Canadian Food Inspection Agency | Agence Canadienne d'inspection des aliments

RETURN SUBMISSIONS TO:
RETOURNER LES SOUMISSIONS À:
Bid Receiving - CFIA / Réception des soumissions - l'ACIA
Address:
1400 Merivale Road
Ottawa, ON KIA OY9
Attn.: Contracting and Procurement Policy Division (CFIA),
Reference of Solicitation #: E0479

Or

Email Address:
cfia.bidreceipt-receptiondesoumission.acia@canada.ca
Reference of Solicitation #: E0479

Address:
1400, chemin Merivale
Ottawa (Ontario) KIA OY9
À l'attention de : Division de la politique des approvisionnements et des marchés (l'ACIA),
Référence de l'invitation no : E0479

Ou

Courriel :
cfia.bidreceipt-receptiondesoumission.acia@canada.ca
Référence de l'invitation n° : E0479

REQUEST FOR INFORMATION
DEMANDE DE RENSEIGNEMENT

Title - Sujet
Robotics, Automation and Integration of Associated Equipment
Robotique, automatisation et intégration des équipements connexes

Solicitation No. - N° de l'invitation	**Date**
E0479	May 30, 2019 / 30 mai 2019
Client Reference No. - N° de référence du client	**File No. - N° de dossier**
E0479	E0479

Solicitation Closes - L'invitation prend fin
at - à 02:00 PM
on - le 2019-07-03

Time Zone
Fuseau horaire
Eastern Standard Time
EST

F.O.B.- F.A.B.
Plant-Usine: ___ Destination: _X_ Other-Autre: ___
Usine : ___ Destination : _X_ Autre : ___

Address Enquiries to: - Adresser toutes questions à:
Ashley Bennett

Telephone No. - N° de téléphone	**FAX No. - N° de FAX**
(613) 773-7769	(613) 773-7615

Destination of Goods, Services, and Construction:
Destination des biens, services et construction:

CANADIAN FOOD INSPECTION AGENCY /
AGENCE CANADIENNE D'INSPECTION DES ALIMENTS
59 CAMELOT DRIVE / 59, PROMENADE CAMELOT
Ottawa, ON K1A 0Y9
Canada

Instructions: See Herein

Instructions: Voir aux présentes

Comments - Commentaires

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

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

Time Zone
Fuseau horaire
Eastern Standard Time
EST

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)

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Contracting and Procurement Policy Division (CFIA) /
Division de la politique des approvisionnements et des marchés (l'ACIA)
59 Camelot Drive / 59 promenade Camelot
Ottawa, ON K1A 0Y9

Canada

Please see attached Request for Information (RFI).

THIS IS NOT A SOLICITATION DOCUMENT

THIS IS A REQUEST FOR INFORMATION (RFI) FROM INDUSTRY FOR ROBOTICS, AUTOMATION AND INTEGRATION OF ASSOCIATED EQUIPMENT

1.0 INTRODUCTION

A Request for Information (RFI) is used when detailed information and feedback are required from suppliers. Such requests might outline a potential requirement and request suppliers to describe their ability to satisfy the requirement and to provide ideas and suggestions on how the eventual solicitation might be structured. Responses are used to assist the client department in finalizing their plans for the requirement and in developing achievable objectives and deliverables.

The intent is to consult Industry to ensure a successful project end state. Feedback from the Industry will assist the CFIA to define:

i. determine whether to proceed with requirements/strategy as planned, and if so, further developing internal planning, approval and solicitation documents that may potentially lead to a solicitation;
ii. refine the project structure, cost estimate, timelines, requirements definition, and other aspects of the requirement;
iii. become a more "informed buyer" with an enhanced understanding of industry goods and service offerings in the areas of interest; and
iv. assess potential alternative solution concepts that would meet its requirement, such as environmentally preferable solutions.

This process will allow suppliers to:

i. assess and comment on the adequacy and clarity of the requirements as currently expressed;
ii. offer suggestions regarding potential alternative solutions that would meet requirements, such as a solution with a lower environmental impact.

