



City of Hamilton PUBLIC WORKS COMMITTEE ADDENDUM


Meeting #: 22-014
Date: October 2, 2023
Time: 1:30 p.m.
Location: Council Chambers
Hamilton City Hall
71 Main Street West

Carrie McIntosh, Legislative Coordinator (905) 546-2424 ext. 2729

	Pages
8. STAFF PRESENTATIONS	
*8.1 Woodward Upgrades Construction Update (PW20043(d)) (City Wide) REVISED - Presentation	2
13. NOTICES OF MOTION	



INFORMATION REPORT

TO:	Chair and Members Public Works Committee
COMMITTEE DATE:	October 2, 2023
SUBJECT/REPORT NO:	Woodward Upgrades Construction Update (PW20043(d)) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	John Helka (905) 546-2424 Ext. 2826
SUBMITTED BY:	John Helka Director, Woodward Upgrades Public Works Department
SIGNATURE:	

COUNCIL DIRECTION

N/A

INFORMATION

Further to Report PW20043(c) presented to Public Works Committee August 10, 2022, the purpose of this report is to provide Council with an update on the Woodward Upgrade Project (WUP), which is an integral part of the Clean Harbour Program. Construction of the Woodward Upgrade Project began in May 2017 and Hamilton Water is pleased to report that after 6 years of construction, substantial performance on all of the project components will be reached in Q4 2023.

The project has been delivered through three construction contracts having an approximate total value of \$340M, which together form the Phase 1 Woodward Wastewater Treatment Plant (WWTP) water quality upgrades:

- Contract 1 – Main Pumping Station Project;
- Contract 2 – Electrical and Chlorination Project; and,
- Contract 3 – Tertiary Treatment Upgrade Project.

OUR Vision: To be the best place to raise a child and age successfully.

OUR Mission: To provide high quality cost conscious public services that contribute to a healthy, safe and prosperous community, in a sustainable manner.

OUR Culture: Collective Ownership, Steadfast Integrity, Courageous Change, Sensational Service, Engaged Empowered Employees.

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Construction photos of each contract are attached to Report PW20043(d) as Appendix "A".

Contract 1 - Main Pumping Station Project:

Beginning May 2017, Maple Ball Joint Venture began constructing the new main wastewater pumping station to replace the existing pumping station. This project included the installation of 12 - 700 Hp pumps for a total firm capacity of 1700 million litres per day, matching the capacity of the incoming trunk sewers.

The project reached substantial performance on August 31, 2022, with some remaining outstanding works and deficiencies to be completed during the two-year warranty period. This replacement project was critical to address aging infrastructure needs and enhance the climate resiliency of the City's wastewater treatment infrastructure by providing the ability to better manage and limit risks associated with increased weather wet flows.

Contract 2 - Electrical and Chlorination Project:

In October 2017, Alberici Constructors started construction on the Electrical and Chlorination upgrades project. This contract replaced the two existing electrical substations and existing standby power building with a new Electrical Power Centre. More specifically, dual 13.8 kilo-volt underground distribution loop duct banks were established around the Wastewater and Water treatment plants and four 3-megawatt diesel generators were installed in the new Energy Power Centre providing a total of 12 megawatts of emergency standby power. Additionally, the chlorination system has been upgraded to increase chlorination capacity at the wastewater treatment plant during wet weather flows to provide full disinfection.

The project reached substantial performance on November 11, 2022, with some remaining outstanding works and deficiencies to be completed during the two-year warranty period. This project addressed the need to replace aging electrical infrastructure and enhance the climate resiliency of the City's water and wastewater treatment infrastructure. Climate change adaptation measures such as provision of secure and reliable power complete with standby power generation to service essential electrical loads provides greater assurance that both treatment plants will continue to operate as intended in the event of power outages.

Contract 3 - Tertiary Treatment Project:

The Tertiary Treatment Project upgrades will result in significant benefits to water quality in Hamilton Harbour. The project adds a higher level of treatment (tertiary) to the wastewater treatment process using disk filtration technology. In addition, the

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project includes an increase in the capacity of the south plant secondary treatment system by doubling the size of the aeration tanks and constructing two new secondary clarifiers, a new chlorine contact tank and outfall and Red Hill Creek modifications. This project will allow the City to meet the Hamilton Harbour Remediation Action Plan objectives for the wastewater treatment plant, including the provision of full nitrification for more complete ammonia removal, increased suspended solids and phosphorus removal. The project will also result in the wastewater treatment plant operating under new and more stringent environmental compliance limits.

The construction contract was awarded to North American Construction and commenced in April 2019. The contract has recently passed a four-year anniversary, with approximately 98% of work performed to date. The following key activities have been completed to date:

- The Stage Two expansion of the South Plant was completed in December 2022, returning the wastewater treatment plant to its full treatment capacity of 614 million litres per day.
- A significant milestone occurred in October 2022, when flow was directed through the new tertiary facility, the new chlorine contact tank and the new outfall. This milestone marked the start of transitioning the wastewater treatment plant from a secondary to a tertiary level treatment plant and supporting the City's ability to meet the Hamilton Harbour Remedial Action Plan objectives.

Although there have been some unforeseen delays during the commissioning phase, the project is scheduled to reach substantial performance in Q4, 2024.

