OMEGA ENVIRONMENTAL SERVICES, INC

Date: 1/25/2021

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 1/18/2021-1/20/2021** {Omega Project #: 21-1020}

Attachment(s):

- *Results Summary Trends*
- *Prestige EnviroMicrobiology Laboratory Analysis Reports for samples collected 1/18-1/20/2021*

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-01	1/18-1/20/2021	ND	ND	ND	ND	NA
Laurel M-01	1/18-1/20/2021	ND	ND	ND	ND	NA
Cypresss-01	1/18-1/20/2021	ND	ND	ND	ND	NA
Greek Honors-01	1/18-1/20/2021	Positive	34.80	Positive	35.96	11
Laurel E-01	1/19-1/20/2021	Positive	31.48	Positive	32.31	150

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 1/14 (most recent data): 1.01% (decreasing)
Essex Positivity Rate 1/19 (most recent data): 9.2% (increasing)
Essex Daily New Cases Per 100k (as of 1/21): 53.9 (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:

(Table updated 1/25/21)

CT Value	RNA/mL	Occupant Risk	Recommendation
>40	<2	None Detected – No Risk identified above normal for the surrounding area.	No Action
39.99 – 34.68	2 – 20	Low	Voluntary COVID-19 Testing for occupants
34.67 – 31.26	20– 200	Moderate	Non-Voluntary COVID-19 testing for all dorm occupants.
31.25 – 28.94	200– 1,999	High	Non-Voluntary COVID-19 testing for all dorm occupants. Occupant isolation until test results are received.
28.93 – <25.07	2,000- >20,000	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

- Positive results in Greek/Honors and Laurel Extension indicate the presence of infected occupants.

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 2021

Week Ending	Cypress					Greek/Honors Combined					Honors Only					Laurel-Extension					Laurel-Main					Oak					Redwood				
	2019-nCoV (N1)	CTV* (N1)	2019 n-CoV (N2)	CTV* (N2)	RNA/ mL	2019 n-CoV (N1)	CTV* (N1)	2019 n-CoV (N2)	CTV* (N2)	RNA/ mL	2019 n-CoV (N1)	CTV* (N1)	2019 n-CoV (N2)	CTV* (N2)	RNA/ mL	2019 n-CoV (N1)	CTV* (N1)	2019 n-CoV (N2)	CTV* (N2)	RNA/ mL	2019 n-CoV (N1)	CTV* (N1)	2019 n-CoV (N2)	CTV* (N2)	RNA/ mL	2019 n-CoV (N1)	CTV* (N1)	2019 n-CoV (N2)	CTV* (N2)	RNA/ mL	2019 n-CoV (N1)	CTV* (N1)	2019 n-CoV (N2)	CTV* (N2)	RNA/ mL
1/18-1/20	ND	ND	ND	ND	NA	Positive	34.80	Positive	35.96	11	---	---	---	---	---	Positive	31.48	Positive	32.31	150	ND	ND	ND	ND	NA	Positive	32.88	Positive	33.32	2,100	---	---	---	---	---

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

N1: N1 Indicator Protein

N2: N2 Indicator Protein

ND: None Detected

CTV: Cycle Threshold Value

ATTACHMENTS

Prestige EnviroMicrobiology, Inc.

Analytical Test Report

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

Client Project/Name: 21-1020

Sample date: 01-18-2021 & 01-19-2021

Submittal date: 01-19-2021

Sample received: 1-20-2021

Samples submitted by: Val Rublikov

Date analysis completed: January 20, 2021

Prestige Report number: 210120-01

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

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)
210120-01-001 Oak-01	ND	ND	ND	ND	NA
210120-01-002 Laurel M-01	ND	ND	ND	ND	NA
210120-01-003 Cypress-01	ND	ND	ND	ND	NA
210120-01-004 Greek Honors-01	Positive	34.80	Positive	35.96	11

Report approved: Theresa Lehman

Theresa Lehman, MPH, Lab Director

Technical Manager:

Chin S Yang, Ph.D.

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.
2. 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 www.Prestige-em.com
242 Terrace Boulevard, Suite B-1, Voorhees, New Jersey 08043

Prestige Proj.#: 210120-01

Chain-of-Custody for SARS-CoV-2 (COVID-19 virus) RT-PCR Analysis Request Form

Company Name: Omega Environmental Services
Company Address: 280 Huyler St., S. Hackensack, NJ 07606

Client Proj. #: 21-1020
PO#:
Date Sampled: 01/18 - 01/19/2021

Contact Name: David Ekstrand Phone: 201-522-9879 E-mail: davidE@Omega-env.com; Lab@Omega-env.com

Sample ID	Location or source	Sample Type (See below)[1]	Area sampled (in^2) Air Volume (L)	Analysis requests **P/A** = Presence/Absence **Quant** = Quantitative	Turnaround time (See below)[2]	Notes or special instructions
Oak -	01	W		Quant	SD	
Laurel	M - 01	W		Quant	SD	
Cypress	- 01	W		Quant	SD	
Greek Honors	- 01	W		Quant	SD	

1. Sample Type Codes	AC-P - Air Cassette-PTFE	AC-G - Air Cassette-Gel	SW - Swab	W - Wastewater	Others – Please indicate
2. Turnaround Time	STD – 3 Business Days	ND – Next Day	SD - Same Day		

Samples Submitted by: (print) Val Rublievv Samples Submitted by: (sign) Date submitted: 01/19/2021

Received by: (sign & print) Ching-Yi Tsai - Ching Yi Date & time received: 1/20/2021, 11:25am Delivered by: Fedex, UPS, USPO, in person

Prestige EnviroMicrobiology, Inc.

Analytical Test Report

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

Client Project/Name: 21-1020

Sample date: 1-19-2021 & 1-20-2021

Submittal date: 1-20-2021

Sample received: 1-21-2021

Samples submitted by: David Ekstrand

Date analysis completed: January 21, 2021

Prestige Report number: 210121-01

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

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)
210121-01-001 Laurel E-01	Positive	31.48	Positive	32.31	150

Report approved: Theresa Lehman
Theresa Lehman, MPH, Lab Director

Technical Manager:
Chin S Yang, Ph.D.

Analyst: Ching-Yi Tsai, Ph.D.

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242 Terrace Boulevard, Suite B-1, Voorhees, New Jersey 08043

Prestige Proj.#: 21021-01

Chain-of-Custody for SARS-CoV-2 (COVID-19 virus) RT-PCR Analysis Request Form

Company Name: OMEGA

Company Address: 280 HUYLER ST.
S. HACKENSACK, NJ

Client Proj. #: ~~21~~ 21-1020

PO#:

Date Sampled: 1/19-1/20/21

Contact Name: DAVID EKSTRAND Phone: 201-522-9879 E-mail:

Sample ID	Location or source	Sample Type (See below)[1]	Area sampled (in^2) Air Volume (L)	Analysis requests **P/A** = Presence/Absence **Quant** = Quantitative	Turnaround time (See below)[2]	Notes or special instructions
LAUREL E-01		W	—	QUANT	SD	
—	—	—				
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1. Sample Type Codes	AC-P - Air Cassette-PTFE	AC-G - Air Cassette-Gel	SW - Swab	W - Wastewater	Others – Please indicate
2. Turnaround Time	STD – 3 Business Days	ND – Next Day	SD - Same Day		

Samples Submitted by: (print) DAVID EKSTRAND Samples Submitted by: (sign) D Ekstrand Date submitted: 1/20/21

Received by: (sign & print) Ching-Yi Tsai Date & time received: 1/21/2021 10:45am Delivered by: Fedex, UPS, USPO, in person