Suppliers will not be contacted by CFIA as a result of this RFI. The Contracting Authority detailed in section 8.0 may communicate with industry to seek more information on responses. Any future industry engagement activity or procurement will be publically posted.

1.1 Previous Request for Information (RFI)

There was an RFI (Ref # 01E86-140157) for Agriculture and Agri-Food Canada issued on 16 August, 2013 and closed on 29 September, 2013. The vision and scope of the Robotics, Automation and Integration of Associated Equipment requirement for the CFIA's Sidney Laboratory, Centre for Plant Health (CPH) has many similarities with this previous RFI; however, due to advances in the industry and technology and some differences in requirements by CFIA, a second RFI is being conducted.

The intent of this new Request for Information (RFI) is to solicit feedback on all aspects detailed herein and the revised draft Statement of Work so as to enable Canada to evaluate the strategy to be taken, if any, regarding further related activities.

More specifically, feedback is sought regarding:

- The potential level of interest in providing services to address the requirements of the attached Draft Statement of Work; and
- To obtain information and suggestions on other ways of performing similar functionality or improving on what is being presented.

2.0 SERVICE REQUIREMENTS

The Canadian Food Inspection Agency (CFIA) is requesting Industry feedback for detailed information from suppliers about robotics, automation and integration of associated equipment in support of research and testing activities conducted at a plant health facility. The purpose of this Request for Information (RFI) is to solicit relevant input from Industry that could contribute to the Government of Canada (GoC) outlining the potential requirement, and for suppliers to describe their ability to satisfy the requirement and to provide ideas and suggestions on how the eventual solicitation might be structured. Also, responses could be used to assist the CFIA in finalizing their plans for the requirement and in developing achievable objectives and deliverables.

3.0 NOTE TO POTENTIAL RESPONDENTS

3.1 Responses

The material in this RFI package is for the solicitation of **feedback only**. Responding to this RFI is not a prerequisite to receiving any Request for Proposal for the requirement. However, all Respondents are encouraged to indicate their level of interest by responding to this RFI with its comments in order to facilitate a better understanding of requirements and Industry perspectives.

The publication of this RFI must not be construed as a commitment on Canada's part to issue a subsequent "Request for Proposal" for the requirement and no contract or other form of commitment will be entered into with any Respondent based on responses to this RFI. This RFI must in no way be considered as authorization by Canada for Respondents to undertake any work, which would result in costs to Canada.

Canada will not be liable for, nor will it reimburse any Respondents for any costs, fees or expenses which any Respondent incurs in the preparation or submission of its response to this RFI. Canada will not be bound by anything stated herein. Canada reserves the right to change, at any time, any or all parts of the requirement as it renders necessary.

Respondents are advised that any information submitted to the CFIA in response to this RFI may be used in the development of a subsequent RFP. Respondents will not be bound by any aspect of their response to this RFI. All responses to this RFI will be held by Canada on a confidential basis (subject to applicable legislation), and remain the property of Canada once they have been received and may be used to support further development of internal planning documents and decisions, and possibly an RFP. Note that responses to the RFI will not be returned.

3.2 Nature and Format of Responses Requested

Respondents are encouraged to identify, in the information they share with Canada, any information that they feel is proprietary, third party or personal information. Please note that Canada may be obligated by law (e.g. in response to a request under the Access of Information and Privacy Act) to disclose proprietary or commercially-sensitive information concerning a respondent (for more information: http://laws-lois.justice.gc.ca/eng/acts/a-1/).

Respondents are asked to identify if their response, or any part of their response, is subject to the *Controlled Goods Regulations*.

Participation in this RFI is encouraged, but is not mandatory. There will be no short-listing of potential suppliers for the purposes of undertaking any future work as a result of this RFI. Similarly, participation in this RFI is not a condition or prerequisite for the participation in any potential subsequent solicitation.