The performance of the tertiary treatment process and filters during the commissioning phase have provided positive results, enabling the City to meet the new environmental compliance limits for suspended solids, phosphorous and ammonia nitrogen. Effluent water quality analysis of the tertiary treatment performance up to the end of August 2023 are included in Appendix "A" to Report PW20043(d).

Next Steps:

In 2015, the City of Hamilton secured \$200M in federal and provincial financial support through the Green Infrastructure Funding program to move ahead with planned improvements to its wastewater systems which includes an approximate \$346M total investment into the Woodward Avenue Wastewater Treatment Plant and other wastewater collection system upgrades. With the Woodward Upgrades Project nearing completion, the City will be hosting a media event on October 12, 2023, to celebrate the investments that contribute toward the Hamilton Harbour Remedial Action Plan goal of

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de-listing Hamilton Harbour from the Area of Concern as identified under the Canada - USA Great Lakes Water Quality Agreement. In advance of this event, the City has been actively engaging with our Federal and Provincial counterparts, including the Office of the Premier, the Office of the Prime Minister, the Ontario Minister of Environment, Conservation & Parks, the Ontario Minister of Infrastructure, the Minister of Environment & Climate Change Canada and the Minister of Housing, Infrastructure and Communities Canada in an effort to seek attendance from both Federal and Provincial dignitaries in order to celebrate this joint investment. Dignitary attendance can reinforce the importance of the project and provided the opportunity for the City to deepen and further cultivate our government relations efforts.

In addition to the planned media event, and in appreciation of the local neighbouring community who have been most affected by the construction since 2017, the Hamilton Water Division is hosting a Community Appreciation BBQ at the Hamilton Steam Museum. This event will provide an excellent opportunity to express the City's gratitude, acknowledge the communities' patience, and share the remarkable work undertaken as part of the Woodward Upgrades Project. The Community Appreciation BBQ has been scheduled for Saturday, October 14, 2023, from 11:00 a.m. to 2:00 p.m. at the Hamilton Steam Museum located at 900 Woodward Avenue, and tours of the Woodward Wastewater Treatment Plant will be provided for attendees.

Closing:

City staff are very proud of the successful completion of the Woodward Upgrades Project which is to-date the single largest capital project delivered by a City team. This accomplishment aligns with the City's strategic objectives, the new term of Council priority for sustainable economic and ecological development, and it is a big part of the City's commitment to supporting the Hamilton Harbour Remedial Action Plan Goals for delisting the Harbour as an Area of Concern under the Great Lakes Water Quality Agreement.

In addition, Hamilton Water is very appreciative of the teamwork and support from other City teams including the Legal and Risk Management Services Division, the Financial Planning Administration and Policy Division, and the Procurement Services Section. Finally, Hamilton Water appreciates the collaboration and professionalism amongst all the contractors working on the wastewater treatment plant site over the past six years (amounting to over two million labour hours worked to-date) and want to recognize that there have been no recorded lost time injuries during this project.

APPENDICES AND SCHEDULES ATTACHED

Appendix "A" to Report PW20043(d) – Construction Photos/Effluent Water Quality Analysis

Construction Photographs



Figure 1: New Main Pumping Station

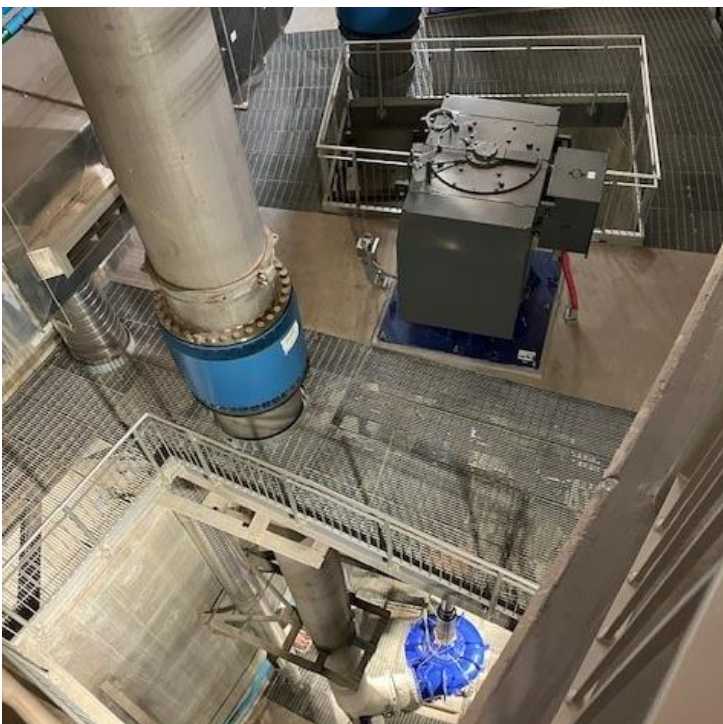


Figure 2: Motor platform level



Figure 3: Pump level



Figure 4: New Electrical Power Centre (Front)



