STATEMENT OF WORK

Requisition #: 312819

Title: Procurement of Alpha Spectroscopy System (AEA)

Revision Number: 0

Date: August 8, 2018

1.0 Objective

The objective of this SOW is to procure an alpha spectroscopy system (AEA) to replace the system currently performing radiochemical analyses of alpha-emitting isotopes at the 222-S laboratory on the Hanford site.

2.0 Background/Introduction

Many of Hanford’s closure missions require radiochemical analyses, both for regulatory confirmation of tank waste samples as well as industrial hygiene samples used to assure worker protection. The current alpha spectroscopy system is used for the determination of the activity of specific alpha-emitting isotopes mainly plutonium and americium and thorium. These samples may contain significant levels of radioactivity.

The current instrumentation is approximately 10 years old and is no longer supported by the manufacturer.

3.0 Scope

Select an Alpha Energy Analyzer (AEA) system with the following specifications:

- Integrated system consisting of 32 independently controlled spectrometers (24 of which should have 450mm$^2$ active area detectors and 8 should have 1200mm$^2$ active area detectors).
- Ability to add additional spectrometers to the system
- Computer controlled with software capable of acquiring data, performing data analyses and providing quality control.
- Software shall have the ability to allow customer to create custom reports.
- Ability to isolate vacuum on individual chambers without affecting the vacuum of other chambers.
- Capable of analyzing samples from 1mm to 51mm in diameter with 4mm to 44mm distance from detector
- Software provided must communicate with current laboratory LIMs system via text file read/write capability. Analysis software must be able to read laboratory LIMs sample data files as well as create format-specific LIMs readable output files.

Detectors/Chambers:

- Energy Resolution (FWHM) less than 20 KeV with Am241 point source at one detector diameter from the detector face (hold point; in-factory performance specification test data)
• Efficiency greater than 25% with Am241 point source less than 10mm from the detector (hold point; in-factory performance specification test data)
• Background less than 1.0 counts/hour above 3 MeV (hold point; in-factory performance specification test data)
• Front mounted valve for pump/hold/vent vacuum control
• Sample to detector spacing selectable from less than 5 mm to more than 40 mm in 4 mm increments

Cabinet/Electronics
• Sample size up to 51 mm diameter
• Detector current monitor (via host computer)
• Reference/calibration pulser adjustable from 4 to 10 MeV
• Bias supply +/-0 to 100 V
• Vacuum/Bias interlock control set to nominal 75 torr maximum for voltage shutoff
• Vacuum monitoring (via host computer) minimum range from 10 to 30 Torr
• Gain adjustable from 5 to 12 MeV full scale with <= 1% nonlinearity and instability <= 50 ppm/°C
• Conversion time per event <= 15 uSec
• Maximum resolution 4096 channels with ability to select lower resolutions if desired
• Ability to terminate acquisition if any channel reaches maximum counts
• Data Connections: Standard Ethernet capable of connecting to existing laboratory network.

Software
• Provide independent control of data acquisition and analysis for a minimum of 32 spectrometers per computer workstation
• Provide energy and efficiency calibrations based on user certificate files
• Allow peak area determination by standard ROI analysis and with peak search/fitting algorithms and background subtraction option (hold point; performance specification test data on buyer provided spectra)
• Allow nuclide identification based on vendor or user supplied library
• MDA calculations available by Curie and KTA algorithms
• Ability to count to preset MDA value
• Provide capability for interactive acquisition and analysis
• Maintain a QC database for user selectable items (i.e. instrument control standards, backgrounds, calibrations, etc.) for statistical analysis and charting

Vendor Requirements
• The vendor shall provide instruments and accessories that arrive at the Hanford site as a NRTL labeled instrument. If not NRTL labeled under typical manufactured circumstances, then the vendor shall arrange for NRTL evaluation prior. The resultant Field Evaluation Report shall be made available to the buyer. [Hold Point]
• Vendor shall provide pre-installation connection requirements (drawings, schematics, etc.) for gas supply, electrical and software connectivity – as applicable – prior to shipment  [Hold Point]
• Vendor will oversee installation of the instrument in the 222-S Laboratory in 200 West area of the Hanford Nuclear Reservation. Access to this location is restricted and vendor personal must meet access requirement of security with a “0” level clearance, and Visitor/Vendor Training.
• Vendor will provide oversight of the instrument system installation and performance.
• The supplied equipment must perform in accordance with the manufacturer’s published specifications. The vendor shall provide a training plan for each training.
• The vendor must be able to work with 222-S maintenance staff to service the equipment at the 222-S laboratory.
• Instrument documentation/manuals (may be CD-ROM or electronic format):
Operation Manuals
- Installation Manuals
- Hardware Manuals
- Instrument Technical (schematics) drawings

- Vendor oversight of on-site installation and performance specifications by buyer that match in-factory performance study (hold point)
  - Data from in-factory and on-site performance specification testing

**Buyer Requirements**

- Buyer will provide analysis computer compliant with system requirements.
- Buyer to provide facility connection details (electrical, gas, ventilation, drain, service water) that match seller’s pre-installation requirements.
- Buyer and their agents will inspect for damage on receipt of instrument and seller will resolve any concerns with the buyer before transfer of the instrument into the 222-S Laboratory. [Hold Point]
- Buyer will perform instrument installation with the oversight of the supplier.
- Buyer will perform same performance specification testing as the in-factory test under the oversight of the vendor.

