

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:
Public Works and Government Services Canada
Telus Plaza North/Plaza Telus Nord
10025 Jasper Ave./10025 ave. Jaspe
5th floor/5e étage
Edmonton
Alberta
T5J 1S6
Bid Fax: (780) 497-3510

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 Novel Energetic Ionic Systems	
Solicitation No. - N° de l'invitation W7702-135601/A	Date 2013-01-23
Client Reference No. - N° de référence du client DRDC	
GETS Reference No. - N° de référence de SEAG PW-\$EDM-007-9701	
File No. - N° de dossier EDM-2-35347 (007)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2013-02-08	Time Zone Fuseau horaire Mountain Standard Time MST
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: Anthony, Mary	Buyer Id - Id de l'acheteur edm007
Telephone No. - N° de téléphone (780) 497-3588 ()	FAX No. - N° de FAX (780) 497-3510
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: DEPARTMENT OF NATIONAL DEFENCE Defence R&D Canada Suffield Bldg 560 Receiving Ralston Alberta T0J 2N0 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
Telus Plaza North/Plaza Telus Nord
10025 Jasper Ave./10025 ave Jasper
5th floor/5e étage
Edmonton
Alberta
T5J 1S6

Delivery Required - Livraison exigée See Herein	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

High-Pressure Synthesis of Novel Energetic Ionic Systems

PART 1 - GENERAL INFORMATION

1. Introduction
2. Summary
3. Debriefings

PART 2 - BIDDER INSTRUCTIONS

1. Standard Instructions, Clauses and Conditions
2. Submission of Bids
3. Enquiries - Bid Solicitation
4. Applicable Laws
5. Improvement of Requirement During Solicitation Period
6. Basis for Canada's Ownership of Intellectual Property

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. Mandatory Certifications Required Precedent to Contract Award
2. Additional Certifications Precedent to Contract Award

PART 6 - RESULTING CONTRACT CLAUSES

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

List of Annexes:

- | | |
|---------|--|
| Annex A | Statement of Work |
| Annex B | Basis of Payment |
| Annex C | Disclosures Certification |
| Annex D | Mandatory Criteria, Evaluation Criteria and Selection Method |

PART 1 - GENERAL INFORMATION

1. Introduction

The bid solicitation is divided into 6 parts plus attachments and annexes, as follows:

- Part 1 General Information: provides a general description of the requirement;
- Part 2 Bidder Instructions: provides the instructions, clauses and conditions applicable to the bid solicitation;
- Part 3 Bid Preparation Instructions: provides bidders with instructions on how to prepare their bid;
- Part 4 Evaluation Procedures and Basis of Selection: indicates how the evaluation will be conducted, the evaluation criteria that must be addressed in the bid, and the basis of selection;
- Part 5 Certifications: includes the certifications to be provided; and
- Part 6 Resulting Contract Clauses: includes the clauses and conditions that will apply to any resulting contract.

The Annexes include the Statement of Work, the Basis of Payment, Disclosures Certification and Mandatory Criteria, Evaluation Criteria and Selection Method.

2. Summary

The contract requirement for this project is to design, high-pressure synthesize and characterize novel high energetic ionic condensed matter as high energetic fuels for enhanced blast explosives under guidance of first-principles theory simulations. To perform high-pressure synthesis of novel ionic energetic materials, a three tier approach will be used as follows:

- 1) Perform first-principles theory simulations with enthalpy minimization with various target pressures to explore novel energetic ionic systems as high energy density fuels which can undergo detonation reactions when contacted with appropriate oxidizers, such as hydrogen-rich ionic liquids being hypergolic with hydrogen peroxide and ionic hydrides with extremely high energy contents.
- 2) Design and synthesize targeted aforementioned novel ionic energetic materials using high-pressure.
- 3) Characterize and study experimentally synthesized ionic energetic materials.

The results obtained will be carefully analyzed and will be used to fine-tune the materials design and high-pressure synthesis to enhance their energetic content, together with their detonation or hypergolic reactivity as energy fuels for enhanced blast explosives.

The period of the contract will be from award of the contract to December 31, 2014.

This requirement is limited to Canadian goods and/or services.

Pursuant to section 01 of Standard Instructions 2003 and 2004, Bidders must submit a complete list of names of all individuals who are currently directors of the Bidder. Furthermore, as determined by the Special Investigations Directorate, Departmental Oversight Branch, each individual named on the list may be requested to complete a Consent to a Criminal Record Verification form and related documentation.

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 (2012-11-19) 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 five (5) 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 Alberta.