Figure 5: Diesel generators



Figure 6: New control panels



Figure 7: New Tertiary Treatment Facility and Chlorine Contact Tank



Figure 8: New Outfall & Dissipation Zone

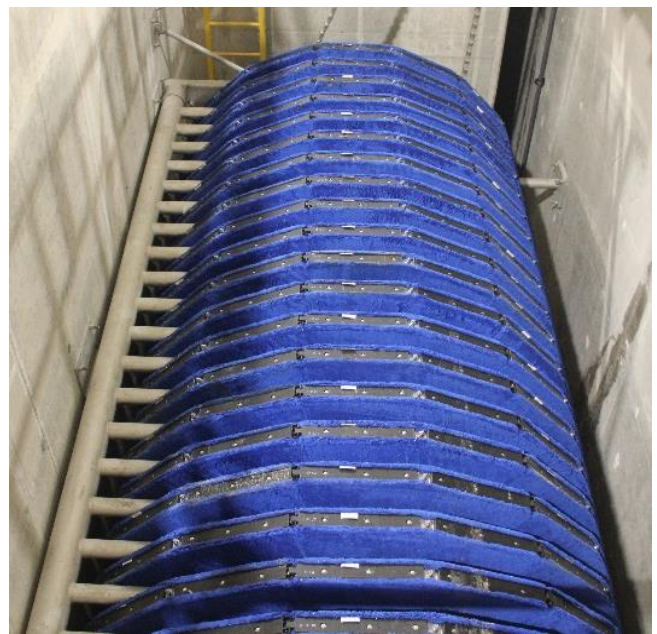


Figure 9: Disk Filter Technology

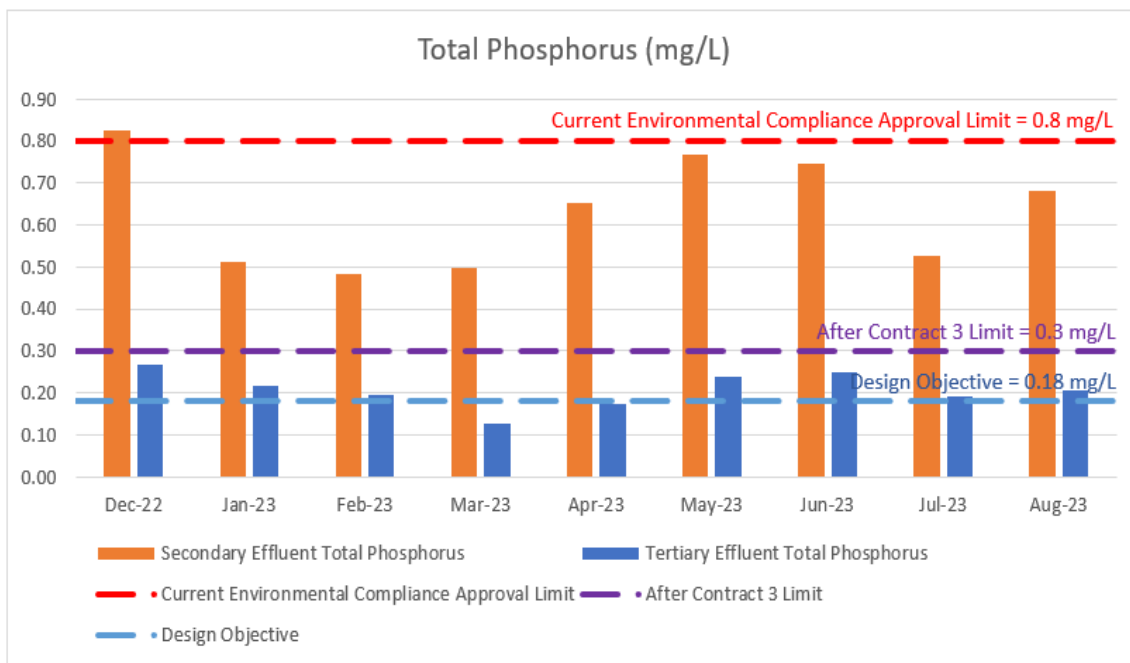


Figure 10: Graph of Total Phosphorus levels in mg/L over a nine-month period

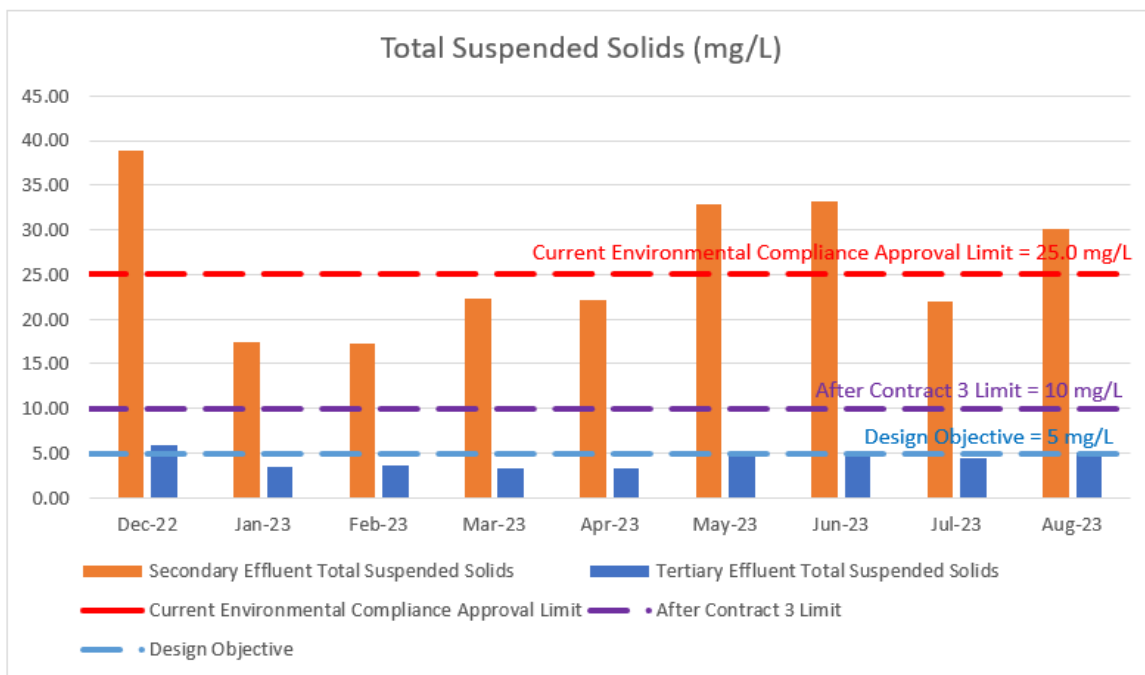


