



# Arthur WWTP Upgrades

October 23, 2017

- + **Project Overview**
- + **Status Update**
- + **Key Components of Upgrade**
  - + Arthur WWTP
  - + Frederick St. SPS
  - + Effluent Conveyance
- + **Energy Saving Opportunities**
- + **Schedule and Cost Estimates**

Project Overview  
EA Proposed Upgrades


# Project Overview EA Proposed Upgrades



# Class EA Recommendations

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## + Existing Plant

- + Extended Aeration with tertiary treatment
- + 1,465 m<sup>3</sup>/d, operating at 92% of its rated capacity
- + Class EA Completed for Phased Expansion in 2016 

## + Phased expansion to Arthur WWTP

- + Phase 1 – 1,860 m<sup>3</sup>/d
- + Phase 2 – 2,300 m<sup>3</sup>/d

## + Expand Frederick Street SPS

- + 9,500 m<sup>3</sup>/d peak

## + Upgrade forcemain conveyance to lagoon in two key sections.

## + Provide SCADA Automation and Control



- + **Condition assessment completed in August 2017**
  - + Most of the equipment is original and commissioned in 1990.
  - + Plant is in good condition considering age of equipment.
  - + Minor structure repair is required.
  - + Aging and seized valves to be replaced.
  - + Electrical equipment is in good condition. Transition essential loads to new electrical equipment to minimize long-term risk

- + **Biosolid Management options reviewed:**

- + **Third Party off-site disposal (current practice):** Low capital cost and minimal operation
- + **Anaerobic Digestion:** Too capital intense for Arthur WWTP, little payback
- + **Aerobic Digestion and Dewatering:** High capital costs, complex operation

- **Current practice is recommended for WWTP upgrades:**

- Minimal capital costs
- Lowest life cycle cost
- No change in biosolids management approach or complexity
- Flexibility to implement other options in future if regulations changes

Key Components of Expansion Project

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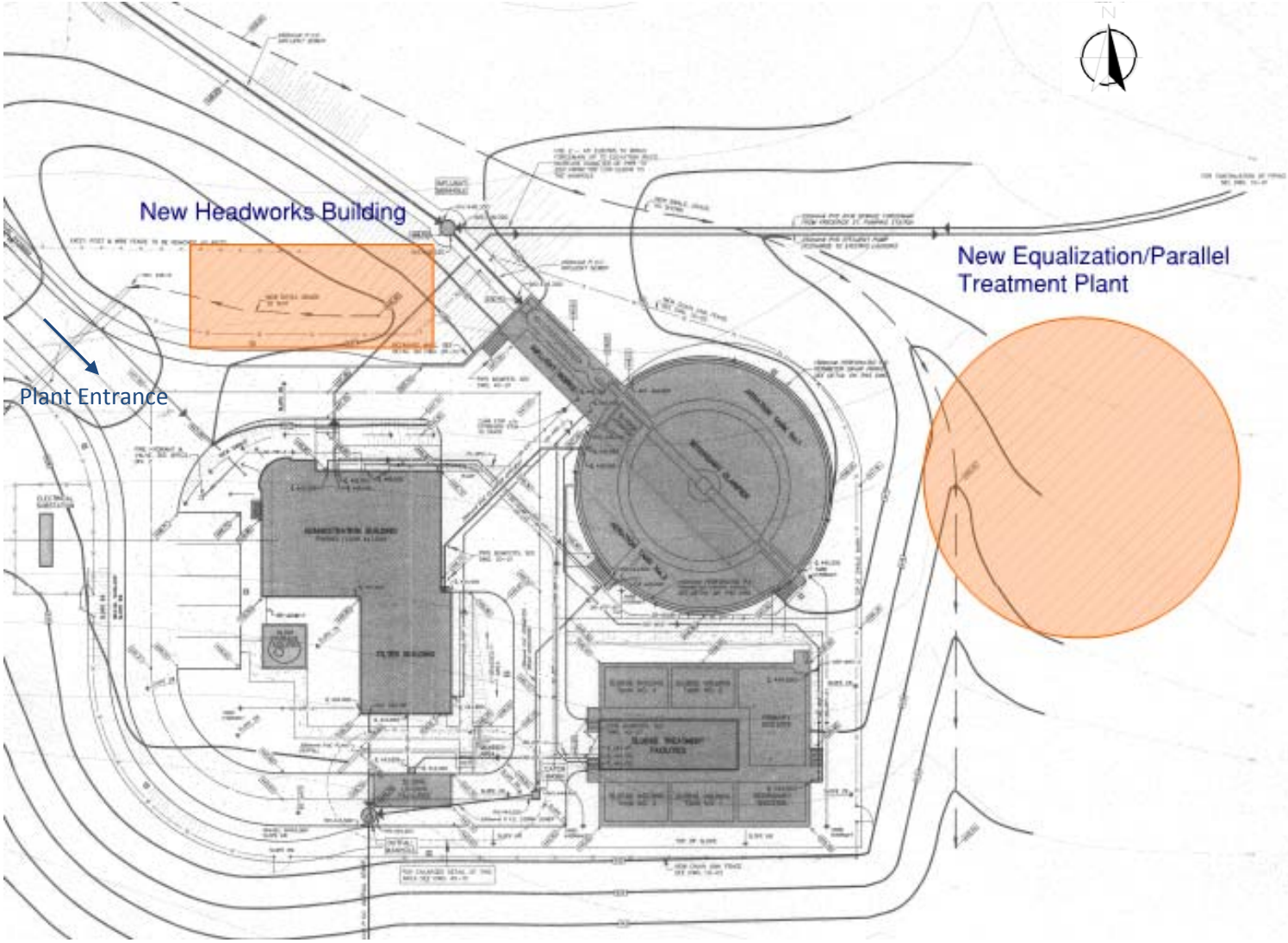


