

Environment and Climate Change Environmental Stewardship Division Environmental Approvals Branch Box 36 14 Fultz Blvd Winnipeg, MB R3Y 0L6 November 15, 2024 Client File No.: 1071.10 Our File No.: S-972, S-1146, EMS 020-17-08-11-00 020-17-08-11-0N

Attention: Agnes Wittmann, Director

RE: QUARTERLY PROGRESS REPORT FOR NEWPCC UPGRADES JULY 1 – SEPTEMBER 30, 2024

This report summarizes progress on the North End Sewage Treatment Plant (NEWPCC) upgrades, operating under Environmental Act Licence No. 2684 RRR, from July 1 to September 30, 2024.

1. INTERIM CHEMICAL PHOSPHOROUS REMOVAL FACILITIES

Update on items from last report:

- Construction and commissioning are complete for the NEWPCC Interim Phosphorous facility
- Dosing has started and its impact is being monitored (details below)

Next steps:

 Dosing will progressively increase and impacts on the NEWPCC facility will be monitored over the next year

Schedule update:

- The current project schedule is provided in <u>Table 1</u> in the Appendix
- Substantial performance was achieved July 2, 2024
- Total performance was achieved August 28, 2024

Phosphorous optimization and plant wide dosing:

- On June 24, 2024, dosing into the secondary clarifiers at the NEWPCC started at approximately 11% of the consultant's recommended dose rate
- On July 5, 2024, dosing was increased to approximately 25% of the recommended dose rate
- Operations and Engineering made the following observations with regards to the July and August NEWPCC plant performance data:
 - In July, the flows were high due to rainfall and storms
 - After flows returned to average summer rates, the operators observed a change in mixed liquor colour
 - The mixed liquor turned a reddish colour, consistent with ferric chloride
 - This coincided with a drop in ultraviolet transmissivity (UVT) and an increase in fecal coliform and *E. Coli* in the final effluent
- On August 14, 2024, ferric chloride dosing rates were reduced back to 11% of the recommended dose rate



- UVT has been gradually returning to normal levels since the decrease in ferric chloride dosing but is still on the low side
- Operations and Engineering will continue to monitor the NEWPCC plant performance and will make dosing adjustments based on this data
 - A higher dosing rate will be reconsidered in October and November
 - Other dosing points (e.g. upstream of the primary clarifiers or in the digesters) will be considered
- The estimated phosphorous concentrations throughout various stages of the NEWPCC upgrades are provided in <u>Table 2</u> in the Appendix.
 - Figure 1 in the Appendix provides a historic 30-day rolling average total phosphorus effluent levels from August 1, 2021 to September 27, 2024.
 - The average final effluent phosphorous level from June 25 to September 27, 2024 was 1.5 mg/L
 - The final effluent phosphorus levels increased in late September
 - The City is investigating potential causes of the increase
 - Increase may be due to the decrease in ferric chloride dosing that occurred on August 14, 2024

2. HEADWORKS FACILITIES

An overall site plan for the headworks project is provided in Figure 2 in the Appendix.

Update on items from last report:

- Submission of various 90% and Issued for Construction (IFC) Design Submission packages continues and are nearing completion
- Tunnels and Chambers:
 - Raw Sewage Pump Station Chamber:
 - Placement of concrete for interior structures is ongoing; multiple pours to occur over several months; installation of suction pipes and wet well slide gates is ongoing; installation of underground drainage piping, floor traps, and associated supports is ongoing
 - Grit Effluent Chamber:
 - Chamber construction is complete
 - H1 Junction Chamber:
 - Excavation work and installation of walers is complete; window closure beams and grouting work is complete; bypass piping installation is complete; rebar work for concrete base is ongoing
- Grit Building: Installation of grit trays, flushing water lines, and slide gates is complete; installation of access hatch frames and covers for effluent channel is complete; installation of grit piping supports, and process and electrical installation is ongoing
- Fine Screening Area: Various formwork, rebar, and concrete work is ongoing; channel gate installation is complete; precast wall installations north of the fine screening is complete; placement of hollow core roof panels is complete; construction of masonry walls is complete



