Corporate Finance Department
Materials Management Division

676-2016 ADDENDUM 3

SUPPLY AND INSTALLATION OF AN INDUCTIVELY COUPLED PLASMA MASS SPECTROMETERY INSTRUMENT

ISSUED: October 12, 2016
BY: Courtney Diduck
TELEPHONE NO. 204 - 986-4752

URGENT

PLEASE FORWARD THIS DOCUMENT TO WHOEVER IS IN POSSESSION OF THE REQUEST FOR PROPOSAL

THIS ADDENDUM SHALL BE INCORPORATED INTO THE REQUEST FOR PROPOSAL AND SHALL FORM A PART OF THE CONTRACT DOCUMENTS

Template Version: Ar20150806

Please note the following and attached changes, corrections, additions, deletions, information and/or instructions in connection with the Request for Proposal, and be governed accordingly. Failure to acknowledge receipt of this Addendum in Paragraph 9 of Form A: Proposal may render your Proposal non-responsive.

PART B – Bidding Procedures

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, October 17, 2016.

PART E – SPECIFICATIONS

Add E8

E8 **The following substitute is approved in accordance with B6.**

E8.1 The Contractor shall supply an auto sampler and ICP-MS instrument in accordance with the requirements hereinafter specified;

(a) All electronic equipment must be CSA certified; acceptable prior to shipping; and

(b) All equipment must have both full support on parts and service for 7 years from the date of purchase.

(c) System should be a compact, bench top design to fit the laboratory space constraints with a flexible system layout

(d) Shall be equipped with a functioning collision/reaction cell with at least two cell gas control fittings with the option for a third.

(e) Instrument must be delivered with all necessary supplies and accessories required for the installation and start-up.

(f) Shall be ability to analyze a sample for at least 20 analytes from start to finish in less than 2 minutes

(g) Shall be able to physically remove interferences during analysis, remove interferences by using a calculation factor is not acceptable.

E8.2 Item No. 1 – Automated Sampler and Sample Induction shall be;

(a) Controlled though the software

(b) Equipped with robotic/automated sample processing capabilities and be able to run unattended for twenty four (24) hours;

(c) A flow-through rinse station to minimize sample to sample contamination

(d) Corrosion resistant sampling components

(e) Flexible rack configurations, that can hold but is not limited to 15 mL and 50 mL, flat and conical tubes.

(f) Rack system capable of accommodating at minimum 150 vial positions. Of the 150 vial position at least 15 vial positions are required to accommodate larger volumes for standards, QC samples and wash solutions. All other require vial positions are required only for samples.

(g) Included with a dedicated auto sampler housing to provide a controlled environment for reducing potential atmospheric deposition and contamination. The housing must allow access to the samples without interruption to an on-going analysis.

(h) Positioned directly next to the ICP-MS instrument to minimize tubing length, increase sample throughput and minimize cross contamination

(i) Integrated three (3) channel computer controlled peristaltic pump for pumping sample, internal standard and spray chamber drain. The quartz spray chamber should be thermoelectrically controlled and should be fitted with a concentric nebulizer.

(j) Capable of analyzing samples containing 3% total dissolved solids without significant manual or automated liquid/liquid sample dilution (ie. Much less than 1:1 pump tubing dilution) for improved workflow and simplify method development. This should also be achieved without use of a humidifier. Direct analysis is required to ensure simplicity of hardware configuration and support, and to minimize the possibility of contamination due to a liquid dilution sample handling step.

(k) Able to allow for a range of optional nebulizers and spray chambers

(l) Automatic optimization via the integrated software for sample introduction system

(m) Included with an integrated flow injection system that is fully controlled via the integrated software with automated switching between rinse solution, tune solution and internal standard solution. No user intervention is required to swap out solutions between tuning and running samples.

