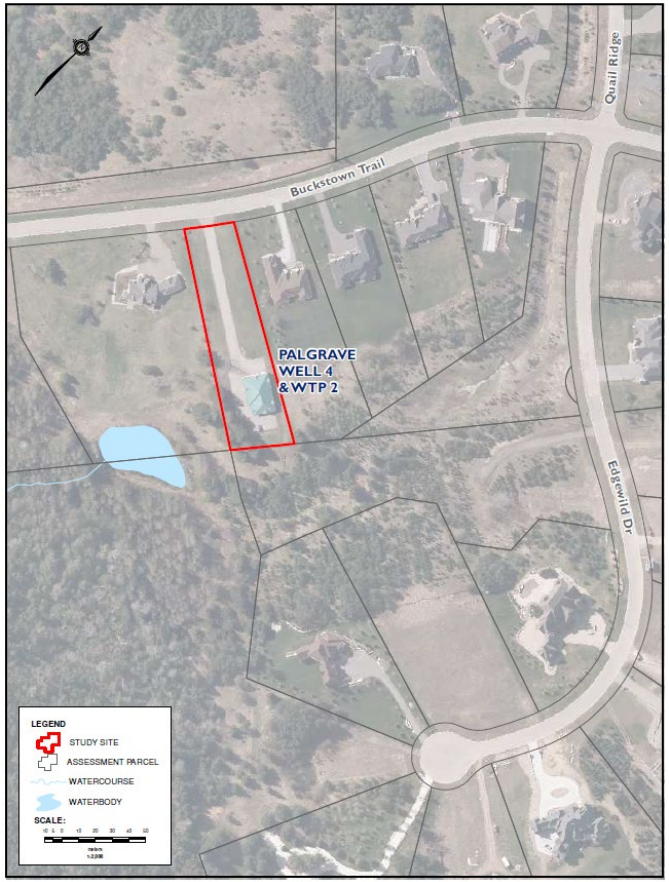
A few of the municipal wells in the system have experienced **a decline in efficiency** due to changes in aquifer pressure.

There is a need to **increase the system supply capacity** and improve the security of supply to meet the long-term needs.

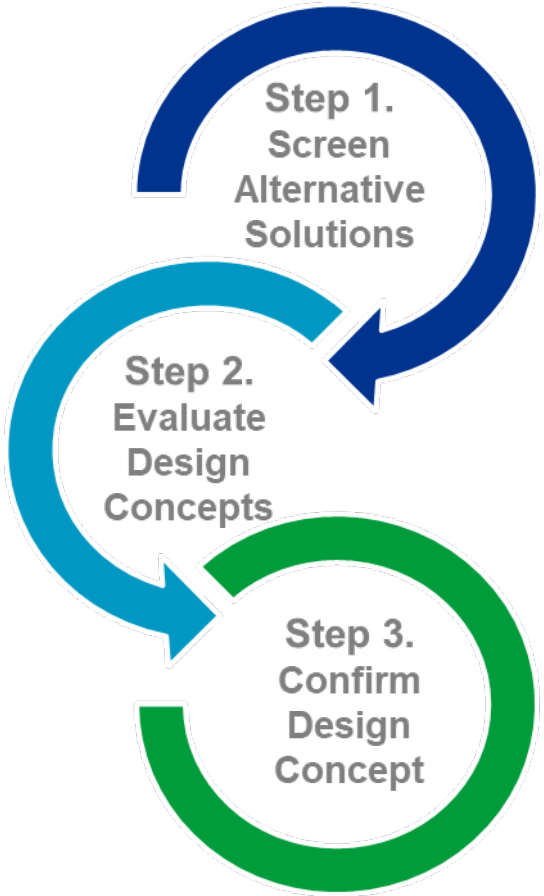


# Palgrave Well No. 4 – Existing Conditions

- Groundwater is treated at the onsite treatment building before going out to the distribution system:
  - Iron in the groundwater is removed through greensand filters
  - Filtered water is chlorinated for disinfection
  - Process wastewater/sludge is hauled away from site
- Hydrogeological testing confirmed that Palgrave Well No. 4 can increase its water capacity from 30 L/s to 60 L/s. Impacts to groundwater or surface water features in the area not anticipated.
- Infrastructure improvements are needed to accommodate the proposed water taking increase and minimize risks from declined well efficiency. The level of treatment from Palgrave Well No.4 will remain unchanged.



