



Return Bids to:

Retourner Les Soumissions à:
Natural Resources Canada

Bid Receiving Natural Resources Canada
See herein for bid submission instructions

**Request for Proposal (RFP)
Demande de proposition (DDP)**

Proposal To: Natural Resources 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.

Comments – Commentaires

Issuing Office – Bureau de distribution
Finance and Procurement Management Branch
Natural Resources Canada

*580 Booth Street, 5th Floor
Ottawa, Ontario
K1A 0E4*

Title – Sujet Hydrogen Service Contract	
Solicitation No. – No de l’invitation NRCan- 5000072187	Date January 25, 2023
Requisition Reference No. - N° de la demande 174792	
Solicitation Closes – L’invitation prend fin at – à 02:00 PM (Eastern Standard Time (EST) OR Eastern Daylight Savings Time (EDT)) on – le February 20, 2023	
Address Enquiries to: - Adresse toutes questions à: Shazeen.Dhanani@NRCan-RNCan.gc.ca	
Telephone No. – No de telephone 343-575-6324	
Destination – of Goods and Services: Destination – des biens et services: <i>(As described herein)</i>	
Security – Sécurité There are no security requirements associated with this requirement.	
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l’entrepreneur Telephone No.:- No. de téléphone: Email – Courriel :	
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) <hr/> Signature _____ Date _____	



TABLE OF CONTENTS

PART 1 - GENERAL INFORMATION.....5

1.1 INTRODUCTION5

1.2 SUMMARY5

1.3 DEBRIEFINGS.....5

PART 2 - BIDDER INSTRUCTIONS.....6

2.1 STANDARD INSTRUCTIONS, CLAUSES AND CONDITIONS6

2.2 SUBMISSION OF BIDS6

2.3 FORMER PUBLIC SERVANT7

2.4 ENQUIRIES - BID SOLICITATION8

2.5 APPLICABLE LAWS.....8

2.6 IMPROVEMENT OF REQUIREMENT DURING SOLICITATION PERIOD.....9

2.7 BASIS FOR CANADA'S OWNERSHIP OF INTELLECTUAL PROPERTY9

2.8 BID CHALLENGE AND RECOURSE MECHANISMS9

PART 3 - BID PREPARATION INSTRUCTIONS.....10

3.1 BID PREPARATION INSTRUCTIONS10

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION12

4.1 EVALUATION PROCEDURES12

4.2 BASIS OF SELECTION12

PART 5 – CERTIFICATIONS AND ADDITIONAL INFORMATION13

5.1 CERTIFICATIONS REQUIRED WITH THE BID.....13

5.2 CERTIFICATIONS PRECEDENT TO CONTRACT AWARD AND ADDITIONAL INFORMATION13

PART 6 – SECURITY, FINANCIAL AND OTHER REQUIREMENTS.....15

6.1 SECURITY REQUIREMENTS15

PART 7 - RESULTING CONTRACT CLAUSES.....16

7.1 STATEMENT OF WORK16

7.2 STANDARD CLAUSES AND CONDITIONS.....16

7.3 SECURITY REQUIREMENTS16

7.4 TERM OF CONTRACT16

7.5 AUTHORITIES16

7.6 PAYMENT17

7.7 INVOICING INSTRUCTIONS.....18

7.8 APPLICABLE LAWS.....18

7.9 PRIORITY OF DOCUMENTS.....18

7.10 INSURANCE18

7.11 DISPUTE RESOLUTION.....18

ANNEX “A”.....20



STATEMENT OF WORK.....	20
ANNEX “B”.....	23
BASIS OF PAYMENT	23
APPENDIX “A” - EVALUATION CRITERIA	24
1. TECHNICAL CRITERIA.....	24
APPENDIX “B” - FINANCIAL BID PRESENTATION SHEET	26



The Articles contained in this document are mandatory in their entirety, unless otherwise indicated. Acceptance of these Articles, in their entirety, as they appear in this document, is a Mandatory requirement of this RFP.

Suppliers submitting a proposal containing statements implying that their proposal is conditional on modification of these clauses or containing terms and conditions that purport to supersede these clauses or derogate from them will be considered non-responsive.

Bidders with concerns regarding the provisions of the Bid Solicitation document (including the Resulting Contract Clauses) should raise such concerns in accordance with the Enquiries provision of this RFP.

By signing the bid, the bidder confirms that it has read the entire solicitation, including the documents incorporated by reference in the solicitation, and certifies that:

1. The Bidder considers that it is able to meet all the mandatory requirements described in the solicitation and the resources proposed by the Bidder;
2. This tender is valid for the period requested in the call for tenders;
3. All information provided in the submission is complete, truthful and accurate;
4. If the Bidder is awarded a contract, the Bidder will agree to all the terms and conditions set out in the resulting contract clauses included in the solicitation.



PART 1 - GENERAL INFORMATION

1.1 Introduction

The bid solicitation is divided into seven 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 and Additional Information: includes the certifications and additional information to be provided;

Part 6 Security, Financial and Other Requirements: includes specific requirements that must be addressed by Bidders; and

Part 7 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, the Federal Contractors Program for Employment Equity - Certification, and any other annexes.

