

Date: 12/11/2020

To: Mitchell Gayer

From: David Ekstrand

Kadeem Hill

Veronica Kero, CIH, P.E.

Re: (NJIT NEWARK CAMPUS WASTEWATER DISCHARGE SARS-CoV-2

SAMPLING & PCR ANALYSIS) WEEKLY DATA SUMMARY FOR 12/7/2020-

12/9/2020 {Omega Project #: 20-1177}

Attachment(s):

• Results Summary Trends

Prestige EnviroMicrobiology Laboratory Analysis Reports for samples collected 12/7-12/9/2020

Project Overview:

In order to proactively predict potential escalation of COVID-19 cases in occupied campus dormitory buildings, 24-hour composite wastewater (WW) discharge sampling is being performed, followed by 3rd party laboratory analysis in accordance with the published method cited on the attached laboratory analysis report using the approved CDC EUA Kit.

Weekly Data Summary:

| WW Discharge Sampling Location | 24-hr Sampling Date Range | 2019- nCoV (N1 Protein) | Cycle Threshold Value ³ (N1 Protein) | 2019-nCoV (N2 Protein) | Cycle Threshold Value ³ (N2 Protein) | Conc. (Copies of RNA/mL) |
|--------------------------------------|---------------------------------|----------------------------------|-------------------------------------------------|------------------------------|-------------------------------------------------|--------------------------------|
| Oak-16 | 12/7- 12/8/2020 | ND | ND | ND | ND | NA |
| Cypress-15 | 12/7- 12/8/2020 | Positive | 35.38 | Positive | 35.50 | 28 |
| Laurel M-15 | 12/7- 12/8/2020 | Positive | 38.56 | Positive | 38.26 | 4 |
| Laurel E-13 | 12/7- 12/8/2020 | Positive | 29.74 | Positive | 29.84 | 1,600 |
| Redwood-14 | 12/8- 12/9/2020 | ND | ND | ND | ND | NA |
| GRK Honors-16 | 12/8- 12/9/2020 | Positive | 30.66 | Positive | 30.90 | 440 |

Local Trending:

According to covidactnow.org online database for Essex County:

Active or imminent outbreak.

Essex County is either actively experiencing an outbreak or is at extreme risk. COVID cases are exponentially growing and/or Essex County's COVID preparedness is significantly below international standards.

Essex Infection Rate 12/2 (most recent data): 1.07% (increasing)
Essex Positivity Rate 12/3 (most recent data): 10.7% (increasing)
Essex Daily New Cases Per 100k (as of 12/10): 57.7 (at a critical level)

Discussion of CT Score

The cycle threshold (Ct) refers to the number of cycles in an RT-PCR assay needed to amplify viral RNA to reach a detectable level. The Ct value can thus indicate the relative viral RNA level in a specimen (with lower Ct values reflective of higher viral levels).

Since the assessment of COVID-19 in sewers is an ongoing developing project the following is intended as a guideline only.

Omega Recommendations:

| CT Value | RNA/L | Occupant Risk | Recommendation |
|---------------|-------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| >40 | <2,000 | None Detected – No Risk identified above normal for the surrounding area. | No Action |
| 39.99 – 37.5 | 2,001 – 20,000 | Low | Voluntary COVID-19 Testing for occupants |
| 37.4 – 32.59 | 20,001 – 200,000 | Moderate | Non-Voluntary COVID-19 testing for all dorm occupants. |
| 32.58 - 29.11 | 200,001 – 1,999,999 | High | Non-Voluntary COVID-19 testing for all dorm occupants. Occupant isolation until test results are received. |
| 29.1 – <26.49 | 2,000,000 - >20,000,000 | Very High | Occupant isolation for a minimum of a week. Non-Voluntary COVID-19 testing for all dorm occupants at the start and end of the week |

Please note, there is an inverse relationship between CT values and RNA/L.