# Selecting the Preferred Solution – The Process




## 1. Identify and Screen Alternative Solutions

Alternatives to address the Problem/Opportunity Statement were identified and screened against "must-meet criteria":

- ✓ Potential contribution to a water supply increase
- ✓ Ability to meet treated water quality standards/objectives and guidelines
- ✓ Compatibility with existing infrastructure/processes
- ✓ Ability to balance benefits and costs relative to other options

**The alternative to Expand/Retrofit Palgrave Well No. 4 Water Treatment Plant was recommended for further evaluation. Results from Step 1 were shown at PIC 1.**

## 2. Identify and Evaluate Design Concepts

The recommended alternative to Expand/Retrofit Palgrave Well No. 4 Water Treatment Plant was further developed into Design Concepts and evaluated against multi-criteria to maximize benefit or minimize impact to:

✓ Technical / Natural Environment ✓ Community / Social ✓ Cost

## 3. Confirm Preferred Design Concept

A **Preliminary Preferred Design Concept** has been selected through a detailed evaluation process.

Results from Steps 2 and 3 are presented in the following panels.

# Developing the Preferred Alternative into Design Concepts

Region of Peel
working with you

The Preferred Alternative Solution from Preliminary Screening was to **Expand / Retrofit Palgrave Well No. 4 Water Treatment Plant.** It includes:

- Treatment capacity upgrades are needed to accommodate the well supply increase to 60 L/s.
- Modifications/replacement/retrofits to the following:
  - Iron removal process
  - Disinfection process
  - Process wastewater management system
  - Emergency power supply
- Treatment and/or process upgrades to be accommodated within existing plant footprint or through a plant expansion.

# Options to Upgrade the Treatment Processes

Region of Peel
working with you

The following technologies and upgrade options were **reviewed**:

## Alternatives for Iron Removal

- ✓ Physical and chemical filtration (currently used) – Removal by pressure filters after oxidation
- ✓ Biological filtration – Removal by filtration through media with beneficial bacteria
- ✓ Sequestration – Chemical addition to maintain iron in solution and avoid precipitation in the water

## Alternatives for Disinfection

- ✓ Chlorination (currently used) – Addition of chlorine to inactivate human pathogens present in water
- ✓ Ultraviolet (UV) Irradiation – Physical process that uses UV irradiation to prevent the cellular replication of organisms
- ✓ Ozonation – Process that destroys bacteria and other microorganisms present in water through an infusion of ozone, a gas produced by subjecting oxygen molecules to high electrical voltages

## Alternatives for Process Wastewater Management System

- ✓ Maintain Existing Process Wastewater Decanting Tank – Modify backwash and draining sequence
- ✓ Provide Additional Volume of Wastewater Decanting Tank – Increase capacity

# Results of Upgrade Options Assessment

Region of Peel
working with you

The following technologies and upgrade options were **selected for consideration**:

## Iron Removal

- ✓ Physical and chemical filtration (currently used): Replacement of existing filters with three larger units – Simple to implement and operate, low space requirements.

## Disinfection

- ✓ Chlorination (currently used): Twinning the existing chlorine contact pipe – Simple to operate, no significant added operation and maintenance requirements
- ✓ Ultraviolet (UV) Irradiation: Provision of new UV reactor in combination with chlorination through the existing chlorine contact pipe – Simple to implement, low space requirements, additional maintenance.

