



Environment and Climate Change  
Environmental Stewardship Division  
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January 30, 2024  
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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  
OCTOBER 1 – DECEMBER 31, 2023**

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This report summarizes progress on the North End Sewage Treatment Plant (NEWPCC) upgrades, operating under Environmental Act Licence No. 2684 RRR, from October 1 to December 31, 2023.

## 1. INTERIM CHEMICAL PHOSPHOROUS REMOVAL FACILITIES

### Update on items from last report:

- Building envelope work approximately 96 percent complete; brickwork is complete
- 26 of the 28 planned shutdowns are complete
- Railway work is approximately 90 percent complete
- The final inspection report for the chemical tanks is still pending

### Other works progressed:

- Electrical work, mechanical work, and piping installations are ongoing
- Civil work is approximately 75 percent complete
- Building civil work is between 96 and 98 percent complete
- Total building work is 83 percent complete
- The remote dosing system is 87 percent complete

### Next steps:

- Continue progressing works listed above
- Complete the remaining railway work, including tie-ins, in January 2024
- Initiate commissioning planning in January 2024
- Delivery of electrical panels is delayed to February 2024
- Exterior insulation for the third building and landscaping will be completed in spring following substantial performance

### Schedule update:

- The current project schedule is provided in Table 1 in the Appendix
- The substantial performance date has been revised to April 3, 2024 due to a delay in the delivery of the electrical panels. The panels, which were originally scheduled for delivery in October 2023, are needed to operate the holding tanks and all the equipment in the sodium hydroxide building. Global shortages in material supply and high market demand have caused delay in delivery. This risk continues to be monitored.

Phosphorous optimization:

- The NEWPCC Operators have maximized ferric dosing to the sequencing batch reactors (SBRs) and digesters based on the existing ferric chloride pumping capacity
  - The average SBR effluent phosphorous load for Q4 2023 is 26 kg/day, which corresponds to an average SBR effluent concentration of 13 mg/L.
- The SBRs are performing better than anticipated in the original design and are producing effluent below the licence limit of 119 kg/day of phosphorous specified in Clause 27 of the NEWPCC Licence No. 2684 RRR.
- Estimated phosphorous concentrations through various stages of the NEWPCC upgrades are provided in Table 2 in the Appendix

## **2. HEADWORKS FACILITIES**

An overall site plan for the headworks project is provided in Figure 1 in the Appendix.

Update on items from last report:

- Submission of various 60%, 90% and Issued for Construction (IFC) Design Submission packages continues; 60% and 90% submissions are nearing completion
- Tunnels and Chambers:
  - Tunnel 2 is complete
  - Concrete base slab in Raw Sewage Pump Station Chamber has been poured
  - Installation of supports for the Northwest Interceptor are in progress
  - Excavation above the Main Street Interceptor is complete
- Grit Building: roof slab pour, installation of process piping, and painting in the basement is complete
- Fine Screening Area: various formwork, rebar, and concrete work is ongoing
- Solids Handling and Mechanical Rooms: equipment pads are complete; offsite coating of structural steel and delivery to site are ongoing
- Y4 Gallery Connection: waterproofing, backfilling and painting are complete
- Transformer Yard: Factory Acceptance Testing is complete; transformers are being delivered
- Existing UV Effluent Conduit: dowel installation is ongoing

Other works progressed:

- Main Control Building: erection of structural steel is complete
- Standby Generator Building: fuel tank pads are complete and fuel tanks are installed; generator assembly is ongoing

Next steps:

- Tunnels and Chambers: continue heating and hoarding of the Raw Sewage Pumping Station Chamber to allow for curing of the concrete base slab, continue installing Northwest Interceptor supports, complete reinforcement of the Main Street Interceptor
- Grit Building: continue installing piping supports and applying coatings in grit cells
- Main Control Building: install exterior wall cladding
- Standby Generator Building: install sewer line

- Y4 Gallery Connection: install flushing water line

Schedule update:

