

Validation Testing of SafePort Water Contaminant Quantitation System (Task N.0820)

Statement of Need

U.S. Army installations and contingency bases do not have a materiel solution for rapid, portable, on-site detection of water contaminants and associated environmental risks in their areas of operations. This causes long sampling times and high costs due to transporting samples to fixed laboratories, followed by an analysis requiring expert personnel using analytical instrumentation. This results in slow decision times and missed opportunities for hazard avoidance and mitigation. The lack of reliable and accurate real-world analytical data in a military environment hinders the ability for rapid decision-making in field sampling scenarios. The SafePort™ system will allow Government personnel with minimal technical background to conduct quantitative chemical analysis in the field. A validation of the SafePort™ system will provide the Government with laboratory-grade precision analyses, meeting regulatory threshold detection limits, and providing actionable answers within minutes.

Technical Approach

The purpose of this Task is to conduct laboratory validation testing of the SafePort™ system for the quantitation of perchlorate and heavy metals in drinking and environmental water matrices. These objectives will be achieved by completing the following activities: 1) Develop a test plan for the analytical validation of the SafePort™ hardware chassis with the microfluidic chips for the quantitation of perchlorate and heavy metals within drinking water and ground water; 2) Execute the testing in accordance with the Government-approved test plan; and 3) Develop technical reports as a result of the laboratory validation testing.

The technical subtasks of this project focus on validation of the SafePort™ system for determining contaminants in drinking water and ground water. The project team will purchase the SafePort™ Water Contaminant Quantitation System to conduct the validation study. One technical subtask will compare the results of perchlorate determination from the SafePort™ system to the standard testing method for perchlorate analysis via ion chromatography (IC). The second technical subtask will compare quantitation of lead and cadmium in drinking and ground waters by the SafePort™ system to the standard method of analysis by inductively coupled plasma (ICP) spectrometry.

Anticipated Results and Benefits

The project team will develop a Perchlorate Quantitation Technical Report and a Heavy Metals Quantitation Technical Report detailing the results of laboratory validation testing.

Each Technical Report will include the following:

- aims and objectives;
- materials and methods used;
- summary of key results;
- positive and negative results of the effort supported by test data;
- problems encountered;
- solutions to problems;
- lessons learned;
- all necessary calculations;
- tables and charts of results and other significant data and data analyses; and
- other graphical or photographic representations necessary for adequate description.

Results reported will include all quality control and detection limit studies conducted prior to sample analysis, as well as quality control checks during sample analysis. These results will support validation of the SafePort™ system with direct comparison to the standard laboratory testing methods in terms of test time, lower detection limit, upper detection limit, reproducibility, matrix interference issues, etc.

Technology Transfer and Outreach

A validation of the SafePort™ system will provide the Government with laboratory-grade precision analyses, meeting regulatory threshold detection limits, and providing actionable answers within minutes. The technical reports that result from the validation study will aid in transition of the technology to field use throughout the Department of Defense for determining the efficacy of water supplies in real time, in the field.

Government POC

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Status

Ongoing

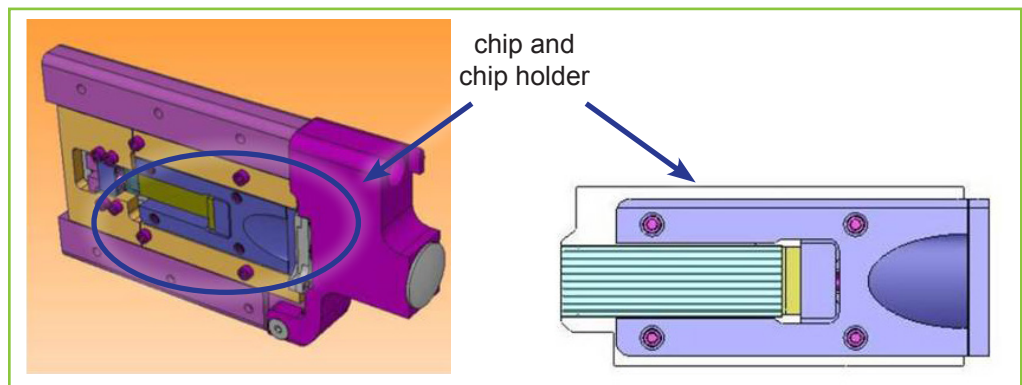


Diagram of SafePort™ chassis with chip/holder in place