Summary

Trending:

- Cypress- *increased* RNA positive results (moderate risk).
- Laurel Extension *increased* RNA positive results (high risk)
- Laurel Main *decreased* RNA positive result (now low risk)

- Greek Houses/Honors increased RNA positive results (now high risk)
- Redwood, Oak no change (ND)

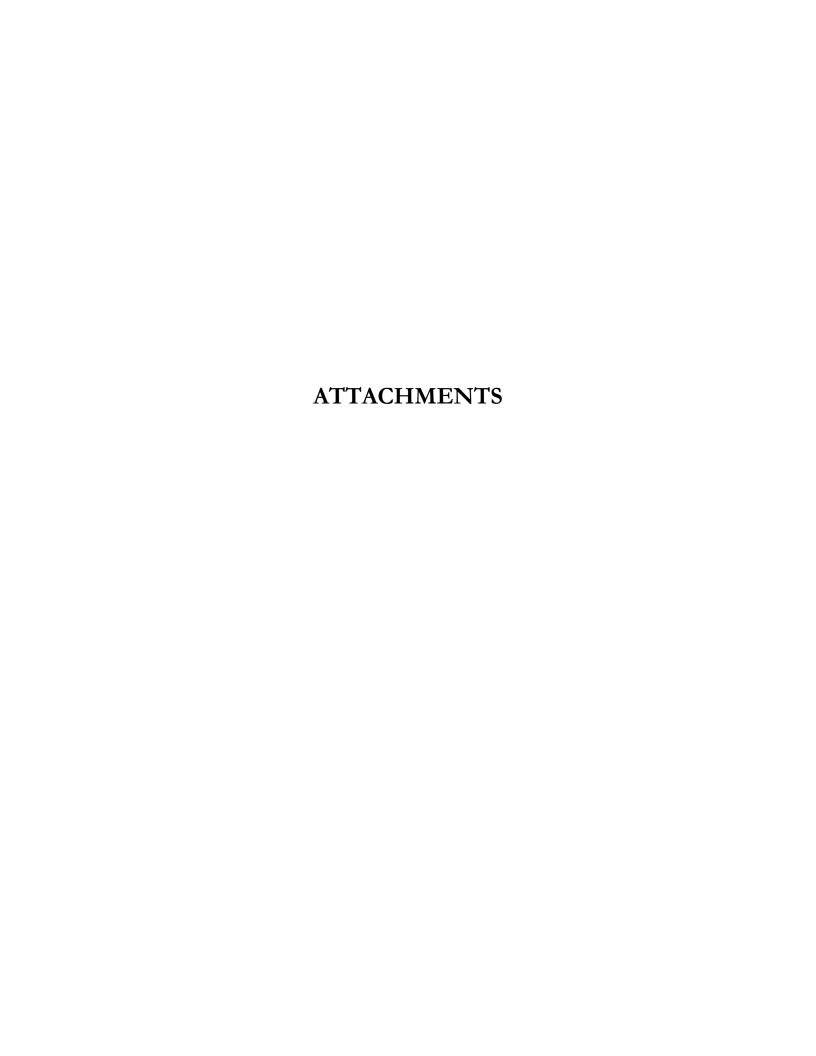
Depending upon NJIT policies Omega recommends:

- For confirmed cases, students should be removed from shared rooms and quarantined in single rooms
- Encourage adherence to standard precautions (mask, social distancing, and personal hygiene).
- Discourage unnecessary social interactions both in the building and elsewhere on campus until negative test results are received.
- Consider installing a temperature checking camera at residence halls entrances and requiring students to undergo a temperature check before entering the building.
- (1) Current information indicates that wastewater testing may reveal the presence of Covid-19 4 or 5 days prior to clinical tests or the development of symptoms. If feasible, NJIT may want to encourage occupants to take two tests, approximately 4 days apart.