- Solids Handling and Mechanical Rooms: Erection of structural steel is complete; placement of hollow core roof panels and installation of precast walls is complete; installation of monorail beams, process piping, rainwater piping, mechanical room equipment, and erection of equipment platforms is ongoing
- Y4 Gallery Connection: Installation of miscellaneous electrical is complete
- Main Control Building: Installation of cladding, framing, and drywall for exterior walls is ongoing; rainwater piping and roofing work is ongoing; installation of interior concrete masonry walls is complete
- Standby Generator Building: Generator assembly, mechanical piping, and installation of miscellaneous electrical is ongoing
- Overflow Piping: Installation of overflow piping is complete; manhole construction and connection to existing overflow remains outstanding

Next steps:

- Raw Sewage Pumping Station: Continue with forming and placing the north walls in the elevator shaft; continue with pump installation, discharge elbows, and risers; installation of metal stairs
- Fine Screening Area: completion of roof slab; installation of south and west precast walls
- Solids Handling and Mechanical Rooms: Installation of precast walls
- H1 Junction Chamber: Completion of main slab

Schedule update:

- The substantial performance date has been revised to March 31, 2026 due to the schedule delays associated with the Northwest Interceptor failure and the differing ground conditions
- A re-baselined schedule has been received

3. BIOSOLIDS FACILITIES

Update on items from last report:

- The preferred proponent was identified and approved by the Standing Policy Committee on Water, Wastewater and the Environment on July 18, 2024
- The Development Phase Agreement was fully executed on September 23, 2024
- The Province's Environment and Climate Change Department approved the proposed Remedial Action Plan for Parcel B
- NEWPCC Piping Installation, Soil Remediation, and Site Compound Development tender closed on September 6, 2024; it is currently going through the award process

Next steps:

- Continue archeological investigations on the Chief Peguis Trail right of way
- Award early works contract for NEWPCC Piping Installation, Soil Remediation, and Site Compound Development
- Continue work on the Development Phase



Schedule Update:

• The current project schedule is provided in Table 4 in the Appendix

4. NUTRIENT REMOVAL FACILITIES

Update on items from last report:

- The enhanced preliminary design (EPD) is nearing completion
- The revised class 3 cost estimate is nearing completion
- A third-party cost and integrated risk, cost, and schedule analysis has commenced

Other works progressed:

- Market sounding is underway
- A geotechnical site investigation has been completed and is under review

Next steps:

- Finalize the EPD, class 3 estimate, risk register, third-party cost and risk reviews, and geotechnical report
- Completion of the market-sounding interviews and summary report
- Undertake a project delivery model assessment following the completion of the marketsounding interviews and reporting

Schedule Update:

• The current project schedule is provided in <u>Table 5</u> in the Appendix

If you have any questions please contact me at 204-986-5210 or by email at <u>cwiebe@winnipeg.ca.</u>

Sincerely,

Cynthia Wiebe, P. Eng., CAMP Manager of Engineering Services

ATTACHMENTS: Figures and Tables LM/jkm

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Table 1: Interim Chemical Phosphorous Removal Facilities - Project Milestones

| Task Description | % Complete | | | Original Targeted | Revised Targeted | Actual |
|---------------------------------------|------------|--------------|--------------|----------------------|---------------------|--------------|
| Task Description | Jul | Aug | Sep | Completion Date | Completion Date | Dates |
| Consultant RFP Award | 100% | | | Sep 30, 2021 | | Sep 28, 2021 |
| Preliminary Design | 100% | | | Feb 3, 2022 | Mar 31, 2022 | Feb 2, 2022 |
| Detailed Design | 100% | | | May 18, 2022 | Jun 30, 2022 | May 18, 2022 |
| Construction Tender Award | 100% | | | Jul 15, 2022 | | Sep 22, 2022 |
| Substantial Completion* | 100% | | | Jun 30, 2023 | July 2, 2024 | Jul 2, 2024 |
| Total Completion* | | Sep 30, 2023 | Aug 28, 2024 | Aug 28, 2024 | | |
| Full-Scale Testing and Implementation | | | | Dec 31, 2024 | Aug 28, 2025 | |