# Arthur WWTP Major Upgrades

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- + **New equalization tank (Phase 1); modified to parallel treatment plant (Phase 2)**
  - + The new tankage is recommended to be slightly larger than the existing secondary treatment plant
  - Simplifies MOECC approvals and minimizes risk
  - Phase 1 will operate as equalization
  - Phase 2 will be modified to parallel plant
- + **New Aeration Blowers (Phase 1)**
- + **New Automation and Controls (Phase 1)**
- + **New Headworks Building (Phase 2)**
- + **New Effluent Pumps (Phase 2)**

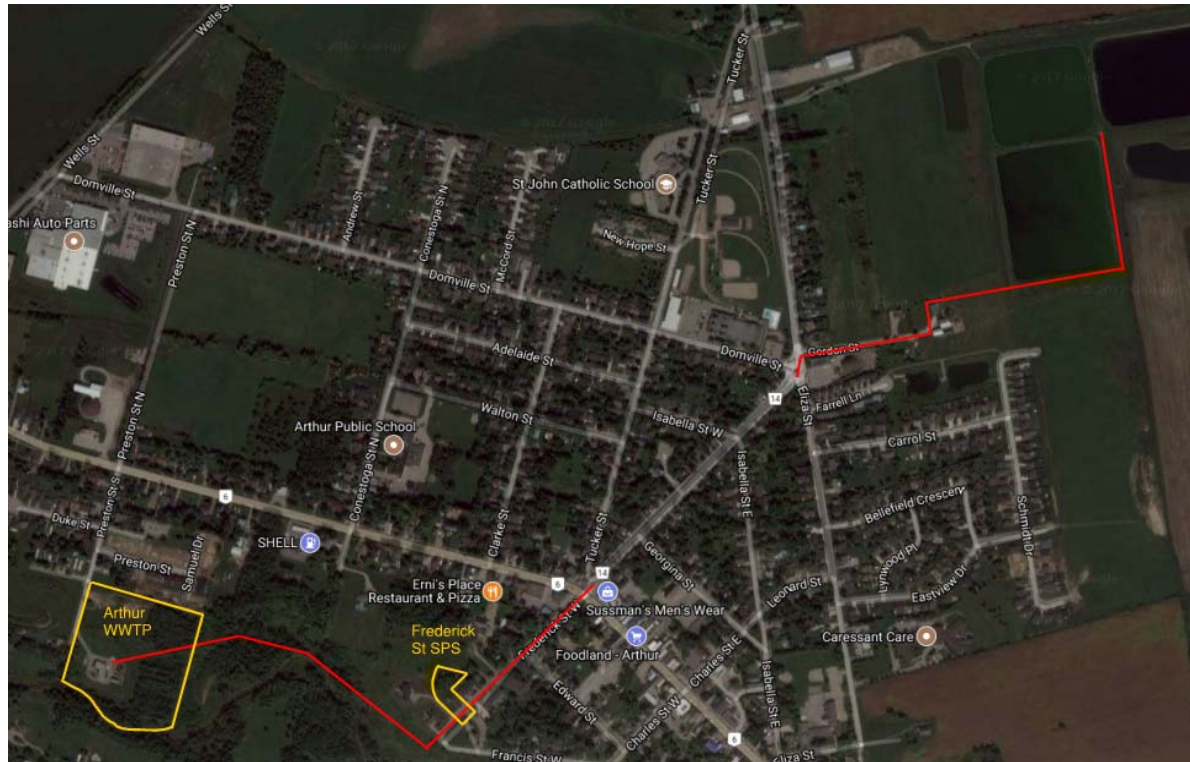
# Arthur WWTP Proposed Site Plan





# Effluent Conveyance Upgrades (Phase 2)

- + **Two sections of effluent forcemain to Lagoons require upgrade**
- + 860m of 200mm replaced with 350mm pipe
- + 1,100m of 250mm replaced with 350mm pipe



Energy Saving Opportunities

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- + **Two largest energy consumption at Arthur WWTP:**
  - + 1+1 Aeration Blowers (60 hp each)
  - + 1+1 Lagoon Transfer Pumps (60 hp each)
- **New smaller blowers with full automation are proposed**
  - 2+1, 25 hp each
  - Approximately 50% saving in energy from existing

Blowers	Flow (m <sup>3</sup> /h)	Power Usage (kW)	Kwh per year	Estimated cost per year	Estimated Annual Savings
Existing blower	1785	42	365,811	\$45,251	\$0.00
New blowers	750	17	145,612	\$18,012	<b>\$27,239</b>

# Energy Saving Opportunities

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- + **Effluent pump control and automation changes**
  - + Minimize flows pumped to the Lagoon
  - + Minimal savings for the current flows
  - + Savings are realized for the future growth
    - Minimize peak flow transfer to the lagoons during the discharge months
    - Monthly discharge will be monitored on-line to meet the compliance and minimize pumping to lagoons

## + **Schedule**

- Draft Preliminary Design complete
- Topographic Survey complete
- Geotechnical Investigation Scheduled for November
- Detail design on schedule
  - Tender Spring 2018

## + **Capital Cost Estimate**

- + Phase 1 \$6,762,000
- + Phase 2 \$8,658,000
- + Costs are consistent with Class EA estimates



# Arthur WWTP Upgrades

Discussions