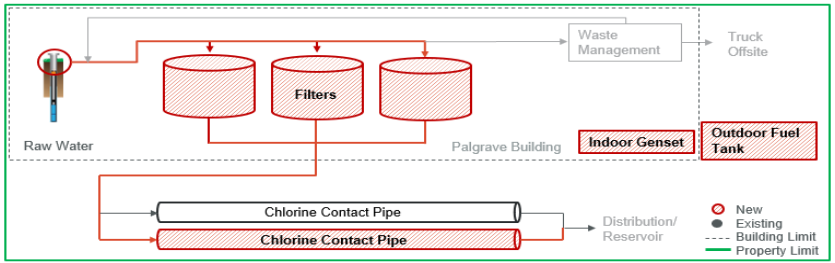
## Process Wastewater Management System

- ✓ Maintain Existing Process Wastewater Decanting Tank: Modify backwash and draining sequence, – No construction or capital expenditure.
- ✓ Provide Additional Volume of Wastewater Decanting Tank: Increase capacity – Operational flexibility and redundancy, significant upgrades/construction

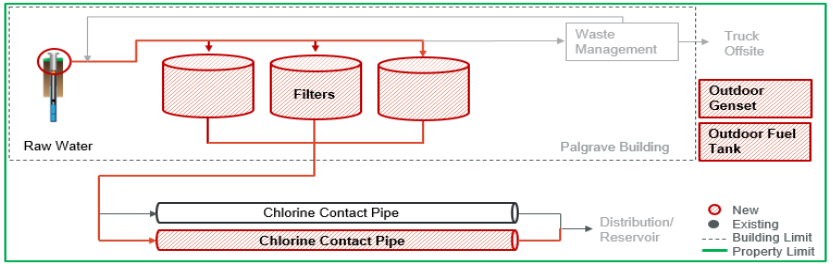
# Implementation Options – Water Treatment

Region of Peel working with you

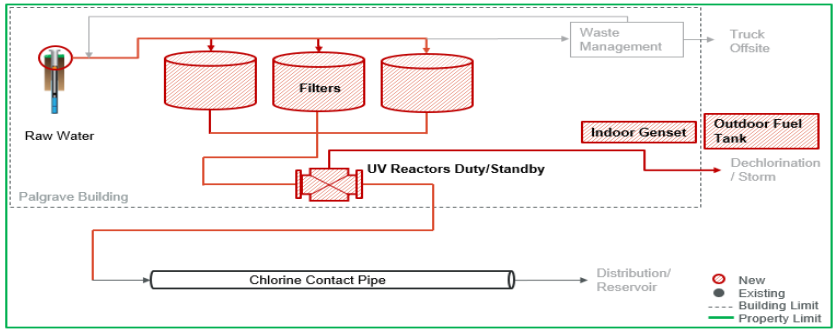
The recommended short-listed technologies / upgrade options were incorporated into the following four (4) treatment trains:



