

**RETURN BIDS TO:**  
**RETOURNER LES SOUMISSIONS À:**  
**Bid Receiving - PWGSC / Réception des**  
**soumissions - TPSGC**  
**11 Laurier St./ 11 rue, Laurier**  
**Place du Portage, Phase III**  
**Core 0B2 / Noyau 0B2**  
**Gatineau, Québec K1A 0S5**  
**Bid Fax: (819) 997-9776**

**REQUEST FOR PROPOSAL**  
**DEMANDE DE PROPOSITION**

**Proposal To: Public Works and Government**  
**Services Canada**

We hereby offer to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods, services, and construction listed herein and on any attached sheets at the price(s) set out therefor.

**Proposition aux: Travaux Publics et Services**  
**Gouvernementaux Canada**

Nous offrons par la présente de vendre à Sa Majesté la Reine du chef du Canada, aux conditions énoncées ou incluses par référence dans la présente et aux annexes ci-jointes, les biens, services et construction énumérés ici sur toute feuille ci-annexée, au(x) prix indiqué(s).

**Comments - Commentaires**

<b>Title - Sujet</b> Variable Electron Microscope	
<b>Solicitation No. - N° de l'invitation</b> 31184-152219/A	<b>Date</b> 2015-03-17
<b>Client Reference No. - N° de référence du client</b> 31184-152219	
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$\$PV-915-66993	
<b>File No. - N° de dossier</b> pv915.31184-152219	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin</b> <b>at - à 02:00 PM</b> <b>on - le 2015-04-27</b>	<b>Time Zone</b> <b>Fuseau horaire</b> Eastern Daylight Saving Time EDT
<b>F.O.B. - F.A.B.</b> <b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input checked="" type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Gosselin, Monique	<b>Buyer Id - Id de l'acheteur</b> pv915
<b>Telephone No. - N° de téléphone</b> (819) 956-3803 ( )	<b>FAX No. - N° de FAX</b> ( ) -
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b> National Research Council Canada Bldg M12 1200 Montreal Road Ottawa, Ontario K1A 0K2	

**Instructions: See Herein**

**Instructions: Voir aux présentes**

**Vendor/Firm Name and Address**

**Raison sociale et adresse du**  
**fournisseur/de l'entrepreneur**

**Issuing Office - Bureau de distribution**

Scientific, Medical and Photographic Division / Division de  
l'équipement scientifique, des produits photographiques et  
pharmaceutiques  
11 Laurier St./ 11 rue, Laurier  
6B1, Place du Portage  
Gatineau, Québec K1A 0S5

<b>Delivery Required - Livraison exigée</b>	<b>Delivery Offered - Livraison proposée</b>
<b>Vendor/Firm Name and Address</b> <b>Raison sociale et adresse du fournisseur/de l'entrepreneur</b>	
<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> <b>(type or print)</b> <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

31184-152219/A

Amd. No. - N° de la modif.

File No. - N° du dossier

pv91531184-152219

Buyer ID - Id de l'acheteur

pv915

CCC No./N° CCC - FMS No/ N° VME

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## TABLE OF CONTENTS

### **PART 1 - GENERAL INFORMATION**

- 1.1 Security Requirement
- 1.2 Requirement
- 1.3 Debriefings

### **PART 2 - BIDDER INSTRUCTIONS**

- 2.1 Standard Instructions, Clauses and Conditions
- 2.2 Submission of Bids
- 2.3 Enquiries - Bid Solicitation
- 2.4 Applicable Laws

### **PART 3 - BID PREPARATION INSTRUCTIONS**

- 3.1 Bid Preparation Instructions

### **PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION**

- 4.1 Evaluation Procedures
- 4.2 Basis of Selection

### **PART 5 - CERTIFICATIONS**

- 5.1 Certifications Required Precedent to Contract Award

### **PART 6 - RESULTING CONTRACT CLAUSES**

- 6.1 Security Requirement
- 6.2 Requirement
- 6.3 Standard Clauses and Conditions
- 6.4 Term of Contract
- 6.5 Authorities
- 6.6 Payment
- 6.7 Invoicing Instructions
- 6.8 Certifications
- 6.9 Applicable Laws
- 6.10 Priority of Documents
- 6.11 SACC Manual Clauses
- 6.12 Shipping Instructions - Delivery at Destination

### **List of Annexes:**

- Annex A Requirement / Basis of Payment
- Annex B Mandatory Specifications for a variable pressure scanning electron microscope (VPSEM)
- Annex B-1 Point Rated Criteria
- Annex C Complete List of Directors

## **PART 1 - GENERAL INFORMATION**

### **1.1 Security Requirement**

There is no security requirement associated with this bid solicitation.

### **1.2 Requirement**

The requirement is detailed under Article 6.2.1 of the resulting contract clauses.

### **1.3 Debriefings**

Bidders may request a debriefing on the results of the bid solicitation process. Bidders should make the request to the Contracting Authority within 15 working days of receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone or in person.

## **PART 2 - BIDDER INSTRUCTIONS**

### **2.1 Standard Instructions, Clauses and Conditions**

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the Standard Acquisition Clauses and Conditions Manual (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

Bidders who submit a bid agree to be bound by the instructions, clauses and conditions of the bid solicitation and accept the clauses and conditions of the resulting contract.

The 2003 (2014-09-25) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

Subsection 5.4 of 2003, Standard Instructions - Goods or Services - Competitive Requirements, is amended as follows:

Delete:           sixty (60) days  
Insert:            one hundred eighty (180) days

#### **2.1.1 SACC Manual Clauses**

B1000T	Condition of Material	2014-06-26
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### **2.2 Submission of Bids**

Bids must be submitted only to Public Works and Government Services Canada (PWGSC) by the date, time and place indicated on page 1 of the bid solicitation.

### **2.3 Enquiries - Bid Solicitation**

All enquiries must be submitted in writing to the Contracting Authority no later than ten (10) calendar days before the bid closing date. Enquiries received after that time may not be answered.

Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the enquiry relates. Care should be taken by bidders to explain each question in sufficient

detail in order to enable Canada to provide an accurate answer. Technical enquiries that are of a proprietary nature must be clearly marked "proprietary" at each relevant item. Items identified as "proprietary " will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the questions or may request that the Bidder do so, so that the proprietary nature of the question(s) is eliminated, and the enquiry can be answered to all bidders. Enquiries not submitted in a form that can be distributed to all bidders may not be answered by Canada.

## 2.4 Applicable Laws

Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in the province of Ontario, Canada.

The Bidder may, at its discretion, substitute the applicable laws of a Canadian province or territory of its choice without affecting the validity of its bid, by deleting the name of the Canadian province or territory specified and inserting the name of the Canadian province or territory of its choice. If no change is made, it acknowledges that the applicable laws specified are acceptable to the Bidder

## PART 3 - BID PREPARATION INSTRUCTIONS

### 3.1 Bid Preparation Instructions

Canada requests that bidders provide their bid in separately bound sections as follows:

Section I: Technical Bid (two (2) copies)  
Section II: Financial Bid (one (1) copy)  
Section III: Certifications (one (1) copy)

Prices must appear in the financial bid only. No prices must be indicated in any other section of the bid.