3.3 Participation

The RFI is inclusive and flexible and is not intended to pre-qualify Respondents for any stages of the project. An interested Respondent who does not participate in the RFI process is not precluded from participating in any subsequent RFP process.

3.4 Treatment of Responses

Use of Responses: Responses will not be formally evaluated. However, the responses received may be used by Canada to develop or modify the procurement approach. Canada will review all responses received. Canada may, at its discretion, review responses received after the RFI closing date.

Review Team: A review team composed of representatives of the Canadian Food Inspection Agency (CFIA) will review the responses. Canada reserves the right to hire any independent consultant or to use any Government of Canada (GOC) resources that it considers necessary to review any response. Not all members of the review team will necessarily review all responses.

Confidentiality: Respondents should mark any portions of their response that they consider proprietary or confidential. Canada will handle the responses in accordance with the Access to Information Act.

3.5 FORMAT OF RESPONSE

Respondents should review and provide comments to the attached draft documents and respond to the set of questions of below.

3.5.1 Format of Responses

Cover Page: If the response includes multiple volumes, respondents are requested to indicate on the front cover page of each volume the title of the response, the solicitation number, the volume number and the full legal name of the respondent.

Title Page: The first page after the cover page should be the title page, which should contain the following information:

i the title of the respondent's response and the volume number;
ii the name and address of the respondent;
iii the name, address and telephone number of the respondent's contact;
iv the date, and
v the solicitation number.

If submitting by email, Canada requests that respondents submit their electronic response in unprotected (i.e. no password) PDF format.

Responses to this RFI may be in either of Canada's official languages, English or French.

4.0 CLOSING DATE

Responses to this RFI will be accepted until **2:00 PM Eastern Standard Time (EST) on July 3, 2019**. Responses are to be submitted by fax or electronically to the Contracting Authority stated below. The information received after that date will be considered only to the extent reasonable, in the sole opinion of Canada, given the progress of the Work at the time of receipt of the said information.

5.0 ENQUIRIES

Any questions from Respondents concerning this RFI must be made in writing to the Contracting Authority stated below, via e-mail on or before the closing date of this RFI.

Respondents are to assume all responsibility for the successful delivery and receipt of all questions to the Contracting Authority stated below. Questions submitted to any other person but the Contracting Authority, or in any other form, will not be answered. Responses given in any other manner than that which is outlined above will not be binding upon any party.

Canada reserves the right not to respond to questions received after the closing date of this RFI, or to any question not related to this RFI. 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 respondent do so, so that the proprietary nature of the question is eliminated, and the responses will be made publicly available through Buy & Sell web site (https://buyandsell.gc.ca/).

Enquiries not submitted in a form that can be distributed to all Respondents may not be answered by Canada. If a question is determined to be proprietary, in Canada’s sole discretion, Canada reserves the right to respond only to that party.

6.0 CLARIFICATION

CFIA may require clarification of written responses and/or comments received as a result of the responses to this RFI. If required, any clarification will be requested by the Contracting Authority after the closing date of the RFI. Requests for clarification will be submitted in writing (by email only) and a response will be requested within two (2) working days of transmission of the clarification questions. Canada will not provide any guidance on how to prepare the responses or of any acceptable response strategy.

7.0 Reserved Rights

In addition to any other expressed or implied rights, CFIA reserves the right to:

i. Cancel this RFI process at any time;

ii. Cancel this RFI process at any time and issue a new RFI for the same or similar information;

iii. Change the structure and timing of the RFI process;

iv. Vary or extend the date or timeline in this RFI at any time, and for such period as CFIA in its absolute discretion considers appropriate;

v. Request written clarification or the substitution of supplementary information from any and all Respondents, or provide additional information or clarification;

vi. Contact any customer or reference provided with a Respondent’s submission, as part of its assessment process

8.0 RESPONSES REGARDING THIS REQUIREMENT ARE TO BE SUBMITTED TO THE FOLLOWING CFIA CONTRACTING AUTHORITY:

Ashley Bennett
Procurement Officer
Canadian Food Inspection Agency
Procurement and Contracting Service Centre
59 Camelot Drive
Ottawa, ON K1A 0Y9
Tel: (613) 773-7769
Fax: (613) 773-7615
Email: Ashley.Bennett@canada.ca

DRAFT Statement of Work
Robotics, Automation and Integration of Associated Equipment

1. Title
Robotics, automation and integration of associated equipment in support of research and testing activities conducted at a plant health facility.