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. Improvement of Requirement During Solicitation Period

Should bidders consider that the specifications or Statement of Work contained in the bid solicitation could be improved technically or technologically, bidders are invited to make suggestions, in writing, to the Contracting Authority named in the bid solicitation. Bidders must clearly outline the suggested improvement as well as the reason for the suggestion. Suggestions that do not restrict the level of competition nor favour a particular bidder will be given consideration provided they are submitted to the

Contracting Authority at least five (5) days before the bid closing date. Canada will have the right to accept or reject any or all suggestions.

6. Basis for Canada's Ownership of Intellectual Property

Defence Research and Development Canada (DRDC) has determined that any intellectual property rights arising from the performance of the Work under the resulting contract will belong to Canada.

7. Maximum Funding

The maximum funding available for the Contract resulting from the bid solicitation is \$100,000.00 (Goods and Services Tax or Harmonized Sales Tax extra, as appropriate). Bids valued in excess of this amount will be considered non-responsive. This disclosure does not commit Canada to pay the maximum funding available.

Estimated fiscal year cash phasing breakdown as follows:

Fiscal Year 2012-2013: \$50,000.00 + GST

Fiscal Year 2013-2014: \$50,000.00 + GST

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:	Management Bid	- 3 hard copies
Section III:	Financial Bid	- 1 hard copy
Section IV:	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 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 demonstrate their understanding of the requirements contained in the bid solicitation and explain how they will meet these requirements. Bidders should demonstrate their capability and describe their approach in a thorough, concise and clear manner for carrying out the work.

The technical bid should address clearly and in sufficient depth the points that are subject to the evaluation criteria against which the bid will be evaluated. Simply repeating the statement contained in the bid solicitation is not sufficient. In order to facilitate the evaluation of the bid, Canada requests that bidders address and present topics in the order of the evaluation criteria under the same headings. To avoid duplication, bidders may refer to different sections of their bids by identifying the specific paragraph and page number where the subject topic has already been addressed.

Section II: Management Bid

In their management bid, bidders must describe their capability and experience, the project management team and provide client contact(s).

Section III: Financial Bid

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

1.2 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, management and financial evaluation criteria.
- b. An evaluation team composed of representatives of Canada will evaluate the bids.

1.1 Technical Evaluation

Mandatory and point rated evaluation criteria are included in Annex D.

1.2 Management Evaluation

Point rated evaluation criteria are included in Annex D.

1.3 Financial Evaluation

To obtain the total evaluated bid price, the financial evaluation will be based on the Firm Lot Price proposed in Annex B not exceeding the ceiling budget for this requirement.

2. Basis of Selection

2.1 Basis of Selection - Highest Rated Within Budget

2.1.1 To be declared responsive, a bid must:

- a. Comply with all the requirements of the bid solicitation;
- b. Meet all mandatory technical evaluation criteria; and
- c. Obtain the required minimum points for the technical evaluation criteria which are subject to point rating.

2.1.2 Bids not meeting a., or b., or c. will be declared non responsive. The responsive bid with the highest number of points will be recommended for award of a contract, provided that the total evaluated price does not exceed the budget available for this requirement.

PART 5 - CERTIFICATIONS

Bidders must provide the required certifications and related documentation to be awarded a contract. Canada will declare a bid non-responsive if the required certifications and related documentation 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, to provide the related documentation or to comply with the request of the Contracting Authority for additional information will also render the bid non-responsive.

1. Mandatory Certifications Required Precedent to Contract Award

1.1 Code of Conduct and Certifications - Related documentation

1.1.1 By submitting a bid, the Bidder certifies, for himself and his affiliates, to be in compliance with the Code of Conduct and Certifications clause of the Standard instructions. The related documentation hereinafter mentioned will help Canada in confirming that the certifications are true. By submitting a bid, the Bidder certifies that it is aware, and that its affiliates are aware, that Canada may request additional information, certifications, consent forms and other evidentiary elements proving identity or eligibility. Canada may also verify the information provided by the Bidder, including the information relating to the acts or convictions specified herein, through independent research, use of any government resources or by contacting third parties. Canada will declare non-responsive any bid in respect of which the information requested is missing or inaccurate, or in respect of which the information contained in the certifications is found to be untrue, in any respect, by Canada. The Bidder and any of the Bidder's affiliates, will also be required to remain free and clear of any acts or convictions specified herein during the period of any contract arising from this bid solicitation.

