



News Release

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County Creates Mask Decontamination Unit for Frederick Health Hospital *Innovative System Uses Water Treatment Plant's UV Technology*

FREDERICK, MD – Facing a potential shortage of N95 masks for healthcare workers, first responders and others, some innovative Frederick County Government employees stepped into action. They knew the County's treatment plants made water safe from viruses, and they wondered if masks could be made safe using the same technology. So a group from the Division of Utilities and Solid Waste Management set to work designing a prototype ultraviolet decontamination unit.

Most of the major components were readily available. UV bulbs, ballasts and sockets are used in disinfection units at several of the county's treatment plants. The County also had the tools needed to test the effectiveness of the unit by measuring the intensity of the UV light. In just three weeks' time, they went from proof-of-concept to a fully operational decontamination unit. This week the prototype was delivered to Frederick Health Hospital. If the hospital runs low on N95 masks for their staff, the device can be used to extend a mask's effectiveness by as many as three additional uses. As many as 84 masks can be decontaminated every hour. A second unit is currently being constructed by the County.

The science behind the work is fairly simple. Using the same ultraviolet technology that is used in the County's water purification and wastewater treatment systems, the unit exposes the masks to shortwave UV-C light for 20 minutes. The UV-C light disrupts the DNA within microorganisms and viruses, making them inactive. UV-C is not naturally found on the earth because the planet's ozone layer filters out shortwave UV light. Staff consulted with award-winning bioengineering professor Dr. Amy E. Herr of the University of California Berkeley. Dr. Herr and her team have been evaluating various methods to decontaminate masks because of their short supply. Her team provided some invaluable insights into the final system design, such as the use of Tyvek as a reflective material to increase the intensity of the UV light inside of the unit.

"I am so impressed with the innovation and creativity of county employees and their dedication to keeping our community safe," said County Executive Jan Gardner. "They realized they could help our healthcare workers, first responders and other address the shortage of masks by developing a decontamination unit to allow safe re-use of existing masks. To turn the concept into a reality in such a short time is remarkable. These dedicated employees are making a difference on the front lines of our fight against the coronavirus."



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“I continue to be impressed and grateful for the support Frederick Health has received from our community,” said Tom Kleinhanzl, President and CEO of Frederick Health. “The development of this decontamination unit is another example of the Frederick Community remaining proactive, and focused on developing solutions to the challenges we currently face due to COVID-19. Frederick Health Hospital currently has an adequate supply of N95 masks to protect our frontline staff. This decontamination unit provides another level of reassurance, in the event of an N95 mask shortage.”

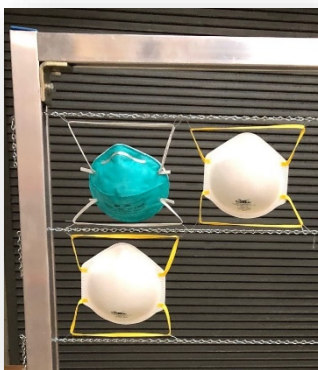


The concept originated with Deputy Chief Administrative Officer Michael Marschner. Department of Water and Wastewater Maintenance Superintendent Brad Nee and Assistant Superintendent Jim Smith were instrumental in bringing the idea to life. Division of Utilities and Solid Waste Management Acting Director Mark Schweitzer collaborated with researchers who formed a scientific consortium, [N95decon.org](https://www.n95decon.org), and validated the device’s effectiveness. Other staff involved in the construction of the prototype were Philip Kershner, electronic instrumentation technician III; Joshua Shafer, electrical maintenance technician IV; Colin Allnut, electrical maintenance technician II; and Wyatt Wilson, electrical maintenance technician II.

To see a video of the Prototype Ultraviolet Light Germicidal Irradiation (UVGI) System for N95 Filtering Facepiece Respirator Mask Decontamination and Reuse in action, click [here](#) or visit <https://youtu.be/yfqkxzwAagI>.

For more information, contact Deputy CAO Michael Marschner by email at mmarschner@FrederickCountyMD.gov or by calling 301-600-1133.

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Photos (from top): The prototype ultraviolet system created by Frederick County staff. An interior view of the decontamination unit. N95 masks hang on racks that are placed inside the unit.