

**RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:**

**Bid Receiving
PWGSC
33 City Centre Drive
Suite 480
Mississauga
Ontario
L5B 2N5
Bid Fax: (905) 615-2095**

**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

Title - Sujet Spectrometer System	
Solicitation No. - N° de l'invitation KM061-121080/A	Date 2012-07-16
Client Reference No. - N° de référence du client KM061-121080	
GETS Reference No. - N° de référence de SEAG PW-\$TOR-212-5968	
File No. - N° de dossier TOR-2-35089 (212)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2012-08-28	
Time Zone Fuseau horaire Eastern Daylight Saving Time EDT	
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Shaw, Marian	Buyer Id - Id de l'acheteur tor212
Telephone No. - N° de téléphone (905) 615-2065 ()	FAX No. - N° de FAX (905) 615-2060
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: DEPARTMENT OF THE ENVIRONMENT 4905 DUFFERIN ST DOWNSVIEW Ontario M3H5T4 Canada	

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

Public Works and Government Services Canada
Ontario Region
33 City Centre Drive
Suite 480
Mississauga
Ontario
L5B 2N5

Delivery Required - Livraison exigée 2013-03-31	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

TABLE OF CONTENTS

PART 1 - GENERAL INFORMATION

1. Security Requirement
2. Requirement
3. Debriefings

PART 2 - BIDDER INSTRUCTIONS

1. Standard Instructions, Clauses and Conditions
2. Submission of Bids
3. Enquiries - Bid Solicitation
4. Applicable Laws

PART 3 - BID PREPARATION INSTRUCTIONS

1. Bid Preparation Instructions

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

1. Evaluation Procedures
2. Basis of Selection

PART 5 - CERTIFICATIONS

1. Code of Conduct Certifications - Consent to a Criminal Record Verification
2. Certifications Precedent to Contract Award

PART 6 - RESULTING CONTRACT CLAUSES

1. Security Requirement
2. Requirement
3. Standard Clauses and Conditions
4. Term of Contract
5. Authorities
6. Payment
7. Invoicing Instructions
8. Certifications
9. Applicable Laws
10. Priority of Documents
11. SACC Manual Clauses

List of Annexes:

- | | |
|---------|---|
| Annex A | Requirement |
| Annex B | Basis of Payment |
| Annex C | Form 1 - OEM Certification |
| | Form 2 - Software Publisher Certification Form, |
| | Form 3 - Software Publisher Authorization Form. |

PART 1 - GENERAL INFORMATION

1. Security Requirement

There is no security requirement associated with the requirement.

2. Requirement

The requirement is detailed under Article 2 of the resulting contract clauses.

3. Debriefings

After contract award, 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

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 (2012-07-11) 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: ninety (90) days

1.1 SACC Manual Clauses

B1000T (2007-11-30) Condition of Material

2. Submission of Bids

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

Due to the nature of the bid solicitation, bids transmitted by facsimile to PWGSC will not be accepted.

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 is eliminated, and the enquiry can be answered with copies to all bidders. Enquiries not submitted in a form that can be distributed to all bidders may not be answered by Canada.

4. Applicable Laws

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

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

PART 3 - BID PREPARATION INSTRUCTIONS

1. Bid Preparation Instructions

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

Section I: Technical Bid ((3 hard copies)

Section II: Financial Bid (2 hard copies)

Section III: Certifications (1 hard 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:

- (a) use 8.5 x 11 inch (216 mm x 279 mm) paper;
- (b) use a numbering system that corresponds to the bid solicitation.

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, bidders are encouraged to:

- 1) use 8.5 x 11 inch (216 mm x 279 mm) paper containing fibre certified as originating from a sustainably-managed forest and/or containing minimum 30% recycled content; and

-
- 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, duotangs or binders.

Section I: Technical Bid

In their technical bid, bidders should explain and demonstrate how they propose to meet the requirements and how they will carry out the Work.

Section II: Financial Bid

Bidders must submit their financial bid in Canadian dollars in accordance with Annex B, Basis of Payment. The total amount of Goods and Services Tax (GST) or Harmonized Sales Tax (HST) must be shown separately, if applicable.

Section III: Certifications

Bidders must submit the certifications required under Part 5.

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

1.1 Technical Evaluation**1.1.1 Mandatory Technical Criteria**

- (a) The Bidder must provide a concise and detailed response to each of the Mandatory criteria detailed at Annex A. Bidders must provide evidence (instrument specification, publication, documented data) to support the fact that their system meets each of the mandatory criteria detailed at Annex A. Simply stating that the criteria is met is not acceptable.

