




INFORMATION REPORT

TO:	Chair and Members Public Works Committee
COMMITTEE DATE:	July 7, 2021
SUBJECT/REPORT NO:	Woodward Upgrades Construction Update (PW20043(b)) (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

Not Applicable

INFORMATION

Further to the recent Information Report (PW20043(a)) presented to the Hamilton Water Sub-Committee, 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. The program is being delivered through three construction projects:

- Contract 1 - Main Pumping Station Project (MPS);
- Contract 2 - Electrical and Chlorination Project (ELU); and,
- Contract 3 - Tertiary Treatment Upgrade Project (TTU).

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

Contract 1 - Main Pumping Station Project:

A new main wastewater pumping station is being constructed to replace the existing pumping station. The MPS project is a \$88M contract that is being constructed by Maple

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Ball Joint Venture and includes the installation of 12 - 700 Hp pumps for a total firm capacity of 1700 million litres per day.

Construction started in May 2017 and has well surpassed its halfway point with \$77M of work performed to date. Some key activities completed to date include:

- Construction of the main pump station wet well and dry well superstructure was fully completed, including the installation of the outside masonry stonework and roofing, along with the HVAC equipment in the mechanical penthouse of the facility;
- The 12 new main pumps, motors and driveshafts were installed in the dry well of the station and interconnecting discharge piping between the pumps was connected into the station outlet collection ring channels; and,
- The main 4160v electrical switchgear and pump Motor Control Centre (MCC) / Variable Frequency Drive (VFD) units were installed in the electrical rooms of the station, and the new transformers were connected to the new 13.8 kV distribution loop, making the new station the first process area to be powered from the new Energy Power Centre.

Over the course of 2021, we will see the completion of the new MPS facility structure including completion of the building services, the start-up and full commissioning of the new MPS facility. In 2022, the City of Hamilton's (City) wastewater collection flow will be fully transitioned to the new MPS station and demolition of the old MPS facility will have been completed.

While construction has progressed well since 2017, the Contractor has experienced construction delays resulting in the project substantial performance date to extend from June 2021 to approximately February 2022.

Contract 2 - Electrical and Chlorination Project:

The Electrical and Chlorination upgrades project is a \$61M contract being undertaken by Alberici Constructors that will replace the two (2) existing electrical substations and existing standby power building with a new Electrical Power Centre (EPC). Dual 13.8 kilo-volt underground distribution loop duct banks around the Wastewater and Water treatment plants and four (4) - three (3) Mega Watt diesel generators providing a total of 12 MegaWatts of emergency standby power are included in the project. The chlorination system is being upgraded to increase chlorination capacity during wet weather flows to provide full disinfection. Construction started in October 2017 and is nearing completion with \$57M of work performed to date.

Some key activities completed to date include:

- The ELU project completed the construction of the new EPC building, including the installation of the four 3MW standby generators, diesel fuel storage tanks, 13,800-volt main switchgear and site-wide electrical distribution system;
- The Water Treatment Plant (WTP) was successfully transferred from the old electrical system onto the new electrical system, allowing the demolition of the WTP electrical substation; and,
- The new Chlorine Evaporator and Chlorinator for the Wastewater Treatment Plant (WWTP) were installed and will be used throughout the entire 2021 disinfection season of the WWTP. New weigh scales have been incorporated at the chlorine rail car unloading facility to enable chemical consumption monitoring by the WTP/WWTP plants.

By the end of 2021, the project will reach the major milestone of substantial performance. The new Energy Power Centre and electrical distribution system will be fully commissioned providing power across the entire plant site, with the old existing system being completely decommissioned and removed.

Contract 3 - Tertiary Treatment Project:

The Tertiary Treatment Project upgrades (TTU) will have the biggest impact on water quality in Hamilton Harbour. The project adds a higher level of treatment (tertiary) to the wastewater treatment process using Disc Filtration technology. In addition, the 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 (2) new clarifiers, new chlorine contact tank and outfall, along with Redhill Creek modifications. This project will allow us to meet the Hamilton Harbour Remediation Action Plan targets, including the provision of full nitrification for more complete ammonia removal, advanced levels of phosphorus removal, and will require the plant to operate under new environmental effluent compliance limits.

The TTU project is a \$165M construction contract that was awarded to North American Construction. Construction started in April 2019 and has reached its two (2) year anniversary, with \$102M of work performed to date:

- Stage 1 of the South Plant expansion was completed, which included the construction of a new 22,000 cubic meter aeration tank AT09, addition of a new secondary clarifier tank #9, and modifications to two (2) existing clarifiers. The start-up and operation of the of the new aeration and secondary tanks was

completed along with demonstrating the nitrification treatment capability of the reconfigured aeration process.

- Structural and mechanical works continued in the new Tertiary Facility and the new effluent outfall channel and headwall construction commenced, along with excavation and concrete works associated with the new Chlorine Contact Tank.
- Completion of the Red Hill Creek Modifications, allowing time for the growth of vegetation prior to the commissioning and operation of the tertiary treatment facility.

Soil Management:

The program continues to experience challenges in construction resulting from the discovery of Polychlorinated biphenyl (PCB) hazardous soil in the vicinity of the new chlorine contact tank and the south secondary treatment clarifier area that was not identified in the geotechnical investigation and subsequently not included within Contract 3.

The City's project team continues to follow the approved soils segregation and sampling program to help mitigate overall costs to the City, however, the costs to date have had an impact on the project budget. Specifically, the total costs in managing these soils is now forecasted to exceed the current project contingency budget within Contract 3 by the summer of this year. The City project team has worked with the Procurement Section to expand the existing purchase order.

The WUP project account has sufficient funds this year to accommodate this request and any potential funding gaps will be included within the 2022 Water, Wastewater and Stormwater Rate Budget process.

In addition, the management of the significant amount PCB soils has impacted Contract 3 construction schedule which is now estimated to reach substantial completion in November 2022, from the original December 30, 2021 date. This delay has also impacted the Green Infrastructure Fund completion timeline of January 31, 2022, however, based on our communication with Infrastructure Canada they are receptive of an extension in which City staff will be submitting a formal extension request in June 2021.

Next Steps:

There is a tremendous amount of effort required over the next one (1) to two (2) years as we commission new equipment, finalize construction and transition the project into operation. Staff are very proud of the collaboration and professionalism amongst all the contractors on site amounting to over one (1) million man-hours worked to date and want to recognize that there have been no recorded lost time injuries.

APPENDICES AND SCHEDULES ATTACHED

Appendix "A" to Report PW20043(b) - Construction Photos.