Figure 11: Graph of Total Suspended Solids levels in mg/L over a nine-month period

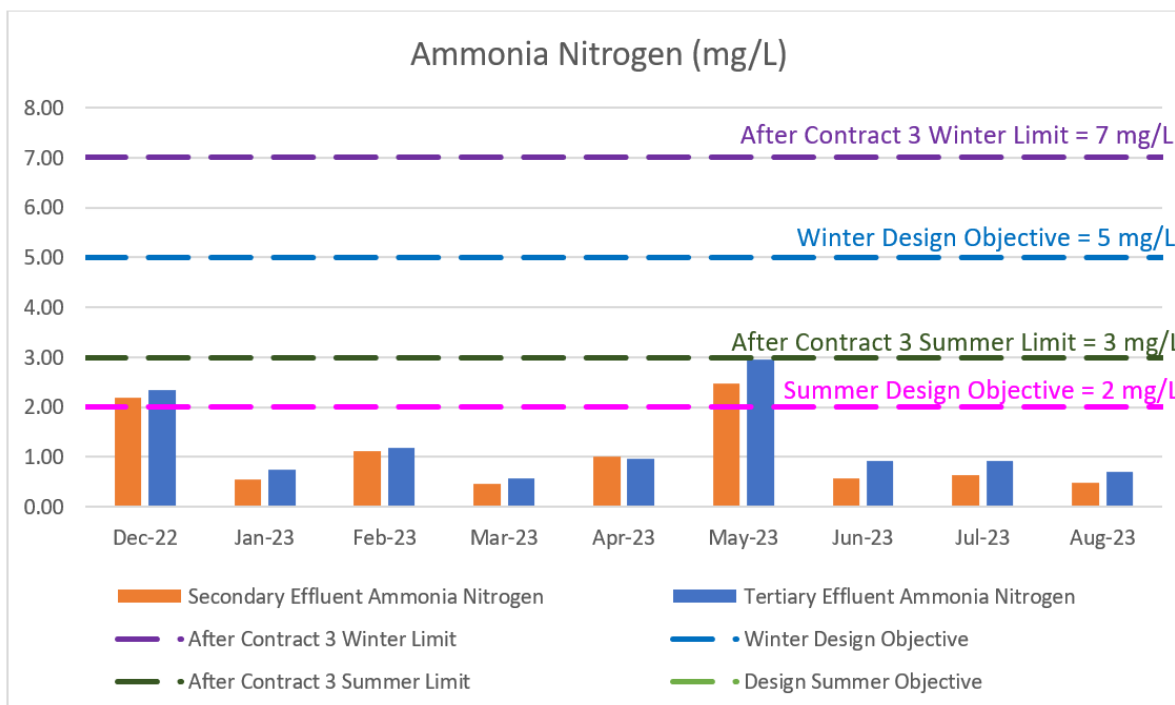


Figure 12: Graph of Ammonia Nitrogen levels in mg/L over a nine-month period



Hamilton

WOODWARD UPGRADES PHASE 1 CONSTRUCTION UPDATE

OCTOBER 2, 2023

OUTLINE

- **Woodward Upgrades Project Overview**
- **Construction Update**
- **Water Quality Update**
- **Project Challenges & Highlights**
- **Next Steps**
- **Questions**