Results Summary Table

| | | Сур | oress | | | Greek | Village | | | Hoi | nors | | Ι | aurel-E | extension | | | Laure | l-Main | | | | Oak | | | Redv | vood | |
|----------------|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|
| Week Ending | 2019- nCoV (N1) | CTV* (N1) | 2019 n-CoV (N2) | CTV* (N2) | 2019 n-CoV (N1) | CTV* (N1) | 2019 n-CoV (N2) | CTV* (N2) |
| 8/28/2020 | | | | | ND | ND | ND | ND | | | | | | | | | ND | ND | ND | ND | ND | ND | ND | ND | | | | |
| 9/4/2020 | ND | ND | | | | | ND | ND | ND | ND | ND | ND | ND | ND | | | | |
| 9/11/2020 | ND | ND | ND | ND | ND | ND | ND | ND | | | | | | | | | ND | ND |
| 9/18/2020 | Positive | 35.68 | Positive | 35.49 | ND | ND | ND | ND | | | | | ND | ND | ND | ND | | | | | ND | ND | ND | ND | ND | ND | ND | ND |
| 9/25/2020 | ND | ND |
| 10/2/2020 | ND | ND |
| 10/9/2020 | ND | ND |
| 10/16/2020 | ND | ND | Positive | 32.88 | Positive | 33.32 | ND | ND | ND | ND | ND | ND | ND | ND |
| 10/23/2020 | ND | ND | Positive | 35.62 | Positive | 33.78 | ND | ND | ND | ND | ND | ND | ND | ND |
| 10/30/2020 | ND | ND | ND | | Positive | | | 31.6 | ND | ND | ND | ND | ND | ND | ND | ND |
| 11/6/2020 | | | Positive | | ND | ND | ND | ND | ND | ND | ND | ND | | 37.65 | Positive | | | | Positive | | ND | ND | ND | ND | ND | ND | ND | ND |
| 11/13/2020 | | | | | | ND | ND | ND | ND | ND | ND | | Positive | | | | | | Positive | 34.26 | | ND | ND | ND | ND | ND | ND | ND |
| 11/20/2020 | | | | | ND | ND | ND | ND | ND | ND | ND | | Positive | | Positive | | | ND | ND | ND | ND | ND | ND | | Positive | | Positive | l e |
| 11/27/2020 | | | Positive | | ND | ND | ND | ND | ND | ND | ND | | Positive | | Positive | - | | | | | ND | ND | ND | ND | ND | ND | ND | ND |
| 12/4/2020 | ND | ND | ND | | Positive | | Positive | | | | Positive | 36.08 | ND | ND | ND | ND | ND | ND | ND | ND |
| 12/11/2020 | Positive | 35.38 | Positive | 35.50 | Positive | 30.66 | Positive | 30.90 | Positive | 30.66 | Positive | 30.90 | Positive | 29.74 | Positive | 29.84 | Positive | 38.56 | Positive | 38.26 | ND | ND | ND | ND | ND | ND | ND | ND |
| 12/18/2020 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12/25/2020 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Note: CTV score decreases with increasing virus detected (> 40 = ND)



Prestige EnviroMicrobiology, Inc.

Analytical Test Report

Client: Omega Environmental Services, Inc., 280 Huyler Street, South Hackensack, NJ 07606

Client Project/Name: 20-1177

Sample date: 12-07-2020 & 12-08-2020

Submittal date: 12-8-2020 Sample received: 12-9-2020

Samples submitted by: Val Rublikov

Date analysis completed: December 9, 2020

Prestige Report number: 201209-01

RT-PCR 2019-nCoV: Analysis of Water samples for the detection of SARS-CoV-2 Genetic Markers

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|--------------------------------------------|---------------------------|------------------------------------------------------------|---------------------------|-------------------------------------------------------|-----------------------------|
| Prestige # Client sample ID Location | 2019-nCoV (N1 Protein) | Cycle Threshold (Ct) Value ³ (N1 Protein) | 2019-nCoV (N2 Protein) | Cycle Threshold Value ³ (N2 Protein) | Conc. (copies of RNA/mL) |
| 201209-01-001 Oak-16 | ND | ND | ND | ND | NA |
| 201209-01-002 Cypress-15 | Positive | 35.38 | Positive | 35.50 | 28 |
| 201209-01-003 Laurel-M-15 | Positive | 38.56 | Positive | 38.26 | 4 |
| 201209-01-004 Laurel-E-13 | Positive | 29.74 | Positive | 29.84 | 1,600 |

| recport approved. | Theresa Lehman, MPH, Lab Director |
|-------------------|-----------------------------------|
| Report approved: | Thuesa Jehman_ |

Technical Manager:

Chin S Yang, Ph.D.

