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 86 Clarence Street, 2nd floor  
 Kingston  
 Ontario  
 K7L 1X3  
 Bid Fax: (613) 545-8067

## SOLICITATION AMENDMENT MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

### Comments - Commentaires

**Vendor/Firm Name and Address**  
 Raison sociale et adresse du  
 fournisseur/de l'entrepreneur

**Issuing Office - Bureau de distribution**  
 Public Works and Government Services / Travaux  
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 Des Acquisitions Kingston  
 86 Clarence Street, 2nd floor  
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<b>Title - Sujet</b> Electron Microscope	
<b>Solicitation No. - N° de l'invitation</b> W0114-155153/A	<b>Amendment No. - N° modif.</b> 001
<b>Client Reference No. - N° de référence du client</b> W0114-15-5153	<b>Date</b> 2014-11-10
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$KIN-620-6457	
<b>File No. - N° de dossier</b> KIN-4-42121 (620)	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin</b> at - à 02:00 PM on - le 2014-12-08	
<b>Time Zone</b> Fuseau horaire Eastern Standard Time EST	
<b>F.O.B. - F.A.B.</b> Specified Herein - Précisé dans les présentes	
<b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input type="checkbox"/> <b>Other-Autre:</b> <input checked="" type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Porter, Marta M.	<b>Buyer Id - Id de l'acheteur</b> kin620
<b>Telephone No. - N° de téléphone</b> (613) 547-7587 ( )	<b>FAX No. - N° de FAX</b> (613) 545-8067
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b> Sawyer Building Loading Dock The Royal Military College 11 General Crerar Cresent Kingston ON., K7K 7B4	

**Instructions: See Herein**

**Instructions: Voir aux présentes**

<b>Delivery Required - Livraison exigée</b>	<b>Delivery Offered - Livraison proposée</b>
<b>Vendor/Firm Name and Address</b> Raison sociale et adresse du fournisseur/de l'entrepreneur          <b>Telephone No. - N° de téléphone</b> <b>Facsimile No. - N° de télécopieur</b>	
<b>Name and title of person authorized to sign on behalf of Vendor/Firm</b> (type or print) <b>Nom et titre de la personne autorisée à signer au nom du fournisseur/</b> <b>de l'entrepreneur (taper ou écrire en caractères d'imprimerie)</b>	
<b>Signature</b>	<b>Date</b>

Solicitation No. - N° de l'invitation

W0114-155153/A

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Amd. No. - N° de la modif.

001

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Buyer ID - Id de l'acheteur

kin620

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**See Attached**

**Amendment 001 – Electron Microscope, is being raised for the following reason:**

- 1. Provide a response back from Public Works and Government Services Canada to questions received from bidders.**
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**Q1. Please identify the specific application at RMC that would require WetSTEM?**

**A1.** RMC has research groups that study nanoparticles/nanostructures in water. One example of this research is the study solutions of Fe-nanoparticles for environmental remediation via injection into the ground. Because the nanoparticles are injected as a solution and travel and react under solution conditions, we are very interested in exploring their properties when in solution. Solid state does not give the same information and does not accurately represent the properties of the material that we are looking for: size, shape, aggregation, etc...

Another research project is the characterization of nanoreactors composed of self-assembled polymeric nanostructures (sheets or nanotubes) interacting with metal nanoclusters (Pt, Au, Ni and alloys). The metal nanoclusters are in the size range 2nm-30nm. The self-assembly of the templates is stable only in water at pH7 and the WetSTEM will allow the characterization of external factors on the structure and growth of the nanoclusters, the characterization will be done in water. The external factors studied will include:

- pH conditions prior template formation and after nanocluster synthesis (between pH4 and 10)
- ionic strength of the solution
- molecular weight of the polymer
- nature of the metal
- temperature (between 10 and 70 Celsius)

As the growth of the metal cluster takes few hours to few days, the instrument will also allow the characterization of the growth process with respect to the factor mentioned above.

Another characterization that will be performed with the WetSTEM will focus on the Au nanoparticles for cancer diagnosis and therapy. With the use of functionalized polymers we will characterise the strength of interaction between the polymer and gold particles in water for optimization of the nucleation point of the nanocrystal and growth mechanism.

**Q2. Please identify the specific application at RMC that would require a 1400 degree heating stage? (vs. a 1000 degree stage?)**

**A2.** RMC has a research group which works with a variety of metals. A 1400deg C stage would be used in the current research program to look at W-based (tungsten-based) systems, where the temperature range of interest is 1225 to 1425 C. It would also be useful for proposed research into Ni-based and Co-based systems used in superalloys, where the temperature range of interest is between

1050 and 1450 C for these alloys. This would be a complementary tool to HT-XRD analysis on the same samples. Therefore, a 1000deg heating stage would not suffice for these applications.

**Q3. Can you please identify the FEG SEM application that would require ESEM mode at RMC? (vs. a Variable Pressure Mode)**

**A3.** Plant biology groups at RMC would like to look at plant samples in their native state and be able to use the EDAX EDX system that we currently own to see the composition of different areas (phloem and xylem) of the plant to see if they take up nutrients/pesticides/etc. differently in different parts of the plant. We currently have a Variable pressure SEM, but the highest pressures dehydrate the sample over time. Therefore, long EDX analyses required to do 'mapping' of the sample are not possible because the sample shrinks slightly as it is being analyzed thus 'blurring' the map obtained. ESEM capabilities include looking at wet or moist samples. High pressures coupled with a cooling stage would allow these samples to remain hydrated over a longer period of time.

**Q4. Can you please identify the application requirement behind the 200 nA specification? (vs. 100 nA?)**

**A4.** Again, the need to do EDX mapping of plant samples necessitates the higher (200 nA) beam current specification. The higher beam current increases the x-ray count, therefore, shortening the acquisition time and improving the image quality and decreasing sample damage. These plant samples typically have a low amount (5-10%) of the target compound present in the plant (in comparison to the carbon and oxygen content) and a higher x-ray count will make it easier to 'see' these low amount compounds.

We also have a metallurgist who is looking at trace quantities of metals in alloys and a higher beam current would allow the trace amounts of these elements to be seen

**Q5. There are several EDX options available - can you please help us understand the reasoning of locking out other manufactures (i.e. Oxford Instruments, Bruker). The tender is calling specifically for an EDAX EDX system.**

**A5.** The chemistry department currently owns an EDAX EDX system which would be transferred to the new SEM instrument. Therefore, that specification is necessary as we need to be able to use the EDX system that we currently have on any new SEM instrument.

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**Q6. I am reviewing this particular request for quote and noticed it completely locks out other EDS venders.**

**It is asking for a EDAX system and there are at least 3 other companies that can supply and EDS system to go the SEM.**

**Just an FYI Oxford Instruments can supply the requested EDS system.**

**A6. See answer #5 above to this question.**

**ALL OTHER TERMS AND CONDITIONS OF THIS SOLICITATION REMAIN UNCHANGED.**

**If your tender has already been forwarded and you wish to revise same, this revision should be faxed and reach the bid receiving area before the closing date. The tender number and the closing date are to be shown on the first page of your fax.**