Canada requests that bidders follow the format instructions described below in the preparation of their bid:

In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process Policy on Green Procurement. (<http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html>). To assist Canada in reaching its objectives, Offerors should follow the format instructions described below in the preparation of their offer:

- 1) use 8.5 x 11 inch (216 mm x 279 mm) paper containing fibre certified as originating from a sustainably-managed forest and containing minimum 30% recycled content;
- 2) use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, using staples or clips instead of cerlox, duotang or binders; and
- 3) use a numbering system that corresponds to that of the Request for Standing Offers.

**Section I: Technical Bid**

The following applies to the Requirement and bidders must provide the following information in the bid:

**3.1.1 Installation**

On-site installation must be provided and be carried out by a qualified service technician.

State your best installation schedule. Installation will be carried out within \_\_\_\_\_ calendar days of delivery and be completed within \_\_\_\_\_ calendar days.

**3.1.2 Training**

On-site training for all components of the microscope for a minimum of three (3) days must be provided for up to three (3) users at a mutual agreed upon time. All costs associated with the on-site training must be included in the price.

On-site training will be scheduled on mutually agreeable dates (Monday – Friday) between the hours of 9:00 AM and 3:30 PM.

**Agreed:**                      **Yes** \_\_\_\_\_

Provide complete details of training e.g. duration, scope, etc.,

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**3.1.3 Service**

Purchase of the system must include: technical support; technical phone support; support via the Internet; and support via a fax-back document system. Service cost must be included in the price.

The Bidder must provide a phone service response of no greater than ≤ 24 hours, Monday to Friday, excluding statutory holidays, during normal EST working hours of 0800 to 1600 hours. If the issue cannot be resolved over the phone, a qualified service engineer must be dispatched and arrive on-site in 48 hours. Weekends are excluded. Any instrument failures that render the instrument unusable must comply with this 48 hour window.

**Agreed:**                      **Yes:** \_\_\_\_\_

Also, provide the following with your bid (for information purposes only):

- a) Location of available service facilities (after sales service and repair). List the service facilities closest to the destination.

\_\_\_\_\_  
\_\_\_\_\_

- b) Locations of available replacement parts from consumables to major components.

\_\_\_\_\_  
\_\_\_\_\_

c) Response time re: service calls, and escalation schedule, i.e. (how many days with no resolution to a problem until a more experienced person is called in, and from which location).

\_\_\_\_\_

\_\_\_\_\_

d) List the frequency of routine maintenance visits provided by a qualified service technician during the warranty period, if applicable and included in the price.

\_\_\_\_\_

\_\_\_\_\_

### 3.1.4 Product(s) Offered

The Bidder must indicate the make and model number of the products offered (identify specific components which make up the system):

Name of Manufacturer: \_\_\_\_\_

Model/Part Number: \_\_\_\_\_

Literature attached: Yes (\_\_\_\_) No (\_\_\_\_)

### 3.1.5 Point of Manufacture/Shipping

The Bidder must state the point of manufacture/shipping of goods or where service is to be performed:

Location: \_\_\_\_\_

Postal Code: \_\_\_\_\_

### 3.1.6 Delivery

While delivery is requested by 31<sup>st</sup> October 2015, the best delivery that could be offered by the Bidder is \_\_\_\_\_.

### 3.1.7 Contacts

Bidders are requested to provide the following: Information pertaining to Article 6.5.4, Contractor Representatives under Part 6, Resulting Contract Clauses.

## Section II: Financial Bid

The bidder must quote a firm lot price all inclusive of supply, installation, training, service and manuals, DDU (Ottawa, Ontario), the total amount of applicable taxes must be shown separately. Freight charges to destination and all applicable Customs duties and Excise taxes must be included.

### 3.2.1 Exchange Rate Fluctuation

C3011TExchange Rate Fluctuation (without protection)

2013-11-06

## Section III: Certifications

Bidders must submit the certifications required under Part 5.

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## PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

### 4.1 Evaluation Procedures

- (a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids.

#### 4.1.1 Technical Evaluation

All proposals submitted must be completed in full and provide all of the information requested in the Request for Proposal (RFP) package to enable a full and complete evaluation. If the requirement is not addressed in the bidder's proposal, the proposal will be considered incomplete or non-responsive and will be rejected. The onus is on the bidder to provide all the information necessary to ensure a complete and accurate assessment.

**Confirm that you have read and understood by checking the: Yes \_\_\_\_\_**

Factors for Evaluation

1. PRICING BASIS (MANDATORY): Prices must be firm, DDU Delivered Duty Unpaid.
2. ABILITY TO MEET THE TECHNICAL REQUIREMENT (MANDATORY):
  - a) For Items Defined by Specifications:

The bidder is requested to cross reference the mandatory technical criteria contained herein to their supporting technical documentation.
  - b) Provision of Supporting Technical Documentation:

Supporting technical documentation for the stores offered must be provided with the bid at time of bid closing.

Technical brochures or technical data MUST be provided to verify compliancy to the technical mandatory specifications.

**Included: Yes: \_\_\_\_\_**

3. COMPLIANCE WITH THE TERMS AND CONDITIONS OF THIS REQUEST FOR PROPOSAL (MANDATORY)
4. Please note that the requirements of the Federal Contractors Program for Employment Equity may apply - (see Part 5).
5. Bidders must identify, by date and location, and no later than at the date of bid closing, a minimum of two (2), non research based, commercial and/or manufacturing clients to whom the bidder has supplied a high vacuum, variable pressure SEM and provided maintenance services over a period of at least 15 years.

**Included: Yes \_\_\_\_\_**

6. The Bidder must include room specification requirements for instrument installation with their bid. This must include requirements for electromagnetic interferences (AC/DC fields), vibration and acoustic parameters necessary for the instrument to meet specifications.

**Comply:** Yes \_\_\_\_\_

7. The Bidder must provide proof of certification of CSA. (photocopy of certificate will suffice)

**Comply:** Yes \_\_\_\_\_

#### **4.1.1.1 Mandatory Technical Criteria**

See Annex B – Mandatory Specifications for a variable pressure scanning electron microscope (VPSEM)

#### **4.1.1.2 Point Rated Technical Criteria**

See Annex B-1 – Point Rated Criteria

### **4.2 Financial Evaluation**

#### Evaluation of Price

The price of the bid will be evaluated in Canadian dollars, Applicable Taxes excluded, DDU (Ottawa, Ontario) Incoterms® 2000, Canadian customs duties and excise taxes excluded.

Unless the bid solicitation specifically requires bids to be submitted in Canadian currency, bids submitted in foreign currency will be converted to Canadian currency for evaluation purposes. The rate given by the Bank of Canada in effect on the bid solicitation closing date, or on another date specified in the bid solicitation, will be applied as a conversion factor to the bids submitted in foreign currency.

### **4.3 Basis of Selection**

#### **4.3.1 Basis of Selection - Highest Combined Rating of Technical Merit and Price**

**4.3.1.1** To be declared responsive, a bid must:

- a) comply with all the requirements of the bid solicitation; and
- b) meet all mandatory criteria; and
- c) obtain the required minimum of 70% (198.1 points) overall for the technical evaluation criteria which are subject to point rating. The rating is performed on a scale of 283 points.

**4.3.1.2** Bids not meeting (a), (b) or (c) will be declared non-responsive.

**4.3.1.3** The selection will be based on the highest responsive combined rating of technical merit and price. The ratio will be 65% for the technical merit and 35% for the price.

