Public Works and Government Services Canada

Travaux publics et Services gouvernementaux Canada

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:

Bid Receiving Public Works and Government Services Canada/Réception des soumissions Travaux publics et Services gouvernementaux Canada
Pacific Region
401 - 1230 Government Street
Victoria, B.C.
V8W 3X4
Bid Fax: (250) 363-3344

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
Mass Spectrometer

Solicitation No. - N° de l'invitation	**Date**
23145-140241/A	2013-10-10

Client Reference No. - N° de référence du client
23145-140241

GETS Reference No. - N° de référence de SEAG
PW-$VIC-210-6336

File No. - N° de dossier	**CCC No./N° CCC - FMS No./N° VME**
VIC-3-36122 (210)	

Solicitation Closes - L'invitation prend fin
at - à 02:00 PM
on - le 2013-11-20

Time Zone
Fuseau horaire
Pacific Daylight Saving Time PDT

F.O.B. - F.A.B.
Plant-Usine: ☐ **Destination:** ☑ **Other-Autre:** ☐

Address Enquiries to: - Adresser toutes questions à:	**Buyer Id - Id de l'acheteur**
Buchan, Torrey	vic210

Telephone No. - N° de téléphone	**FAX No. - N° de FAX**
(250) 363-3249 ( )	(250) 363-0395

Destination - of Goods, Services, and Construction:
Destination - des biens, services et construction:
DEPARTMENT OF NATURAL RESOURCES
506 WEST BURNSIDE RD
VICTORIA
British Columbia
V8Z1M5
Canada

Instructions: See Herein

Instructions: Voir aux présentes

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

Delivery Required - Livraison exigée	**Delivery Offered - Livraison proposée**
See Herein	

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**

Issuing Office - Bureau de distribution
Public Works and Government Services Canada - Pacific Region
401 - 1230 Government Street
Victoria, B. C.
V8W 3X4

Canada

TABLE OF CONTENTS

PART 1 - GENERAL INFORMATION

1. Security Requirement
There is no security requirement associated with this bid solicitation.

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

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

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 (2013-06-01) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

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.

3. Enquiries - Bid Solicitation
All enquiries must be submitted in writing to the Contracting Authority no later than seven (7) 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 British Columbia.

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.

5. Optional Site Visit

It is recommended that the Bidder or a representative of the Bidder visit the work site. Arrangements have been made for a tour of the work site. The site visit will be held on Tuesday October 29th, at 1PM at the Pacific Forestry Centre. Bidders are requested to communicate with the Contracting Authority four (4) days before the scheduled visit to confirm attendance and provide the name(s) of the person(s) who will attend. Bidders may be requested to sign an attendance form. Bidders who do not attend or send a representative will not be given an alternative appointment but they will not be precluded from submitting a bid. Any clarifications or changes to the bid solicitation resulting from the site visit will be included as an amendment to the bid solicitation.

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 - Two hard copies
Section II: Financial Bid - One hard copy
Section III: Certifications - One 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 should:

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; 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 accordance with the Basis of Payment. The total amount of Applicable Taxes must be shown separately.

1.1 Exchange Rate Fluctuation
C3011T (2010-01-11), Exchange Rate Fluctuation

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
See Annex B, Mandatory Criteria.

1.2 Financial Evaluation
SACC Manual Clause A0220T (2013-04-25), Evaluation of Price

2. Basis of Selection
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 and documentation 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, if any certification made by the Bidder is found to be untrue whether 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 with this request will also render the bid non-responsive or will constitute a default under the Contract.

1. Mandatory Certifications Required Precedent to Contract Award
1.1 Code of Conduct and Certifications - Related documentation
By submitting a bid, the Bidder certifies that the Bidder and its affiliates are in compliance with the provisions as stated in Section 01 Code of Conduct and Certifications - Bid of Standard Instructions 2003. The related documentation therein required will assist Canada in confirming that the certifications are true.

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.hrsdc.gc.ca/eng/labour/index.shtml) available from Human Resources and Skills Development Canada (HRSDC) - 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.

