

CLRUSC Wastewater Treatment Facility- MBBR Pilot Study Update

February 24, 2020



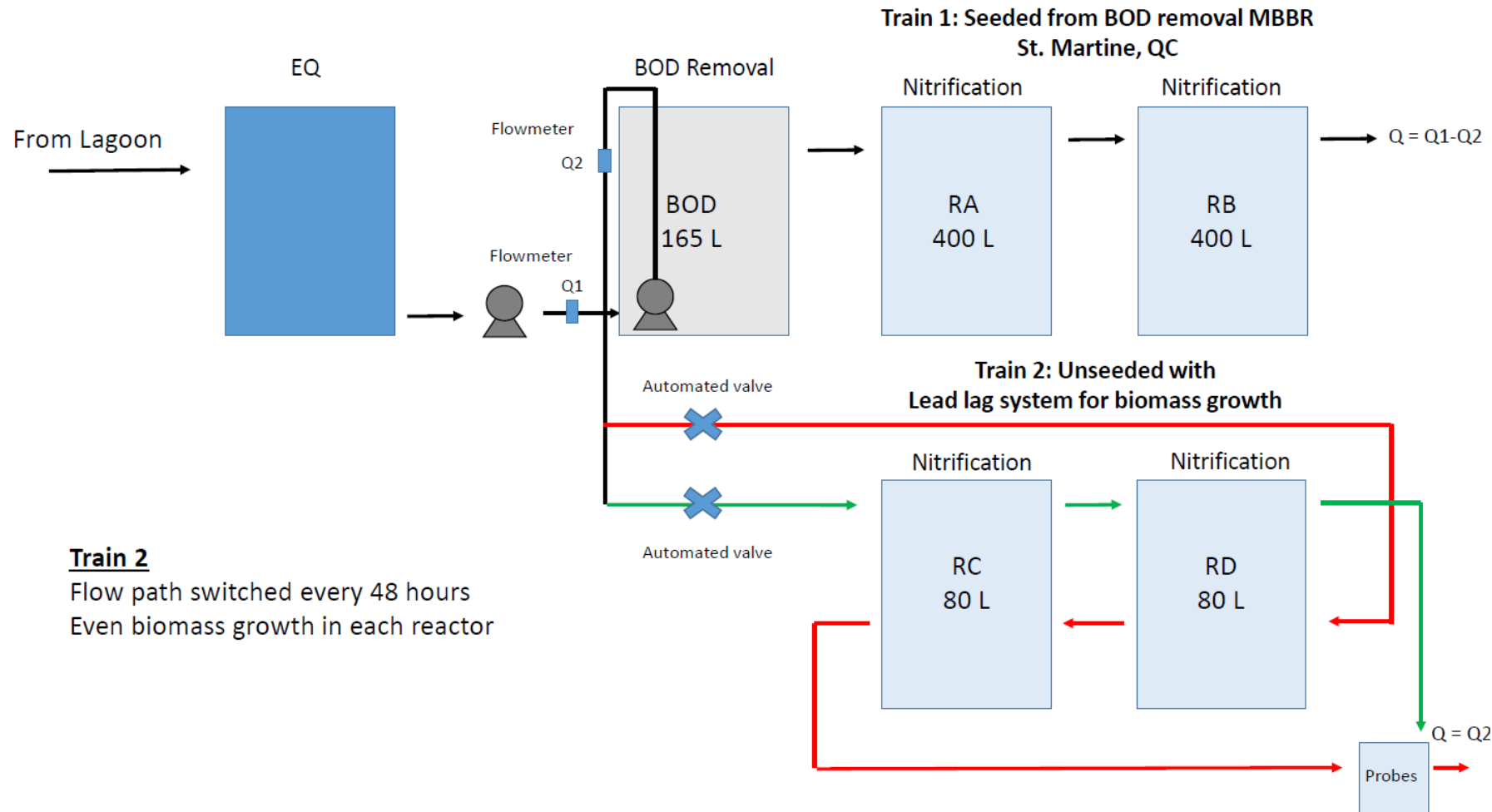


- The pilot plant became operational on November 1, 2019.