Electrical Power Centre

Tertiary Treatment Facility

Chlorine Contact Tank/Outfall/Red Hill Creek

Main Pumping Station

South Plant Expansion

13.8kV Loop

Contract 1: Main Pumping Station

Contract Value: **\$87.6 Million (Current \$86.2M)**

Construction Began: **May 2017**

Substantial Performance: **August 31, 2022**

Work Performed to Date: **\$85.5 Million (99%)**



Contract 2: Electrical and Chlorination Upgrades

Contract Value: **\$60.9 Million (Current \$62.9M)**

Construction Began: **October 2017**

Substantial Performance: **November 11, 2022**

Work Performed to Date: **\$62.1 Million (99%)**



Contract 3: Tertiary Treatment Upgrades

Contract Value: **\$165.3 Million (Current \$184.5M)**

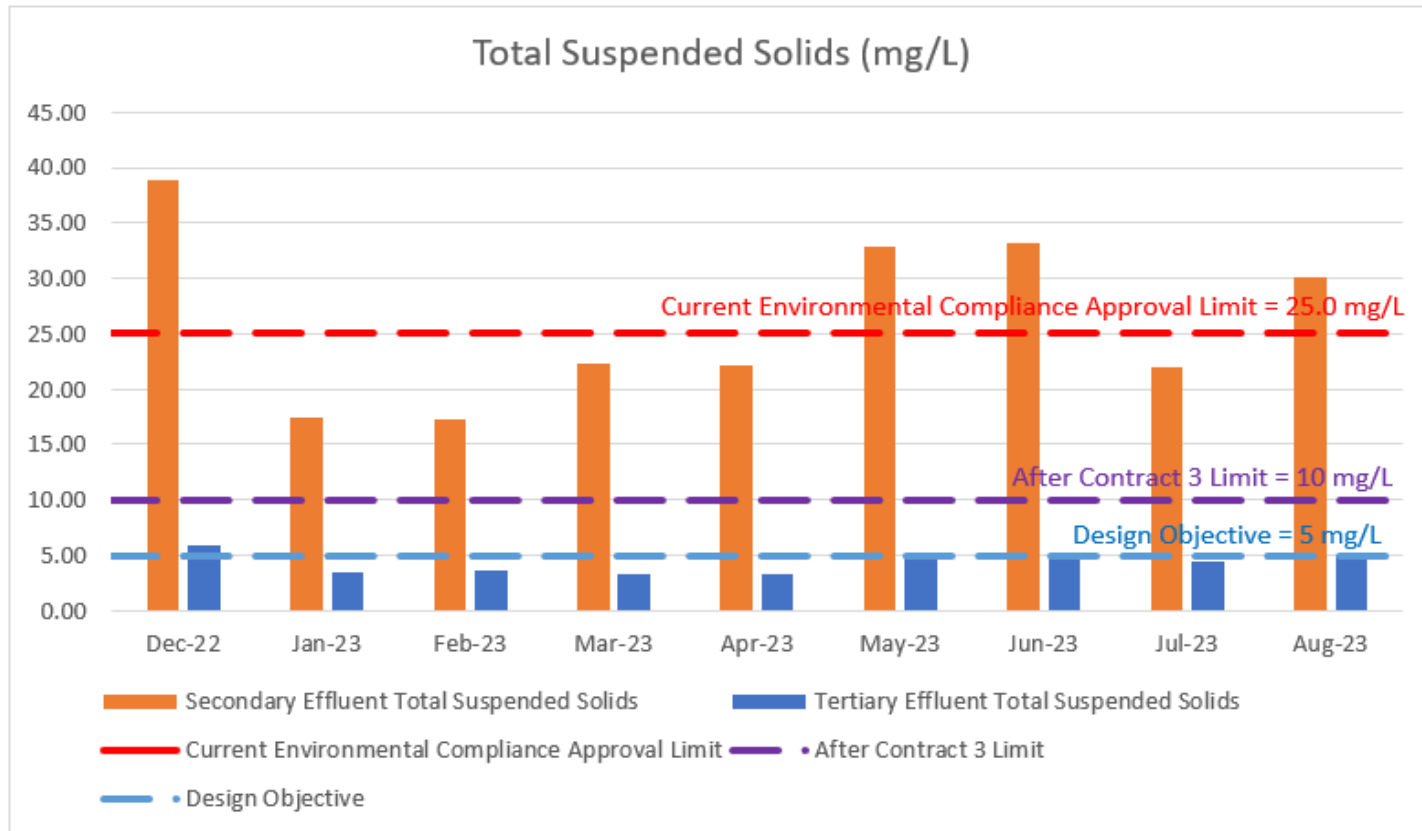
Construction Began: **May 2019**

Substantial Performance: **Expected Q4 2023**

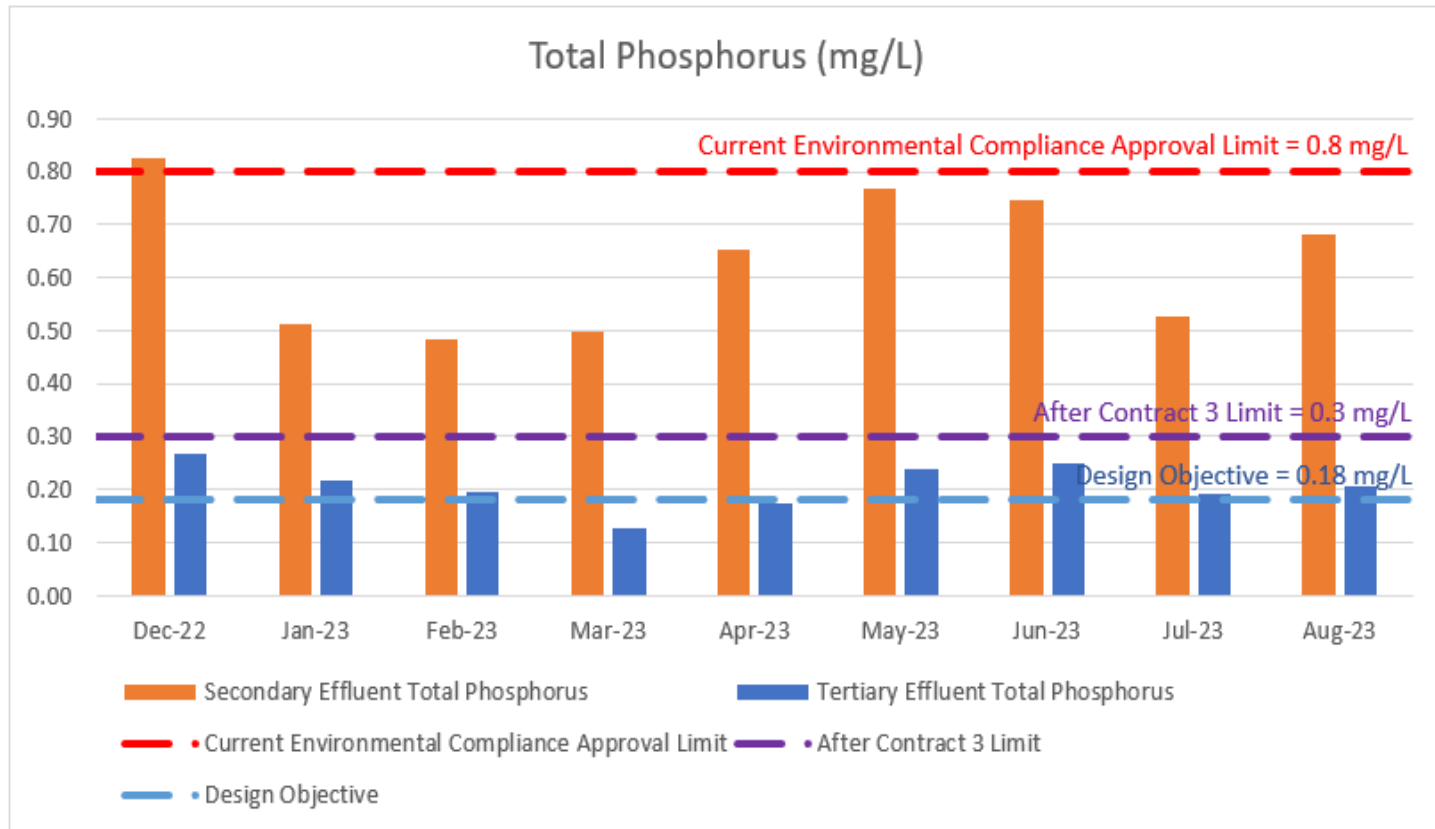
Work Performed to Date: **\$179.9 Million (98%)**