Analyst: Ching-Yi Tsai, Ph.D.

The samples in this report were received in good, acceptable conditions. Results relate only to the items tested.

 Wastewater samples are processed following the protocol described in the article: Ahmed, W., et al. 2020. First confirmed detection of SARS-CoV-2 in untreated wastewater in Australia: A proof of concept for the wastewater surveillance of COVID-

19 in the community. Science of the Total Environment 728. https://doi.org/10.1016/j.scitotenv.2020.138764

3. The primers and probes in 2019-nCoV CDC EUA Kit are designed for the detection of the two SARS-CoV-2 genes that encode for the N1 and N2 proteins. The kit is manufactured and supplied by Integrated DNA Technologies and approved by the U.S. Centers for Disease Control and Prevention (CDC). Three controls, two positive controls for N proteins and one internal control for the RNA extraction process, are simultaneously run with the samples.

4. Cycle Threshold Value refers to the number of cycles required for the fluorescent signal to cross the detectable threshold in Reverse Transcriptase Polymerase Chain Reaction (RT-PCR); a lower cycle threshold value indicates a higher viral load.
5. ND = not detected, no genetic marker is detected within 40 PCR cycles. NA = not applicable. The detection limit is 10 copies/reaction.

Prestige EnviroMicrobiology, Inc. Tel: 856-767-8300 242 Terrace Boulevard, Suite B-1, Voorhees, New Jersey 08043

www.Prestige-em.com

Prestige Proj.#: 201209_0

Chain-of-Custody and Analysis Request Form

| Contact Name: 280 Huyler St., S. Hackensack, NJ Phone: 2014; Contact Name: David Ekstrand Phone: 201-522-9879 E-mail: davide@omega-env.com/lab@omega-env.com | ompany Name: | | Omega Environmental Services | ces | | Client Proj. #: 20-1177 | : 20-1177 |
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| Phone: 201-522-9879 Water | | | | | | Date Sampled: 12 | 107 - 12/08/2020 |
| Location or source Sample type Area (inch²) analysis requests Turnaround time* 1 € Water PCR for COVID19 Same Day Mi - 1 € Water PCR for COVID19 Same Day PCR for COVID19 Same Day E - 13 Water PCR for COVID19 Same Day Water PCR for COVID19 | ontact Name: | David Ekstrand | - E | hone: 201-522 | | -mail: davide@omeg | a-env.com/lab@omega-env.cor |
| 16 Water PCR for COVID19 15 Water PCR for COVID19 € - 13 Water PCR for COVID19 . Water PCR for COVID19 . Water PCR for COVID19 | Sample ID | Location or source | Sample type | Area (inch²) | Analysis requests code or description | - | Notes or special instructions |
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Samples Submitted by: (print) Val Rublike Samples Submitted by: (sign) Julie Fang Date & time received: Received by: (sign & print)

B+45-01

Delivered by: Fedex, JPS, USPO, in person Rev 05 12-11-2019

Date submitted: 12/08/2020

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Prestige EnviroMicrobiology, Inc.

