



November 29, 2021

Manitoba Conservation and Climate
Environmental Stewardship Division
Environmental Approvals Branch
1007 Century Street
Winnipeg, MB R3H 0W4

Client File No.: 1069.10
Our File Nos.: S-926, EMS
020-17-08-11-00
020-17-08-11-0N

Attention: Laura Pyles, Acting Director

**RE: NOTICE OF ALTERATION – CITY OF WINNIPEG SOUTH END WATER POLLUTION
CONTROL CENTRE (SEWPCC) – ENVIRONMENT ACT LICENCE
NO. 2716RR**

On March 15, 2021 Manitoba Conservation and Climate (MCC) responded to the City of Winnipeg's (City) Notice of Alteration (NOA) submitted on December 18, 2020 whereby the City requested a one-year extension to December 31, 2021 to meet the total phosphorus limit of 1.0 mg/l and to report back by September 30, 2021 with an updated construction completion date.

MCC requested the City provide a revised NOA by September 30, 2021.

On September 8, 2021 a virtual meeting was held between MCC and the City to discuss the progress and status of the South End Water Pollution Control Centre (SEWPCC) upgrades. At this meeting the City shared several significant schedule milestones for October and November that impact the critical path and, because of this, the City requested an extension for the NOA submission to November 30, 2021; this was approved by the Province on September 29, 2021.

A subsequent virtual meeting was held on November 10, 2021 between MCC and the City to discuss the continued construction and commissioning issues at SEWPCC and to advise MCC that the critical milestones to start Biological Nutrient Removal (BNR) demonstration testing were not met and SEWPCC would not achieve licence compliance by December 31, 2021.

The revised start of BNR demonstration testing is now scheduled for January 10, 2022. This date has been deferred due to the number of automation and control deficiencies identified following Integrated Wet Testing (IWT). These items are prerequisites to the start of demonstration testing and require resolution. Other factors that have contributed to delays also include:

- Schedule slippage due to contractor quality control and productivity. This has delayed testing of areas that are prerequisite to the start of the biological nutrient removal (BNR) system
- IWT conducted as a quality check identified significant issues, including automation and controls which affects the operation of the BNR, preventing the start of demonstration testing and seeding activities

- Delay in delivery of media material required for the commissioning of the BNR system. Media material is being supplied from Korea. COVID has had an impact on the global shipping industry due to shortage of containers and vessel capacity. The City has mitigated this risk by confirming with the design engineer that we have sufficient media to commission the facility. The City still awaits delivery of 60% of the materials to optimize the plant for all flow conditions

Ferric dosing to reduce phosphorous levels is expected to start approximately 1 week following the start of demonstration testing. Based on this schedule, it is expected that phosphorous concentrations will be reduced incrementally as BNR tanks are sequentially seeded and will be below the 1.0 mg/l licence requirement by the end of March 2022.

SEWPCC COMMISSIONING SEQUENCE

The following identifies the steps required for commissioning, associated operational risks and current status. Table 1 summarizes the key milestone dates through the commissioning activities to stable operation and licence compliance.

Area C:

Chemical Building

- Demonstration testing of the HVAC system prior to the delivery of ferric chloride to meet health and safety requirements
- Remediate final prerequisites for demonstration testing of the ferric dosing system

Electrical Building

- Complete power sequence testing for emergency generation

Area R: BNR

- Remediate final prerequisites for demonstration testing of the HVAC system for the building
- Remediate final deficiencies identified during IWT
- IFAS media to be installed in the three tanks starting November 2021. Currently, approximately 40% of the total media is on site. An additional 20% was expected prior to the start of seeding in January, however disruptions to the supply chain are impacting rail transportation to Manitoba. Modelling has indicated that the system can perform with 30% of the media
- Demonstration testing and seeding of BNR Tank 1 will start January 10, 2022; Tanks 2 and 3 will be tested sequentially following stable operation of the prior tank
 - “Seeding” begins with the transportation of waste activated sludge (WAS) from the West End Water Pollution Control Centre (WEWPCC); the WAS helps start the bacterial growth which is required for the biological nutrient removal process
 - Stable operation is expected to take three to four weeks per tank

- Once Tank 1 is stable and bacteria has been established, Tank 2, and subsequently Tank 3, will be tested. From experience, Tanks 2 and 3 will reach stable operation in a shorter period of time because the bacteria in Tank 1 will help populate the other tanks
- As each tank comes online, chemical dosing with ferric will be used to reduce phosphorous concentrations incrementally.

Table 1: SEWPCC Commissioning Sequence

Task	Expected Start	Expected Completion
Area C: Chemical HVAC Demo	Nov 15, 2021	Nov 26, 2021
Area C: Chemical Ferric delivery pre-requisites	Nov 15, 2021	Dec 17, 2021
Area C: Electrical	Nov 15, 2021	Dec 17, 2021
Area R: HVAC Demo Testing	Nov 15, 2021	Dec 10, 2021
Area R: Demonstration prerequisites	Nov 15, 2021	Dec 17, 2021
Area R: Media in all 3 BNR Tanks	Nov 22, 2021	Dec 17, 2021
Area R: Tank 1 Seeding and Stable Operations	Jan 10, 2022	Feb 11, 2022
Area R: Tank 2 Seeding and Stable Operations	Feb 11, 2022	March 11, 2022
Area R: Tank 3 Seeding and Stable Operations	March 11, 2022	March 29, 2022
Phosphorous Removal with Chemical Trimming		March 29, 2022
Nitrogen Removal		June 30, 2022
Compliance with Nutrient Limits for all Flow Conditions		July 31, 2022
Licence Compliance with Biological Nutrient Removal		January 31, 2023

Based on modelling, as each BNR Tank is brought online the effluent quality will incrementally improve towards licence compliance. With Tank 1 operating, approximately 43% of the primary effluent will go through the BNR; this increases to 85% and 100% with Tanks 2 and 3, respectively. The individual process and combined effluent parameters are indicated in Table 2 for the various stages of BNR commissioning.

