INFORMATION REPORT

TO:	Chair and Members Public Works Committee
COMMITTEE DATE:	July 8, 2020
SUBJECT/REPORT NO:	Woodward Upgrade Project Construction and Progress Update (PW20043) (City Wide)
WARD(S) AFFECTED:	City Wide
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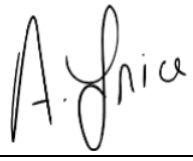
SUBMITTED BY: **SIGNATURE:**	Andrew Grice Director, Hamilton Water Public Works 

COUNCIL DIRECTION

Not Applicable

INFORMATION

The purpose of this report is to provide Council an update on the Woodward Upgrade Project (WUP) which is an integral part of the Clean Harbour Program. The Clean Harbour Program is a series of projects designed to have a direct impact on the health of our local environment, specifically the water quality of Hamilton Harbour (Harbour) and ultimately to support the de-listing of the Harbour as an Area of Concern with the International Joint Commission. The City of Hamilton's (City) largest investment in the Clean Harbour program is a multi-phase plan to upgrade the Woodward Wastewater Treatment Plant (Woodward WWTP). Considering that the Woodward WWTP effluent discharge is the largest single source of water flowing into the Harbour, the quality of the effluent has a direct and powerful impact on the Harbour's water quality and environmental health.

The approximately $380M program remains within the approved budget and despite some schedule delays, is on track to be completed within the Green Infrastructure Fund (GIF) timelines. 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 included in Appendix "A" to attached to Report PW20043.

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 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 surpassed its halfway point with $61M of work performed to date, with the following key activities:

- Construction of the wet well and dry well super structures are nearing completion and precast roof panels have been installed;

- Enhancements to the wet well and distribution channels were implemented following hydraulic modelling that was conducted on the station configuration to improve flow distribution;

- The first phase of a new concrete lined tunnel interconnecting the main influent wastewater pipe to the new pump station was completed;

- Over 10,700 cubic meters of concrete has been poured along with the installation of 2,500 tonnes of structural rebar; and,

- The 12 – 700 Hp pumps were factory tested in Germany and have been installed on their support bases in the drywell of the facility.

Over the course of 2020, we will see the completion of the new MPS facility structure including completion of the building services, structural steel platforms, electrical wiring and high voltage electrical equipment installation, along with the start-up and pre-commissioning of the 12 new pumps. In 2021, the City's wastewater collection flow will be transitioned to the new MPS station and decommissioning and demolition of the old MPS facility will have been completed.

While construction has progressed well, the Contractor is experiencing construction delays beyond the current approved Substantial Completion date of June 2021. The City's project team is closely monitoring and looking for ways to mitigate impacts. One of the efforts undertaken by the Contractor to date to help mitigate the scheduling impact was working double shifts for an extended period of time on the forming and pouring of the station structural concrete walls.

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. 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 Mega Watts 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 has surpassed the 80% completion mark, with $52M of work performed to date with the following key activities:

- Installation of over 3.7km of underground duct bank utilities and 22km of high voltage cabling has been completed;

- Factory acceptance testing and delivery of major electrical equipment, including the four (4) diesel generators, 12 main high voltage distribution switchgear and 17 electrical power transformers and placement at the site;

- Construction of the new Electrical Power Centre building, including the installation of the four (4) – three (3) Mega Watt standby generators, fuel storage tanks and the 13.8 kilo-volt main switch gear; and,

- The new Chlorine Evaporator and Chlorinators for the WWTP were installed and associated pipework including the chlorine distribution trench were completed in preparation for the WWTP disinfection season.

By the end of 2020, we will see the completion of all new 13.8 kilo-volt main and electrical distribution equipment installed, tested and energized and the Energy Power Centre commissioned. In 2021 the new Energy Power Centre will be fully operational, and the two (2) existing electrical substations and standby power building will have been decommissioned and removed.

The project is currently on track to meet the scheduled substantial completion date in June 2021.

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 the one (1) year anniversary, with $35M of work performed to date with the following key activities:

- Initiated construction of the new aeration tank configuration and new secondary clarifier tank addition. In order to move forward with construction, the WWTP capacity has been temporarily reduced from 614MLD to 511MLD. This was facilitated after an extensive collaboration and discussion process with the Ministry of Environment, Climate and Parks (MECP) to gain their acceptance and approval;

- Construction of the new tertiary treatment facility began with initial concrete pours of the filter building base slab and process tank wall sections that will house the 10-disc filter units;

- Red Hill Creek modifications included widening and wildlife enhancements; and,

- Over 2,700 cubic meters of concrete has been poured along with the placement 300 tonnes of structural rebar has been installed to date.

Over the course of 2020, we will see the completion of stage one of the south plant secondary treatment process upgrade which will permit an increase in WWTP capacity to 562MLD. The WWTP capacity will remain at 562MLD until the project is complete and the full 614MLD capacity is re-established. In 2021 construction of the new disc filtration based tertiary treatment facility, chlorine contact tank and modifications to Red Hill Creek will continue.

One of the main challenges in construction to date has been the discovery of a significant amount of Polychlorinated biphenyl (PCB) hazardous soil in the vicinity of the new chlorine contact tank area that was unforeseen and not included within the construction Contract. In order to mitigate the amount of additional costs and schedule impacts, the project team, in consultation with the MECP, developed comprehensive segregation and sampling plans to separate the PCB hazardous soils from the non-hazardous soils. The City's project team is closely monitoring the situation and won't know the full cost and schedule impacts until the excavation work is complete.

The project is currently scheduled to reach substantial completion in December 2021. However, as a result of the issues associated with discovery of the PCB hazardous soils, there may be an impact to the overall project schedule.

Next Steps:

There is a tremendous amount of effort required over the next two (2) to three (3) 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 and want to recognize that there have been no recorded lost time injuries to date.

Additional project updates will be provided to the Public Works Committee as milestones are achieved. Additional information can be found at our website – www.hamilton.ca/cleanharbour.

APPENDICES AND SCHEDULES ATTACHED

Appendix “A” to Report PW20043 – Construction Photographs