1.1.2 Bidders who are incorporated, including those bidding as a joint venture, must provide with their bid or promptly thereafter a complete list of names of all individuals who are currently directors of the Bidder. Bidders bidding as sole proprietorship, including those bidding as a joint venture, must provide the name of the owner with their bid or promptly thereafter. Bidders bidding as societies, firms, partnerships or associations of persons do not need to provide lists of names. If the required names have not been received by the time the evaluation of bids is completed, Canada will inform the Bidder of a time frame within which to provide the information. Failure to comply will render the bid non-responsive. Providing the required names is a mandatory requirement for contract award.

1.1.3 Canada may, at any time, request that a Bidder provide properly completed and Signed Consent Forms ([Consent to a Criminal Record Verification](http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/formulaires-forms-eng.html) form- PWGSC-TPSGC 229) (<http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/formulaires-forms-eng.html>) for any or all individuals aforementioned within the time specified. Failure to provide such Consent Forms within the time period provided will result in the bid being declared non-responsive.

2. Additional 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 - over \$25,000 and below \$200,000

2.1.1 Suppliers who are subject to the Federal Contractors Program (FCP) and have been declared ineligible contractors by Human Resources and Skills Development Canada (HRSDC) are no longer eligible to receive federal government contracts over the threshold for solicitation of bids as set out in the Government Contracts Regulations.

2.1.2 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.

2.1.3 The Bidder, or, if the Bidder is a joint venture the member of the joint venture, certifies its status with the FCP, as follows:

2.1.4 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;
- d. () has not been declared an ineligible contractor by HRSDC, and has a valid certificate number as follows: _____.

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

2.2 Former Public Servant Certification

Contracts with former public servants (FPS) in receipt of a pension or of a lump sum payment must bear the closest public scrutiny, and reflect fairness in the spending of public funds. In order to comply with Treasury Board policies and directives on contracts with FPS, bidders must provide the information required below.

2.2.1 Definitions

For the purposes of this clause, "*former public servant*" is any former member of a department as defined in the Financial Administration Act, R.S., 1985, c. F-11, a former member of the Canadian Armed Forces or a former member of the Royal Canadian Mounted Police. A former public servant may be:

- a. an individual;
- b. an individual who has incorporated;
- c. a partnership made of former public servants; or
- d. a sole proprietorship or entity where the affected individual has a controlling or major interest in the entity.

"lump sum payment period" means the period measured in weeks of salary, for which payment has been made to facilitate the transition to retirement or to other employment as a result of the implementation of various programs to reduce the size of the Public Service. The lump sum payment period does not include the period of severance pay, which is measured in a like manner.

"*pension*" means, a pension or annual allowance paid under the Public Service Superannuation Act (PSSA), R.S., 1985, c.P-36, and any increases paid pursuant to the Supplementary Retirement Benefits Act, R.S., 1985, c.S-24 as it affects the PSSA. It does not include pensions payable pursuant to the Canadian Forces Superannuation Act, R.S., 1985, c.C-17, the Defence Services Pension Continuation Act, 1970, c.D-3, the Royal Canadian Mounted Police Pension Continuation Act, 1970, c.R-10, and the Royal

Canadian Mounted Police Superannuation Act, R.S., 1985, c.R-11, the Members of Parliament Retiring Allowances Act, R.S., 1985, c.M-5, and that portion of pension payable to the Canada Pension Plan Act, R.S., 1985, c.C-8.

2.2.2 Former Public Servant in Receipt of a Pension

As per the above definitions, is the Bidder a FPS in receipt of a pension? **Yes () No ()**

If so, the Bidder must provide the following information, for all FPS in receipt of a pension, as applicable:

- a. name of former public servant;
- b. date of termination of employment or retirement from the Public Service.

By providing this information, Bidders agree that the successful Bidder's status, with respect to being a former public servant in receipt of a pension, will be reported on departmental websites as part of the published proactive disclosure reports in accordance with Contracting Policy Notice: 2012-2 and the Guidelines on the Proactive Disclosure of Contracts.

2.2.3 Work Force Reduction Program

Is the Bidder a FPS who received a lump sum payment pursuant to the terms of a work force reduction program? **Yes () No ()**

If so, the Bidder must provide the following information:

- a. name of former public servant;
- b. conditions of the lump sum payment incentive;
- c. date of termination of employment;
- d. amount of lump sum payment;
- e. rate of pay on which lump sum payment is based;
- f. period of lump sum payment including start date, end date and number of weeks;
- g. number and amount (professional fees) of other contracts subject to the restrictions of a work force reduction program.

For all contracts awarded during the lump sum payment period, the total amount of fees that may be paid to a FPS who received a lump sum payment is \$5,000, including the Goods and Services Tax or Harmonized Sales Tax.