1.2 Financial Evaluation**1.2.1 Mandatory Financial Criteria**

The bidder must complete and submit Annex B, Basis of Payment, with their bid at time of bid closing.

1.2.2 Evaluation of Price

The price of the bid will be evaluated in Canadian dollars, the Goods and Services Tax or the Harmonized Sales Tax excluded, FOB destination, Canadian customs duties and excise taxes included.

- 1.2.3** The price used in the evaluation will be the total firm lot price proposed at Annex B, Basis of Payment for the complete system.

2. Basis of Selection

2.1 Basis of Selection - Mandatory Technical Criteria

A bid must comply with the requirements of the bid solicitation and meet all mandatory technical evaluation criteria to be declared responsive. The responsive bid with the lowest evaluated price will be recommended for award of a contract.

PART 5 - CERTIFICATIONS

Bidders must provide the required certifications to be awarded a contract. Canada will declare a bid non-responsive if the required certifications are not completed and submitted as requested.

Compliance with the certifications bidders provide to Canada is subject to verification by Canada during the bid evaluation period (before award of a contract) and after award of a contract. The Contracting Authority will have the right to ask for additional information to verify bidders' compliance with the certifications before award of a contract. The bid will be declared non-responsive if any certification made by the Bidder is untrue, whether made knowingly or unknowingly. Failure to comply with the certifications or to comply with the request of the Contracting Authority for additional information will also render the bid non-responsive.

1. Code of Conduct Certifications - Consent to a Criminal Record Verification

1.1 Bidders must submit with their bid, by the bid solicitation closing date:

- (a) a complete list of names of all individuals who are currently directors of the Bidder;
- (b) a properly completed and signed form Consent to a Criminal Record Verification (PWGSC-TPSGC 229), for each individual named in the list.

2. Certifications 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 so inform the Bidder and provide the Bidder with a time frame within which to meet the requirement. Failure to comply with the request of the Contracting Authority and meet the requirement within that time period will render the bid non-responsive.

2.1 Federal Contractors Program - Certification

Federal Contractors Program - \$200,000 or more

1. The Federal Contractors Program (FCP) requires that some suppliers, including a supplier who is a member of a joint venture, bidding for federal government contracts, valued at \$200,000 or more (including all applicable taxes), make a formal commitment to implement employment equity. This is a condition precedent to contract award. If the Bidder, or, if the Bidder is a joint venture and if any member of the joint venture, is subject to the FCP, evidence of its commitment must be provided before the award of the Contract.

Suppliers who have been declared ineligible contractors by Human Resources and Skills Development Canada (HRSDC) are no longer eligible to receive government contracts over the threshold for solicitation of bids as set out in the Government Contracts Regulations. Suppliers may be declared ineligible contractors either as a result of a finding of non-compliance by HRSDC, or following their voluntary withdrawal from the FCP for a reason other than the reduction of their workforce to less than 100 employees. Any bids from ineligible contractors, including a bid from a joint venture that has a member who is an ineligible contractor, will be declared non-responsive.

2. If the Bidder does not fall within the exceptions enumerated in 3.(a) or (b) below, or does not have a valid certificate number confirming its adherence to the FCP, the Bidder must fax (819-953-8768) a copy of the signed form LAB 1168, Certificate of Commitment to Implement Employment Equity, to the Labour Branch of HRSDC.
3. The Bidder, or, if the Bidder is a joint venture the member of the joint venture, certifies its status with the FCP, as follows:

The Bidder or the member of the joint venture

- (a) () is not subject to the FCP, having a workforce of less than 100 full-time or part-time permanent employees, and/or temporary employees having worked 12 weeks or more in Canada;
- (b) () is not subject to the FCP, being a regulated employer under the Employment Equity Act, S.C. 1995, c. 44;
- (c) () is subject to the requirements of the FCP, having a workforce of 100 or more full-time or part-time permanent employees, and/or temporary employees having worked 12 weeks or more in Canada, but has not previously obtained a certificate number from HRSDC (having not bid on requirements of \$200,000 or more), in which case a duly signed certificate of commitment is attached;
- (d) () is subject to the FCP, and has a valid certificate number as follows: _____ (e.g. has not been declared an ineligible contractor by HRSDC.)

Further information on the FCP is available on the HRSDC Web site.