- 4.3.1.4** To establish the technical merit score, the overall technical score for each responsive bid will be determined as follows: total number of points obtained / maximum number of points available multiplied by the ratio of 65%.
- 4.3.1.5** To establish the pricing score, each responsive bid will be prorated against the lowest evaluated price and the ratio of 35%.
- 4.3.1.6** For each responsive bid, the technical merit score and the pricing score will be added to determine its combined rating.
- 4.3.1.7** Neither the responsive bid obtaining the highest technical score nor the one with the lowest evaluated price will necessarily be accepted. The responsive bid with the highest combined rating of technical merit and price will be recommended for award of a contract.

The table below illustrates an example where all three bids are responsive and the selection of the contractor is determined by a 65/35 ratio of technical merit and price, respectively. The total available points equals 100 and the lowest evaluated price is \$45,000.00.

		<b>Bidder 1</b>	<b>Bidder 2</b>	<b>Bidder 3</b>
<b>Overall Technical Score</b>		88/100	75/100	77/100
<b>Bid Evaluated Price</b>		\$55,000.00	\$50,000.00	\$45,000
<b>Calculations</b>	<b>Technical Merit Score</b>	$88/100 \times 65 = 57.2$	$75/100 \times 65 = 48.75$	$77/100 \times 65 = 50.05$
	<b>Pricing Score</b>	$45/55 \times 35 = 28.63$	$45/50 \times 35 = 31.5$	$45/45 \times 35 = 35$
<b>Combined Rating</b>		85.83	80.25	85.05
<b>Overall Rating</b>		1 <sup>st</sup>	3 <sup>rd</sup>	2 <sup>nd</sup>

## **PART 5 – CERTIFICATIONS**

Bidders must provide the required certifications and associated information to be awarded a contract.

The certifications provided by bidders to Canada are subject to verification by Canada at all times. Canada will declare a bid non-responsive, or will declare a contractor in default in carrying out any of its obligations under the Contract, if any certification made by the Bidder is found to be untrue whether made knowingly or unknowingly, during the bid evaluation period or during the contract period.

The Contracting Authority will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply and to cooperate with any request or requirement imposed by the Contracting Authority may render the bid non-responsive or constitute a default under the Contract.

### **5.1 Certifications Required Precedent to Contract Award**

The certifications listed below should be completed and submitted with the bid, but may be submitted afterwards. If any of these required certifications is not completed and submitted as requested, the Contracting Authority will inform the Bidder of a time frame within which to provide the information. Failure to comply with the request of the Contracting Authority and to provide the certifications within the time frame provided will render the bid non-responsive.

### **5.1.1 Integrity Provisions - Associated Information**

By submitting a bid, the Bidder certifies that the Bidder and its Affiliates are in compliance with the provisions as stated in Section 01 Integrity Provisions - Bid of Standard Instructions 2003. The associated information required within the Integrity Provisions will assist Canada in confirming that the certifications are true.

### **5.1.2 Federal Contractors Program for Employment Equity - Bid Certification**

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "FCP Limited Eligibility to Bid" list ([http://www.labour.gc.ca/eng/standards\\_equity/eq/emp/fcp/list/inelig.shtml](http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml)) available from Employment and Social Development Canada (ESDC) - Labour's website.

Canada will have the right to declare a bid non-responsive if the Bidder, or any member of the Bidder if the Bidder is a Joint Venture, appears on the "FCP Limited Eligibility to Bid " list at the time of contract award.

### **5.1.3 Additional Certifications Required Precedent to Contract Award**

The certifications listed below should be completed and submitted with the bid, but may be submitted afterwards. If any of these required certifications is not completed and submitted as requested, the Contracting Authority will inform the Bidder of a time frame within which to provide the information. Failure to comply with the request of the Contracting Authority and to provide the certifications within the time frame provided will render the bid non-responsive.

## **PART 6 - RESULTING CONTRACT CLAUSES**

The following clauses and conditions apply to and form part of any contract resulting from the bid solicitation.

### **6.1 Security Requirement**

**6.1.1** There is no security requirement applicable to this contract.

### **6.2 Requirement**

#### **6.2.1 Requirement**

The Contractor must provide the items detailed under Annex A – Requirement / Basis of Payment.

#### **6.2.2 Installation**

On-site installation must be provided and be carried out by a qualified service technician.

#### **6.2.3 Manuals**

The Contractor must provide the following documentation in English:

**6.2.3.1** Complete documentation of all automation, acquisition, and control software;

**6.2.3.2** Complete documentation of electronic circuitry, interfaces and communication protocols to the main instrument microprocessor.

#### **6.2.4 Training**

On-site training for all components of the microscope for a minimum of three (3) days must be provided for up to three (3) users at a mutual agreed upon time.

On-site training will be scheduled on mutually agreeable dates (Monday – Friday) between the hours of 9:00 AM and 3:30 PM.

#### **6.2.5 Service**

Purchase of the system must include: technical support; technical phone support; support via the Internet; and support via a fax-back document system. Service cost must be included in the price.

The Contractor must provide a phone service response of no greater than ≤ 24 hours, Monday to Friday, excluding statutory holidays, during normal EST working hours of 0800 to 1600 hours. If the issue cannot be resolved over the phone, a qualified service engineer must be dispatched and arrive on-site in 48 hours. Weekends are excluded. Any instrument failures that render the instrument unusable must comply with this 48 hour window.

### 6.3 Standard Clauses and Conditions

All clauses and conditions identified in the Contract by number, date and title are set out in the Standard Acquisition Clauses and Conditions Manual (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

#### 6.3.1 General Conditions

2010A (2014-11-27) General Conditions - Goods (Medium Complexity), apply to and form part of the Contract.

Subsection 9 of 2010A (2014-11-27) General Conditions - Goods or Services, is amended as follows:

Delete: Subsection 9 in his entirety.

Insert: " The Work is subject to inspection and acceptance by Canada. Despite prior acceptance of the Work and without restricting any conditions or warranty imposed by law, the Contractor, if requested by the Minister to do so, must replace, repair or correct at its option and its own expense any Work which becomes defective or which fails to conform to the Contract requirements, where applicable. For goods, the on-site warranty period will be 3 year on the entire system and 5-year on the emitter (Schottky Source) after delivery and acceptance or the length of the Contractor's or manufacturer's standard warranty period, whichever is longer. The on-site warranty covers parts, labor and all related expenses. Any Work replaced, repaired or corrected pursuant to this section is subject to all provisions of the contract to the same extent as Work initially performed."

Agreed: Yes \_\_\_\_\_

### 6.4 Term of Contract

#### 6.4.1 Delivery Date

All the deliverables must be received on or before \_\_\_\_\_ (to be filled in only at contract award).

### 6.5 Authorities

#### 6.5.1 Contracting Authority

The Contracting Authority for the Contract is:

Monique Gosselin  
Public Works and Government Services Canada  
Acquisitions Branch  
Commercial Consumer Products Directorate  
11 Laurier Street, 6A2, Phase III  
Place du Portage, Gatineau, Quebec, K1A 0S5

Telephone: (819) 956-3803  
Facsimile: (819) 956-3814  
E-mail address: monique.gosselin@pwgsc.gc.ca

The Contracting Authority is responsible for the management of the Contract and any changes to the Contract must be authorized in writing by the Contracting Authority. The Contractor must not perform work in excess of or outside the scope of the Contract based on verbal or written requests or instructions from anybody other than the Contracting Authority.