(n) Comprehensive user interface for a real time status of run

E8.3 Item No. 2 -Desktop Computer shall:

(a) be loaded with the most current version of the software from E8.4 (software maybe load onsite)

(b) be Windows 7 and Windows 10 Software compliant operating system (licenced);

(c) include a 23” LCD widescreen monitor;

(d) have RS232 Interface board and all cables;

(e) include a minimum of two (2) USB ports;

(f) include a network card;

(g) be supplied with all power and communication cables; and

(h) be equipped with a power supply of 120V, 50/60 Hz.

(i) be HP hardware

(j) Open access to allow the buyer to install their programs required to do business, or administrator access for the City of Winnipeg “IST” group.

E8.4 Item No. 3 - Instrument Software shall:

(a) run under Windows 7 or Window 10;

(b) accept patches and upgrades. Patches shall be provided free of charge;

(c) include no annual licence fee for software;

(d) be supplied with a backup copy of the software in case reinstallation is required;

(e) operate and control the auto-sampler, sample induction, the instrument and for data acquisition, processing and reporting.

(f) be equipped with template/work list and allows all samples/standards to be selected individually or grouped for type analysis;

(g) be equipped with template methods and a tools which helps you create custom methods (method wizards or assistant). The method wizard shall be capable of building a fully functional method by guiding the user through a series of well-defined steps or by analyzing a typical sample.

(h) Allow for the use of the calibration standards to be analyzed as the detector cross mode calibration solution and be run as part of an analysis batch with no extra steps, to save time and simplify operations.

(i) Be able to collect and report multiple sublists of elements for individual samples within the batch to save time and allow for ease of analysis. The use of multiple methods to achieve this is not acceptable as this introduces the potential for incorrect method selection or deviations between the methods

(j) include comprehensive and user-friendly data management tools

(k) be able to select individual elements to add/ subtract to a method

(l) allow for automatic shutdown/start up or be placed in standby mode for unattended analysis which includes feature which conserve both gas, reagents and electricity when not in use;

(m) be equipped with alarm functions with user definable alarm limits to enable unattended analysis including visual notification and alerts;

(n) be equipped with integrated early maintenance feedback reports which includes notifications on number of analysis performed or instrument run times to allow for scheduling maintenance and eliminating unnecessary down-time;

(o) have a one-click plasma setting which shall provide a simpler, more reproducible plasma optimization.

(p) be equipped with vision real time status reports for each sample at different phases of analysis;

(q) include preconfigured methods (or method templates) for auto-tuning, calibration, analysis, with auto-optimization tools.

(r) allow for the modification (e.g. insertion/deletion) of sample positions during analysis run;

(s) be capable of preforming method validations;

(t) have template reports to use in reporting quality control information, tuning information and sample analysis reports;

(u) be capable of pausing runs at any point then resuming from the same point;

(v) include options for auto-tuning and manual tuning options for the instrument which also provides the step by step values to determine instrument performance

(w) have the ability to exclude a single calibration standard (from the calibration curve) after analysis and allow for reprocessing the complete batch data afterwards

(x) be capable of exporting results in different formats to Microsoft Excel or LIMS during/after analysis;

(y) comply with 21 CFR (Code of Federal Regulation) Part 11;

(z) produce reports that are acceptable under Good Laboratory Practices (GLP);

(aa) include auditing tools for recording changes made in the method and settings;

(bb) have remote access and remote monitoring to software and instrument using a tablet or smartphone. Includes access to key processes, instrument status, and run progress information and ability to control key features including instrument shut down and start up or auto tuning and optimization.

E8.5 Item No. 3 – Plasma and Ion Optics which includes the torch, torch position, RF generator, interface, ion optics and collision/reaction cell system shall be:

(a) A torch which is easy to remove and replace to minimize down time and has little to no alignment required after replacement.