2.3 Canadian Content Certification

2.3.1 Canadian Content Definition

SACC Manual Clause A3050T(2010-01-11), Canadian Content Definition

2.3.2 Canadian Content Certification

2.3.2.1 This procurement is limited to Canadian services.

2.3.2.2 Bidders should submit this certification completed with their bid. If the certification is not completed and submitted with the bid, the Contracting Authority will so inform the Bidder and provide the Bidder with a time frame within which to submit this completed certification. Failure to comply with the request of the Contracting Authority and submit the completed certification will render the bid non-responsive.

2.3.2.3 The Bidder certifies that:

() the services offered are Canadian services as defined in paragraph 4 of clause A3050T.

For more information on how to determine the Canadian content for a mix of goods, a mix of services or a mix of goods and services, consult Annex 3.6.(9), Example 2, of the Supply Manual.

2.4 Status and Availability of Resources

The Bidder certifies that, should it be awarded a contract as a result of the bid solicitation, every individual proposed in its bid will be available to perform the Work as required by Canada's representatives and at the time specified in the bid solicitation or agreed to with Canada's representatives. If for reasons beyond its control, the Bidder is unable to provide the services of an individual named in its bid, the Bidder may propose a substitute with similar qualifications and experience. The Bidder must advise the Contracting Authority of the reason for the substitution and provide the name, qualifications and experience of the proposed replacement. For the purposes of this clause, only the following reasons will be considered as beyond the control of the Bidder: death, sickness, maternity and parental leave, retirement, resignation, dismissal for cause or termination of an agreement for default.

If the Bidder has proposed any individual who is not an employee of the Bidder, the Bidder certifies that it has the permission from that individual to propose his/her services in relation to the Work to be performed and to submit his/her résumé to Canada. The Bidder must, upon request from the Contracting Authority, provide a written confirmation, signed by the individual, of the permission given to the Bidder and of his/her availability.

2.5 Education and Experience

SACC Manual Clause A3010T (2010-08-16), Education and Experience

PART 6 - RESULTING CONTRACT CLAUSES

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

1. Statement of Work

The Contractor must perform the Work in accordance with the Statement of Work at Annex A.

2. 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) (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

2.1 General Conditions

2040 (2012-11-19), General Conditions - Research & Development, apply to and form part of the Contract.

2.1.1 Canada to Own Intellectual Property Rights in Foreground Information

SACC Manual Clause K3410C (2008-12-12), Canada to Own Intellectual Property Rights in Foreground Information

3. Term of Contract

3.1 Period of the Contract

The period of the Contract is from date of Contract to December 31, 2014 inclusive.

4. Authorities

4.1 Contracting Authority

The Contracting Authority for the Contract is:

Mary Anthony

Supply Specialist

Public Works and Government Services Canada

Acquisitions Branch

Directorate: Western Region

Address: 5th floor, 10025 Jasper Ave. Edmonton AB T5J 1S6.

Telephone: 780-497-3588

Facsimile: 780-497-3510

E-mail address: mary.anthony@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.

4.2 Technical AuthorityThe Technical Authority for the Contract is: *(to be named upon contract award)*

Name:

Title:

Organization:

Address:

Telephone: ____-____-____

Facsimile: ____-____-____

E-mail: _____.

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.

4.3 Administrative AuthorityThe Administrative Authority for the Contract is: *(to be named upon contract award)*

Name:

Title:

Organization:

Address:

Telephone: ____-____-____

Facsimile: ____-____-____

E-mail: _____.

The Administrative Authority is the representative of the department or agency for whom the Work is being carried out under the Contract. The Administrative Authority is responsible for the implementation of tools and processes required for the administration of the Contract. The Contractor may discuss administrative matters identified in the Contract with the Administrative Authority however the Administrative Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of Work can only be made through a contract amendment issued by the Contracting Authority.

4.4 Contractor's Representative *(to be filled in by bidder)*

Name:

Title:

Organization:

Address:

Telephone: ____-____-____

Facsimile: ____-____-____

E-mail: _____.

5. Payment

5.1 Basis of Payment - Ceiling Price

The Contractor will be reimbursed for the costs reasonably and properly incurred in the performance of the Work, as determined in accordance with the Basis of Payment in Annex B, to a ceiling price of \$_____ (***insert the amount at contract award***). Customs duties are included, and Goods and Services Tax or Harmonized Sales Tax is extra, if applicable.

The ceiling price is subject to downward adjustment so as not to exceed the actual costs reasonably incurred in the performance of the Work and computed in accordance with the Basis of Payment.