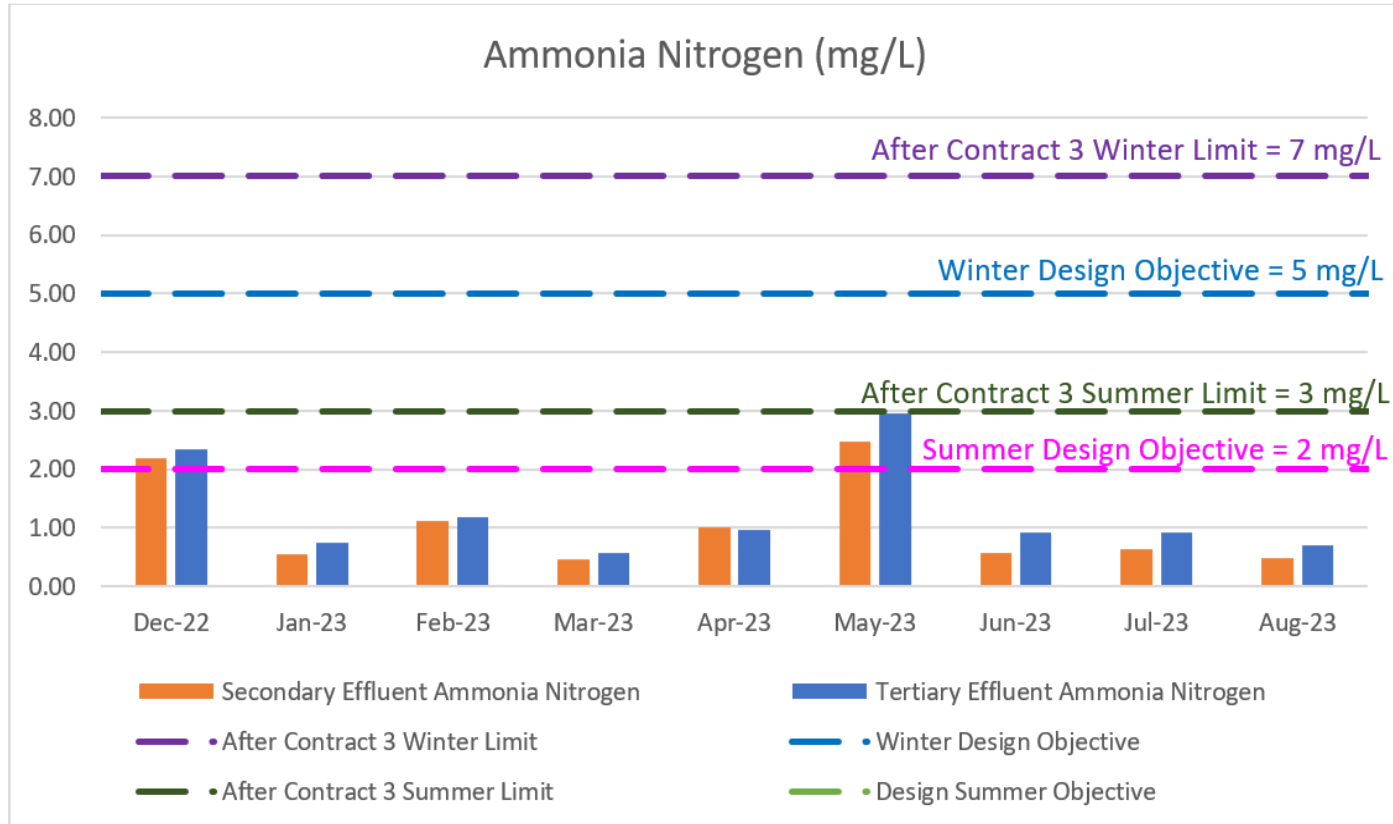
Total Suspended Solids



Total Phosphorus

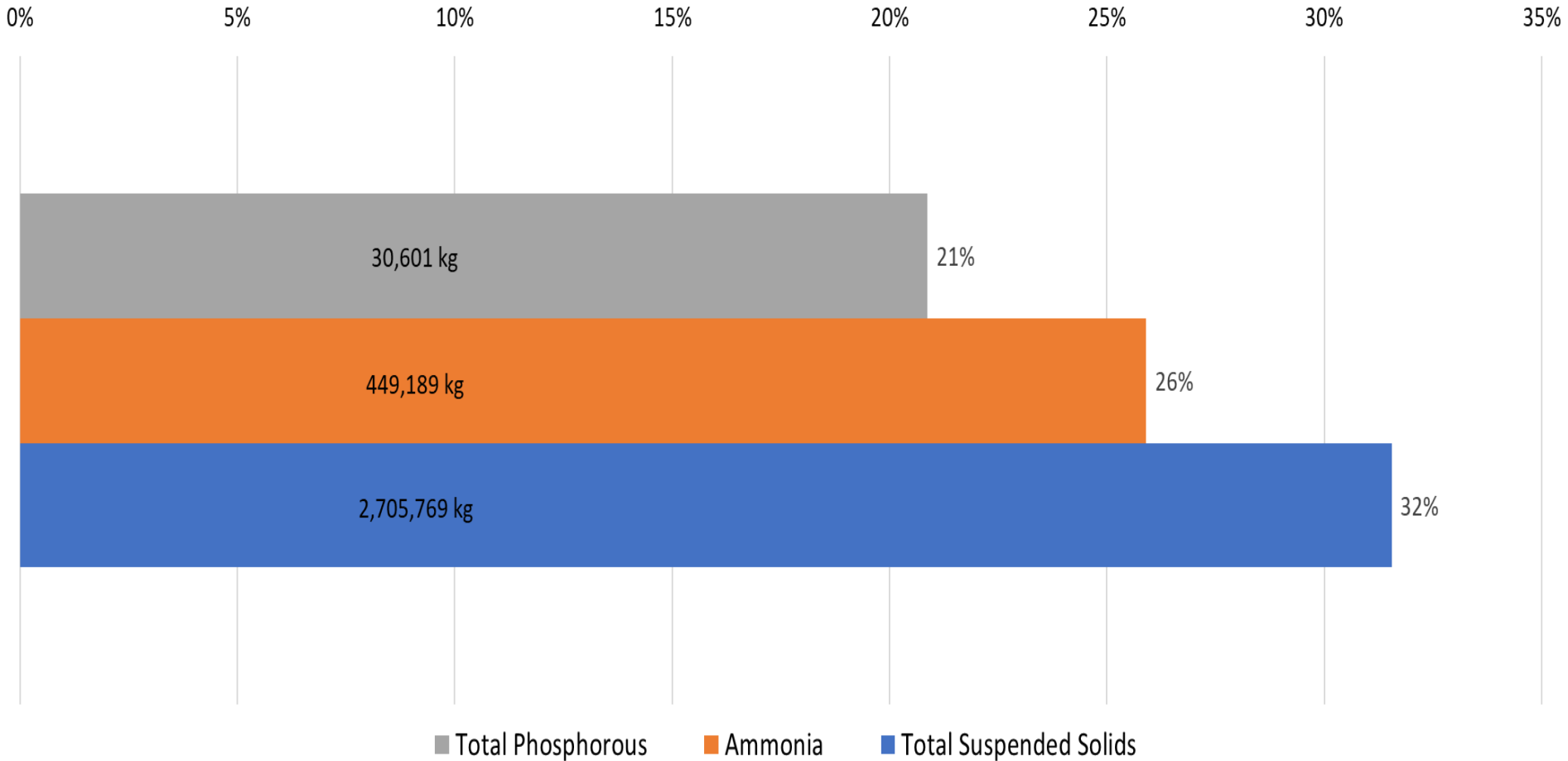


Ammonia Nitrogen



Additional Mass Loadings Removed Post Tertiary Treatment Upgrades

Percentage Additional Mass Removal (%)



