CITY AND BOROUGH OF JUNEAU
ALASKA'S CAPITAL CITY

ENGINEERING & PUBLIC WORKS DEPARTMENT

TO: Michelle Hale
Chair, Public Works and Facilities Committee

THROUGH: Katie Koester
Engineering & Public Works Director

FROM: Lori Sowa,
Utilities Engineer

DATE: November 6, 2020

RE: Sewage Surveillance for SARS-CoV-2 Virus in Wastewater

The Wastewater Utility has started a sewage surveillance program for SARS-CoV-2, the virus that causes Covid-19. This program is funded through an appropriation of $75,000 in CARES Act funding. The goal of this program is to monitor and track the relative abundance of virus in our wastewater streams as another means to understand the prevalence of Covid-19 in the community. This information is intended to complement our clinical data, and we hope that it will provide additional information for the EOC to use in making decisions regarding risk level for the community.

Background

Wastewater (or sewage) includes water from household/building use (i.e., toilets, showers, sinks) that can contain human fecal waste, as well as water from non-household sources (e.g., rainwater and industrial use.) We commonly hear about people who are infected with COVID shedding the virus in their respiratory droplets, but the virus is also shed in feces. Wastewater which contains this feces can be tested for RNA from SARS-CoV-2, the virus that causes COVID-19. It is important to note that there is no information to date that anyone has become sick with COVID-19 because of direct exposure to treated or untreated wastewater, and CDC advises that standard practices associated with wastewater treatment plant operations should be sufficient to protect wastewater workers from the virus that causes COVID-19.

Monitoring and Sampling Program

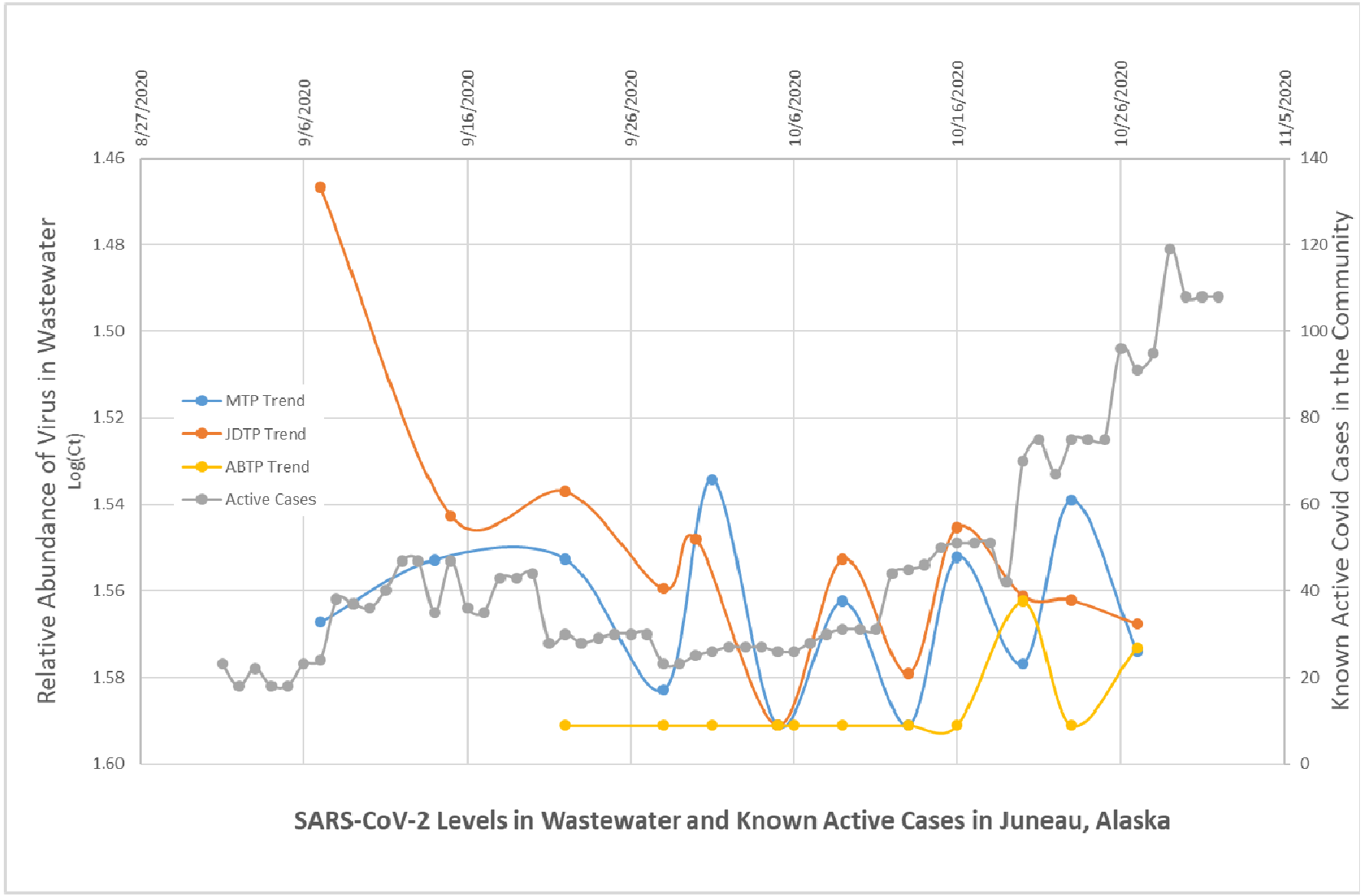
Currently, two samples per week are collected from each of our three treatment plants and sent to a commercial laboratory for analysis. Results are received approximately one week after samples are submitted to the laboratory. There are many variables to be considered in interpreting the data, including factors specific to our sewer systems (size of the sewer shed, commercial and industrial inputs to the treatment system, rainwater influence), as well as factors such as shed rates in feces, which vary over time. Based upon guidance from CDC and the research community, the goal is to look for trends (stable, increasing, or decreasing abundance) rather than try to estimate a specific number of cases in the community.

Data and Results

The wastewater samples collected from each plant are shipped out once per week, and it takes approximately a week to receive lab results once samples are shipped. Data collected so far is displayed on the attached figure along with the known active COVID cases for the community. We are

consulting with University of Alaska Anchorage and Water Research Federation (Denver) researchers on our sampling plan, methods of analysis, and data interpretation.

Initial data indicates that SARS-CoV-2 has been consistently present at the JD and Mendenhall plants, and more recently has been detected at the Auke Bay Treatment plant. The levels of virus detected at each plant fluctuates, and some rainwater influence (dilution) is suspected. Starting next week, our samples will be sent to a different laboratory that will report results in viral counts per volume, and this should help with data interpretation. We will continue to work with the EOC and Public Health on how to incorporate this data into our risk matrix, and how to make it available to the public.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9/6/2020
9/16/2020
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1.46
1.48
1.50
1.52
1.54
1.56
1.58
1.60
140
120
100
80
60
40
20
0
Relative Abundance of Virus in Wastewater
Log(Ct)
Known Active Covid Cases in the Community
MTP Trend
JDTP Trend
ABTP Trend
Active Cases
SARS-CoV-2 Levels in Wastewater and Known Active Cases in Juneau, Alaska