5.2 Limitation of Price

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

5.3 Method of Payment

5.3.1 Method of Payment - Progress Payments

5.3.1.1 Canada will make progress payments in accordance with the payment provisions of the Contract, no more than once a month, for cost incurred in the performance of the Work, up to 90 percent of the amount claimed and approved by Canada if:

- a. an accurate and complete claim for payment using form PWGSC-TPSGC WR01, Claim for Progress Payment, and any other document required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
- b. the amount claimed is in accordance with the basis of payment;
- c. the total amount for all progress payments paid by Canada does not exceed 90 percent of the total amount to be paid under the Contract;
- d. all certificates appearing on form PWGSC-TPSGC WR01 have been signed by the respective authorized representatives.

5.3.1.2 The balance of the amount payable will be paid in accordance with the payment provisions of the Contract upon completion and delivery of the item if the Work has been accepted by Canada and a final claim for the payment is submitted.

5.3.1.3 Progress payments are interim payments only. Canada may conduct a government audit and interim time and cost verifications and reserves the rights to make adjustments to the Contract from time to time during the performance of the Work. Any overpayment resulting from progress payments or otherwise must be refunded promptly to Canada.

5.4 Discretionary Audit

SACC Manual Clause C0705C (2010-01-11), Discretionary Audit

5.5 Time and Contract Price Verification

SACC Manual Clause C0710C (2007-11-30), Time and Contract Price Verification

5.6 T1204 - Direct Request by Customer Department

SACC Manual Clause A9117C (2007-11-30, T1204 - Direct Request by Customer Department)

6.0 Invoicing Instructions**6.1 Invoicing Instructions - Progress Payment Claim**

6.1.1 The Contractor must submit a claim for payment using form PWGSC-TPSGC-WR01, Claim for Progress Payment.

6.1.2 Each claim must show:

- a. all information required on form PWGSC-TPSGC-WR01;
- b. all applicable information detailed under the section entitled "Invoice Submission" of the general conditions;
- c. a list of all expenses in accordance with the Basis of Payment for the Work performed during the period of the claim;
- d. holdback of 10 percent;
- e. total of all previous claims against the Contract and the extension of the totals to date.

6.1.3 Each claim must be supported by:

- a. a copy of time sheets to support the time claimed;
- b. a copy of the invoices, receipts, vouchers for all direct expenses, travel and living expenses;
- c. a copy of the monthly progress report.

6.1.4 The Goods and Services Tax or Harmonized Sales Tax (GST/HST), as applicable, must be calculated on the total amount of the claim before the holdback is applied. At the time the holdback is claimed, there will be no GST/HST payable as it was claimed and payable under the previous claims for progress payments.

6.1.5 The Contractor must prepare and certify one original and two (2) copies of the claim on *form PWGSC-TPSGC 1*, and forward it to the Administrative Authority identified under the section entitled "Authorities" of the Contract for appropriate certification after inspection and acceptance of the Work takes place.

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

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

7. Certifications**7.1 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.

7.2 Disclosure Certification

On completion of the Work, the Contractor must submit to the *Technical Authority* and to the Contracting Authority a copy of the Disclosure Certification attached as Annex C stating that all applicable disclosures were submitted or that there were no disclosures to submit under general conditions 2040.

7.3 Canadian Content Certification

SACC Manual Clause A3060C (2008-05-12), Canadian Content Certification

8. Applicable Laws

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

9. 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 2040, (2012-11-19), General Conditions - Research and Development
- (c) Annex A, Statement of Work;
- (d) Annex B, Basis of Payment;
- (e) Annex C, Disclosure Certification;
- (f) the Contractor's bid dated _____, (*insert date of bid*).

10. Defence Contract

SACC Manual Clause A9006C (2012-07-16), Defence Contract

11. Insurance

SACC Manual Clause G1005C (2008-05-12), Insurance

12. SACC Manual Clauses (*if applicable*)

SACC Manual Clause A2000C (2006-06-16), Foreign Nationals (Canadian Contractor)