2. Background
The Government of Canada committed $80 million in Budget 2017 to revitalize the Centre for Plant Health (CPH; 8801 East Saanich Road, North Saanich, BC, V8L 1H3) with a world-class research and diagnostic testing facility. Funding for this initiative will help CPH scientists and partners conduct innovative, cutting-edge work in agri-food and plant science, leading to innovation, economic growth and improved delivery of CFIA's mandate.

As Canada's only post-entry quarantine facility, the research and diagnostic units at the CPH are essential to delivering critical regulatory programs for the Government of Canada for tree fruit, grapevine and small fruit commodities. The modernized CPH will provide opportunities for enhanced research collaborations and strategic partnerships with opportunities for co-location and shared spaces for scientific collaboration, both of which will help drive research in plant science forward and provide innovative solutions to support the agricultural and agri-food sector.

CPH scientists work collaboratively with plant health experts to develop state-of-the-art technology and gain expertise in plant pathogen identification and characterization in support of CFIA's mandate, these collaborations include all levels of government, academia, and industry (regionally, nationally, and internationally). Modern equipment and advanced technologies enabled through the enhanced CPH will support continued development of new applications and improving current processes resulting in enhanced detection methods and streamlining sample analysis.

2.1 Pending the results of this RFI process, and incorporating any lessons learned, the scope and range of robotic or automated solutions and associated equipment in support of plant health research and testing activities sought by CFIA may be altered to better reflect what is currently available within the current marketplace. Information from this RFI may be used by other CFIA laboratories in need of similar equipment and capability.

2.2 CFIA is issuing this RFI as a means of gathering information to assist in accomplishing the following specific purposes:

2.2.1 To develop a customized proposal for a full solution robotics and integrated associated equipment package capable of supporting nucleic acid extraction processes and the subsequent PCR/qPCR applications.

2.2.2 To develop a customized proposal for a full or partial solution robotics package with associated equipment capable of supporting ELISA applications. The solution includes; liquid handling, microplate washing and reading.

2.2.3 To develop a customized proposal for a full solution robotics and associated equipment package capable of supporting sequencing (Sanger and NGS) and sequence data processing workflows with the incorporation of QA/QC analyses related to library preparation.

2.2.4 To develop a customized proposal for a wired and wireless barcoding system for sample tracking from plant growth facilities to laboratory analysis. Included in this proposal is a solution for a paperless sample analysis system which incorporates the essential CPH

Quality Management System worksheets and forms. Compatibility with Omni-Assistant Quality Management (Omnitech Innovations Inc.) software must be considered.

2.2.5 To provide a solution for the development of a customizable Laboratory Information Management System (LIMS) which encompasses all research, diagnostic testing and sample tracking activities at the CPH. This system must integrate with the CFIA approved LIMS system (SampleManager version 12, ThermoFisher Scientific) without the requirement for the duplication of data entry.

OR

To develop a cost analysis associated with the full integration with CFIA approved LIMS (SampleManager version 12, ThermoFisher Scientific), including the costs associated with professional services to integrate with the new and existing equipment.

2.2.6 Develop custom workflows, including bioinformatics analyses, within the software. Must also integrate with existing software or web applications via an exposed API.

3. Objectives

The overarching objective is to provide a plan for a fully integrated solution (robotics, automation and sample management) for the processing of plant samples through various diagnostic-based molecular tests. Three specific objectives to fulfill this goal are outlined below:

Objective 1: Develop a customized proposal for a full or partial robotics package solution at the CPH with integrated equipment capable of supporting molecular methods and processes.