**6.5.2 Technical Authority *(to be filled in only at contract award)***

The Technical Authority for the Contract is:

Name: \_\_\_\_\_  
Telephone: (\_\_\_\_) \_\_\_\_\_  
Facsimile: (\_\_\_\_) \_\_\_\_\_  
E-mail address: \_\_\_\_\_

The Technical Authority named above is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Technical Authority, however the Technical Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

**6.5.3 NRC Procurement Authority *(to be filled in only at contract award)***

The NRC Procurement Authority for the Contract is:

Name: \_\_\_\_\_  
Telephone: (\_\_\_\_) \_\_\_\_\_  
Facsimile: (\_\_\_\_) \_\_\_\_\_  
E-mail address: \_\_\_\_\_

The NRC Procurement Authority is responsible for the NRC contract management and for the authorization of all work against this contract.

**6.5.4 Contractor's Representative *(fill in)***

The telephone number of the person responsible for:

**General enquiries**

Name: \_\_\_\_\_  
Telephone No. \_\_\_\_\_  
Facsimile No. \_\_\_\_\_  
E-mail address: \_\_\_\_\_

**Delivery Follow-up**

Name: \_\_\_\_\_  
Telephone No. \_\_\_\_\_  
Facsimile No. \_\_\_\_\_  
E-mail address: \_\_\_\_\_

**6.6 Payment**

**6.6.1 Milestone Payments**

Canada will make milestone payments in accordance with the Schedule of Milestones detailed in the Contract and the payment provisions of the Contract if:

- a. an accurate and complete claim for payment using PWGSC-TPSGC 1111, Claim for Progress Payment, and any other document required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;

- b. all the certificates appearing on form PWGSC-TPSGC 1111 have been signed by the respective authorized representatives;
- c. all work associated with the milestone and as applicable any deliverable required has been completed and accepted by Canada.

**6.6.2 Schedule of Milestones**

Payment by Canada to the Contractor will be made in accordance with the following schedule:

Milestone No.	Deliverables	Firm Amount	Payment Due
1	Delivery of the Variable Pressure Scanning Electron Microscope	50% of the overall contract amount	Upon receipt of the equipment at the NRC Facility, Ottawa, Ontario.
2	For the completion of the installation	35% of the overall contract amount	Upon completion of the installation at the NRC Facility, Ottawa, Ontario.
3	At the final acceptance testing of the equipment	15% of the overall contract amount	Upon final inspection and acceptance of the equipment by the Technical Authority at NRC Facility, Ottawa, Ontario.

**6.6.3 SACC Manual Clauses**

C2000C	Taxes - Foreign-based Contractor	2007-11-30
C6000C	Limitation of Price	2001-05-16

**6.7 Invoicing Instructions - Progress Payment Claim**

- 1. The Contractor must submit a claim for payment using form PWGSC-TPSGC 1111, Claim for Progress Payment.

Each claim must show:

- a. all information required on form PWGSC-TPSGC 1111;
- b. all applicable information detailed under the section entitled "Invoice Submission" of the general conditions;
- c. a list of all expenses;
- d. the description and value of the milestone claimed as detailed in the Contract.

Each claim must be supported by:

- a. a copy of the invoices, receipts, vouchers for all direct expenses, travel and living expenses;
- 2. Applicable Taxes must be calculated on the total amount of the claim before the holdback is applied. At the time the holdback is claimed, there will be no Applicable Taxes payable as it was claimed and payable under the previous claims for progress payments.

3. The Contractor must prepare and certify one original and two (2) copies of the claim on form PWGSC-TPSGC 1111, and forward it to the Technical Authority identified under the section entitled "Authorities" of the Contract for appropriate certification after inspection and acceptance of the Work takes place.

The Technical Authority will then forward the original and two (2) copies of the claim to the Contracting Authority for certification and onward submission to the Payment Office for the remaining certification and payment action.

4. The Contractor must not submit claims until all work identified in the claim is completed.

## 6.8 Certifications

### 6.8.1 Compliance

The continuous compliance with the certifications provided by the Contractor in its bid and the ongoing cooperation in providing associated information are conditions of the Contract. Certifications are subject to verification by Canada during the entire period of the Contract. If the Contractor does not comply with any certification, fails to, provide the associated information, or if it is determined that any certification made by the Contractor in its bid is untrue, whether made knowingly or unknowingly, Canada has the right, pursuant to the default provision of the Contract, to terminate the Contract for default.

## 6.9 Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in the province of Ontario.

## 6.10 Priority of Documents

If there is a discrepancy between the wordings of any documents that appear on the list, the wording of the document that first appears on the list has priority over the wording of any document that subsequently appears on the list.

- (a) the Articles of Agreement;
- (b) 2010A (2014-11-27) General Conditions - Goods (Medium Complexity);
- (c) Annex A, Requirement / Basis of Payment;
- (d) Annex B, Mandatory specifications for a variable pressure scanning electron microscope (VPSEM);
- (e) the Contractor's bid dated \_\_\_\_\_ (*insert date of bid*).

## 6.11 SACC Manual clause

B1501C	Electrical Equipment	2006-06-16
A9068C	Government Site Regulations	2010-01-11
A2000C	Foreign Nationals (Canadian Contractor)	2006-06-16
A2001C	Foreign Nationals (Foreign Contractor)	2006-06-16
G1005C	Insurance	2008-05-12

Solicitation No. - N° de l'invitation  
31184-152219/A  
Client Ref. No. - N° de réf. du client  
31184-152219

Amd. No. - N° de la modif.  
File No. - N° du dossier  
pv91531184-152219

Buyer ID - Id de l'acheteur  
pv915  
CCC No./N° CCC - FMS No/N° VME

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## **6.12 Shipping Instructions**

### **6.12.1 Shipping Instructions - Delivery at Destination**

1. Goods must be consigned to the destination specified in the Contract and delivered:  
  
Delivered Duty Unpaid (DDU) (Ottawa, Ontario) Incoterms 2000 for shipments from a commercial contractor.
2. The Contractor will be responsible for all delivery charges, administration, costs and risk of transport. Canada will be responsible for customs clearance, including the payment of customs duties and taxes.

Solicitation No. - N° de l'invitation  
31184-152219/A  
Client Ref. No. - N° de réf. du client  
31184-152219

Amd. No. - N° de la modif.  
File No. - N° du dossier  
pv91531184-152219

Buyer ID - Id de l'acheteur  
pv915  
CCC No./N° CCC - FMS No/N° VME

## ANNEX A

### REQUIREMENT / BASIS OF PAYMENT

The National Research Council has a requirement for the supply and installation of a variable pressure scanning electron microscope (VPSEM) with user training for up to 3 users in accordance with the mandatory specifications detailed in Annex B for delivery to Ottawa, Ontario

Item	Description	Unit of Issue	Qty	Firm Unit Price DDU (Ottawa, Ontario)
1	Variable pressure scanning electron microscope (VPSEM) equipped with a silicon drift energy dispersive detector and an electron backscattered diffraction detector in accordance with the mandatory specifications detailed in Annex B.	Lot	1	\$ _____

The variable pressure scanning electron microscope (VPSEM) must also include the following:

An uninterruptible power supply (protection against power surges and supply failure) for electrical system backup capable of running all pumps, chiller, computers and electronics for a period of at least ½ hour.

**Agreed:** Yes \_\_\_\_\_

All gas pressure regulators necessary for the operation of the instrument.

**Agreed:** Yes \_\_\_\_\_

## ANNEX B

### MANDATORY SPECIFICATIONS FOR A VARIABLE PRESSURE SCANNING ELECTRON MICROSCOPE (VPSEM)

The National Research Council Canada (NRC) has a requirement for a variable pressure scanning electron microscope (VPSEM) equipped with a silicon drift energy dispersive detector and an electron backscattered diffraction detector.