SACC Manual Clause A9062C, (2011-05-16), Canadian Forces Site Regulations

Annex A Statement of Work

1. Title: High-Pressure Synthesis of Novel Energetic Ionic Systems

2. Background:

Over past years, DRDC Suffield has conducted programs associated with first-principles theory simulations on bonding pathways of high-pressure chemical transformations towards emerging high energy density materials. These simulations have established some fundamental principles for chemical transformations under compression to understand how atoms and electrons move for chemical energy storage during the course of transformations. Applying these principles, both molecular precursors and transformation bonding pathways of energetic nitrogen-rich solids were successfully simulated. Through the collaboration with a research team at University of Ottawa to work on chemical synthesis of nitrogen-rich molecular precursors, several key milestones have been achieved, including novel nitrogen-rich compounds, such as cyanuric triazide (CTA), 2,5,8-triazido-heptazine (TAH), 4,4,6,6-tetraazido-2,2-bis(1,3,5-triazide) (TABTZ), ammonium azide (AA), 2-tetrazene (TTZ), and bi(1H-tetrazol-5-yl)amine (BTA). Recent first-principles simulations conducted by DRDC Suffield have shown that hydrated BTA under pressure was transformed into a higher energetic ionic structure with BTA anion and hydronium cation H_3O^+ around 3 GPa. It also shows that such chemical transformation towards energetic ionic structures can be linked to proton transfer under compression, resulting in modifying chemical bonds of molecules. The bonding pathways are associated with high-pressure induced disproportionation reactions. Recent high-pressure experiments have shown this transformation in agreement with first-principles simulations. Thus, high-pressure chemical transformations can open a unique avenue to synthesize novel energetic ionic liquids using high-pressure autoionization effects combined with high-pressure disproportionation reactions. More importantly high-pressure as a novel reactive variable can be applied to development of new concepts of novel ionic energetic materials which are featured with high-energy-density and insensitivity in a full solid state for a number of applications including enhanced blast explosive technology.

3. Objective:

The contract requirement for this project is to design, high-pressure synthesize and characterize novel high energetic ionic condensed matter as high energetic fuels for enhanced blast explosives under guidance of first-principles theory simulations. To perform high-pressure synthesis of novel ionic energetic materials, a three tier approach will be used as shown below:

1. Perform first-principles theory simulations with enthalpy minimization with various target pressures to explore novel energetic ionic systems as high energy density fuels which can undergo detonation reactions when contacted with appropriate oxidizers, such as hydrogen-rich ionic liquids being hypergolic with hydrogen peroxide and ionic hydrides with extremely high energy contents.
2. Design and synthesize targeted aforementioned novel ionic energetic materials using high-pressure.
3. Characterize and study experimentally synthesized ionic energetic materials.

The results obtained will be carefully analyzed and will be used to fine-tune the materials design and high-pressure synthesis to enhance their energetic content, together with their detonation or hypergolic reactivity as energy fuels for enhanced blast explosives.

4. Scope of Work:

Year One:

Task 1:

Select energetic cation and anion molecules containing covalent bonds for stable cation-anion combinations. This will be done in collaboration with the first principles simulation (DRDC Suffield) and chemistry synthesis (University of Ottawa) teams. The simulation will provide bonding pathways of high-pressure chemical transformations towards energetic ionic systems with ionic covalent bonds. Chemistry synthesis then will be performed. The expected experimental results will in turn serve as a feedback to the simulations, chemistry and high-pressure synthesis. The iterative process between experiments and simulations will be carried out throughout the period of the proposed work.

Task 2:

High-pressure synthesis and characterization of energetic cations and anions using diagnostics including high-pressure Raman, IR and X-ray.

Task 3:

Perform synchrotron X-ray structural characterization to study bonding conformations of energetic ionic systems.

Task 4:

To write an annual technique report and papers for publishing the results obtained from high-pressure synthesis of novel ionic energetic materials with first-principles simulations.

Year Two:

Task 5:

Study physical and chemical properties of high-pressure synthesized ionic energetic materials. This will be done in collaboration with the first principles simulation (DRDC Suffield) and chemistry synthesis (University of Ottawa) teams together with high-pressure synthesis team. The simulation will provide insights regarding the structural stability, sensitivity toward thermal shock, mechanical friction and electrostatic discharge. The experimental teams will assist in providing materials and performing synthesis. The expected experimental results will in turn serve as a feedback to both the simulations and synthesis. The iterative process between experiments and simulations will be carried out throughout the period of the proposed work.

Task 6:

High-pressure synthesis and experimental study of novel ionic energetic materials and other high energy density systems as well.

Task 7:

Characterization and in-depth study of novel ionic energetic materials and other high energy density systems.

Task 8:

Write an annual technique report and papers for publishing the results obtained from high-pressure synthesis of novel ionic energetic materials and high energy density systems with first-principles simulations.

5. Established Budget

Total budget: \$100,000.00 + GST

Fiscal year 2012/2013: \$50,000.00

Fiscal year 2013/2014: \$50,000.00

6. Meetings:

International conferences related to high-pressure physics and chemistry will be allowed for the contractor to present scientific results. The travels to synchrotron light source facility will be also allowed for the contractor to characterize crystal structures of high-pressure synthesized materials. The cost proposal should include the travel portion.