2.2 **OEM Certification**

- a) Any Bidder that is not the Original Equipment Manufacturer (OEM) for every item of hardware proposed as part of its bid is required to submit the OEM's certification regarding the Bidder's authority to provide and maintain the OEM's hardware, which must be signed by the OEM (not the Bidder). No Contract will be awarded to a Bidder who is not the OEM of the hardware it proposes to supply to Canada, unless the OEM certification has been provided to Canada. Bidders are requested to use the OEM Certification Form included with the bid solicitation. Although all the contents of the OEM Certification Form are required, using the form itself to provide this information is not mandatory. For Bidders/OEMs who use an alternate form, it is in Canada's sole discretion to determine whether all the required information has been provided.
- b) If the hardware proposed by the Bidder originates with multiple OEMs, a separate OEM certification is required from each OEM.

- c) For the purposes of this bid solicitation, OEM means the manufacturer of the hardware, as evidenced by the name appearing on the hardware, on all accompanying documentation, on mandatory certification reports, and on any support software.

2.3 Software Publisher Certification and Software Publisher Authorization

- a) If the Bidder is the Software Publisher for any of the proprietary software component(s) it bids, Canada requires that the Bidder confirm in writing that it is the Software Publisher. Bidders are requested to use the Software Publisher Certification Form included with the bid solicitation. Although all the contents of the Software Publisher Certification Form are required, using the form itself to provide this information is not mandatory. For bidders who use an alternate form, it is in Canada's sole discretion to determine whether all the required information has been provided.
- b) Any Bidder that is not the Software Publisher of all the proprietary software products or components proposed as part of its bid is required to submit proof of the Software Publisher's authorization, which must be signed by the Software Publisher (not the Bidder). No Contract will be awarded to a Bidder who is not the Software Publisher of all of the proprietary software it proposes to supply to Canada, unless proof of this authorization has been provided to Canada. If the proprietary software proposed by the Bidder originates with multiple Software Publishers, authorization is required from each Software Publisher. Bidders are requested to use the Software Publisher Authorization Form included with the bid solicitation. Although all the contents of the Software Publisher Authorization Form are required, using the form itself to provide this information is not mandatory. For Bidders/Software Publishers who use an alternate form, it is in Canada's sole discretion to determine whether all the required information has been provided.
- c) In this bid solicitation, "Software Publisher" means the owner of the copyright in any software included in the bid, who has the right to license (and authorize others to license/sub-license) its software products.

PART 6 - RESULTING CONTRACT CLAUSES

1. Security Requirement

There is no security requirement associated with the requirement.

2. Requirement

The Contractor must provide the Open Path Fourier Transform Infra Red Mobile Spectrometer System in accordance with the Requirement at Annex A and the Contractor's technical bid entitled _____, dated _____.

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.

3.1 General Conditions

2030 (2012-07-16) General Conditions - Higher Complexity - Goods, apply to and form part of the Contract.

3.2 Supplemental General Conditions

4001 (2010-08-16) Hardware Purchase, Lease and Maintenance, apply to and form part of the Contract.

4003 (2010-08-16) Licensed Software, apply to and form part of the Contract.

4. Term of Contract

4.1 Delivery Date

All the deliverables must be received on or before 29 March 2013.

5. Authorities

5.1 Contracting Authority

The Contracting Authority for the Contract is:

Marian Shaw
Public Works and Government Services Canada
Acquisitions Branch
33 City Centre Drive, Suite 480
Mississauga, Ontario L5B 2N5
Telephone : (905) 615-2065
Facsimile: (905) 615-2060
E-mail address: marian.shaw@pwgsc-tpsgc.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.

5.2 Project Authority

The Project Authority for the Contract is:

(To be provided at contract award).

The Project Authority 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 Project Authority, however the Project 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.

5.3 Contractor's Representative

Name: _____
Title: _____
Telephone No. _____
Facsimile No. _____
E-mail address: _____

6. Payment

6.1 Basis of Payment - Firm Lot Price(s)

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid the firm lot price(s), as specified in Annex B, for a cost of \$ _____ (*amount to be inserted at contract award*). Customs duties are included and Goods and Services Tax or Harmonized Sales Tax is extra, if applicable.

Canada will not pay the Contractor for any design changes, modifications or interpretations of the Work, unless they have been approved, in writing, by the Contracting Authority before their incorporation into the Work.

6.2 Limitation of Price

SACC Manual clause C6000C (2011-05-16) Limitation of Price

6.3 Single Payment

SACC Manual clause H1000C (2008-05-12) Single Payment

7. Invoicing Instructions

7.1 The Contractor must submit invoices in accordance with the section entitled "Invoice Submission" of the general conditions. Invoices cannot be submitted until all work identified in the invoice is completed.