**4.0 Submittals**

In support of the work scope established in Section 3.0 above, submittals are listed on the Master Submittal Register (MSR).

Submittals shall be provided using the TOC Incoming Letter of Transmittal form provided by the Procurement Specialist. All transmittal subject headings shall contain, at a minimum, the subcontract number, submittal number, and submittal description.

Submittals shall be provided in electronic format unless available only as a hard copy. Electronic submittals shall be sent in accordance with instructions provided by the Procurement Specialist. Electronic formats must be non-password protected in one of the formats noted on the Procurement Website located and the following web address: [http://www.hanford.gov/tocpmm/files.cfm/APPROVED_ELECTRONIC_RECORD_FOR_MATS.pdf](http://www.hanford.gov/tocpmm/files.cfm/APPROVED_ELECTRONIC_RECORD_FOR_MATS.pdf)

**5.0 Acceptance Criteria**

1. All deliverable documentation shall be complete, accurate, legible, and reproducible. Before delivery, design media and documents shall be reviewed by qualified Subcontractor personnel for technical adequacy and appropriate content. The Subcontractor shall attest, in writing, to the accuracy and completeness of the information contained in the final deliverables.

2. Certification of National Electric Code by a Nationally Recognized Testing Laboratory (NRTL) completed prior to shipment. All electrical work must comply with NFPA 70-2014 National Electrical Code. The suitability of electrical equipment shall be evidenced by listing, labeling, acceptance, certification by NRTL that is recognized by OSHA under 29 CFR 1910 Subpart S. Must be documented to buyer before shipment [Hold Point]

**6.0 Configuration Management and Standards**

6.1 Configuration Management Requirements

There are no specific Configuration Management requirements applicable to this SOW.
7.0 ESH&Q Requirements

7.1 Quality Assurance Requirements

The subcontractor’s program shall be submitted for review/approval against the requirements identified on site form A-6006-661 Quality Assurance Requirements dated 8/08/18.

7.2 Price-Anderson Amendments Act Requirements

The subcontractor shall comply with Article 2.11 entitled, Price-Anderson Amendments Act (PAAA), contained in the General Provisions and shall have a process in place to ensure that noncompliance documentation that affects work performed for WRPS, is submitted to WRPSAAA@RL.Gov.

Subcontractor personnel shall be trained to the nuclear safety rules consistent with their specific position and assigned work.

7.3 Special ESH&Q Requirements

Preliminary hazard assessment PHA ID: 32 is to be used for general office duties performed in TOC-controlled office facilities and/or observations/walkthroughs in tank farm non-radiological and controlled radiological areas, including soil contamination areas and buffer areas, requiring a Low Risk Radiological Work Permit (RWP) only. Only observation activities are allowed (no hands-on work activities may be performed). Ladder/scaffolding access is not allowed. Prior to performing any other activities, a Job Hazard Analysis (JHA) must be completed to cover the activities to be performed. The JHA must be approved by a TOC Safety Representative.

8.0 Verification/Hold Points

- Manufacturer must have current ISO 9001 certification [Hold Point]
- Instruments and electrical components must meet 29 CFR 1910 Subpart S and comply with NFPA 70-20014 National Electrical Code - Nationally Recognized Testing Laboratories (NRTL) [Hold Point]
- Receipt damage inspection by buyer and agents, resolution by vendor to buyer’s approval. [Hold Point]
- On-site performance specification test by buyer to buyer’s acceptance. [Hold Point]

9.0 Reserved

10.0 Work Location/Potential Access Requirements

Instrument will be installed on Department of Energy Hanford Nuclear Reservation in the 200 West Area, 222-S Facility, 222-S Building. The 222-S laboratory is a Radiation Contamination Control Area and, thus, dosimetry is required and will be provided by the Buyer. Access to this location is restricted and vendor personnel must meet access requirement of security with an “0” level clearance, and Hanford Site Orientation (HSO) training. Access is limited to Monday - Thursday 7:00 A.M. - 4:30 P.M.

11.0 Training
Vendor personnel are required to receive buyer provided Hanford General Employee Training and Visitor/Vendor training before on site work can be initiated.

12.0 Qualifications

Installation oversight shall be performed by experienced personnel.

13.0 Special Requirements

Use of Government Vehicles

There is no anticipated need for any Subcontractor employees to use a Government-furnished vehicle in the performance of this statement of work. The Subcontractor’s employees, therefore, are specifically prohibited from driving any Government-furnished vehicles under the performance of this statement of work unless this statement of work is formally so modified by the parties and the employee(s) will present a valid driver’s license to the BTR for review.

14.0 Reporting/Administration

Not Applicable

15.0 Workplace Substance Abuse Program Requirements

A Workplace Substance Abuse Program is not required for this SOW.