Table 2: Estimated Phosphorous Concentrations through NEWPCC Upgrade Stages

| Stage | Period | Estimated Total Phosphorous Concentration in NEWPCC Final Effluent ¹ | Monitoring Data: Total Phosphorous (NEWPCC Final Effluent) | |
|---|-----------------------------|---|---|--|
| Stage 1 : Phosphorous reduction with existing infrastructure | Until Aug 2021 | Approximately 4.0 to 4.5 mg/L on average | 3.6 mg/L (Average from 2017 – 2021) | |
| Stage 2 : Maximized phosphorous reduction through optimization with existing infrastructure | Aug 2021 to Jun 24, 2024 | Approximately 3.5 mg/L on average | 2.5 mg/L (Average from 2022 onward) | |
| Stage 3 : Phosphorous reduction with Interim Chemical Phosphorous Facilities | Jun 25, 2024 to Dec 2030 | Approximately 2.5 to 3.0 mg/L on average ² | 1.5 mg/L ⁴ | |
| Stage 4 : Phosphorous reduction with commissioned Biosolids Facilities | Jan 2031 to Jan 2032 | 1 mg/L to Jan 2032 ³ | | |
| Stage 5 : Ongoing phosphorous reduction with commissioned Nutrient Removal Facilities | TBD | 1 mg/L | | |

¹ Based on the 'NEWPCC Interim Phosphorous Removal and Detail Review and Bench Scale Testing Report, December 2020

² Phosphorous levels may increase as City growth consumes sludge processing capacity

³ Phosphorous levels may increase after January 2032 dependent on sludge loading levels (assuming maximum sludge generating scenario)

⁴ Average final effluent phosphorous level for June 25 to September 27, 2024

The modelled data is a conservative estimate of total phosphorous concentrations. The model was developed based on historical wastewater loadings and factored in the projected impacts of upgrades at SEWPCC. Actual results are dependent on many variables, such as:

- the overall health and performance of the treatment bacteria
- the performance of various processes
- wet weather flow
- changes in development
- industrial activity (especially high strength industry)
- ongoing capital improvements

Phosphorous concentrations in the final effluent are reported in the NEWPCC's monthly compliance reports and can be found online at <u>winnipeg.ca/wwcompliance</u>.





Figure 1: 30-Day Rolling Average Total Phosphorus NEWPCC Final Effluent Levels from August 1, 2021 to September 27, 2024



Figure 2: Headworks Facilities – Site Plan





Table 3: Headworks Facilities – Project Milestones

| Task Description | % Complete** | | | Original Targeted | Revised Targeted | Actual |
|--|--------------|------|-----|----------------------|---|--------------|
| | Jul | Aug | Sep | Completion Date | Completion Date | Dates |
| Procurement and Contract Award | | 100% | | Jun 30, 2021 | | Jun 11, 2021 |
| DB Mobilization Complete | | 100% | | Dec 31, 2021 | | Dec 15, 2021 |
| 30% Design | | 100% | | Dec 14, 2021 | | Dec 14, 2021 |
| 60% Design | 100% | | | Sep 30, 2022 | | May 22, 2024 |
| 90% Design | 96% | 97% | 98% | Jan 23, 2023 | Aug 30, 2024 Nov 30, 2024 | |
| IFC Design | 85% | 90% | 92% | Apr 17, 2023 | Oct 30, 2024 Nov 30, 2024 | |
| Driven Piles (All Areas) | 100% | | | Aug 19, 2022 | | Mar 14, 2023 |
| Secant Piles (H2, H1, Y5) | 100% | | | Sep 29, 2022 | | Jan 13, 2023 |
| Microtunneling (H1 to H2 and H1 to Y5) | 65% | 65% | 65% | Dec 20, 2022 | Aug 9, 2024 Feb 28, 2025 | |
| Generator Building, Structural and External Finishes | 88% | 88% | 88% | Mar 14, 2023 | Aug 30, 2024 May 30, 2025 | |
| Standby Generators, Install | 100% | | | Aug 3, 2023 | | Oct 30, 2022 |
| Raw Sewage Pumping Station (H2), Concrete | 79% | 81% | 84% | Aug 7, 2023 | Nov 8, 2024 May 30, 2025 | |
| H1 Chamber | 18% | 18% | 18% | Sep 5, 2023 | May 22, 2025 Aug 28, 2026 | |