Analytical Test Report

Client: Omega Environmental Services, Inc., 280 Huyler Street, South Hackensack, NJ 07606

Client Project/Name: 20-1177

Sample date: 12-8-2020 & 12-9-2020

Submittal date: 12-9-2020 Sample received: 12-9-2020

Samples submitted by: David Ekstrand

Date analysis completed: December 10, 2020

Prestige Report number: 201209-06

RT-PCR 2019-nCoV: Analysis of Water samples for the detection of SARS-CoV-2 Genetic Markers

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|--------------------------------------------|---------------------------|------------------------------------------------------------|---------------------------|-------------------------------------------------------|-----------------------------|
| Prestige # Client sample ID Location | 2019-nCoV (N1 Protein) | Cycle Threshold (Ct) Value ³ (N1 Protein) | 2019-nCoV (N2 Protein) | Cycle Threshold Value ³ (N2 Protein) | Conc. (copies of RNA/mL) |
| 201209-06-039 Redwood-14 | ND | ND | ND | ND | NA |
| 201209-06-040 GRK Honor-16 | Positive | 30.66 | Positive | 30.90 | 440 |

| Report approved: | Thuesa Jehman |
|------------------|-----------------------------------|
| | Theresa Lehman, MPH, Lab Director |

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Theresa Delinial, Wil 11, Day Director

Technical Manager:

Analyst: Ching-Yi Tsai, Ph.D.

1. The samples in this report were received in good, acceptable conditions. Results relate only to the items tested.

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- Wastewater samples are processed following the protocol described in the article: Ahmed, W., et al. 2020. First confirmed detection of SARS-CoV-2 in untreated wastewater in Australia: A proof of concept for the wastewater surveillance of COVID-19 in the community. Science of the Total Environment 728. https://doi.org/10.1016/j.scitotenv.2020.138764
- 3. The primers and probes in 2019-nCoV CDC EUA Kit are designed for the detection of the two SARS-CoV-2 genes that encode for the N1 and N2 proteins. The kit is manufactured and supplied by Integrated DNA Technologies and approved by the U.S. Centers for Disease Control and Prevention (CDC). Three controls, two positive controls for N proteins and one internal control for the RNA extraction process, are simultaneously run with the samples.
- 4. Cycle Threshold Value refers to the number of cycles required for the fluorescent signal to cross the detectable threshold in Reverse Transcriptase Polymerase Chain Reaction (RT-PCR); a lower cycle threshold value indicates a higher viral load.
 5. ND = not detected, no genetic marker is detected within 40 PCR cycles. NA = not applicable. The detection limit is 10 copies/reaction.

Prestige Proj.#: 201209-06

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Prestige EnviroMicrobiology, Inc. Tel: 856-767-8300 242 Terrace Boulevard, Suite B-1, Voorhees, New Jersey 08043

Chain-of-Custody and Analysis Request Form

| Company Name: | Omega Envi | Omega Environmental Services | SS | | Client Proj. #: 20-1177 | 20-1177 |
|-----------------------------------------------------------------------------------------|----------------------|-------------------------------|---------------------|------------------------------------------|---------------------------|------------------------------------------------|
| Company Address: | 280 Huyler St., | Huyler St., S. Hackensack, NJ | F) | | PO#: | 4 |
| , | | | | | Date Sampled: 12/8 - 13/4 | h/e1-8/2 |
| Contact Name: David Ekstrand | rid Ekstrand | ୟା | Phone: 201-522-9879 | 1 | -mail: davide@omeg | E-mail: davide@omega-env.com/lab@omega-env.com |
| Sample ID | Location or source | Sample type | Area (inch²) | Analysis requests code or description | Turnaround time* | Notes or special instructions |
| REDWOOD - 14 | 41- | Water | | PCR for COVID19 | Same Day | |
| GRK-HUNDAS-16 | 91-1 | Water | | PCR for COVID19 | Same Day | |
| | | Water | | PCR for COVID19 | Same Day | |
| | | Water | | PCR for COVID19 | Same Day | |
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| | | Water | | PCR for COVID19 | | |
| *Indicate your pequest pither standard (3 business days) next day same day or Saturday. | et either etandard (| 3 histinger dave) | next day same | day or Saturday. | | |

Samples Submitted by: (print) DAVID E1697AANN Samples Submitted by: (sign) D. Jak

32300M Delivered by: Fedex, UPS, USPO, in person Wax/8/81 Date & time received:

Controlled Copy Property of Prestige EnviroMicrobiology, Inc.

Received by: (sign & print)

Rev 05 12-11-2019

Date submitted: 12/9/20