7.2 Invoices must be distributed as follows:

- (a) The original and one (1) copy must be forwarded to the address shown on page 1 of the Contract for certification and payment.
- (b) One (1) copy must be forwarded to the Contracting Authority identified under the section entitled "Authorities" of the Contract.

8. Certifications

8.1 Compliance with the certifications provided by the Contractor in its bid is a condition of the Contract and subject to verification by Canada during the term of the Contract. If the Contractor does not comply with any certification or 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.

9. Applicable Laws

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

10. Priority of Documents

If there is a discrepancy between the wording 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) the supplemental general conditions, 4001 (2010-08-16) - Hardware Purchase, Lease and Maintenance, apply to and form part of the Contract;
- (c) the supplemental general conditions, 4003 (2010-08-16) - Licensed Software, apply to and form part of the Contract;
- (d) the general conditions 2030 (2012-07-16) Higher Complexity - Goods, apply to and form part of the Contract.
- (e) Annex A, Requirement;
- (f) Annex B, Basis of Payment
- (g) the Contractor's bid dated _____ as clarified on _____ " **or** ", as amended on _____ "
(if applicable)

11. SACC Manual Clauses

B1501C (2006-06-16) Electrical Equipment

G1005C (2008-05-12) Insurance

Solicitation No. - N° de l'invitation

KM061-121080/A

Amd. No. - N° de la modif.

File No. - N° du dossier

TOR-2-35089

Buyer ID - Id de l'acheteur

tor212

CCC No./N° CCC - FMS No/ N° VME

KM061-121080

ANNEX A

REQUIREMENT

See attached document entitled "Annex A , Open Path Fourier Transform Infra-Red (OP-FTIR) mobile Spectrometer System (2 pages)

ANNEX B**BASIS OF PAYMENT**

The firm lot price herein is an all inclusive price, in accordance with Annex A, in Canadian funds including Canadian customs duties, excise taxes, F.O.B. destination, including all delivery charges to Environment Canada, Downview, Ontario.

The total amount of Goods and Services Tax or Harmonized Sales Tax is to be shown separately, if applicable.

Item No.	Description	Qty	Firm Lot Price
001	For the supply and delivery of an Open Path Fourier Transform Infra-Red (OP-FTIR) Mobile Spectrometer System in accordance with the specifications detailed in Annex A, <u>and any other item or service required to complete the system as specified in Annex A.</u> Manufacturer: _____ Make and Model: _____	1	\$
	GST / HST		
	NET TOTAL		

Delivery Date

All the deliverables must be received on or before 29 March 2013.

Solicitation No. - N° de l'invitation

KM061-121080/A

Amd. No. - N° de la modif.

Buyer ID - Id de l'acheteur

tor212

Client Ref. No. - N° de réf. du client

KM061-121080

File No. - N° du dossier

TOR-2-35089

CCC No./N° CCC - FMS No/ N° VME

ANNEX C

Form 1 - OEM Certification

Form 2 - Software Publisher Certification Form

Form 3 - Software Publisher Authorization Form

Form 1

OEM Certification Form

This confirms that the original equipment manufacturer (OEM) identified below has authorized the Bidder named below to provide and maintain its products under any contract resulting from the bid solicitation identified below.

Name of OEM _____

Signature of authorized signatory of OEM _____

Print Name of authorized signatory of OEM _____

Print Title of authorized signatory of OEM _____

Address for authorized signatory of OEM _____

Telephone no. for authorized signatory of OEM _____

Fax no. for authorized signatory of OEM _____

Date signed _____

Solicitation Number _____

Name of Bidder _____

Solicitation No. - N° de l'invitation

KM061-121080/A

Amd. No. - N° de la modif.

File No. - N° du dossier

TOR-2-35089

Buyer ID - Id de l'acheteur

tor212

Client Ref. No. - N° de réf. du client

KM061-121080

CCC No./N° CCC - FMS No/ N° VME

Form 2

Software Publisher Certification Form

(to be used where the Bidder itself is the Software Publisher)

The Bidder certifies that it is the software publisher of all the following software products and components and that it has all the rights necessary to license them (and any non-proprietary sub-components incorporated into the software) on a royalty-free basis to Canada:

[bidders should add or remove lines as needed]

Solicitation No. - N° de l'invitation

KM061-121080/A

Amd. No. - N° de la modif.

Buyer ID - Id de l'acheteur

tor212

Client Ref. No. - N° de réf. du client

KM061-121080

File No. - N° du dossier

TOR-2-35089

CCC No./N° CCC - FMS No/ N° VME

Form 3

Software Publisher Authorization Form

(to be used where the Bidder is not the Software Publisher)

This confirms that the software publisher identified below has authorized the Bidder named below to license its proprietary software products under any contract resulting from the bid solicitation identified below.