PART 6 - RESULTING CONTRACT CLAUSES

1. Security Requirement

There is no security requirement applicable to this Contract.

2. Requirement

The Contractor must provide the items detailed under the "Requirement" at Annex A.

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

2010A (2013-04-25), General Conditions - Goods (Medium Complexity), 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 March 31, 2014.

4.2 Shipping Instructions - Delivered Duty Paid

Goods must be consigned and delivered to the destination specified in the contract: Incoterms 2000 "DDP Delivered Duty Paid" Pacific Forestry Centre - Victoria, BC.

5. Authorities

5.1 Contracting Authority

The Contracting Authority for the Contract is:

Name:	Torrey Buchan
Title:	Supply Officer Public Works and Government Services Canada Acquisitions Branch
Telephone:	250-363-3249
Facsimile:	250-363-0395
E-mail address:	torrey.buchan2@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.

5.2 Technical Authority

The Technical Authority for the Contract is provided upon contract award.

Name:
Telephone:
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.

5.3 Contractor's Representative

Supplier is to complete table below and submit with their bid.

Contact for:	Name	Telephone	Email
Contracting issues			
Technical issues			
Invoicing issues			

6. Payment

6.1 Basis of Payment

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid a firm price as specified in Annex B for a cost of $ _____ . Customs duties are included and Applicable Taxes are extra.

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 Single Payment

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

7. Invoicing Instructions

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.

Invoices must be distributed as follows:
The original and one (1) copy must be forwarded to the address shown on page 1 of the Contract for certification and payment.

8. Certifications

8.1 Compliance

Compliance with the certifications and related documentation 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, provide the related documentation 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.

9. Applicable Laws

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

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 general conditions 2010A (2013-04-25), General Conditions - Goods (Medium Complexity);
(c) Annex A, Requirement;
(d) Annex B, Mandatory Criteria;
(e) Annex C, Basis of Payment;
(f) the Contractor's bid dated _____

11. Insurance

The Contractor is responsible for deciding if insurance coverage is necessary to fulfill its obligation under the Contract and to ensure compliance with any applicable law. Any insurance acquired or maintained by the Contractor is at its own expense and for its own benefit and protection. It does not release the Contractor from or reduce its liability under the Contract.

12. SACC Manual Clauses

B1501C (2006-06-16), Electrical Equipment

ANNEX A
REQUIREMENT

1. Requirement

Natural Resources Canada (NRCan) requires the supply, installation and training in the use of an Elemental Analyzer Isotope Ratio Mass Spectrometer (EA-IRMS) System in the Analytical Chemistry Laboratory at the Pacific Forestry Centre (PFC) in Victoria, BC. The EA-IRMS System will be used for the qualitative and quantitative analysis of natural abundance and enriched elemental stable isotope ratios of Hydrogen, Carbon, Nitrogen, Oxygen and Sulphur found in wood, wood fibre, trees, plants, soils, black carbon, sludge and biota. The instrument will be used as a research tool to support broad ranging forest science research priorities and initiatives within Natural Resources Canada.

The supplied system shall include all parts, equipment, accessories and software necessary for analysis. It is incumbent upon the Contractor to recommend a specific hardware configuration for a complete system that is guaranteed suitable for the purposes specified.

2. Components - EA-IRMS System

The EA-IRMS System shall consist of, but not be limited to, the following components, complete with all software/hardware and interfacing necessary to make a fully integrated system.

2.1 Elemental Analyzer (EA)
2.2 Isotope Ratio Mass Spectrometer (IRMS)
2.3 Continuous Flow Interface
2.4 Instrument Control Software and PC Workstation

