Total Suspended Solids (TSS) Automated Weighing System

General:

This specification states the requirements for a total suspended solids (TSS) automated weighing system to be used for the determination of total suspended solids in aqueous samples, in accordance with USGS-I-3765 environmental test method.

Specifications:

Provide one total suspended solids automated weighing system. The automated system performs the weighing of up to 150 Gooch crucibles used for the Total Suspended Solids (TSS) testing. The automated TSS procedure follows the analysis reference method from USGS-I-3765 currently performed at the DEP Bureau of Laboratories.

The Total Suspended Solids (TSS) automated weighing system is required to do the initial weights of the crucibles used to perform the TSS analysis, the final weights of the crucibles, calculate the TSS results, print the results and create a file that can upload the TSS results to the laboratory’s BlazeLIMS computer system.

Specifications and options as listed below.

Total System Platform which includes:

- Single System Platform Nucleus, 110V (48”W x 72”D x 36”H) – Bosch extruded aluminum frame with HDPE top (0.75”, 19mm), system controller, network, power and air distribution.
- Intelligent Actuator SCARA Robot – IX600, 4 axis, with Controller, with maximum speed of 7121mm/sec, 10 kg payload, ±0.015 mm repeatability, reach (no grip) of 600mm, 300mm vertical and 360° rotary.
- Pneumatic Gripper for Crucibles

Crucible Weighing which includes:

- RS232, 5 place balance, Mettler with automation door capable of weighing to 0.1mg
- Marble Table Support Structure
- NOTE: The desiccating cabinets (2) and one (1) crucible rack that we are currently using will be supplied by the DEP Bureau of Laboratories to be reused for the design and build of the new TSS automated weighing system.
Automated TSS procedure for initial weight of crucible:

- Robot gets crucible from desiccating cabinet, performs the initial weight and moves the crucible from the balance back to the tray in the desiccating cabinet.
- This process is repeated for each sample in the batch and the required standard and blank QC samples for the batch.
- After all of the crucibles are weighed, a list is printed with the analysis date and time, lab sample numbers, crucible numbers, initial weight of crucibles and volume of samples.

Automated TSS procedure for the final weight of crucible and TSS result is calculated:

- Robot gets crucible from a tray in the desiccating cabinet, performs the final weight and moves the crucible from the balance back to the tray in the desiccating cabinet.
- This process is repeated for each sample in the batch and the required standard and blank QC samples for the batch.
- After all of the crucibles are weighed, a list is printed with the analysis date and time, lab sample numbers, crucible numbers, initial weight of crucibles, final weight of the crucibles, volume of sample and the calculated TSS result.
- The final results are also output to a file that can be uploaded to the Lab’s BlazeLIMS system.

**Total Software and Control which includes:**

- VB Software Development

**Total Provided Services which includes:**

- Field Service Integration.
- Field Service Installation.
- Training to the analysts in the operation of the system, loading of consumables, preparation of samples and analysis of the data.

**Software:**

- Must be capable of uploading a date/time stamp of analysis to a Laboratory Information Management Systems (LIMS).
- The software must allow data export to a Laboratory Information Management Systems (LIMS).
- The software must auto save data as the run proceeds so that in the event of a power outage during a run the data is not lost and can be restarted where it stopped.
- The user must be able to define:
  - The number of samples to be run, including blanks and standard
• Lab numbers of the samples to be analyzed – the system must be able to generate consecutive lab numbers based on the starting lab number and the total number of samples to be run, but the lab number must be able to be changed if required.

• The sample volume to be filtered. A default volume must be entered automatically, but it must be able to be changed if required for a specific lab sample or samples.

• A printed list of the lab sample numbers including the crucible number, sample volume, initial weight of the crucible, etc.

**Included items:**

The following items must be included as part of the bid specification.

• Total suspended solids (TSS) automated weighing system including system design and build, required system hardware.
• A data acquisition unit
• A data recorder
• Balance
• Marble Table support structure
• Delivery and on-site installation in the laboratory. Includes hardware, software and application training for analysts.