**Vendors must cross reference the mandatory technical criteria in a concise format by using page, paragraph(s) & sub-paragraphs as applicable to their supporting technical documentation.**

#### 1.0 ELECTRON OPTICS AND COLUMN CONTROL

1.1 The VPSEM must have a schottky electron emission source (W/ZrO tip);

**Reference in Contractors Proposal:** \_\_\_\_\_

1.2 The VPSEM accelerating voltage must have a range of 0.2 – 30 kV;

**Reference in Contractors Proposal:** \_\_\_\_\_

1.3 The VPSEM maximum probe current (High Vacuum mode) must be 100 nA;

**Reference in Contractors Proposal:** \_\_\_\_\_

1.4 The VPSEM maximum probe current (Low Vacuum mode) must be 20 nA;

**Reference in Contractors Proposal:** \_\_\_\_\_

1.5 The VPSEM must have a faraday cup (probe current detector);

**Reference in Contractors Proposal:** \_\_\_\_\_

1.6 The VPSEM must be capable of storing and recalling the following analytical parameters:

1.6.1 accelerating voltage (kV);

1.6.2 current;

1.6.3 detector; and

1.6.4 lens settings.

**Reference in Contractors Proposal:** \_\_\_\_\_

1.7 The auto functions must include but need not be restricted to:

1.7.1 focus;

1.7.2 brightness;

1.7.3 contrast; and

1.7.4 stigmation and gun and aperture alignment.

**Reference in Contractors Proposal:** \_\_\_\_\_

- 1.8** The VPSEM absolute accuracy of all magnification readouts or displays must be < 2% (+/- 1%) at 1000X, 10000X and 100000X.

**Reference in Contractors Proposal:** \_\_\_\_\_

**2.0 ANALYTICAL SPECIMEN CHAMBER**

- 2.1** In low vacuum mode, the chamber must be able to attain pressures between 10 – 270 Pa controlled by pneumatic valves;

**Reference in Contractors Proposal:** \_\_\_\_\_

- 2.2** The chamber must be capable of accommodating the following:

- 2.2.1** energy dispersive x-ray detector (EDX);
- 2.2.2** electron backscattered diffraction detector (EBSD); and
- 2.2.3** wavelength dispersive x-ray system (WDS) (not part of this acquisition).

**Reference in Contractors Proposal:** \_\_\_\_\_

- 2.3** The chamber must have a camera with display incorporated into the computer display;

**Reference in Contractors Proposal:** \_\_\_\_\_

- 2.4** The chamber must have a port for the EBSD that is perpendicular to the stage tilt axis and which the stage tilts towards;

**Reference in Contractors Proposal:** \_\_\_\_\_

- 2.5** The chamber must have a port for the EDX detector that is in the same quadrant as the EBSD port;

**Reference in Contractors Proposal:** \_\_\_\_\_

- 2.6** The chamber must be large enough to accommodate a maximum sample size of 150 mm in diameter and 35 mm in height;

**Reference in Contractors Proposal:** \_\_\_\_\_

- 2.7** The chamber must include a liquid nitrogen anti-contamination trap;

**Reference in Contractors Proposal:** \_\_\_\_\_

- 2.8** The VPSEM must have the following specimen holders:

- 2.8.1** 12.5mm (diameter) x 10mm (h) stub;
- 2.8.2** 25mm (diameter) x 10mm (h) stub;
- 2.8.3** 32mm (diameter) x 20mm (h) stub;
- 2.8.4** Bulk holder with inserts for 4 to 6, 12.5mm SEM stubs; and
- 2.8.5** Geological thin section holder for a minimum of one (1) specimen

**Reference in Contractors Proposal:** \_\_\_\_\_

### 3.0 EVACUATION SYSTEM

3.1 The VPSEM evacuation system must be fully automated control system;

**Reference in Contractors Proposal:** \_\_\_\_\_

3.2 The VPSEM ultimate electron gun chamber vacuum must be  $10^{-7}$  Pa;

**Reference in Contractors Proposal:** \_\_\_\_\_

3.3 The VPSEM ultimate specimen chamber vacuum must be  $10^{-4}$  Pa;

**Reference in Contractors Proposal:** \_\_\_\_\_

3.4 The vacuum pumping system must be completely oil free;

**Reference in Contractors Proposal:** \_\_\_\_\_

3.5 The vacuum pumping system must have at least one of each of the following types of pumps: scroll, turbo-molecular, and ion.

**Reference in Contractors Proposal:** \_\_\_\_\_

### 4.0 RESOLUTION IN HIGH VACUUM MODE (SECONDARY AND BACKSCATTERED ELECTRON)

4.1 The secondary electron (SE) at 30 kV must be 1.2 nm;

**Reference in Contractors Proposal:** \_\_\_\_\_

4.2 The SE at 1 kV must be 3.0 nm;

**Reference in Contractors Proposal:** \_\_\_\_\_

4.3 The backscattered electron (BE) at 30 kV must be 2.5nm;

**Reference in Contractors Proposal:** \_\_\_\_\_

### 5.0 RESOLUTION IN LOW VACUUM MODE (SECONDARY ELECTRON)

5.1 The SE image (30 kV, 10 Pa) must be 2.0 nm;

**Reference in Contractors Proposal:** \_\_\_\_\_

5.2 The BE image (30 kV, 10 Pa) must be 2.5 nm.

**Reference in Contractors Proposal:** \_\_\_\_\_

### 6.0 DETECTORS

6.1 The VPSEM must have a secondary E/T electron detector for high vacuum mode in-lens;

**Reference in Contractors Proposal:** \_\_\_\_\_

**6.2** The VPSEM must have a secondary electron detector for low vacuum mode;

**Reference in Contractors Proposal:** \_\_\_\_\_

**6.3** The VPSEM must have a dedicated high sensitivity solid state backscattered electron detector that allows for image mixing including compositional contrast, and topography;

**Reference in Contractors Proposal:** \_\_\_\_\_

**6.4** The VPSEM must have a silicon drift energy dispersive X-ray detector (SDD) (*specifications at Section 9.0*);

**Reference in Contractors Proposal:** \_\_\_\_\_

**6.5** The VPSEM must have an electron backscattered diffraction detector (EBSD) (*specifications at Section 10.0*);

**Reference in Contractors Proposal:** \_\_\_\_\_

## **7.0 STAGE**

**7.1** The VPSEM must have a five (5) directional (X, Y, Z, R and T), motor driven, computer controlled, eucentric specimen stage with backlash correction and the ability to store position locations in X-Y-Z-R-T space.