Objective 2: To develop a customized proposal for a wired and wireless barcoding system for sample tracking from plant growth facilities to laboratory analysis at the CPH.

Objective 3: To provide a solution for the development of a customizable Laboratory Information Management System (LIMS) which encompasses all research, diagnostic testing and sample tracking activities at the CPH.

4. Scope of Work

The scope of work is outlined below under the three Objectives as outlined in Section 3 above. However as part of the scope the following information is also sought:

Vendor Profile:

i. Describe your organizations previous and current experience as a provider of equipment and/or software as described in this Statement of Work. Experience related with private institutions and the Federal Government should be noted separately, as applicable.
ii. Indicate if the solutions are developed by your organization, or whether you are a third-party reseller of another vendor's system. If applicable, indicate the items for which your organization or the third parties you represent cannot provide a solution.
iii. Indicate your organizations previous and current experience as a provider of equipment/software solution which are compatible with or modified to be compatible with Laboratory Information Management Systems (LIMS).
iv. Indicate whether you have office location(s) and if so, where they are located, in Canada, or worldwide.
v. Please indicate the number of years your organization has been in the business of supplying the solution(s) to address this Statement of Work.
vi. Describe your experience in providing directly or coordinating training from third party vendors on the use of equipment/software.
vii. Indicate how technical support is available for the solution (i.e. phone support, site visits, etc.)
viii. Does your organization provide a preventative maintenance program for the equipment? If so,

please describe.

ix. As an equipment/software manufacturer is your organization accredited to any International Standard? If so, what standard and provide the date of Scope.

x. Describe your organization's previous and current experience in successfully providing solutions. For each solution provided please provide:
   a) details of the date and location of the customized solution(s);
   b) the name of the Client organization for whom this was accomplished;
   c) A description of the similarities or differences between the solution(s) provided to these clients and requirement described herein;
   d) The name, position, and current contact information (phone, fax and/or email address) of a contact within the Client organization for whom this was accomplished who would be knowledgeable of the experience with your company and your solution(s).
   e) Describe the training and customer support you provide.

Costing Information:

Please ensure that the following points are considered and included in the proposal:

i. Clearly indicate both initial (i.e. purchase & installation) and recurring (e.g. maintenance, upgrade) costs for the possible options and the pricing difference between options.
ii. Clearly describe all per user, host, instrument and other factors that influence pricing.
iii. Include all consumable and associated reagent costs, where applicable. Also indicate whether these must be purchased from the manufacturer or are available from another supplier. Identify the supplier, if applicable, and the costs.
iv. Describe the training and customer support that would be provided including, ongoing support.
v. Describe the options for customization of the solution.

Equipment Information:

Please ensure that the following points are considered and included in the proposal:

i. Equipment compatibility
ii. Software and Windows Operating System compatibility
iii. Equipment footprint, additional facility requirements and equipment specifications
iv. The warranty that comes with the instrument (length of warranty and what is covered); Cost for an annual maintenance agreement, or applicable service fees in the absence of a maintenance agreement;
v. Availability of adequate long-term (minimum 5 years) service for such instrumentation by personnel approved by the instrument manufacturer;
vi. List of any lab supplied consumables associated with the instrument(s) and the approximate cost of all consumables;
vii. The validated protocols which could be used on the platforms quoted. Should a protocol still be in the validation process, please indicate the expected validation date;
viii. Any other information that is deemed pertinent to the stated instrumentation.

Objective 1: Develop a customized proposal for a full or partial robotics package solution with integrated equipment capable of supporting molecular methods and processes.

i. Through a detailed summary of the main technical features of the instruments, a customized proposal is sought for a full solution robotics package, capable of supporting Nucleic acid extraction of double stranded RNA and total nucleic acid, PCR, qPCR, ELISA and QA/QC analyses related to library preparation and sequencing (Sanger and NGS) workflows. The system must come complete with a data basing system and protocols that can eventually be ISO 17025 certified. The following points must be considered:

