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## Electrostatic Radionuclide Aerosol Collection as Part of RASA 2.0

Creare has developed an electrostatic precipitator (ESP) for high volume atmospheric aerosol collection. Previously, we demonstrated a laboratory-based ESP system with limited flow rates. With this work, we have demonstrated well over 80% collection efficiencies of 0.2–0.3  $\mu\text{m}$  particles at significantly higher flow rates and lower pressure drop than the current RASA system. The particles are collected on a flexible medium that can be packaged into a small volume and placed next to a high-resolution germanium detector. An eighth-scale system has been designed, built and tested using atmospheric air, in a range of temperatures and humidities with excellent performance. We have demonstrated robust autonomous control of the blower and power supplies and have drawn numerous samples through the system. We are now building the full-scale system for long duration deployment and testing, with results expected by autumn 2025. The system performance is expected to exceed CTBT specifications for particle collection efficiencies at over twice the flow rate of the current RASA system while consuming significantly less power. If successful, this will allow the potential to sample at shorter time intervals than the current 24 hour specification.

### E-mail

swanwick@creare.com

### In-person or online preference

**Primary authors:** Mr SWANWICK, Michael E. (Creare LLC); Mr DEVOY, Clive L. (Creare LLC); Ms FERGUSON, Katharine (Creare LLC); Ms ELLIOTT, Jessica M. (Creare LLC); Dr STOKES, Sheldon D. (Creare LLC); Dr MCENANEY, Kenneth (Creare LLC)

**Presenter:** Mr SWANWICK, Michael E. (Creare LLC)

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