7. Reports and Deliverables:

- a. Progress reports to keep the Technical Authority informed about the progress of the work.
- b. Comprehensive summary report at the end of each fiscal year (3 paper copies plus 1 electronic copy in Word).
- c. The chemical synthesis methods developed in this contract will be transferred to DRDC Suffield.
- d. The deliverables include results of chemical synthesis on novel ionic energetic materials, papers, conference proceedings and synthesized novel ionic energetic materials selected for experimental demonstrations of enhanced blast effects conducted at DRDC Suffield.

8. Government Furnished Support/Equipment/Information:

DRDC Suffield will provide the following Government Furnished Support:

- a. Background data available to DRDC Suffield as appropriate for completing the work in the contract.
- b. First principles simulation results for novel ionic energetic materials conducted at DRDC Suffield.

9. Special Considerations:

All papers, conference presentations or formal reports must be approved by the DRDC Suffield Document Review Panel (DRP) prior to the planned dissemination of information.

10. Acceptance Criteria:

The work will be monitored regularly for adherence to the work plan and to approve any modifications which may be required. Acceptance will be determined following examination, satisfactory completion and acceptance of the final report by the Technical Authority.

ANNEX B BASIS OF PAYMENT

Payment will be made for time expended and other costs reasonably and properly incurred from the date of contract to contract completion in accordance with the following:

1. Labour at firm (daily/hourly) rates: one day consists of 7.5 hours; the rates will be prorated for any period of more or less than one day.

Provide firm all-inclusive daily or hourly rates for each category of personnel; indicate whether profit is included in the labour rates or list profit as a separate item.

a) Title/name _____, (est) ____ days/hours @ \$---./day/hour (est.) \$_____

b) Title/name _____, (est) ____ days/hours @ \$---./day/hour (est.) \$_____

c) Title/name _____, (est) ____ days/hours @ \$---./day/hour (est.) \$_____

Total Estimated Labour: \$_____

2. Material and supplies at actual cost without markup; provide a listing of material and supplies of the sort likely to be used or consumed during the course of the work and provide a detailed cost estimate. (est.) \$_____
3. Purchased equipment at laid down cost without markup; provide a listing of equipment (e.g. hardware/software) to be purchased for use under the proposed contract and provide a detailed cost estimate. (est.) \$_____
4. Subcontracting at actual cost incurred without markup; list individually any subcontracts proposed and provide a cost breakdown including labour rates by category of personnel; identify the basis of selection of any subcontractors. (est.) \$_____
5. Authorized travel and living: provide a cost estimate for each trip, specifying the purpose of the trip, who will be travelling, destination, duration of the trip, mode of transportation, estimated cost of meals and accommodation. Travel and living expenses will be reimbursed at actual cost incurred, except for meals and private vehicle mileage which are not to exceed Treasury Board Travel and Living Guidelines (Appendix B and C) in effect at the time of travel. A copy of the current rates is available at: http://www.tbs-sct.gc.ca/pubs_pol/hrpubs/TBM_113/td-dv_e.asp. (est.) \$_____
6. Other direct charges at actual cost incurred without markup: list any other costs which may be applicable, giving an estimated cost for each (e.g. computing costs, long distance telephone/facsimile charges, reproduction, shipping). (est.) \$_____
7. Profit at a firm --% of items -, -, above (\$----.), not to exceed (max.) \$_____

TOTAL Ceiling Price: \$_____

Solicitation No. - N° de l'invitation

W7702-135601/A

Amd. No. - N° de la modif.

Buyer ID - Id de l'acheteur

edm007

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

DRDC

File No. - N° du dossier

EDM-2-35347

CCC No./N° CCC - FMS No/ N° VME

The requirements of the Statement of Work are to be completed under the terms and conditions of this Contract, which is subject to a ceiling price of \$000,000.00.

The ceiling price of \$000,000.00 is subject to adjustment downward so as not to exceed the actual costs incurred in accordance with the Basis of Payment as may be established by Government Audit. In the event that the total cost of the work required under the Contract exceeds the sum of \$000,000.00, the Contractor shall complete the work at his own expense.

With the exception of the firm elements above, the amounts shown in the respective categories of the above Basis of Payment are estimates and it is the intention that changes from item to item will be accepted for billing purposes as the work proceeds, provided that the total cost of the Contract does not exceed \$_____, GST extra.

GOODS AND SERVICES TAX: The Total Estimated Goods and Services Tax (GST), is not included in the amounts above. The GST is to be shown as a completely separate item on each invoice.

F.O.B. Destination: Defence Research and Development Canada, Suffield, Alberta.