- The current project schedule is provided in Table 3 in the Appendix
- Contractor is tracking behind schedule based on key milestones but the substantial performance date has not changed
  - The Earned Value Analysis (EVA) in Figure 2 of the Appendix compares the performance measurement baseline (schedule for how they intended to progress the work) to the actual schedule. The EVA indicates the Contractor planned to be 76.6% complete but is only 48.5% complete.
  - The City continues to work with the contractor to evaluate the impacts of the NWI failure and how it will impact the schedule and substantial performance date. The extent of this is currently unknown and will be determined in the coming months.
  - Once the impact of the interceptor failure is determined, the contractor can rebaseline their schedule and EVA, and options to recover schedule will be evaluated

### **3. BIOSOLIDS FACILITIES**

Update on items from last report:

- Request for Proposal (RFP) Step 1 closed on November 7, 2023; submissions were evaluated and two proponents were shortlisted to proceed to RFP Step 2. RFP Step 2 Procurement is on-going
- Results from the additional environmental testing for contaminated soils on Parcel A and B were received; next steps are being determined
- Contracts were signed for both Ostara and Cambi

Other works progressed:

- Three subsurface applications for Canadian Pacific Railway (CPR) were submitted

Next steps:

- Continue archeological investigations on the Chief Peguis Trail right of way
- Continue detailed design for early works packages, such as land drainage, water main extensions, and utilidor construction
- Continue procurement of RFP Step 2

Schedule Update:

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

#### 4. NUTRIENT REMOVAL FACILITIES

Update on items from last report:

- Work on the enhanced preliminary design (EPD) continues and will be ongoing until mid-2024
- The deep tank (Westbank) biological nutrient removal process was selected as the nutrient removal technology; this technology is used at the WEWPCC

Next steps:

- A revised class 3 estimate is being developed concurrent with the EPD work

Schedule Update:

- The current project schedule is provided in Table 5 in the Appendix

#### 5. NEWPCC UPGRADE PLAN UPDATE

Update on items from last report:

- The NEWPCC Upgrade Plan Update was submitted on December 29, 2023

Should you have any questions, please contact me at 204-986-5210 or by email at [cwiebe@winnipeg.ca](mailto:cwiebe@winnipeg.ca).

Sincerely,



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

#### ATTACHMENTS: Figures and Tables

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**Table 1:** Interim Chemical Phosphorous Removal Facilities - Project Milestones

Task Description	% Complete			Original Targeted Completion Date	Revised Targeted Completion Date	Actual Completion Dates
	Oct	Nov	Dec			
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	70%	75%	80%	Jun 30, 2023	<del>Jan 26, 2024</del> April 3, 2024	
Total Completion				Sep 30, 2023	<del>Mar 26, 2024</del> May 30, 2024	
Full-Scale Testing and Implementation				Dec 31, 2024	<del>Mar 26, 2024</del> May 30, 2025	

**Table 2:** Estimated Phosphorous Concentrations through NEWPCC Upgrade Stages

Stage	Period	Estimated Total Phosphorous Concentration in NEWPCC Final Effluent <sup>1</sup>	Monitoring Data: Total Phosphorous (NEWPCC Final Effluent)
<b>Stage 1:</b> 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)
<b>Stage 2:</b> Maximized phosphorous reduction through optimization with existing infrastructure	Aug 2021 to Jan 26, 2024	Approximately 3.5 mg/L on average	2.7 mg/L (Average from 2022 onward)
<b>Stage 3:</b> Phosphorous reduction with Interim Chemical Phosphorous Facilities	March 3, 2024 to Dec 2030	Approximately 2.5 to 3.0 mg/L on average <sup>2</sup>	
<b>Stage 4:</b> Phosphorous reduction with commissioned Biosolids Facilities	Jan 2031 to Jan 2032	1 mg/L to Jan 2032 <sup>3</sup>	
<b>Stage 5:</b> Ongoing phosphorous reduction with commissioned Nutrient Removal Facilities	TBD	1 mg/L	

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

<sup>2</sup> Phosphorous levels may increase as City growth consumes sludge processing capacity

<sup>3</sup> Phosphorous levels may increase after January 2032 dependant on sludge loading levels (assuming maximum sludge generating scenario)

Monitored average total phosphorous concentrations at NEWPCC indicate the plant has been outperforming anticipated modelled data. Although the Stage 2 average has increased slightly from 2.5 mg/L since the last reporting period, the results have been trending downward with noticeably lower total phosphorous concentrations for Stage 2. The City is working on decreasing sludge loading to the existing digesters by removing grease, scum, and grit through various projects.