3. Specifications

Component 1 Elemental Analyzer	
1	Intended for use with a continuous flow isotope ratio mass spectrometer (IRMS) using He carrier gas
2	Must be able to perform quantitative determination of Carbon, Nitrogen and Sulphur in solid samples by combustion Combustion Temperature: i. 1100°C Combustion Efficiency: ii. Complete combustion of approximately 30 mg of plant tissue (~50% C) iii. Complete combustion of approximately 200 mg of mineral soil (<10% C) Combustion operating modes: iv. N v. CN vi. CNS

	vii. S Combustion Precision (isotope ratio, solids): viii. $\delta^{15}N \leq 0.20$ ‰ ix. $\delta^{13}C \leq 0.15$ ‰ x. $\delta^{34}S \leq 0.20$ ‰
3	Must be able to perform quantitative determination of hydrogen and oxygen in solid samples by high temperature conversion (pyrolysis). Pyrolysis Temperature: i. 1450C Pyrolysis operating modes: ii. OH iii. H iv. O Pyrolysis Precision (isotope ratio, solids): v. δD (H_2)≤ 3.0 ‰ vi. $\delta^{18}O$ (CO)≤ 0.5 ‰
4	Equipped with an autosampler for use with solids, using tin or silver-encapsulated samples. Autosampler Capacity: approximately 100 samples
5	Autosampler sample compartment purged with inert carrier gas to eliminate ambient atmospheric gases.
6	Equipped with chemical traps for the removal of water vapour and carbon dioxide.
7	Equipped with an analytical microbalance with automated draft shield Microbalance Resolution: 0.001mg Microbalance Capacity: 2g
Component 2 Isotope Ratio Mass Spectrometer (IRMS)	
9	Must be designed to operate in continuous flow (He carrier gas) and dual inlet modes
10	Must be equipped with universal triple ion collectors (Faraday Cups) suitable for determining isotope ratios for carbon, nitrogen, oxygen and sulphur, plus hydrogen and deuterium collector system for hydrogen isotope analysis.
11	Includes optical element or electrostatic filter to remove He contamination from the mass/charge (m/z) 3 ion beam, or to prevent ions other than HD+ from entering the m/z 3 ion collector.

12	Ion source and tuning parameters under software control
13	Amplifier for ion current detection must have a linear dynamic range of 0 to 50 volts or more and with amplification factors that can be automatically switched to accommodate a wide range of isotopic enrichments from natural abundance to high artificial enrichments (e.g. 30 atom% or greater) in samples from manipulative tracer studies.
14	Mass range from 1 to 70 atomic mass unit at 3kV
15	Instrument capable of "peak jumping" to permit sequential analysis of at least three different elements within a single analytical run.
16	Includes a dependable and robust vacuum system with a long-lived turbo molecular pump capable of 250L/s pump rate, and a durable rotary vane fore pump.
17	The system performance specifications listed below are intended to supplement the Contractor's standard installation tests. The following performance specifications must be demonstrated at the time of installation and are considered the basis for system acceptance. i. Sensitivity for CO_2 in continuous flow mode: must require 1500 or fewer molecules per m/z 44 ion. ii. Ion source linearity must be 0.04‰/nA or less for $\delta^{13}C$ (CO_2), $\delta^{15}N$ (N_2), and $\delta^{18}0$ (CO_2). iii. Analytical precision for 10 reference gas pulses in continuous flow mode: 1 σ = 0.08‰ or less for $\delta^{13}C$ (CO_2), $\delta^{15}N$ (N_2) and $\delta^{18}0$ (CO_2); and 0.50 ‰ or less for $\delta^{2}H$ (H_2). iv. H_3+ correction less than or equal to 10 ppm/nA. v. Vacuum system to reach approximately 5 x10^{-8} mBar
Component 3 Continuous Flow Interface	
18	Designed to permit transfer of combustion gases from an elemental analyzer (EA) to the IRMS.
19	In conjunction with system software, introduces reference gas at the appropriate times within an analytical cycle via moveable capillaries or switchable valves.
20	In conjunction with system software, dilutes sample gas to suitable range with He to facilitate sequential IRMS analysis in three or more different elements within a single analytical run.
21	Can connect to and switch between a minimum of three different cylinders of pure reference gas
Component 4 Instrument Control Software and PC workstation	
22	Instrument control and data collection software is stable, reliable and documented (i.e. includes hardcopy or electronic manual)
23	Includes a current model PC suitable for use with the EA-IRMS system software and hardware. PC to include Microsoft Windows operating system, MS Office, monitor, printer, keyboard and mouse.
24	Provides fully integrated control, monitoring, data capture, processing and reporting for the EA-IRMS system components