**Reference in Contractors Proposal:** \_\_\_\_\_

**7.2** In addition to controlling the stage movement through a graphical interface, the VPSEM must allow the stage to be controlled manually in all five directions (X-Y-Z-R-T) through the use of a joystick, touch ball or touch pad controller system;

**Reference in Contractors Proposal:** \_\_\_\_\_

**7.3** The software controlling the stage movement must be capable of setting range of movement limitations to restrict user range of travel thereby preventing collision between the specimen holder/specimen assembly with the chamber and chamber components;

**Reference in Contractors Proposal:** \_\_\_\_\_

**7.4** All stage axes must be part of an integrated motion safety interlock system that is controlled by the software and networks the stage, specimen holder and specimen with all objects in the chamber to prevent the stage, specimen holder and specimen from coming in contact with the chamber and objects inside the chamber;

**Reference in Contractors Proposal:** \_\_\_\_\_

**7.5** The rotation must be a full 360°;

**Reference in Contractors Proposal:** \_\_\_\_\_

**7.6** The stage tilt must range from -5° to +70°;

**Reference in Contractors Proposal:** \_\_\_\_\_

7.7 The VPSEM must have a tilt scan correction of 70° for spatial distortion of raster coverage and focus;

**Reference in Contractors Proposal:** \_\_\_\_\_

7.8 The VPSEM must accommodate samples up to 6"/150mm in diameter;

**Reference in Contractors Proposal:** \_\_\_\_\_

7.9 The VPSEM must have Peltier Cooling stage capable of cooling samples to -25°C for one (1) hour;

**Reference in Contractors Proposal:** \_\_\_\_\_

## 8.0 COMPUTING AND IMAGING

8.1 The scanning speeds must be fast, slow;

**Reference in Contractors Proposal:** \_\_\_\_\_

8.2 The software controlling the operation of the instrument must provide on line user guidance;

**Reference in Contractors Proposal:** \_\_\_\_\_

8.3 The vendor supplied image acquisition and associated database management software must be independent of any software associated with 3<sup>rd</sup> party vendors.

**Reference in Contractors Proposal:** \_\_\_\_\_

8.4 The software must allow for image acquisition, image rotation, zooming and image processing (brightness, contrast, smoothing, sharpening) and must include the ability to export images in the following formats; bmp, jpg, jpeg, tif, tiff;

**Reference in Contractors Proposal:** \_\_\_\_\_

8.5 The photos must have the option to display or exclude all/or any combination of the following acquisition parameters: accelerating voltage, magnification, micron bar, working distance, detector used, pressure (when in VP mode);

**Reference in Contractors Proposal:** \_\_\_\_\_

8.6 The software must be capable of electronic scan rotation;

**Reference in Contractors Proposal:** \_\_\_\_\_

8.7 The VPSEM must have a high resolution dual monitor system with a minimum pixel resolution 1280x960;

**Reference in Contractors Proposal:** \_\_\_\_\_

8.8 The image acquisition software (SEM or EDX) must be capable of drift correction;

**Reference in Contractors Proposal:** \_\_\_\_\_

**8.9** The VPSEM must have energy dispersive x-ray (EDX) analysis software for use with EDX Spectrometer (*see section 9.0 for details*);

**Reference in Contractors Proposal:** \_\_\_\_\_

**8.10** The software must have an automated X-ray mapping and image/feature analysis capability to classify particles/grains based on chemistry and morphology (*see section 10.0 for details*);

**Reference in Contractors Proposal:** \_\_\_\_\_

**8.11** The X-ray mapping software must have the capability of generating quantitative chemical X-ray maps which are software corrected for background and peak overlaps for use with the EDX spectrometer;

**Reference in Contractors Proposal:** \_\_\_\_\_

**8.12** The VPSEM's computer system must have a minimum of two (2) high speed USB ports;

**Reference in Contractors Proposal:** \_\_\_\_\_

**8.13** The VPSEM must have a mirror image backup of computer system;

**Reference in Contractors Proposal:** \_\_\_\_\_

**8.14** The VPSEM must have a separate workstation for image and data processing;

**Reference in Contractors Proposal:** \_\_\_\_\_

**8.15** The image workstation must include computer desk, high resolution monitor and computer complete with off-line software licences for both the electron microscope image processing/database software, as well as, any EDX and EBSD software;

**Reference in Contractors Proposal:** \_\_\_\_\_

**8.16** The workstation computer must be equipped as follows:

- 8.16.1** Intel core i7 series processor,
- 8.16.2** 2TB hard disk,
- 8.16.3** 12 GB DDR3 RAM (expandable to 16GB),
- 8.16.4** mirror backup of the computer system,
- 8.16.5** NVIDIA (Geforce GT 635) graphics card, and
- 8.16.6** Windows 8.1

**Reference in Contractors Proposal:** \_\_\_\_\_

**8.17** The monitor connected to the computer in 8.13 must consist of a 21" widescreen with native resolution of 1980 by 1080 pixel resolution;

**Reference in Contractors Proposal:** \_\_\_\_\_

**8.18** An additional software site licence to be installed on the lab manager's desk computer must be provided.

**Reference in Contractors Proposal:** \_\_\_\_\_

## 9.0 ENERGY DISPERSIVE X-RAY (EDX) SPECTROMETER

9.1 The EDX system must be capable of reading and processing INCA data files;

**Reference in Contractors Proposal:** \_\_\_\_\_

9.2 The EDX must have a silicon drifted detector (SDD), with an active surface area of 80mm<sup>2</sup> area, with LN<sub>2</sub>-free, Peltier cooling;

**Reference in Contractors Proposal:** \_\_\_\_\_

9.3 The minimum spectral resolution must be 127eV at 50,000 counts per second on Mn K $\alpha$ ;

**Reference in Contractors Proposal:** \_\_\_\_\_

9.4 The EDX must have the ability to detect beryllium (Be) to californium (Cf);

**Reference in Contractors Proposal:** \_\_\_\_\_

9.5 The EDX must be able to acquire images with up to 8Kx8K pixel resolution;

**Reference in Contractors Proposal:** \_\_\_\_\_

9.6 The EDX must be able to acquire X-ray maps at resolution of up to 4Kx4K with each pixel containing full X-ray data;

**Reference in Contractors Proposal:** \_\_\_\_\_

9.7 The EDX must be able to acquire both secondary electron (SE) and backscatter electron (BE) images simultaneously;

**Reference in Contractors Proposal:** \_\_\_\_\_

9.8 The software package must be capable of performing the following routines:

- 9.8.1 image acquisition,
- 9.8.2 standard less/standard quantitative analysis,
- 9.8.3 x-ray mapping,
- 9.8.4 auto identification of peaks,
- 9.8.5 linescan,
- 9.8.6 phase mapping,
- 9.8.7 large area analysis/mapping capable of stitching multiple frames into one image,
- 9.8.8 particle analysis, and
- 9.8.9 batch processing of all data.

**Reference in Contractors Proposal:** \_\_\_\_\_

9.9 The quantification software must be included to allow users to choose between a standard-less routine or calibrated routine employing user defined standards;

**Reference in Contractors Proposal:** \_\_\_\_\_

**9.10** The analytical routine must include the capability for both normalized and un-normalized quantification;

**Reference in Contractors Proposal:** \_\_\_\_\_

**9.11** The quantification routine must allow one or more elements to have a fixed concentration as part of the quantification routine;

**Reference in Contractors Proposal:** \_\_\_\_\_

**9.12** The User must be able to store multiple points in X-Y-Z space for queued unattended acquisition of spectra, X-ray maps, and linescans;

**Reference in Contractors Proposal:** \_\_\_\_\_

**9.13** The software must include two (2) additional site licences for installation on computers other than that which is associated with the electron microscope. One of these additional site licences will be installed on the workstation computer (see 8.12) and the other will be installed on the lab manager's desktop computer.