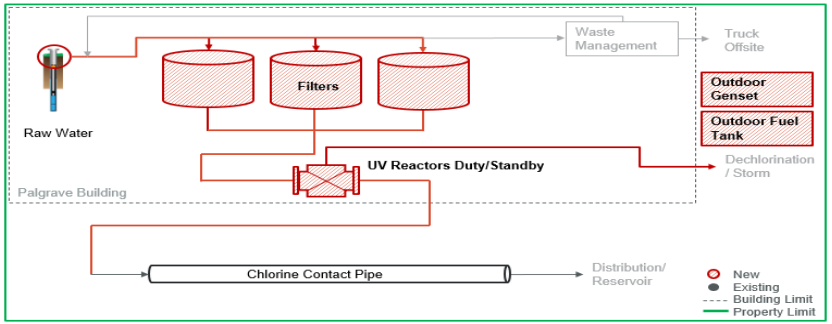

**Option 1A:** Three Larger Filters + Chlorination (alone) + Indoor Genset




**Option 2A:** Three Larger Filters + Chlorination (alone) + Outdoor Genset




**Option 1B:** Three Larger Filters + UV/Chlorination + Indoor Genset

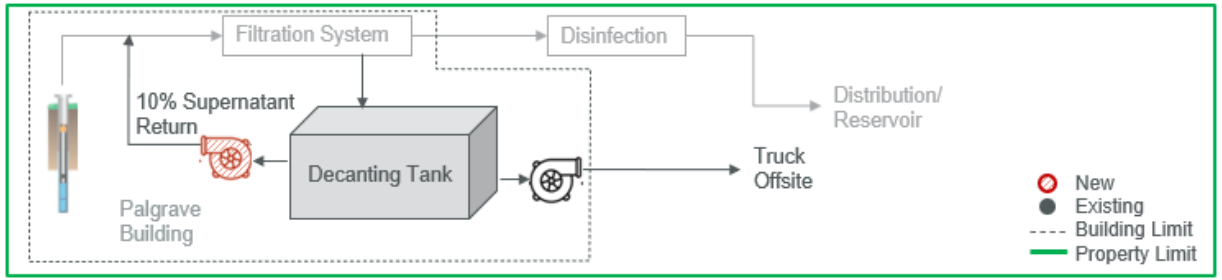



**Option 2B:** Three Larger Filters + UV/Chlorination + Outdoor Genset

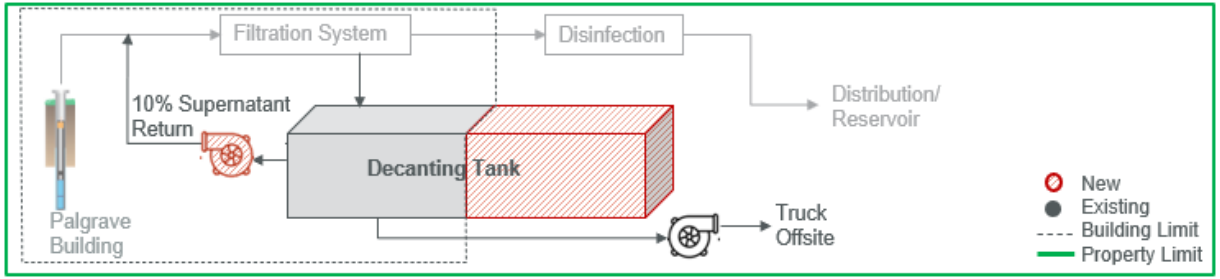
# Implementation Options – Residuals Treatment

Region of Peel working with you

The recommended short-listed upgrade options were incorporated into the following two residual treatment options:




**Option RM1:** Maintain Existing Process Wastewater Decanting Tank

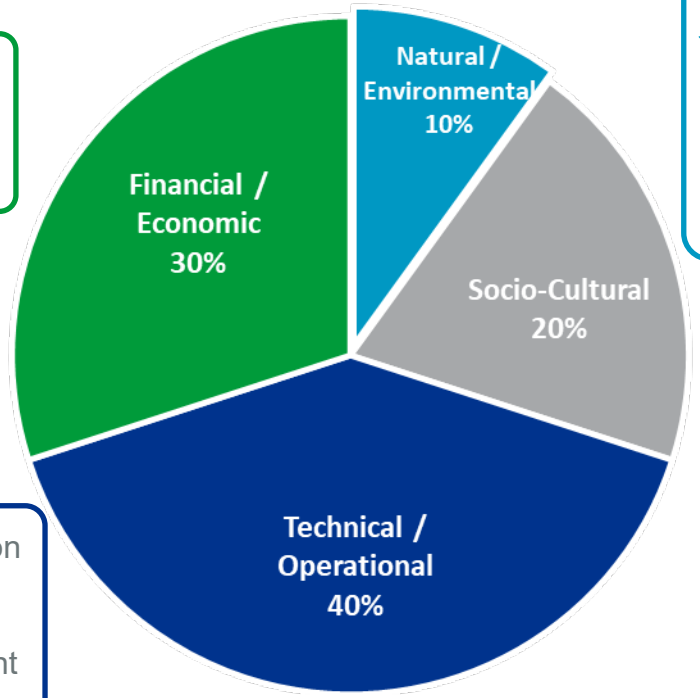



**Option RM2:** Provide Additional Volume of Wastewater Decanting Tank

# Evaluating Alternative Design Concepts

The criteria and weighting factors shown below were used to evaluate the design concepts.

