



# HALEY WARD

ENGINEERING | ENVIRONMENTAL | SURVEYING

FORMERLY:  CES INC

July 19, 2021

Burlington Department of Public Works  
Attn: John Sanchez, Director  
25 Center Street  
Burlington, Massachusetts 01803

## Re: TC & Ecoli Incident report

Dear Mr. Sanchez

Haley Ward Inc. was requested by Burlington to conduct an evaluation of the June 2021 drinking water bacteria sample results, where most samples were positive for Escherichia coli (*E.coli*) and Total Coliform bacteria. The result of our evaluation indicated that there was a high potential that the samples were un-intentional contaminated after the courier picked up the samples from Burlington and the samples were analyzed by the laboratory.

On June 16, 2021 Burlington conducted their required weekly Total Coliform bacteria sampling at eleven (11) routine system sites, two (2) finish water treatment plants and three (3) raw water supply sites. Massachusetts Department of Environmental Protection (MassDEP) agency regulates the Total Coliform Rule that requires Public Water Suppliers to test weekly for Total Coliform bacteria. If a sample is Total Coliform positive then the laboratory tests the sample for the fecal indicator *E.coli*.

The following were the results of that sample round.

- Eight (8) of the Eleven (11) routine system samples were Total Coliform bacteria positive,
- Three (3) of the Eight (8) routine system samples were *E.coli* positive,
- One (1) Water Treatment Plant finish water tested positive for Total Coliform bacteria, but negative for *E.coli*.

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63 Great Road, Suite 200, Maynard, MA 01754  
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Burlington conducted a full round of confirmation bacteria sampling on June 18, 2021, which included the June 16<sup>th</sup> sites that tested positive for Total Coliform plus their associated upstream and downstream sites along with the remaining routine distribution and supply sites, totaling 37 samples. All repeat/confirmation round samples came back negative for Total Coliform.

The result of our meetings with Burlington water representatives revealed no known operational changes, equipment failures, sanitary safeguard failures or major water main breaks that may have contributed to Total Coliform or *E.coli* positive samples. This was an indication that the contamination might not have been in the water distribution system, but maybe an un-intentional contamination of the samples might have occurred.

The total chlorine residuals in the samples throughout the water distribution system during the June 16<sup>th</sup> and June 18<sup>th</sup> were within the typical range. Chlorine residuals remaining within the typical range, without operational changes, can indicate there was no additional chlorine demand from wide-spread Total Coliform or *E.coli* bacteria.

To remove a system-wide Total Coliform and *E.coli* contamination of the water distribution system, Burlington would have to completely flush the system and increase the chlorine residual to much higher residual than 2 ppm to disinfect the entire water system. None of this occurred.

It is our conclusion, based on the whole of our investigation, that the Burlington samples were taken in accordance with Burlington water sampling standard operating procedures and industry standards, and the samples were packaged properly for pick up by the courier for delivery to the laboratory in Hudson, MA. Therefore, it is our opinion that the samples may have been un-intentionally contaminated somewhere from the time the courier picked up the samples in Burlington and the completion of the analysis at the Warwick R.I. Laboratory. We cannot attest to the procedures utilized by the laboratory for the delivery and analysis at the laboratory.

Thank you for the opportunity of performing this evaluation, and if you have any questions, please contact me at any time.

Sincerely,  
Haley Ward, Inc.

Gregory J. Eldridge  
Vice President – Senior Project Manager

Cc: Russ Makiej