The system must be compatible with the following equipment, already in place:

a) Thermo Scientific KingFisher mL DNA extractor (Nucleic acid purification system);
b) Thermo Scientific KingFisher Flex DNA extractor (Nucleic acid purification system);
c) Applied Biosystems SeqStudio Genetic Analyzer (to be purchased*);

d) Illumina NextSeq500 (Next–Generation sequencing analysis);
e) Roche LightCycler 480 Real-Time PCR system;
f) Applied Biosystems QuantStudio Real-Time PCR system
g) Agilent 2100 Bioanalyzer;
h) QIAxcel Advanced System (to be purchased*)
i) Virtool bioinformatics pipeline (www.virtool.ca);
j) Epoch 2 Microplate reader: used to read 96 well plates for ELISA tests
k) DNA quantification systems, including
    a) Invitrogen Qubit Fluorometer
    b) NanoDrop Spectrophotometer

* If the vendor can supply this instrument directly or through third party, please include in the package. If the vendor sells an equivalent or superior alternative please include in the package.

ii. The integrated robotics platform consisting of the following pieces of equipment, including liquid handling robot(s). Please ensure that for each piece of equipment listed, the approximate price, electrical and space requirements, as well as any other special requirements necessary for the proper installation and operation are included:
    a. DNA, Double stranded RNA and small RNA extraction;
    b. DNA shearer capable of fragmenting DNA for genomic library construction;
    c. Automated nucleic acid size fractionation system;
    d. All equipment required to automate all the applications listed below, with minimal human intervention. The integrated solution may consist of multi-purpose robots, or a variety of instruments for the different applications, to avoid a bottleneck. Please be aware that pre-and post-PCR activities are to be kept physically separated from each other.
    e. The robotics solution should also have a component dedicated to microfluidics, in order to facilitate Taqman/SYBRgreen assays, and very small samples volumes associated with certain obligate pathogens, and precious type specimens.
    f. Among other functions robotic should have an automated vacuum station, suction and positive pressure solid phase extraction capability
    g. The capability to reuse tips would be an asset.
    h. Liquid handling capabilities with ELISA-based testing

iii. The applications expected to be performed on the system include:
    a. PCR Mastermix Preparation;
    b. PCR Reaction set up;
    c. PCR Clean Up;
    d. qPCR and digital PCR Sample Preparation;
    e. Sanger sequencing Reaction Set-Up;
    f. Sanger sequencing Reaction Clean Up (ethanol/ salt precipitation or commercially available kits);
    g. Cloning of PCR products;
    h. Routine Sample Preparation and Dilutions;
    i. DNA, dsRNA, totRNA and smRNA extractions
    j. DNA/RNA sequencing, using Illumina TruSeq and Nextera Sample Preparation;
    k. All RNA-Seq and Nextera Sample Preparation and enrichment kits for RNA and DNA used in Ilumina applications.
    l. QA/QC instrument(s) for the analyses of samples throughout the process to prevent failures and trouble shoot problems.
    m. ELISA-testing liquid handling (96 well plate format)