25	Software is capable of 'peak jumping' data collection to determine the isotopic abundances of at least three elements sequentially in a single analytical run.
26	Software calculates isotope abundance ratios for C, H, N, O and S
27	Software calculates element concentration based on the detector signal in the attached continuous flow device (EA), including elements or gases that are not necessarily analyzed by the IRMS.
28	Software monitors EA or other continuous flow device detector signal
29	Software provides real time monitoring and display of critical IRMS settings, including vacuum status, and provides safety interlocks or ready status warnings to prevent accidental system damage
30	Software provides comprehensive reporting utility including formatted text output option for direct import into a Laboratory Information Management System or a standard spreadsheet application including MS Excel.
General Requirements	
1	Maximum dimensions without PC workstation and Continuous Flow Interface (Component 3) approximately: EA (Component 1) may be bench mounted with maximum dimension: 1m X 1m x 0.8m (H X W X D) IRMS (Component 2) may be bench or floor mounted with maximum dimension: 1m X 1m x 0.8m (H X W X D)
2	The EA-IRMS system must be powered by either 115V or 208V (from 3 phase) 50/60Hz power or must include equipment to ensure full compatibility to the laboratory's power supply.
3	If the IRMS system requires additional power conditioning to protect sensitive components from power spikes or fluctuations, it is the responsibility of the Contractor to include suitable power conditioning equipment with the system.
4	All electrical equipment supplied under the Contract must be certified or approved for use in Canada in accordance with the Canadian Electrical Code, **prior to delivery**, by a certification organization accredited by the Standards Council of Canada
5	The instrument to include all necessary wiring, connectors, tubing, gas line and fittings for complete system installation.
6	The system must include consumable supplies sufficient for approximately 1000 analyses.
7	The system must be supplied with primary or secondary reference material as required to validate system installation, calibration and verification of instrument performance.
8	The system must be supplied with any specialized tools or tool kit(s) necessary for maintaining routine operation.
9	The Contractor agrees to provide space and utility requirements at least 1 month before scheduled installation to ensure the laboratory is adequately prepared.
10	The Contractor must provide a description of the availability of post-purchase service and support, including details (names & contact info.) and locations of factory authorized IRMS service engineers.
11	Telephone support service calls must be responded to within one business day.
12	On-site service technicians must be available within 5 business days of a service request.
13	Instrument systems must meet all applicable ISO and CSA standards

14	A minimum of one year warranty from installation must be included with the system offered.
15	Required Training must occur within 5 business days of system installation and verification. Training must be for a minimum of two eight-hour days, and be offered for up to two personnel.
16	The Isotope Ratio Mass Spectrometer System and all installation and training must be delivered on or before **March 31, 2014.**

ANNEX B

MANDATORY CRITERIA

The Bidder MUST respond in detail to each item in the mandatory criteria detailed below, referencing the supporting documentation that they have provided with their technical bid. Failure to do so, or failure to reply in sufficient detail, may result in the bid being deemed non-responsive. The provision of company literature alone is NOT acceptable and may result in the Bidder being deemed non-responsive.

Proposal must meet all the mandatory criteria for each of the components for the bid to be considered. Those bids not meeting any one of the mandatory criteria will not be considered further. Bids must indicate whether the proposed system and its components meets or does not meet each mandatory and rated criterion and must provide documentation to substantiate that each criterion is met and cross-referenced with a page number of their supplied documentation. Where Bidder specifications differ, indicate how and state the comparable quality, technology or service offered.

Bidders must include current literature for the make and model of system components being offered. Failure to provide documentation will result in your bid being considered non-responsive.