City of Winnipeg | NEWPCC Upgrade Quarter 3 Progress Report



Table 3: Headworks Facilities – Project Milestones continued...

| Task Description | % Complete** | | | Original Targeted | Revised Targeted | Actual Completion |
|--|--------------|-----|-----|----------------------|---|----------------------|
| Task Description | Jul | Aug | Sep | Completion Date | Completion Date | Dates |
| Standby Generator Facility and Fuel Storage System | 77% | 77% | 80% | Sep 15, 2023 | Feb 3, 2025 May 30, 2025 | |
| Grit Removal System, Install | 100% | | | Sep 18, 2023 | Jul 31, 2024 | Jul 19, 2024 |
| Y5 Chamber | 25% | 25% | 25% | Dec 7, 2023 | Dec 5, 2024 Aug 28, 2026 | |
| Raw Sewage Pumps, Install | 0% | 0% | 0% | Jan 23, 2024 | Nov 25, 2024 | |
| Fine Screens, Install | 0% | 4% | 14% | Mar 26, 2024 | Dec 2, 2024 Jan 17, 2025 | |
| Headworks Building, Structural and External Finishes | 0% | 5% | 20% | Jun 7, 2024 | Jan 22, 2025 Jun 30, 2025 | |
| Odour Control System, Install | 0% | 0% | 0% | Jul 8, 2024 | Jan 6, 2025 Aug 29, 2025 | |
| Civil Works and Landscaping | 0% | 0% | 0% | Jul 26, 2024 | Apr 11, 2025 Aug 28, 2026 | |
| Headworks Building, Complete | 0% | 20% | 23% | Nov 5, 2024 | Feb 4, 2025 Mar 31, 2026 | |
| Commissioning | 0% | 0% | 0% | Mar 31, 2025 | May 11, 2025 Mar 31, 2026 | |
| Decommissioning – Original Equipment | 0% | 0% | 0% | May 14, 2025 | Jul 28, 2025 Aug 28, 2026 | |
| Substantial Completion* | 0% | 0% | 0% | Jun 30, 2025 | Mar 31, 2026 | |

*This is the only milestone that is contractual and cannot slide without penalty

**Data source: Red River Solution's Monthly Report



Table 4: Biosolids Facilities – Project Milestones

| Task Description | % Complete | | | Original Targeted | Revised Targeted | Actual |
|---|------------|-----|------|---|---------------------|---|
| | Jul | Aug | Sep | Completion Date | Completion Date | Dates |
| Updated Preliminary Design and Procurement Strategy | 100% | | | Dec 31, 2021 | Apr 1, 2022 | Apr 14, 2022 Council Approved Jul 21, 2022 |
| Post RFP Step 1 (Following Council Approval for a PDB procurement strategy) | 100% | | | Jul 13, 2023 | | Jul 14, 2023 |
| Shortlist Proponents | 100% | | | Sep 30, 2023 | Dec 4, 2023 | Dec 1, 2023 |
| Post RFP Step 2 | 100% | | | Oct 31, 2023 | Dec 4, 2023 | Dec 11, 2023 |
| Contract Award of Development Phase Agreement | 0% | 0% | 100% | Jun 30, 2024 | Sept 27, 2024 | September 23, 2024 |
| Contract Award of Design Build Agreement | 0% | 0% | 0% | TBD | | |
| Substantial Completion | | | | TBD following DBA – by Dec 31, 2030 | | |



Table 5: Nutrient Removal Facilities – Project Milestones

| Task Description | % Complete | | | Original Targeted | Revised Targeted | Actual Completion |
|--|------------|------|-----|----------------------|---------------------|----------------------|
| | Jul | Aug | Sep | Completion Date | Completion Date | Dates |
| Nutrient Removal Technology Selection | | 100% | | Oct 19, 2023 | | Oct 12, 2023 |
| Updated EPD | 98% | 99% | 99% | Jun 30, 2024 | Oct 18, 2024 | |
| Revised Class 3 Cost Estimate | 50% | 60% | 90% | Sep 30, 2024 | Nov 15, 2024 | |
| Procurement and Contract Award | 0% | 0% | 0% | TBD | | |
| Substantial Completion | | | | TBD | | |