Annex C

Disclosures Certification

This document is to be completed and signed by the Contractor at the completion of the subject contract and submitted to the Contracting Officer and the Technical Authority designated below:

Contracting Authority

Mary Anthony
Supply Specialist
Acquisitions, Western Region
Public Works & Government Services Canada
5th Floor, Telus Plaza North
10025 Jasper Avenue
Edmonton, AB T5J 1S6
E-mail: mary.anthony@pwgsc.gc.ca

Technical Authority

Dr. Anguang Hu
Military Engineering Section
Defence Research & Development Canada Suffield
P.O. Box 4000 Main
Medicine Hat, AB T1A 8K6
E-mail: Anguang.Hu@drdc-rddc.gc.ca

CONTRACT TITLE: High-Pressure Synthesis of Novel Energetic Ionic Systems

Please tick appropriate box:

- [] We hereby certify that all applicable disclosures were submitted in compliance with General Conditions 2040 - Research and Development.

YOUR ATTENTION IS DRAWN TO THE TERMS AND CONDITIONS, REGARDING IMPLICATIONS ON NON-DISCLOSURE OF any Technical Documentation, Prototypes, Inventions and Technical Information arising during the performance of work pursuant to the above identified contract,

OR

- [] We hereby certify that there are no disclosures to submit under the above-referenced Contract, referred to in General Conditions 2040 - Research and Development.

Signature

Print Name

Title

Contractor Name

Date

Annex D Mandatory Criteria, Evaluation Criteria and Selection Method

I. MANDATORY CRITERIA

Mandatory Criteria a Solicitation Closing

Failure to meet any of the following mandatory requirements **at solicitation closing** will render your submission non-compliant and given no further consideration.

I. MANDATORY REQUIREMENTS	YES	NO
1. Price Proposal does not exceed the established budget.		
2. Education: principal investigators(s) must have a PhD in either high-pressure chemistry and/or chemical physics.		
3. Experience: <ul style="list-style-type: none"> • Experience in the field of high-pressure chemistry synthesis • Experience with high-pressure molecular spectral techniques • Relevant refereed publication record in the open literature 		

2. EVALUATION CRITERIA

Point Rated Criteria

Each Technical Bid which meets all the Mandatory Criteria specified above, will be evaluated and scored in accordance with the following evaluation criteria:

POINT RATED REQUIREMENTS: Rating: 4=excellent, 3=very good, 2=average, 1=poor, 0=N/A			
A. STUDY STRATEGY	WEIGHT	RATING	SCORE
1. demonstrated understanding of scope and importance of study and the Statement of work as set out in RFP.	25		
2. breakdown of project into logical tasks; planning and detail of tasks; detailed schedule and timetable; realistic estimation of the time required to complete the work	25		
3. Methods of handling potential problems during the project	25		
4. Demonstrated original and innovative ideas	25		
Maximum points available			400
Minimum points acceptable			280
Points awarded			
B. TRAINING AND EXPERIENCE	WEIGHT	RATING	SCORE
1. demonstrated corporate experience in projects of this nature	25		
2. suitability of academic backgrounds of personnel assigned	25		

3. relevant experience of personnel assigned to the project	25		
4. Adequacy and availability of personnel to carry out the project	25		
Maximum points available			400
Minimum points acceptable			280
Points awarded			
C. PROJECT ORGANIZATION	WEIGHT	RATING	SCORE
1. study team organization for external and internal control	25		
2. allocation of manpower for efficient use of personnel	25		
3. Assurance of liaison with the Technical Authority	25		
4. Overall organization of the project	25		
Maximum points available			400
Minimum points acceptable			280
Points awarded			
MAXIMUM TOTAL POINTS AVAILABLE			1200
MINIMUM TOTAL POINTS ACCEPTABLE			840
TOTAL POINTS AWARDED			

EVALUATION:

Each proposal must meet all of the mandatory requirements set out in the evaluation criteria. Proposals that fail to meet these requirements will be discarded without further consideration.

Each evaluation criterion has a number allotment (weight) that reflects its importance in proposal submissions. The degree to that the proposal satisfies the requirement of each criterion will be assessed and a rating will be assigned ranging from 0 to 4, with 0 meaning the proposal completely fails to satisfy the requirement, and the total allotment meaning the proposal fully meets the outlined criterion. A score will be assessed by multiplying the weight by the rating.

Each proposal must achieve a minimum score of **70%** of the maximum points available in EACH category subject to point rating. Proposals that fail to achieve this score will be considered technically unacceptable and will be given no further consideration.

3. SELECTION METHOD:

Contractor selection will be based on the bidder that submits the highest rated technically acceptable proposal provided that the total evaluated bid price does not exceed the established budget.