	Component 1 Elemental Analyzer	**Criterion Met** Y/N	**Documented on page#**
1	Intended for use with a continuous flow isotope ratio mass spectrometer (IRMS) using He carrier gas		
2	Must be able to perform quantitative determination of Carbon, Nitrogen and Sulphur in solid samples by combustion Combustion Temperature: viii. 1100^{o}C Combustion Efficiency: ix. Complete combustion of approximately 30 mg of plant tissue (~50% C) x. Complete combustion of approximately 200 mg of mineral soil (<10% C) Combustion operating modes: xi. N xii. CN xiii. CNS xiv. S		

	Combustion Precision (isotope ratio, solids): xi. $\delta^{15}N \leq 0.20$ ‰ xii. $\delta^{13}C \leq 0.15$ ‰ xiii. $\delta^{34}S \leq 0.20$ ‰		
3	Must be able to perform quantitative determination of hydrogen and oxygen in solid samples by high temperature conversion (pyrolysis). Pyrolysis Temperature: ii. 1450C Pyrolysis operating modes: v. OH vi. H vii. O Pyrolysis Precision (isotope ratio, solids): vii. δD (H_2)≤ 3.0 ‰ viii. $\delta^{18}O$ (CO)≤ 0.5 ‰		
4	Equipped with an autosampler for use with solids, using tin or silver-encapsulated samples. Autosampler Capacity: approximately 100 samples		
5	Autosampler sample compartment purged with inert carrier gas to eliminate ambient atmospheric gases.		
6	Equipped with chemical traps for the removal of water vapour and carbon dioxide.		
7	Equipped with an analytical microbalance with automated draft shield Microbalance Resolution: 0.001mg Microbalance Capacity: 2g		

	Component 2 Isotope Ratio Mass Spectrometer (IRMS)	**Criterion Met** Y/N	**Documented on page#**
9	Must be designed to operate in continuous flow (He carrier gas) and dual inlet modes		

10	Must be equipped with universal triple ion collectors (Faraday Cups) suitable for determining isotope ratios for carbon, nitrogen, oxygen and sulphur, plus hydrogen and deuterium collector system for hydrogen isotope analysis.		
11	Includes optical element or electrostatic filter to remove He contamination from the mass/charge (m/z) 3 ion beam, or to prevent ions other than HD+ from entering the m/z 3 ion collector.		
12	Ion source and tuning parameters under software control		
13	Amplifier for ion current detection must have a linear dynamic range of 0 to 50 volts or more and with amplification factors that can be automatically switched to accommodate a wide range of isotopic enrichments from natural abundance to high artificial enrichments (e.g. 30 atom% or greater) in samples from manipulative tracer studies.		
14	Mass range from 1 to 70 atomic mass unit at 3kV		
15	Instrument capable of “peak jumping” to permit sequential analysis of at least three different elements within a single analytical run.		
16	Includes a dependable and robust vacuum system with a long-lived turbo molecular pump capable of 250L/s pump rate, and a durable rotary vane fore pump.		
17	The system performance specifications listed below are intended to supplement the Vendor’s standard installation tests. The following performance specifications must be demonstrated at the time of installation and are considered the basis for system acceptance. vi. Sensitivity for CO_2 in continuous flow mode: must require 1500 or fewer molecules per m/z 44 ion. vii. Ion source linearity must be 0.04‰/nA or less for $\delta^{13}C$ (CO_2), $\delta^{15}N$ (N_2), and $\delta^{18}0$ (CO_2). viii. Analytical precision for 10 reference gas pulses in continuous flow mode: 1 σ = 0.08‰ or less for $\delta^{13}C$ (CO_2), $\delta^{15}N$ (N_2) and $\delta^{18}0$ (CO_2); and 0.50 ‰ or less for $\delta^{2}H$ (H_2). ix. H_3+ correction less than or equal to 10 ppm/nA. x. Vacuum system to reach approximately 5 x10^{-8} mBar		

	Component 3 Continuous Flow Interface	**Criterion Met** Y/N	**Documented on page #**
18	Designed to permit transfer of combustion gases from an elemental analyzer (EA) to the IRMS.		
19	In conjunction with system software, introduces reference gas at the appropriate times within an analytical cycle via moveable capillaries or switchable valves.		
20	In conjunction with system software, dilutes sample gas to suitable range with He to facilitate sequential IRMS analysis in three or more different elements within a single analytical run.		
21	Can connect to and switch between a minimum of three different cylinders of pure reference gas		