- Life cycle costs, including capital and operation and maintenance costs




- Terrestrial, aquatic species and habitats
- Regulated and protected areas
- Water resources and source water protection areas (surface and groundwater).
- Energy requirements

- Ease of construction and integration with existing system
- Length of construction, phasing
- Ability to maximize existing footprint
- Operational complexity / flexibility

- Short-term disruption during construction
- Long-term disruption during operation (e.g., visual, noise, dust, traffic, air quality)

# Scoring Approach and Preferability

Region of Peel
working with you

Alternative design concepts were assessed relative to each other, and assigned a score based on potential net impact and available mitigation measures. Scores are based on the following scoring approach:

|  |  |  |  |  |
|---|---|---|---|---|
| Potential impacts are significant, implementation of substantial mitigation measures are required. Risk cannot be completely eliminated. | Potential impacts are major, implementation of extensive mitigation measures required to reduce/eliminate risks. | Potential impacts are moderate, implementation of many mitigation measures required to reduce/eliminate risks. | Potential impacts are minor and can be easily mitigated through implementation of standard mitigation measures. | Potential impacts are negligible, no mitigation required. |

Least Preferred → Most Preferred

# Water Treatment Design Concepts – Results

Region of Peel working with you

Results from the comparative evaluation of treatment design concepts:

| Criteria | Sub-criteria | Option 1A: 3 Larger Filters + Chlorination (only) + Indoor Genset | Option 1B: 3 Larger Filters + UV and Chlorination + Indoor Genset | Option 2A: 3 Larger Filters + Chlorination (only) + Outdoor Genset | Option 2B: 3 Larger Filters + UV and Chlorination + Outdoor Genset |
|---|---|---|---|---|---|
| **Natural Environmental (10%)** | • Terrestrial, aquatic species & habitats<br>• Regulated and protected areas<br>• Water resources and source water protection areas (surface and groundwater).<br>• Energy requirements | ● | ◕ | ◕ | ◕ |
| **Socio-Cultural (20%)** | • Short-term disruption during construction<br>• Long-term disruption during operation (e.g., visual, noise, dust, traffic, air quality) | ● | ● | ◕ | ◕ |
| **Technical / Operational (40%)** | • Ease of construction and integration with existing system<br>• Length of construction, phasing<br>• Ability to maximize existing footprint<br>• Operational complexity / flexibility | ◕ | ◕ | ◕ | ◕ |
| **Financial / Economic (30%)** | • Life cycle costs, including capital and operation and maintenance costs | ● | ◕ | ● | ◕ |
| **Overall Recommendation** | | **Preferred** | **Less Preferred** | **Less Preferred** | **Least Preferred** |

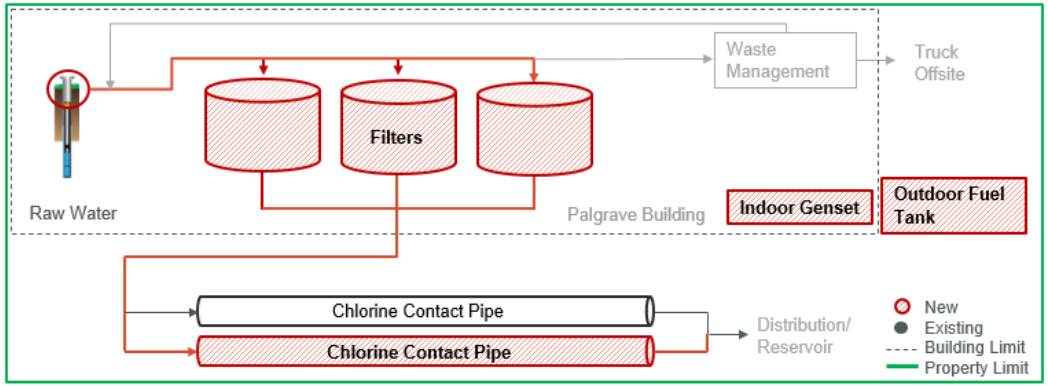
# Preferred Water Treatment Design Concept