**Reference in Contractors Proposal:** \_\_\_\_\_

## **10.0 ELECTRON BACKSCATTERED DIFFRACTION (EBSD) DETECTOR**

**10.1** The EBSD must be integrated with the EDX software using a single interface such that there is no compromise in the functionality of either the EDX or EBSD software;

**Reference in Contractors Proposal:** \_\_\_\_\_

**10.2** The User must be able to create a profile that contains acquisition, camera, and phase settings;

**Reference in Contractors Proposal:** \_\_\_\_\_

**10.3** The EBSD must be integrated with the EDX spectrometer through a single interface to allow simultaneous acquisition of EBSD and X-ray spectral maps at a point per second count of 870;

**Reference in Contractors Proposal:** \_\_\_\_\_

**10.4** The EBSD must be able to archive EBSD patterns & EDX spectra collected together to be used as a database for identifying unknown phases;

**Reference in Contractors Proposal:** \_\_\_\_\_

**10.5** The EBSD must be able to collect EBSD maps and X-ray spectral maps simultaneously in both manual and unattended mode at up to 2k x 2k resolution;

**Reference in Contractors Proposal:** \_\_\_\_\_

**10.6** The EBSD must be capable of stitching a number of maps (up to 64 million data points in size) together into a single montaged data set.

**Reference in Contractors Proposal:** \_\_\_\_\_

**10.7** The camera must be capable of acquiring scanned images up to 8k x 8k resolution;

**Reference in Contractors Proposal:** \_\_\_\_\_

**10.8** The EBSD must be capable of collecting EBSD maps up to 4k x 4k resolution;

**Reference in Contractors Proposal:** \_\_\_\_\_

**10.9** The EBSD must be capable of performing dynamic auto background correction routine;

**Reference in Contractors Proposal:** \_\_\_\_\_

**10.10** The EBSD must include a 20MHz, 12 bit digital CCD camera with on-chip integration;

**Reference in Contractors Proposal:** \_\_\_\_\_

**10.11** The detector must be retractable with an audible safety alarm to prevent collision;

**Reference in Contractors Proposal:** \_\_\_\_\_

**10.12** The EBSD must have a rectangular phosphor screen matching the dimensions of the CCD chip;

**Reference in Contractors Proposal:** \_\_\_\_\_

**10.13** The EBSD must have a phosphor screen capable of low kV ( $\leq 5\text{kV}$ ) data acquisition;

**Reference in Contractors Proposal:** \_\_\_\_\_

**10.14** The EBSD must be capable of collecting multiple adjacent area maps and combining the maps into a single montaged data set;

**Reference in Contractors Proposal:** \_\_\_\_\_

**10.15** The EBSD must have external beam control;

**Reference in Contractors Proposal:** \_\_\_\_\_

**10.16** The EBSD software package must include ICSD, HKL, NIST and American Mineralogist databases;

**Reference in Contractors Proposal:** \_\_\_\_\_

**10.17** The EBSD must be able to archive EBSD patterns and EDX spectra to be used as a database for identifying unknown phases;

**Reference in Contractors Proposal:** \_\_\_\_\_

**10.18** All images must be saved and exported automatically in the following formats; bmp, gif, jpg, jpeg, png, tif, tiff;

**Reference in Contractors Proposal:** \_\_\_\_\_

Solicitation No. - N° de l'invitation  
31184-152219/A  
Client Ref. No. - N° de réf. du client  
31184-152219

Amd. No. - N° de la modif.  
File No. - N° du dossier  
pv91531184-152219

Buyer ID - Id de 'acheteur  
pv915  
CCC No./N° CCC - FMS No/N° VME

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**10.19** All patterns must be capable of being saved as bmp, gif, jpg, jpeg, png, tif or tiff files;

**Reference in Contractors Proposal:** \_\_\_\_\_

**10.20** The software must include two (2) additional site licences for installation on computers other than that which is associated with the electron microscope. One of these additional site licences will be installed on the workstation computer (see 8.12) and the other will be installed on the lab manager's desktop computer.

**Reference in Contractors Proposal:** \_\_\_\_\_

Solicitation No. - N° de l'invitation  
31184-152219/A  
Client Ref. No. - N° de réf. du client  
31184-152219

Amd. No. - N° de la modif.  
File No. - N° du dossier  
pv91531184-152219

Buyer ID - Id de l'acheteur  
pv915  
CCC No./N° CCC - FMS No/N° VME

### ANNEX B-1

#### POINT RATED CRITERIA

Mandatory Specification	Requirement	Maximum of Points	Reference to Mand. Spec.	Comment	Score
<b>Electron Optics – 10 points maximum</b>					
Probe Current High Vacuum (HV)	1 point for every 20 nA (at 30 kV) above 100 nA	5	1.3		
Probe Current Low Vacuum (LV)	1 point for every 20 nA (at 30 kV) above 100 nA	5	1.4		
<b>Subtotal</b>					
<b>Column Control and Operation – 44 points maximum</b>					
Column Condition settings	Vendor must demonstrate that column conditions listed in A-6 of the mandatory requirements [accelerating voltage, current, detector type (SE, LV-SE, BE) and lens settings] and chamber pressure (in LV mode) can be stored and later recalled such that the user need only select their column conditions file and the microscope can re-call them. 2 points for each of the 5 conditions that can be stored in a user specific file and recalled.	10	1.6		
Auto focus, brightness and contrast, stigmation, as well as, gun and aperture alignment	Image of gold beads on carbon substrate to be taken at the following magnifications; 1000, 10000, and 100000 times. Secondary electron images will be taken at 30kV at each magnification. After each photo, the column conditions will be reset by the examiner, the magnification will be increased and the auto functions will be re-applied. 3 points will be awarded based on the ability to auto setup to successfully auto image at each magnification.	9	1.7		
<b>Subtotal</b>					

Solicitation No. - N° de l'invitation  
31184-152219/A  
Client Ref. No. - N° de réf. du client  
31184-152219

Amd. No. - N° de la modif.  
pv915  
File No. - N° du dossier  
pv91531184-152219

Buyer ID - Id de l'acheteur  
pv915  
CCC No./N° CCC - FMS No/N° VME

Mandatory Specification	Requirement	Maximum of Points	Reference to Mand. Spec.	Comment	Score
<b>Column Control and Operation – 45 points maximum (continued)</b>					
Supervisor controlled operation mode	The vendor must demonstrate that the software controlling the microscope gives the expert analyst full control over the operation of the instrument but also allows the laboratory supervisor to prevent or limit changes novice users can make to individual column parameters (as defined above). 2 point for each column parameter locked out.	10	7.3		
Real-time Operational Guidance	Vendor must demonstrate the reference materials available to the user. Points will be awarded as follows: on-line help in the form of a users manual (2 point), software-based training taking the user through the execution of key operational parameters of the instrument (5 points) and interactive operational guidance based on the objectives of the user, for example, surface/secondary electron imaging, compositional/backscattered electron imaging, or elemental analysis (8 points).	15			
<b>Analytical Specimen Chamber – 9 points maximum</b>					
Analytical Specimen Chamber - Variable Pressure Mode	While in low vacuum mode the chamber must be able to attain pressure between 10-270 Pa. 3 points will be awarded for each of the following gases that can be used in the instrument to attain these pressures: nitrogen, helium, water vapor.	9	2.1		
<b>Subtotal</b>					<b>Subtotal</b>

Solicitation No. - N° de l'invitation  
31184-152219/A  
Client Ref. No. - N° de réf. du client  
31184-152219

Amd. No. - N° de la modif.  
pv915  
File No. - N° du dossier  
pv91531184-152219