	Component 4 Instrument Control Software and PC workstation	**Criterion Met** Y/N	**Documented on page #**
22	Instrument control and data collection software is stable, reliable and documented (i.e. includes hardcopy or electronic manual)		
23	Includes a current model PC suitable for use with the EA-IRMS system software and hardware. PC to include Microsoft Windows operating system, MS Office, monitor, printer, keyboard and mouse.		
24	Provides fully integrated control, monitoring, data capture, processing and reporting for the EA-IRMS system components		
25	Software is capable of 'peak jumping' data collection to determine the isotopic abundances of at least three elements sequentially in a single analytical run.		
26	Software calculates isotope abundance ratios for C, H, N, O and S		
27	Software calculates element concentration based on the detector signal in the attached continuous flow device (EA), including elements or gases that are not necessarily analyzed by the IRMS.		
28	Software monitors EA or other continuous flow device detector signal		
29	Software provides real time monitoring and display of critical IRMS settings, including vacuum status, and provides safety interlocks or ready status warnings to prevent accidental system damage		
30	Software provides comprehensive reporting utility including formatted text output option for direct import into a Laboratory Information Management System or a standard spreadsheet application including MS Excel.		

	General Requirements	Criterion Met Y/N	Documented On page#
1	Maximum dimensions without PC workstation and Continuous Flow Interface (Component 3) approximately: EA (Component 1) may be bench mounted with maximum dimension: 1m X 1m x 0.8m (H X W X D) IRMS (Component 2) may be bench or floor mounted with maximum dimension: 1m X 1m x 0.8m (H X W X D)		
2	The EA-IRMS system must be powered by either 115V or 208V (from 3 phase) 50/60Hz power or must include equipment to ensure full compatibility to the laboratory's power supply.		
3	If the IRMS system requires additional power conditioning to protect sensitive components from power spikes or fluctuations, it is the responsibility of the bidder to include suitable power conditioning equipment with the system.		
4	All electrical equipment supplied under the Contract must be certified or approved for use in Canada in accordance with the Canadian Electrical Code, **prior to delivery**, by a certification organization accredited by the Standards Council of Canada		
5	The instrument to include all necessary wiring, connectors, tubing, gas line and fittings for complete system installation.		
6	The system must include consumable supplies sufficient for approximately 1000 analyses.		
7	The system must be supplied with primary or secondary reference material as required to validate system installation, calibration and verification of instrument performance.		
8	The system must be supplied with any specialized tools or tool kit(s) necessary for maintaining routine operation.		
9	By indicating met, the bidder agrees to provide space and utility requirements at least 1 month before scheduled installation to ensure the laboratory is adequately prepared.		
10	The proposal must include a description of the availability of post-purchase service and support, including details (names & contact info.) and locations of factory authorized IRMS service engineers.		
11	Telephone support service calls must be responded to within one business day.		
12	On-site service technicians must be available within 5 business days of a service request.		
13	Instrument systems must meet all applicable ISO and CSA standards		
14	A minimum of one year warranty from installation must be included with the system offered.		
15	Required Training must occur within 5 business days of system installation and verification. Training must be for a minimum of two eight-hour days, and be offered for up to two personnel.		
16	The Isotope Ratio Mass Spectrometer System and all installation and training must be delivered on or before March 31, 2014.		

ANNEX C
BASIS OF PAYMENT

Itm	Description	Price (CAD$)
1.	The supply, installation, testing, training and on-site warranty service of an Elemental Analyzer Isotope Ratio Mass Spectrometer (EA-IRMS) System, in accordance with Annex A, Requirement.	$_____
2.	Delivery Incoterms 2000 DDP - Pacific Forestry Centre - Victoria, BC, Canada	$_____
	Firm Total Price (CAD$)	$_____ __

GST (as applicable), is extra.