INFORMATION REPORT

TO:	Chair and Members Public Works Committee
COMMITTEE DATE:	August 11, 2021
SUBJECT/REPORT NO:	COVID-19 Wastewater Surveillance Initiative (PW21048) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Susan Girt (905) 546-2424 Ext. 2671 Rosemary Eszes-Wegner (905) 546-2424 Ext. 1432 Hector Quintero (905) 546-2424 Ext. 5087
SUBMITTED BY: **SIGNATURE:**	Andrew Grice Director, Hamilton Water Public Works Department 

COUNCIL DIRECTION

Not Applicable

INFORMATION

This report provides a brief summary of the City of Hamilton's (City) ongoing effort to support COVID-19 wastewater surveillance and ongoing research aimed at measuring COVID-19 indicators in wastewater as a potential early indicator to help determine COVID-19 activity in the community. A listing of findings so far is documented and attached as Appendix "A" to Report PW21048.

Studies have shown that a significant proportion of people with active COVID-19 infections shed the coronavirus (called SARS-CoV-2) in their stool, sometimes even before their symptoms start. This allows for centralized measuring of the level of the coronavirus genetic material (known as RNA), which can help shed light on the number of infected people in Hamilton.

Thanks to this innovative research at Children's Hospital of Eastern Ontario Research Institute (CHEO-RI) and the University of Ottawa, we are one of the first communities in

Canada to participate in monitoring of wastewater looking for indicators of the SARS-CoV-2 virus. It is also important to note that for a number of reasons, there is some variability in the data and researchers and engineers are working on improving the Polymerase Chain Reaction (PCR) methodology. Some of the reasons for this variability include: the level of virus in stool may be fairly low; the actual number of people with COVID-19 may be quite low in relation to the total population; and wastewater is a harsh environment which can break down the virus and may break down the viral RNA resulting in lower readings. Nonetheless, ongoing research has observed some correlation with other established COVID-19 measures.

In May 2020, Hamilton Water began supporting this research by providing samples from the Woodward Wastewater Treatment Plant. This support continues to date at a frequency of four (4) times a week. In December 2020, Hamilton Water expanded scope of monitoring by collecting wastewater at sampling sites near two (2) long term care facilities (LTCF). The program focus shifted in May 2021 to explore the feasibility of a larger scale neighbourhood monitoring.

In June 2021, Hamilton Water and the University of Ottawa partnered with Unity Health in Toronto as part of the Government of Canada COVID-19 Immunity Task Force (CITF). The mandate of this task force is to help determine the extent of SARS-CoV-2 infection in Canada. Hamilton Water is providing wastewater samples from one (1) long term care facility in the sewershed.

Hamilton Water also formed a partnership with McMaster University and began freezing/storing samples in September 2020. McMaster had decided to take an alternate route and look for the presence of the live virus, as well as develop an artificial intelligence application that was hoped to be able to predict outbreaks based on changes in routine process control data. This line of research was put on hold in December 2020 when the Ministry of Environment, Conservation and Parks (MECP) unveiled its Wastewater Surveillance Program. The three (3) universities who had developed PCR methods were asked to bring 10 other universities, including McMaster University, on board with PCR analysis of wastewater. Hamilton Water began supplying McMaster University with samples in December 2020 to aid in their PCR method development and verification. McMaster's project was put on hold in April 2021.

The Ontario government is investing more than $12 million in the Wastewater Surveillance Program to detect COVID-19 in wastewater. The province has partnered with 13 academic and research institutions to create a surveillance network to test wastewater samples taken from communities across Ontario. This has the potential to enhance the ability of local public health units to identify, monitor and manage potential COVID-19 outbreaks.

The provincial funding builds on work already underway in several municipalities. Wastewater sampling for the early detection of COVID-19 is taking place in Ottawa, Windsor, Toronto, Casselman, Hamilton and London, as well as the Region of Peel, York Region, Durham Region, Region of Waterloo, and Essex County.

The province is also expanding testing to include some First Nation communities, long-term care homes, retirement residences, shelters and correctional facilities.

Innovative methods for detecting early signs of COVID-19 infections in our communities is an excellent example of the applications of fundamental science. This investment by the provincial government clearly demonstrates its commitment to using Ontario-based scientific strengths.

A component of the MECP surveillance initiative is to develop and support a Data and Visualization Hub as an integrated space available to participants in the Wastewater Surveillance Initiative. The goal of the Data and Visualization Hub is to provide users with easily accessible information related to wastewater surveillance data and to help public health units make complex public health decisions required for the ongoing management of COVID-19.

Conclusion

Wastewater based measurement has been used in recent years to monitor the presence of drugs or disease agents in communities across the globe.

Collaborating with City of Hamilton Public Health, University of Ottawa and CHEO-RI; Hamilton Water embarked in a new journey to explore using wastewater data as a tool to potentially assist Public Health authorities in decision-making and potentially serve as an early warning for subsequent COVID-19 waves of illness in our community.

Coronavirus detection in sewage has the potential to serve as an indicator that is independent of healthcare-seeking behaviours and access to clinical testing. Data from wastewater testing is not meant to replace existing COVID-19 surveillance systems; instead they are meant to complement them.

APPENDICES AND SCHEDULES ATTACHED

Appendix “A” to Report PW21048 - Results from Wastewater SARS-COV-2 Monitoring