The preferred water treatment design concept to **Expand / Retrofit Palgrave Well No. 4 Water Treatment Plant is through:**

- Option 1A: Three (3) Larger Filters + Chlorination (alone) + Indoor Genset

**Key Advantages:**

- ✓ Compatibility with existing processes, reducing overall complexity
- ✓ Minimal long-term nuisance impacts on adjacent neighbours as new standby generator will be located indoors



# Residuals Treatment Design Concepts – Results

Region of Peel working with you

Results from the comparative evaluation of residuals treatment design concepts:

| Criteria | Sub-criteria | Option RM1: Maintain Existing Process Wastewater Decanting Tank | Option RM2: Provide Additional Volume of Wastewater Decanting Tank |
|---|---|---|---|
| **Natural Environmental (10%)** | • Terrestrial, aquatic species & habitats<br>• Regulated and protected areas<br>• Water resources and source water protection areas (surface and groundwater).<br>• Energy requirements |  |  |
| **Socio-Cultural (20%)** | • Short-term disruption during construction<br>• Long-term disruption during operation (e.g., visual, noise, dust, traffic, air quality) |  |  |
| **Technical / Operational (40%)** | • Ease of construction and integration with existing system<br>• Length of construction, phasing<br>• Ability to maximize existing footprint<br>• Operational complexity / flexibility |  |  |
| **Financial / Economic (30%)** | • Life cycle costs, including capital and operation and maintenance costs |  |  |
| **Overall Recommendation** | | **Preferred** | **Least Preferred** |

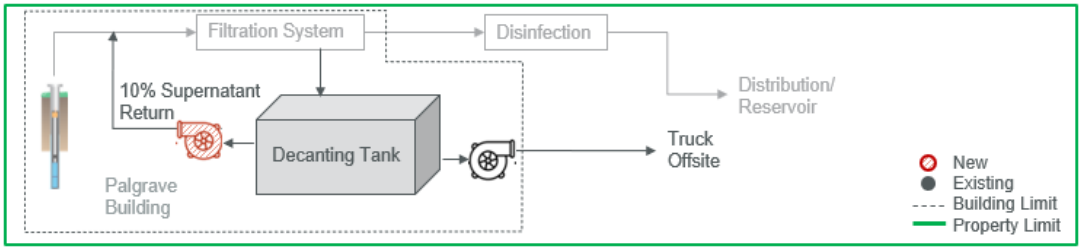
# Preferred Residuals Treatment Design Concept

The preferred design concept for residuals treatment associated with **Expand / Retrofit Palgrave Well No. 4 Water Treatment Plant is through:**

- Option RM1: Maintain Existing Process Wastewater Decanting Tank

**Key Advantages:**

- ✓ Minimal construction, no excavation required
- ✓ Maximizes existing infrastructure
- ✓ Easily implemented through operational modifications



# Anticipated Impacts and Mitigation Measures

Region of Peel
working with you

## Potential Impacts

Community / Social Impact – Short Term Construction Impacts from Noise, Dust, Traffic

Natural Environment – Short- and Long-Term Impacts to Water, Air, Soil, Natural Heritage Features