iv. The ultimate end goal is to be able to automate CPH routine workflows, primarily for the detection of virus and virus-like pathogens associated with plants but also for other applications (e.g. genomics, ELISA and genotyping of plants, insects, fungi, and bacteria). The report should emphasize how this can be best achieved using validated protocols, and robotics included in the response. Example workflows should be directed against the application stated above. For instance:
    a. RNA to Sanger sequencing workflow through PCR to Sanger Sequencing will encompass extraction of RNA/DNA, automated PCR set-up, electrophoresis, automated sequencing set-up and Sanger sequencing on ABI SeqStudio Genetic Analyzer.
    b. RNA/DNA to NextSeq genome sequencing workflow will encompass extraction of RNA/DNA/dsRNA/smRNA, quality control verification using bioanalyzer, RNA-seq or Nextera library construction, library QC using Bioanalyzer, automated sequencing set-up on NextSeq500.
    c. Please provide an option to demo or view the robotics system performing an RNA-seq library construction using input double stranded RNA supplied by CFIA-CPH.
    d. Liquid handling for ELISA based testing on 96 well plates
v. Samples are likely to be stored in a variety of states and / or environments (ex. air- or freeze-dried, -20oC, -80oC, etc.) The ability to store and retrieve specimen DNA rapidly is imperative;
vi. Due to the fact that protocols are continually being developed and modified to fulfill the ongoing requirements associated with types of pathogens, genotyping and genome sequencing, the system must be flexible. Flexibility is also required in the type of workflow that is being used; the ability to seamlessly work between various workflows is imperative. If instruments can be preloaded with commercially available protocols, as described herein, it should be duly noted within the specifications;
vii. For Sanger sequencing, the expected annual throughput will be between 500 and 1,000 samples (low-/mid-throughput). The proposal must include instruments capable of cherry-picking samples, and making both PCR- and Sequencing- master mixes. Clean-up of sequencing products, using ABI Big Dye chemistries, should also be discussed as part of the solution;
viii. For NGS, the expected annual throughput for is to be between 500 and 5,000 samples (low-throughput). The NGS will consist of small RNA and DNA genomes. The proposal must include instruments capable of using a variety of kits available through Illumina, including, but not limited to, Genomic DNA sample Prep, Mate Pair Library Prep., Truseq RNA and Nextera XT DNA sample prep;
ix. The robotics solution must be capable of working between a variety of container types, including but not limited to 96-and 384-well plates, strip tubes, and 0.5mL and 1.5 mL tubes;
x. Response time versus repair time;
xi. The robotics may need to be self-contained in order to prevent cross contamination;
xii. The minimum volume to be dispensed must be 1µl, less is better. Please state the CV value, and provide supporting data, if applicable.
xiii. The validated protocols which could be used on the platforms quoted. Should a protocol still be in the validation process, please indicate the expected validation date;
xiv. Any other information that is deemed pertinent to the stated instrumentation.

Objective 2: To develop a customized proposal for a wired and wireless barcoding system for sample tracking from plant growth facilities to laboratory analysis.

To achieve this objective, a detailed proposal is request to outline a solution for a paperless sample analysis system which incorporates the essential CPH Quality Management System (ISO 17025) worksheets and forms. Moreover, compatibility with the current Omni-Assistant Quality Management (Omnitech Innovations Inc.) software must be considered. The system will incorporate barcoding for both

sample tracking within the laboratory setting but also in the field, i.e. plants labelled with barcodes in the greenhouse and field.

Objective 3: To provide a solution for the development of a customizable Laboratory Information Management System (LIMS) which encompasses all research, diagnostic testing and sample tracking activities at the CPH.

A detailed proposal is requested for a system that integrates with the CFIA approved LIMS system (SampleManager version 12, ThermoFisher Scientific) without the requirement for the duplication of data entry or to develop a cost analysis associated with the full integration with CFIA approved LIMS (SampleManager version 12, ThermoFisher Scientific), including the costs associated with professional services to integrate with the new and existing equipment. The system must also integrate with existing software or web applications via an exposed API. Bioinformatics hardware/software solutions to analyze the data can be added as an option (see Section below)

For the proposal LIMS system, please describe the possible options and pricing difference:

i. Be sure to clearly indicate both upfront (i.e. purchase & installation) and recurring (e.g. maintenance) costs.
ii. Clearly describe all per user, host, instrument and other factors that influence pricing.
iii. Describe the process and cost associated with custom LIMS feature development including the ability to integrate with custom software and web applications via API
iv. Describe the training and customer support that would be provided.
v. Outline if the client interface is web or desktop based, and describe the available options for hosting the LIMS service (e.g. local server & storage vs. "cloud"), storing the data, and associated costs:
    a. Where the LIMS is offered as a cloud-based service, please include documents and diagrams describing technical (e.g. bandwidth) and security policy requirements (e.g. availability of ports) to permit an assessment by IT security, and a description of data security standards.
    b. Where the LIMS system is locally hosted, please describe the IT requirements and whether required equipment is to be provided by the vendor or the client.
    c. Where the LIMS is locally hosted, please describe the OS and client/server configuration.
    d. Where the LIMS is locally hosted and running Windows, please indicate the version of windows and comment on best practices with respect to enterprise integration including use of anti-virus.