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

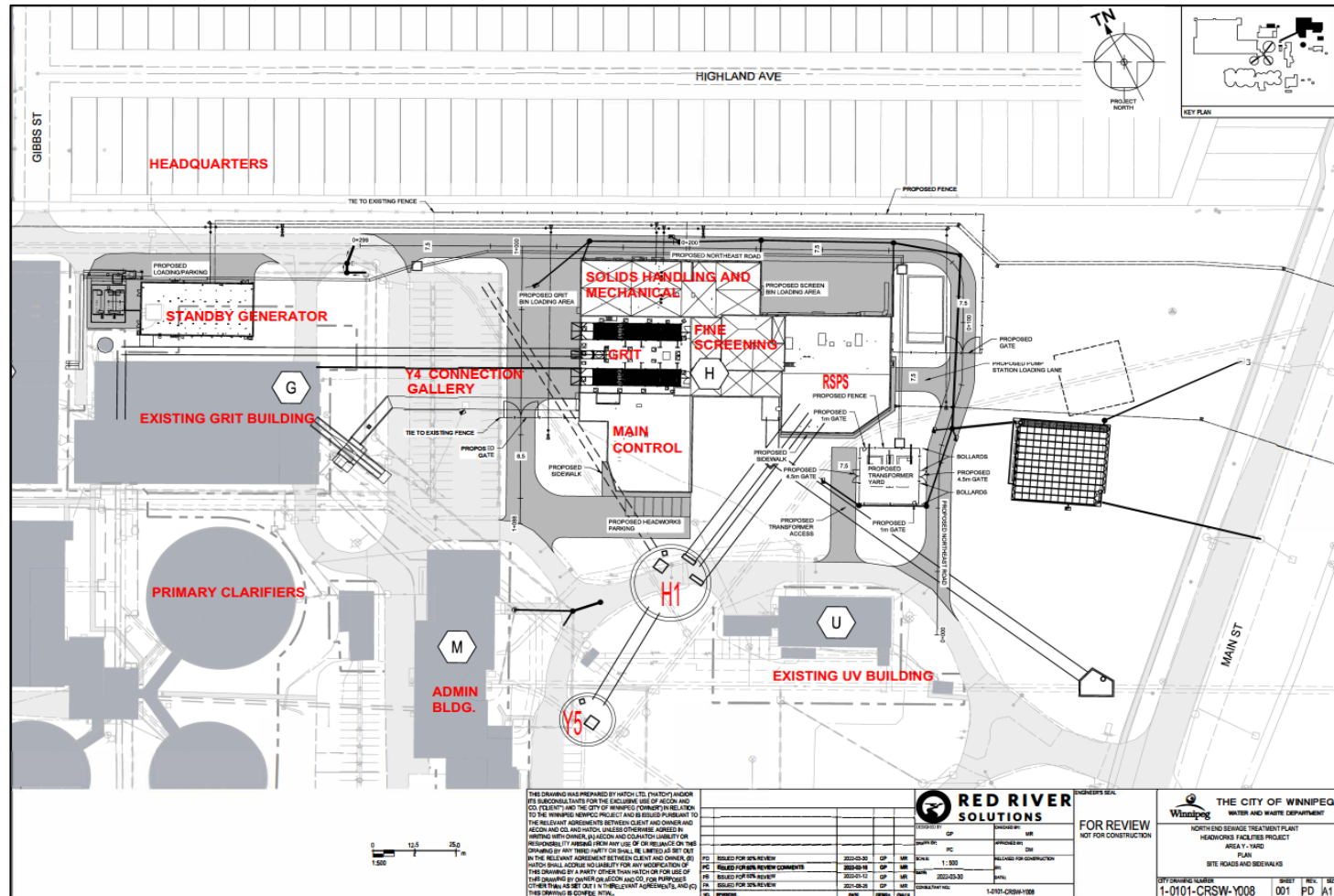
- changes in development
- industrial activity (especially high strength industry)
- ongoing capital improvements

With the commissioning of the Interim Phosphorous facility in Q1 and Q2 2024, it is anticipated that total phosphorous will further decrease. Based on the better than expected results over the past several years, it is expected that the plant could be at or near licence limits for phosphorous for portions of the year through the use of chemical removal.

