GREYSCAN Detection of Viruses with the Fieldable GreyScan Trace Virus Detector (TVD-1)

Currently, there is no way to detect and verify the absence or presence of 2019-nCoV in an environment on surfaces. The NIH determined that most secondary cases of the virus transmission of SARS-CoV-2 are occurring in community settings that are not cleaned to the same rigorous protocol as health care settings. The virus lives on surfaces and continues to infect secondary populations for quite a while. The inability to test and certify the lack of the presence of the SARS-CoV-2 will have a serious economic impact on the U.S, immobilizing a fearful population. It is critical to have a tool analyze surface contamination order to help stop the spread of the virus. Eventually, proof of cleanliness in public and private sector venues will be a critical step in creating enabling society to return to daily functions, repairing the global economy.

GreyScan Pty Ltd proposes to repurpose an existing $25M commercialized technology designed for trace detection of certain explosives to detect viruses, starting with COVID-19. The GreyScan ETD 100™ was introduced this year: it is a breakthrough technology designed to detect certain categories of common explosives. The GreyScan ETD 100™ has engineered an existing laboratory analytical detection technology, Capillary Zone Electrophoresis (CZE) into a fieldable system contained within a pelican case that can be set up within ten minutes and used to screen for explosive devices by swabbing surfaces. The major engineering designs that that were necessary to design a compact, fast, reliable and fieldable screening instrument that can be run with a minimally trained operator is the baseline technology that facilitates the rapid repurposing of this technology into a fieldable virus detector. This baseline engineering represents a multi-million-dollar effort with world class scientists invested for the explosive application that can be directly applied to the rapid development of field detector for viruses.

Operation: The sample is collected from surfaces by swabbing the area with a disposable sample trap, chemicals from surfaces. After collection, the sample swab is inserted into the GreyScan device. CZE can differentiate between molecules by measuring the time it takes a substance of interest to reach the detector.

This approach to virus screening is extremely reliable and novel. While CZE has not yet been exploited for detection of pandemic viruses, as timely laboratory biochemical techniques have been used in the past, it has an extremely low false positive rate for explosive trace detection. Second, there are currently no fieldable devices for trace contamination verification, and GreyScan's ETD solutions through CZE technology created the fastest process in the world for CZE detection in the field. Bringing detection of the COVID-19 virus to locations for onsite detection will rapidly increase the pace at which the government can address contaminated areas.

The project will be demonstrated in two phases. **Phase I will develop the CZE technology in a laboratory necessary to separate and identify the virus.** During this phase, the detection method will be developed. At the end of this phase, a new method of virus detection will be demonstrated that is evolutionary to viral detection in that it will be faster and less complex than existing laboratory methods. Upon completion of phase I, which is parallel with phase two, we will produce a cheaper, faster, reliable, and simpler method for SARS-CoV-2 detection, a major win for surveillance in its own right**. Phase II will repurpose of the existing fieldable GreyScan detector for virus detection**, based upon the detection method developed in Phase I**. The total effort can be accelerated to be accomplished in 6 months. Production will be accomplished in the USA, creating jobs and exporting from the states.**