Buyer ID - Id de l'acheteur  
pv915  
CCC No./N° CCC - FMS No/N° VME

Mandatory Specification	Requirement	Maximum of Points	Reference to Mand. Spec.	Comment	Score
<b>Evacuation System – 5 points maximum</b>					
Sample Chamber pump down time from atmosphere to High Vacuum (pressure suitable to turn on emission source)	Fastest 3 instruments will get points as follows: 1st 5 points, 2nd 3 points, and 3rd 1 point.	5	3.0		
<b>Stage Control – 10 points maximum</b>					
Stage Control	Vendor must demonstrate that Stage positions (X-Y-Z-T-R) can be stored in a user specific file and recalled for later observation. 2 points for each of the 5 axes that can be stored and recalled from a column conditions file.	10	7.1		
<b>Resolution Tests - 40 points maximum</b>					
HV SE resolution (nm) at 30 kV	1 point for every 0.1 nm resolution obtained below the mandatory specification of 1.2 nm	5	4.1		
HV SE resolution (nm) at 1 kV	1 point for every 0.1 nm resolution obtained below the mandatory specification of 3.0 nm	5	4.2		
HV BE resolution (nm) at 30 kV	1 point for every 0.1 nm resolution obtained below the mandatory specification of 2.5 nm	5	4.3		
LV SE resolution (nm) at 30k V, 10 Pa	1 point for every 0.1 nm resolution obtained below the mandatory specification of 2.0 nm	5	5.1		
LV BE resolution (nm) at 30 kV, 10 Pa	1 point for every 0.1 nm resolution obtained below the mandatory specification of 2.5 nm	5	5.2		
<b>Subtotal</b>					
<b>Subtotal</b>					

Mandatory Specification	Requirement	Maximum of Points	Reference to Mand. Spec.	Comment	Score
<b>Resolution Tests - 40 points maximum (continued)</b>					
Magnification Check	The absolute accuracy of the magnification display will be verified at 1,000X, 10,000 and 100,000X magnification in HV mode at 30 kV. An absolute accuracy of less than or equal to 2% (+/- 1%) at each magnification will be awarded 5 points. One point will be deducted for each 1% (+/- 0.5%) deviation from the readout at each magnification.	15	1.8		
<b>Additional On-site tests – 100 points maximum</b>					
LV mode: SE image of Ag threads on polymer substrate	Images to be assessed by panel at NRC after site visit. Vendor deemed to have the best image will receive all the points as follows; 1st, 25 points; 2nd, 15 points; 3rd, 10 points; 4th, 5 points; 5th, 0 points.	25		Silver threads on polymer substrate. Source: NRC printable electronics group.	
LV mode: SE image of ultra fine clays	Images to be assessed by panel at NRC after site visit. Vendor deemed to have the best image will receive all the points as follows; 1st, 25 points; 2nd, 15 points; 3rd, 10 points; 4th, 5 points; 5th, 0 points.	25		Ultra fine clay minerals. Source: NRC's high efficiency mining group.	
HV Mode: BE 30kV, a/β brass	Images to be assessed by panel at NRC after site visit. Vendor deemed to have the best image will receive all the points as follows; 1st, 25 points; 2nd, 15 points; 3rd, 10 points; 4th, 5 points; 5th, 0 points.	25		Backscattered electron atomic number resolution will be evaluated on an a/b brass with a mean atomic number difference of less than 0.1 atm. The sample will be supplied by Micro Analysis Consultants Limited of England (product number DBR5MM).	
		<b>Subtotal</b>			

Mandatory Specification	Requirement	Maximum of Points	Reference to Mand. Spec.	Comment	Score
<b>Additional On-site tests – 100 points maximum (continued)</b>					
LV Mode: BE 30kV, 10 Pa, a/β brass	Images to be assessed by panel at NRC after site visit. Vendor deemed to have the best image will receive all the points as follows; 1st, 25 points; 2nd, 15 points; 3rd, 10 points; 4th, 5 points; 5th, 0 points.	25		Backscattered electron atomic number resolution will be evaluated on an a/b brass with a mean atomic number difference of less than 0.1 atm. The sample will be supplied by Micro Analysis Consultants Limited of England (product number DBR5MM).	
<b>Subtotal</b>					
<b>Miscellaneous – 60 points maximum</b>					
The designated room for installation has been evaluated by an independent engineering firm (Vibration Engineering Inc.). Points will be assigned based on a pass/fail basis. Data submitted by vendors for installation requirements will be evaluated by Vibration Engineering to determine if the microscope can meet its specifications without any remediation.					
Vibration	Vendor submitted data for room vibration requirements necessary for the instrument to meet specifications must be within measured tolerances as determined by Vibration Engineering Inc. Points assign as either pass (20) or fail (0).	20	PART 4 Section 4.1.1 para 6	Vibration measurements were made on the floor in three directions at the proposed location of the scanning electron microscope column.	
Electromagnetic	Vendor submitted data for Electromagnetic interferences (AC/DC Fields) as measured in the designated room must be within measured tolerances as determined by Vibration Engineering Inc. Points assigned on a pass (20) or fail (0) basis	20	PART 4 Section 4.1.1 para 6	Electromagnetic interferences (AC/DC Fields) were made approximately 1 meter above the ground	
Acoustic	Acoustic measurements were made approximately 1 meter above the ground. Points will be assigned on a pass (20) of fail (0) basis.	20	PART 4 Section 4.1.1 para 6	Acoustic measurements were made approximately 1 meter above the ground	
<b>Subtotal</b>					

Solicitation No. - N° de l'invitation  
31184-152219/A  
Client Ref. No. - N° de réf. du client  
31184-152219

Amd. No. - N° de la modif.  
File No. - N° du dossier  
pv91531184-152219

Buyer ID - Id de l'acheteur  
pv915  
CCC No./N° CCC - FMS No/N° VME

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### **Samples Supplied by Customer**

Resolution will be evaluated on an ultra high resolution, gold on carbon sample, supplied by Ted Pella Inc., product number 617-3.

Backscattered electron atomic number resolution will be evaluated on an a/b brass with a mean atomic number difference of less than 0.1 atm. The sample will be supplied by Micro Analysis Consultants Limited of England (product number DBR5MM).

Magnification accuracy will be verified using the NIST and NPL traceable certified reference material MRS 4.2

Silver threads on polymer substrate. Source: NRC printable electronics group.

Ultra fine clay minerals. Source: NRC's high efficiency mining group.

### **Instrumentation and Procedures used for room assessment**

Vibration Engineering Inc.

The instrumentation utilized to conduct the testing is itemized below:

Spectrum Analyzer: Data Physics Quattro DP-240

Accelerometer: Wilcoxon Research 731A seismic accelerometer,

Serial Number 1934 & 1904, 1000 Volts per g

AC & DC EMI: MEDA u-Mag # 3267 Fluxgate Sensor

Microphone: ACO Pacific

Vibration measurements were made on the floor in three directions at the proposed location of the scanning electron microscope.

The EMI and sound pressure measurements were made approximately 1 meter above the floor.

Measurements were taken under normal operating conditions.

Solicitation No. - N° de l'invitation  
31184-152219/A  
Client Ref. No. - N° de réf. du client  
31184-152219

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pv91531184-152219

Buyer ID - Id de 'acheteur  
pv915  
CCC No./N° CCC - FMS No/N° VME

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### ANNEX C

#### COMPLETE LIST OF DIRECTORS (As per Standard Instructions, Clauses and Conditions Part 2)

Name	Position
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____