The City will continue to optimize phosphorous removal within existing digester capacity to the greatest extent possible with the various dosing points. Actual results will depend on full scale testing following commissioning of the Interim Phosphorous facility and the various factors described above.

Phosphorous concentrations in the final effluent are reported in the NEWPCC's monthly compliance reports and can be found online at [winnipeg.ca/wwcompliance](http://winnipeg.ca/wwcompliance).

Figure 1: Headworks Facilities – Site Plan





**Table 3: Headworks Facilities – Project Milestones**

Task Description	% Complete**			Original Targeted Completion Date	Revised Targeted Completion Date	Actual Completion Dates
	Oct	Nov	Dec**			
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	92%	92%	95%	Sep 30, 2022	<del>Jan 15, 2024</del> Jan 30, 2024	
90% Design	50%	50%	60%	Jan 23, 2023	<del>Feb 1, 2024</del> Mar 4, 2024	
IFC Design	36%	42%	45%	Apr 17, 2023	<del>Mar 26, 2024</del> Apr 15, 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)	50%	65%	65%	Dec 20, 2022	August 9, 2024	
Generator Building, Structural and External Finishes	85%	88%	88%	Mar 14, 2023	Aug 30, 2024	
Standby Generators, Install	100%			Aug 3, 2023		Oct 30, 2022
Raw Sewage Pumping Station (H2), Concrete	15%	15%	25%	Aug 7, 2023	Jun 10, 2024	
H1 Chamber	15%	15%	15%	Sep 5, 2023	<del>Feb 12, 2025</del> May 22, 2025	

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

Task Description	% Complete**			Original Targeted Completion Date	Revised Targeted Completion Date	Actual Completion Dates
	Oct	Nov	Dec**			
Standby Generator Facility and Fuel Storage System	35%	40%	45%	Sep 15, 2023	Feb 3, 2025	
Grit Removal System, Install	10%	10%	15%	Sep 18, 2023	Jul 31, 2024	
Y5 Chamber	5%	10%	15%	Dec 7, 2023	Dec 5, 2024	
Raw Sewage Pumps, Install	0%	0%	0%	Jan 23, 2024	Nov 25, 2024	
Fine Screens, Install	0%	0%	0%	Mar 26, 2024	Dec 2, 2024	
Headworks Building, Structural and External Finishes	0%	0%	0%	Jun 7, 2024	Jan 22, 2025	
Odour Control System, Install	0%	0%	0%	Jul 8, 2024	Jan 6, 2025	
Civil Works and Landscaping	0%	0%	0%	Jul 26, 2024	Apr 11, 2025	
Headworks Building, Complete	0%	0%	0%	Nov 5, 2024	Feb 4, 2025	
Commissioning	0%	0%	0%	Mar 31, 2025	May 11, 2025	
Decommissioning – Original Equipment	0%	0%	0%	May 14, 2025	Jul 28, 2025	
Substantial Completion*	0%	0%	0%	Jun 30, 2025		

\*This is the only milestone that is contractual and cannot slide without penalty. This date will be revised to address delays beyond the Contractor's control including the Northwest Interceptor failure. Once the Contractor rebaselines schedule, other interim milestone dates may also change.

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



**Table 4: Biosolids Facilities – Project Milestones**

Task Description	% Complete			Original Targeted Completion Date	Revised Targeted Completion Date	Actual Completion Dates
	Oct	Nov	Dec			
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	0%	80%	100%	Sep 30, 2023	Dec 4, 2023	Dec 1, 2023
Post RFP Step 2	94%	96%	100%	Oct 31, 2023	Dec 4, 2023	Dec 11, 2023
Contract Award of Development Phase Agreement	0%	0%	0%	Jun 30, 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 Completion Date	Revised Targeted Completion Date	Actual Completion Dates
	Oct	Nov	Dec			
Nutrient Removal Technology Selection	100%			Oct 19, 2023		Oct 12, 2023
Updated EPD	8%	15%	20%	Jun 30, 2024		
Revised Class 3 Cost Estimate	0%	0%	0%	Sep 30, 2024		
Procurement and Contract Award	0%	0%	0%	TBD		
Substantial Completion				TBD		