Risks to BNR Commissioning

The following are some key risks related to licence compliance:

- Continued quality and schedule impacts by the contractor with respect to the remediation of deficiencies to move to demonstration testing and seeding. The project team continues to work with the contractor to resolve scheduling and work plan deficiencies
- Supply chain issues still present a challenge and increase the risk of receiving the remaining materials
- As effluent temperature decreases, bacterial growth is slowed. Cold weather seeding may limit nitrification in the BNR tanks resulting in delayed compliance for total nitrogen and ammonia levels until warmer weather. Effluent temperatures typically increase approximately mid-May, enabling improved bacterial growth; nitrification should be

achieved by June 2022. Cold weather is not expected to disrupt the phosphorous reduction, TSS, or BOD performance

- BNR commissioning will be diverting flows from the high purity oxygen (HPO) system; during this transition, there may be minor impacts to the effluent quality

Table 2: Average Effluent Quality at Different BNR Commissioning Stages

Commissioning Stage	HPO Secondary Effluent	BNR Effluent	Combined Effluent	Expected Date	
BNR Tank 1 in Stable Operation	Flow, ML/d	22 to 26	Flow, ML/d	16 to 20	February 11, 2022
	BOD, mg/L	10	BOD, mg/L	10	
	TSS, mg/L	10	TSS, mg/L	10	
	NH ₃ -N, mg/L	40	NH ₃ -N, mg/L	2	
	TKN, mg/L	55	TN, mg/L	12	
	TP, mg/L	4.5	TP, mg/L	0.8	
BNR Tanks 1 and 2 in Stable Operation	Flow, ML/d	4 to 8	Flow, ML/d	32 to 36	March 11, 2022
	BOD, mg/L	10	BOD, mg/L	10	
	TSS, mg/L	10	TSS, mg/L	10	
	NH ₃ -N, mg/L	40	NH ₃ -N, mg/L	2	
	TKN, mg/L	55	TN, mg/L	12	
	TP, mg/L	4.5	TP, mg/L	0.8	
BNR Tanks 1, 2 and 3 in Stable Operation (40% Media)			Flow, ML/d	48	March 29, 2022
			BOD, mg/L	10	
			TSS, mg/L	10	
			NH ₃ -N, mg/L	2	
			TN, mg/L	12	
			TP, mg/L	0.8	
BNR Tanks 1, 2 and 3 in Full Operation (100% Media and Design Flows and Loads)			Flow, ML/d	90	July 31, 2022
			BOD, mg/L	8	
			TSS, mg/L	8	
			NH ₃ -N, mg/L	1.5	
			TN, mg/L	11	
			TP, mg/L	0.8	

REMAINING PROJECT UPGRADE WORK ACTIVITIES

Due to the schedule slippage, the focus has been on completing the BNR commissioning. As a result, the remaining work on other areas of the project, listed below and in Table 3, has been paused.

- **Secondary Clarifiers 1 & 2**

Refurbishment of the secondary clarifiers (SC) 1 & 2 commenced September 20th following the stable operation of SC 4 & 5. Work involves the concrete refurbishment, installation of new weir baffles, electrical controls, mechanical skimmer and walkway. Work expected to be complete by March 2022.

- Grit and Screening Building (Area G) Demonstration Test**
Commissioning has been delayed as a result of automation deficiency items and commissioning delays. This work is ongoing and expected to be complete by February 2022.
- Secondary Clarifiers 4 & 5 Demonstration Test**
Demonstration testing and stable operation of SC 4 and 5 has been achieved and are operating without issue. The contractor still needs to complete documentation and final contract deliverables. This work is ongoing and expected to be complete by January 2022.
- High Rate Clarification System Demonstration Test**
The high rate clarifiers testing and commissioning has been delayed to allow the contractor to focus on Areas S and R. This work is expected to be complete by September 2022.
- Raw Sewage Pump #2 Demonstration Test**
The raw sewage pump #2 to be installed and tested during the low flow period of 2023. This work is expected to be complete by March 31, 2023.
- HPO Tanks conversion to Fermenters and Biofilter, Demonstration Test**
Work on the HPO Tank conversion to fermenters will occur once seeding of the BNR is completed and stable. An estimated completion is January 31, 2023.

Table 3: Remaining Upgrade Work to Achieve Full Biological Nutrient Removal

Task	Expected Start	Expected Completion
Area S: Secondary Clarifiers 1 & 2	Started	March 29, 2022
Area G: Grit and Screen Commissioning	Ongoing	February 28, 2022
Area S: Secondary Clarifiers 4 & 5	Ongoing	January 31, 2022
Area K: High Rate Clarification System	January 2022	September 9, 2022
Raw Sewage Pump #2	November 2022	March 31, 2023
HPO Tank Conversion	June 2022	January 31, 2023

Based on current schedule, compliance with licence limits under average flow conditions should be achieved for phosphorus by end of March 2022 and total nitrogen between March and June 2022. Licence limit compliance for all flow conditions should be achieved by July 2022 with full licence compliance, including biological nutrient removal, anticipated by January 31, 2023.

The City will continue to update MCC on the progress and schedule of critical milestones as part of the regular SEWPCC Biological Nutrient Removal and Upgrade Project summary reports.

Should you have any questions on this letter, please contact Mr. Colin Javra at 204-986-4480 or by email at cjavra@winnipeg.ca.

Sincerely,

A handwritten signature in blue ink, appearing to read "Chris Carroll".

Chris Carroll, P.Eng.
Manager of Wastewater Services

CMJ/dr

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