➤ Location of the Pilot trailer

Process Flow Diagram





Project Photos-

MBBR inflow and outflow

11 01 2019



Project Photos- Equalisation Tank



Project Photos-

Train 1,
Reactors A and B,
Pre seeded.

Reactor A- BOD removal
+ Nitrification

Reactor B- Nitrification



Project Photo-

Train 2,
Reactors C and D,

Non seeded media



Project Photo- Measurement Probes



11 01 2019

Project Photo:
Control Unit



Unseeded media (left),



Seeded media (right)

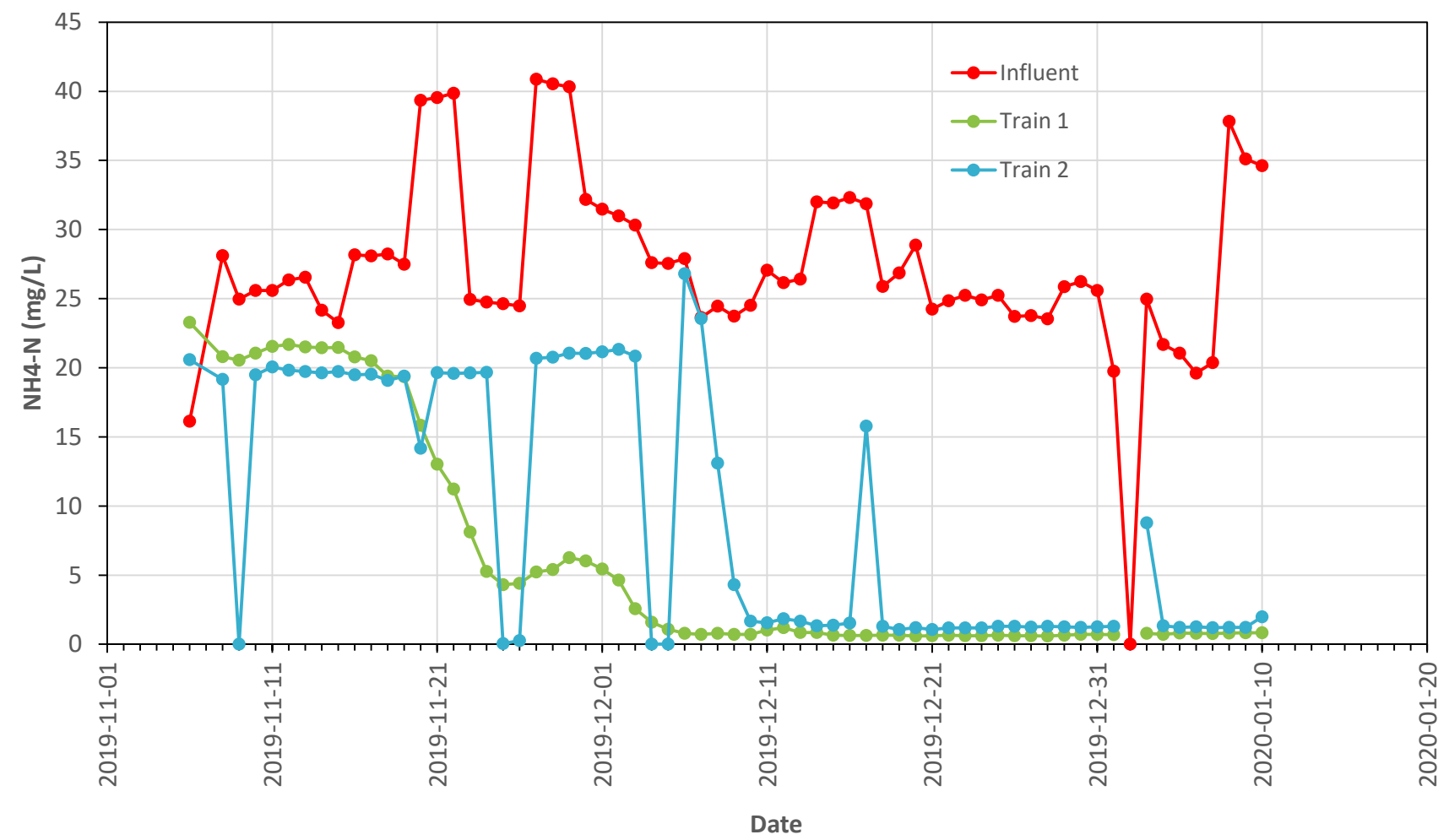
The process consists of two trains running in parallel:

- The first train was commissioned using pre-seeded media, and
- The second train was commissioned using unseeded media
- Both trains together are treating approximately 3.5 m³/d

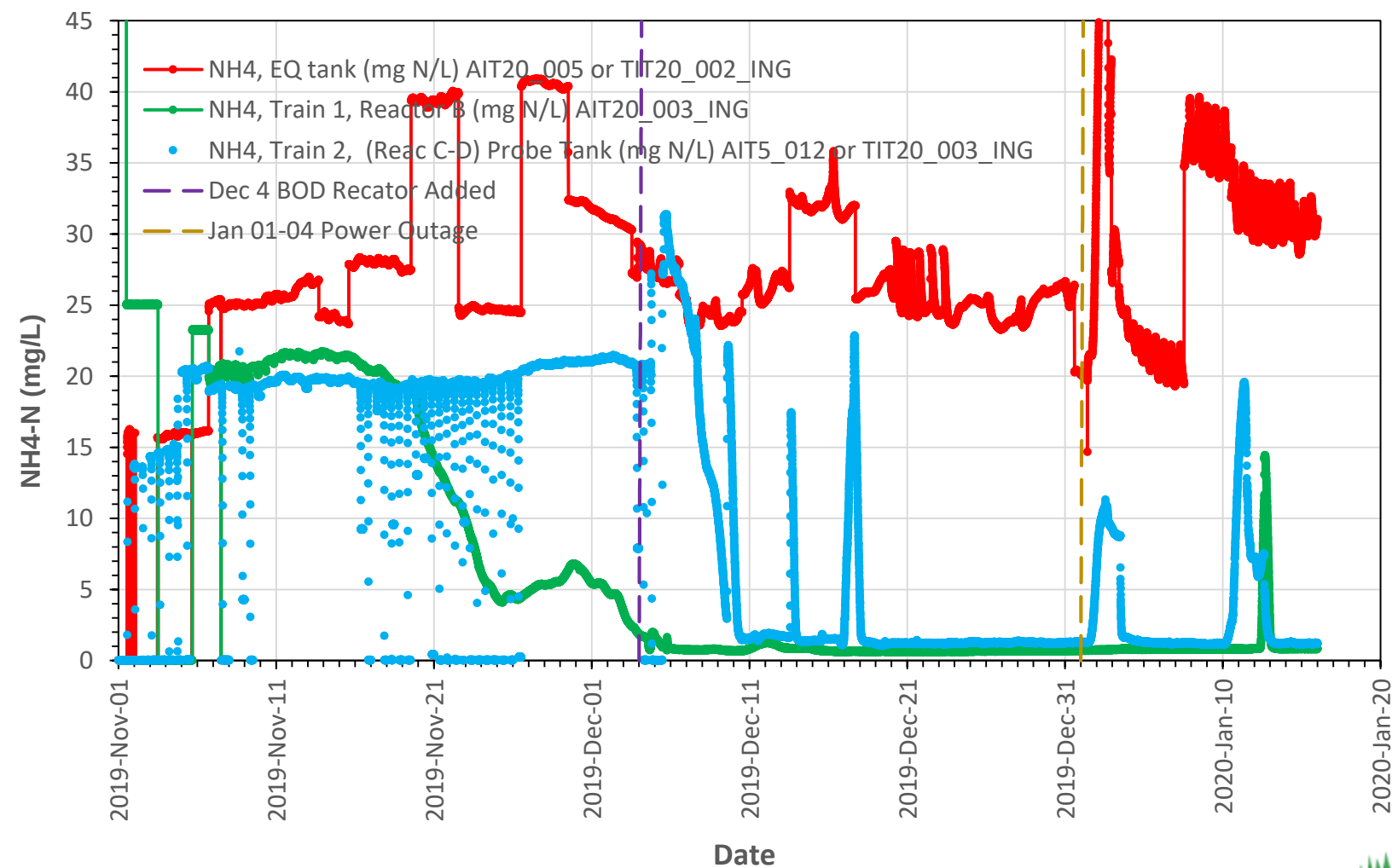
Laboratory Analyses and Frequency

Parameters	Units	Influent	RA	RB	RC	RD
Total Ammonia	mg N/L	2x/week	2x/week	2x/week	2x/week	2x/week
Nitrites	mg N/L	1x/week	2x/week	2x/week	2x/week	2x/week
Nitrates	mg N/L	1x/week	2x/week	2x/week	2x/week	2x/week
pH, temperature		2x/week	2x/week	2x/week	2x/week	2x/week
DO	mg/L	---	Online	---	Online	Online
Soluble COD	mg/L	2x/week	2x/week	---		
TSS*	mg/L	1x/week	---	1x/week	1x/week	1x/week
Total phosphorus	mg P/L	1x/week	---	1x/week	1x/week	1x/week
Orthophosphate	mg P/L	1x/week	---	1x/week	1x/week	1x/week
Alkalinity (CaCO ₃)	mg/L	1x/week	1x/week	1x/week	1x/week	1x/week

Performance Review- Ammonium Removal (Lab Data)



Performance Review- Ammonium Removal (Online Data)



Performance Comparison

- The main purpose of integrating a MBBR system into the existing lagoon facility is to remove ammonium from wastewater to meet the effluent limits by Alberta Environment and Parks (AEP) and Environment Canada (EC)
- The proposed effluent limits for ammonium concentration based on AEP and EC feedback is compared with the current pilot plant performance in the table below:

Parameters	Proposed Limit	Pilot Plant Performance
Ammonia-Nitrogen (July 1 to September 30)	≤ 5.0 mg/L monthly arithmetic mean	No Data Available
Ammonia-Nitrogen (October 1 to June 30)	≤ 10 mg/L monthly arithmetic mean	1.1 mg/L (Based on Dec 2019 data) 1.3 mg/L (Based on Jan 2020 data)

Next Steps – Piloting Phase

- The Veolia pilot plant is expected to be onsite and in operation through the winter months until the end of May 2020.
- The results of the pilot study will be summarized in a draft report that AECOM expect to submit to the CLRUSC by the end of June 2020. The report will include:
 - Commentary on the results of the study;
 - Recommendations for the full-scale system to be designed and constructed;
 - A conceptual site plan identifying the location of the proposed new equipment;
 - Updated cost estimates;
 - Commentary on equipment procurement options; and
 - Updated project completion schedules.

Next Steps – Project Funding

- WWTF existing license is due to expire by January 1, 2022, Alberta Environment and Parks expects the upgraded facility be operational by January 2022.
- It may be difficult to achieve this schedule if there is a delay between the completion of the pilot study and start of detailed design.
- It is understood that the design and construction phases of the proposed WWTP may be contingent on the availability of federal and provincial funding.
- Therefore, it would be prudent to apply for contributing funds from the Federation of Canadian Municipalities (FCM), the Water for Life Program, and any other grants that may be available for this project.