<u>Further required LIMS-related information:</u>

- To what extent is your LIMS "enterprise" ready, e.g. use of central user management & authentication?
- To what extent does the LIMS differentiate between different types of users (e.g. roles) and what types of roles are available within the LIMS?
- Is the source code for your LIMS available for review and in-house modification?
- Does your LIMS provide an Application Programming Interface (API) to facilitate integration with other systems? If so, please include API documentation with RFI.
- Does your LIMS system provide a plugin architecture permitting execution of client-developed functionality? If so, please include plugin architecture documentation with RFI.
- Does your LIMS provide sample/reagent tracking via bar-coding capabilities that include wireless functionality for sample identification and recording of associated data in the laboratory, field or greenhouse?
- Do you have any experience with existing open-source LIMS systems? If so, please describe.
- Do you have any direct or indirect experience with LIMS SampleManager 12?

Bioinformatics hardware/software (if applicable):

i. If your company has that expertise and capability, please provide bioinformatics solutions for the laboratory. The solution should be in the appropriate scale to analyse and process the data generated by the robotics and associated equipment described above for NGS.
ii. The solution could be a hybrid with high performance Linux desktops specialized for bioinformatics and a small Linux server for more demanding analyses.
iii. It is the expectation of CFIA-CPH that open source and custom designed software will be primarily used, but if your company has some software solutions that could be of interest to CFIA and integrated with open source, custom designed software and the LIMS solution, please provide the information.

5. Travel

Provides estimates of the overall value of the requirement, including the cost of professional services, and the travel and living costs related to the following:

1) Travel to the CPH in order to understand, document and witness current infrastructure and equipment associated with the scope of work.
2) Costs for CPH staff (2-3), if necessary, for travel to witness demonstrations of equipment solutions that will be incorporated into the proposals. Note that the current TBS Travel Directive will apply.

6. Constraints

Constraints are identified under the following topics:

1. Equipment and Infrastructure
    a. Current equipment at the CPH and associated infrastructure must be considered for the [proposed solution(s)], i.e. compatibility with existing facility and equipment specifications. See Section 4 for details.
2. Information technology (IT) and management
    a. Physical constraints: i.e. solution must comply and must have the capacity to be incorporated in the current IT network/infrastructure and security-related requirements.
    b. Compatibility with current software: i.e. Windows Operating System, Sample Manager and Omni-Assistant Quality Management (see Section 4)
3. Quality
    a. The CPH laboratory functions within an accredited ISO 17025 quality system and therefore solutions must fit within this framework.

7. Security Requirement

There is no security requirement associated with this RFI.

8. CFIA Support

CFIA will provide the vendor with all information and documentation required to ensure the proposal plans can be developed with adequate knowledge of current processes/equipment/software and infrastructure. Within adequate warning, CFIA staff will be made available, on site, without cost to facilitate this knowledge collection and transfer also encompassing meetings and site-visit. Off site visits must be factored into travel costs as outlined in Section 5.

9. Meetings

Various on-site meetings will be required to discuss with end users and allow adequate time to understand and document current existing infrastructure, equipment, work processes and sample tracking/quality related processes and software solutions. It is envisioned that multiple on site, in-person meetings will be required at the beginning of the work program, with these in–person meeting being less necessary over the time-course of the proposal development. Video-conferencing is also an option as necessary. Off-site meetings may also be required for CPH staff to view demonstrations of equipment/software based solutions. Ensure all travel costs associated with meetings are outlined within the proposals as defined in Section 5.

10. Language

English is the language of work.

11. Output/Deliverables

The overarching deliverable is a proposal that addresses the three objectives as listed in Section 3. This deliverable may consist of one or more reports and can be delivered electronically to CFIA.