This authorization applies to the following software products:

[bidders should add or remove lines as needed]

Name of Software Publisher (SP) _____

Signature of authorized signatory of SP _____

Print Name of authorized signatory of SP _____

Print Title of authorized signatory of SP _____

Address for authorized signatory of SP _____

Telephone no. for authorized signatory of SP _____

Fax no. for authorized signatory of SP _____

Date signed _____

Solicitation Number _____

Name of Bidder _____

Open Path Fourier Transform Infra Red Mobile Spectrometer System

Environment Canada (EC), Air Quality Research Division, Toronto, Ontario has a requirement for one (1) open path Fourier Transform Infra Red (OP-FTIR) Mobile Spectrometer System. This instrument is required for making measurements in the oil sands particularly over tailings ponds, mines and other inaccessible locations. EC requires a unit that is mobile, since there are a number of measurement sites. The unit must be a remote sensing device coupled with a telescope, since the areas of interest are generally inaccessible and distant from unit's position. The unit must be capable of scanning an area and visually displaying the chemical constituent movement superimposed on a day/night camera image of the same area. The unit must be capable of providing a broad spectrum in the infrared. Quantification of the observed spectrum provides valuable information regarding what chemical constituents are being emitted from the aforementioned areas of interest. Scanning an area will provide real time information regarding movement of chemical constituents under study. These measurements will advance EC's knowledge and understanding of pollutant sources. This system must use FTIR technology coupled with scanning mirror and continuously measure a suite of chemical constituents with high precision and be robust for sampling from various platforms including vehicles and outdoor ground sites.

SCOPE OF WORK AND DELIVERABLES:

The open path Fourier Transform Infra-Red (OP-FTIR) mobile spectrometer system must meet the following minimum mandatory criteria at time of delivery:

This requirement is not for instrument development. Environment Canada requires an instrument that has been performing in a commercial or government environment for a period of at least one year.

Hardware Configuration and Operation:

- Must be configured so that all required calibrations (including infra-red black body for emission measurements), maintenance and repairs can readily be performed at remote field stations by station operators or network staff.
- Must be portable, rugged, operate automatically and continuously under standard PC control, in all environments, including equatorial and Arctic.
- Must be configured with a scanning mirror that scans a user specified area.
- Must be configured to make observations in 360 degrees of azimuth.
- Must be configured with a night vision camera.
- Must be configured with a telescope that extends the range of measurement to minimum 10 kilometres.
- Must be configured to transmit data to an external server.
- Must operate using 120 or 240 VAC power sources.
- Must be configured with a mobile battery power supply for remote operations.
- Must communicate with controlling computer through a manufacturer provided Ethernet interface with TCP/IP.
- Must be configured with a shock mount for vehicle deployment.
- Must have a transportation/storage container.
- Must have an all weather cover for outdoor operation.

Required Measurements:

- Must be configured to allow the instrument operator to specify measurement type, time and frequency.
- Must be configured for the identification and quantification of persistent organic pollutants, greenhouse gases, and other toxic substances in the atmosphere along a horizontal path.
- Must be configured to acquire two sided interferograms.
- Must be configured to automatically identify in real time the gas being viewed by the spectrometer.
- Must be configured to analyse the recorded infrared spectra.
- Must have an interface to a library containing a minimum of 400 pollutants.
- Must have a tomography reconstruction algorithm.
- Must be configured to overlay the concentration measurement of the gas onto the image acquired with the night vision camera.
- Must be configured to acquire mid infra-red spectra resolved to 0.5 cm^{-1} over the 1500 to 680 cm^{-1} range.

Specifications:

Noise: must be maximum NETD=20mK at $\Delta\sigma=4 \text{ cm}^{-1}$

Resolution: must be minimum 0.5 cm^{-1} over measurement range

Field of View: must be maximum 10 milliradians

Measurement range: must be 1500 – 680 cm^{-1}

Area of Surveillance: must be minimum 360° horizontal x 30° vertical

Interface: must be Ethernet TCP/IP to computer

Detector: must be Stirling closed cycle cooled MCT

Interferometer: must be High-Throughput Modified Michelson permanently aligned

A/D converter: must have 24 bit ADC

Internal Sources / Quality Assurance

Calibration: must have internal black body

Wavelength Calibration – must have internal Helium Neon laser

Environmental

Operating Temperature: must be -20°C – 40°C with a maximum variation of $\pm 1^\circ\text{C}$

Electrical

Must operate using either 120 or 240 VAC power sources