(b) Able to auto-align after maintenance

(c) Included with the following feature for the torch position. Fully computer controlled and fully auto-tunable via the ICP-MS software in all three axis (XYZ); horizontal, vertical position, and sampling depth. The movement in each axis shall be independent of the other two. Torch position and reproducibility shall be within 0.1mm in all three axes. Computer readout of torch position is required for method and data audit purposes

(d) Included with a RF generator that should be maintenance free and can easily tolerate changes in matrix. It shall also be able to tolerate change from volatile organic solvents to aqueous samples without affecting plasma stability, even if highly volatile organic solvents are introduced.

(e) Equipped with a quadrupole ion deflector (QID) to remove photons and neutrals.

(f) If present the main ion-lens assembly shall be accessible without the need to open the main vacuum system. (Do not need to break vacuum for cleaning/replacing cones and lens.)

(g) Able to maintain short analysis times and high productivity, the instrument should be able to analyze most elements in collision cell mode, not only a small set of analytes.

(h) Able to move between gas modes and non-gas modes. And must reach a steady state in a reasonable period of time (5 seconds or less).

(i) Capable of delivering the same sensitivity and background performance when analyzing complex, high solid samples (up to 3%TDS) as non-complex samples using the same sample introduction configuration. It is not acceptable to use different interface cones or inserts to achieve the same sensitivity for complex, high solid sample analysis.

(j) Able to enable fast, stable and consistent interference removal, the cell must be thermally stabilized and operated with fixed RF amplitude for the full mass range.

(k) An octopole or a double quadruple to act as an efficient ion guide for optimal sensitivity performance across a wide mass range.

(l) an ICP-MS able to perform semi-quantitative analysis, using a single semi-quant standard in any mode as part of the analysis method, especially helium since helium handles most spectral interference.

(m) Able with the cell to show effective interference removal by achieving guaranteed detection limits of 20ppt As and 40ppt Se in Helium mode in a matrix of 1% HNO3, 2%HCl and 100ppm Ca, demonstrating the effective removal of both ArCl+ and CaCl+.

(n) An instrument supplied that is able to be used for muli-element analysis of unknown sample containing Cl, SO4, and organic content, without need for any polyatomic interference correction equations.

E8.6 Item No. 4 – Vacuum and Cooling System shall be:

(a) A vacuum system for the ICP-MS that shall consist of a single floor mounted rotary pump, which can be located remotely, and a single 2-stage turbomolecular pump.

(b) The vacuum pump shall use synthetic, wear resistant rotary pump oil to improve resistance to aggressive sample matrices and lengthening the periods between routine maintenance.

(c) A cooling system that supplies cooling water to the ICP-MS shall be via a non-refrigerated heat exchanger (Chiller). The chiller must be able to maintain a constant stable temperature for 8 hours even if the surrounding room temperature is at 30^{o}C, which happens occasionally in the laboratory.

E8.7 Item No. 5 – Gas Flow Controllers shall be:

(a) Independently computer controlled mass flow controllers which shall control plasma, auxiliary, make-up and carrier gases.

(b) Two collision/reaction cell gas lines shall be included. One gas being pure Helium the other pure Hydrogen.

(c) Analyze Selenium to 1 ppt.

(d) Upgradable to a fully integrated 3rd cell gas to cover possible future applications. It is not acceptable to use an external gas manifold or switching valve for the additional cell gas lines as dead volume is increased, it is also required to be able to mix cell gases in any ratio via the gas controllers.

E8.8 Item No. 6 – Quadrupole Mass Analyzer and detection system shall be:

(a) Quadrupole rods that shall be truly hyperbolic in cross section to generate the ideal true hyperbolic or virtual hyperbolic field.

(b) Able to analyze from 2 to 260 amu.

(c) A 90° bend can occur before or after the mass analyzer to lower background signal and improve signal to noise ratios.

(d) Shall have a linear dynamic range of at least 10 orders of magnitude, for all major trace elements, without the use of increased resolution or signal attenuation via custom cell settings at the highest concentration point.

E8.9 Item No. 7 – Consumables shall be:

(a) Nickel cones, optional Platinum cones

(b) Torch/injector

(c) Load Coil

(d) Nebulizer

(e) Spray chamber