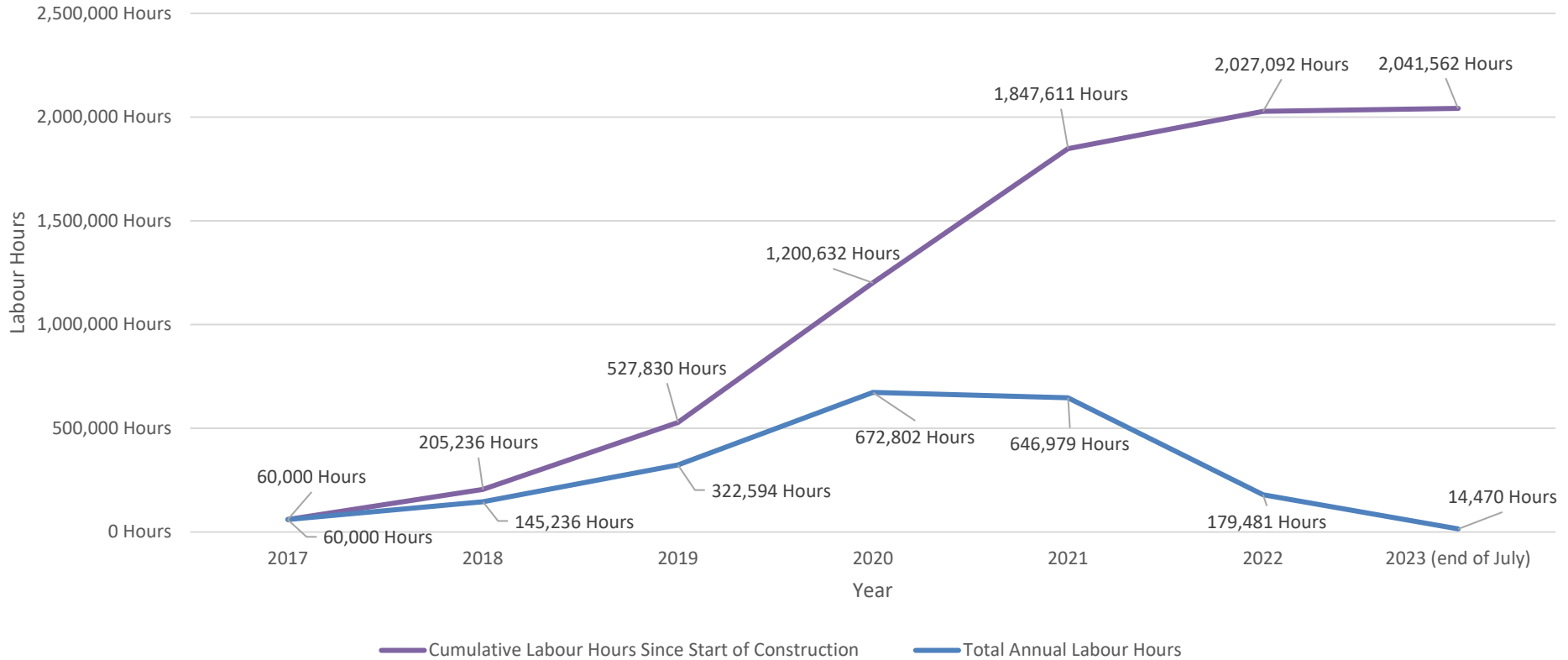
Note: This data set compares the difference in mass removed between Nov 2017 - Aug 2018 (pre-treatment upgrades) and Nov 2022 - Aug 2023 (post-treatment upgrades)

Woodward Upgrades Program

Excess Soil Management

Project / Location	Estimated Quantity (tonnes)	Estimated # of Trucks
[-] P3 Biosolids Management Project; Award Date: Mar 30, 2017	2550	130
[+] Soil (Clean) - OPS 180	2550	130
[-] MPS (C13-60-16); Award Date: Apr 26, 2017	132360	6618
[+] Soil (Clean) - OPS 180	132360	6618
[-] ELU (C13-36-17); Award Date: Sep 13, 2017	3240	162
[+] Soil (Clean) - OPS 180	3220	161
[+] Soil (Contaminated)	20	1
[-] TTU (C13-71-18); Award Date: Mar 26, 2019	245243	11997
[+] Soil (Clean) - OPS 180	142240	7112
[+] Soil (Contaminated)	90738	4537
[+] Soil (Hazardous)	12265	348
Grand Total	383393	18907

Construction Labour Hours Worked Across the Woodward Upgrades Contracts



Next Steps – Media Event

Date: Thursday, October 12th

Time: 9:30am

Location: Woodward Avenue
Wastewater Treatment Plant



Next Steps – Community Appreciation BBQ

Date: Saturday, Oct. 14th

Time: 11:00am – 2:00pm

Location: Steam Museum







QUESTIONS