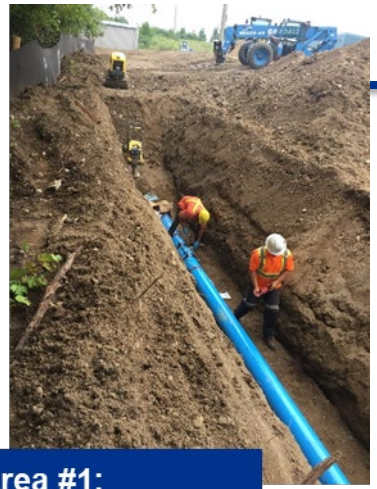
## Mitigation Measures

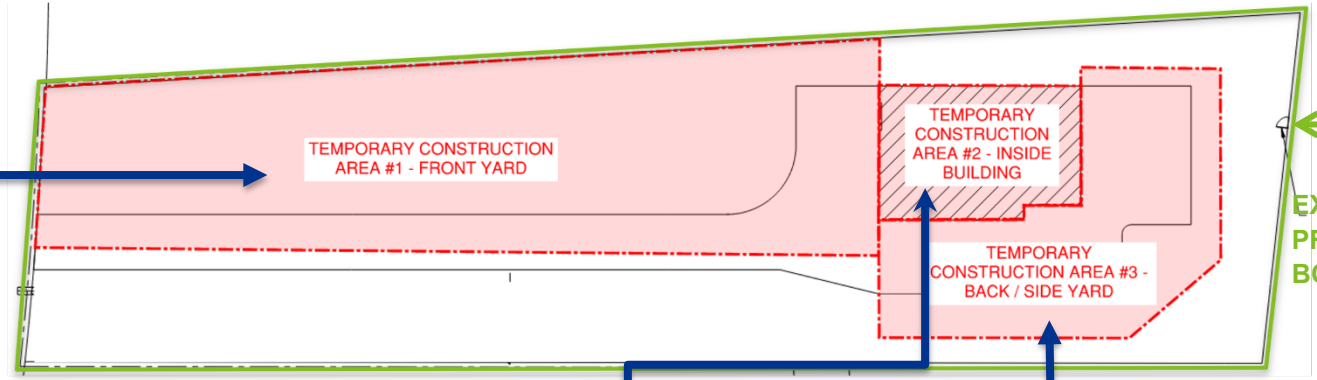
- Health and safety is a priority to the Region. All construction will adhere to strict safety guidelines.
- The project will not affect the quantity or quality of groundwater or surface water features in the area. Residents on the municipal system will continue to receive water that meets all drinking water standards.
- Standard best practices for vehicle and pedestrian safety will be used during construction.
- Temporary measures will be undertaken during construction to minimize noise, dust, mud and visual impacts.

# Proposed Temporary Construction Areas

Region of Peel
working with you

Construction duration of approximately 12 months is anticipated.






**Area #1:** Excavation for chlorine contact pipe

**Area #2:** Replace filters and piping inside existing building

**Area #3:** Shallow excavation and concrete pad for fuel containment enclosure

# Environmental Assessment – What's Next?

Region of Peel
working with you

- Comments will be considered in finalizing the preferred design concepts for the required Expansion/Retrofit of the Palgrave Well No. 4 Water Treatment Plant through:
  - **Option 1A –** Three (3) Larger Filters + Chlorination Only + Indoor Genset for water treatment, and,
  - **Option RM1 –** Maintain Existing Process Wastewater Decanting Tank for process wastewater management.
- A Project File Report presenting the Class EA study will be prepared and made available for a **30-day public review period**, where you will have a final chance to comment on the recommendations.
- Proposed Source Water Protection Amendments:
  - Local source protection authorities will conduct a **35-day public consultation** planned in mid-2023 on the proposed amendments to the Palgrave Wellhead Protection Areas (draft presented at PIC 1).
  - Affected landowners will have an opportunity to provide written comments as part of the Source Water Protection Amendment process.

## Project Information

- For more information about this project, please visit our webpage:

  Link to PIC Material

- Should you have any questions or comments at any time during the project, please contact:


Erin Ihnat
erin.ihnat@peelregion.ca
Peel Region
Project Manager

Sandra Rodriguez
sandra.rodriguez@cima.ca
CIMA+
Project Manager


# Thank You for Attending!