1.2 Summary

By means of the RFP, Natural Resources Canada's CanmetMATERIALS (CMAT) Research Centre is investigating the hydrogen uptake into representative pipeline steel (API X65) and casing steel (P110) under near-pure hydrogen transportation and storage conditions. Due to the limitation of lab capacity, CMAT needs external support on (1) investigating the effect of surface conditions of X65 pipeline steel and P110 casing steel on hydrogen uptake under high pressure conditions based on theoretical analyses and laboratory validation, (2) understanding the role of operating parameters in hydrogen uptake with or without the consideration of steel surface conditions, and (3) seeking practical solutions to effectively reduce hydrogen uptake.

The estimated period of this contract is from the date of contract award to February 28, 2026. Annual report is required to be submitted to CMAT. The first delivery date will be March 31, 2023, and the other reports are due on February 29, 2024, February 28, 2025 and February 28, 2026.

1.3 Debriefings

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



PART 2 - BIDDER INSTRUCTIONS

2.1 Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the [Standard Acquisition Clauses and Conditions Manual](https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) (<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](#) (2022-03-29) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

- **In the complete text content (except Section 1 and 3) Delete:** Public Works and Government Services Canada” and **Insert:** “Natural Resources Canada.” **Delete:** “PWGSC” and **Insert:** “NRCan”
- **Section 2: Delete:** “Suppliers are required to” and **Insert:** “It is suggested that suppliers”
- **Subsection 1 of Section 8: Delete Entirely**
- **Subsection 2 of Section 8: Delete:** : The only acceptable email address to use with CPC Connect for responses to bid solicitations issued by PWGSC headquarters is: tpsgc.pareceptiondessoumissions-apbidReceiving.pwgsc@tpsgc-pwgsc.gc.ca, or, if applicable, the email address identified in the bid solicitation. : The only acceptable email address to use with CPC Connect for responses to bid solicitations issued by PWGSC headquarters is: tpsgc.pareceptiondessoumissions-apbidReceiving.pwgsc@tpsgc-pwgsc.gc.ca, or, if applicable, the email address identified in the bid solicitation.
Insert: The only acceptable email address to use with CPC Connect for responses to bid solicitation issued by NRCan is: <mailto:procurement-apvisionnement@NRCan-RNCan.gc.ca>
Subsection 2b of Section 8:
Delete: “six business days”
Insert: “five business days”
- **Under Subsection 2 of Section 20:** Delete in its entirety

2.2 Submission of Bids

Bidders must submit all proposals using the Canada Post Canada (CPC) Connect service. Given the current constraints on NRCan’s networks, the electronic mail system has a limit of 1GB per single message received and a limit of 20GB per conversation.

Bids must be submitted no later than the date and time indicated on page 1 of the bid solicitation.

Only bids submitted using CPC Connect service will be accepted.

At least five (5) business days before the bid solicitation closing date, it is necessary for the Bidder to send an email requesting to open CPC Connect conversation to the following address:

<mailto:procurement-apvisionnement@NRCan-RNCan.gc.ca>



Note: Bids will not be accepted if e-mailed directly to this address. This e-mail address is to be used to open CPC Connect conversation, as detailed in the Standard Instructions [2003 \(Subsection of Section 08\)](#), or to send bids through CPC Connect message if the bidder is using its own licensing agreement for CPC Connect.

IMPORTANT: It is requested that you write the bid solicitation number in "Subject" of the email:
[NRCan RFP 5000072187- Hydrogen Service Contract](#)

NRCan will not assume responsibility for proposals directed to any other location.

The onus is on the Bidder to ensure that the bid is submitted correctly using CPC Connect service. Not complying with the instructions may result in NRCan's inability to ascertain reception date and/or to consider the bid prior to contract award. Therefore, NRCan reserves the right to reject any proposal not complying with these instructions.

Due to the nature of the bid solicitation, bids transmitted by email, mail or facsimile to NRCan will not be accepted.

2.3 Former Public Servant

Contracts awarded to 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 awarded to FPSs, bidders must provide the information required below before contract award. If the answer to the questions and, as applicable the information required 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 with Canada's request and meet the requirement within the prescribed time frame will render the bid non-responsive.

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.

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 FPSs 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: 2019-01 and the Guidelines on the Proactive Disclosure of Contracts.

Work Force Adjustment Directive

Is the Bidder a FPS who received a lump sum payment pursuant to the terms of the Work Force Adjustment Directive? **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 adjustment program.

2.4 Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority no later than 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 question(s) or may request that the Bidder do so, so that the proprietary nature of the question(s) is eliminated and the enquiry can be answered to all Bidders. Enquiries not submitted in a form that can be distributed to all Bidders may not be answered by Canada.

2.5 Applicable Laws

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



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

2.6 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 5 days before the bid closing date. Canada will have the right to accept or reject any or all suggestions.

2.7 Basis for Canada's Ownership of Intellectual Property.

Natural Resources Canada has determined that any intellectual property rights arising from the performance of the Work under the resulting contract will belong to Canada, on the following reasons: as set out in the [Policy on Title to Intellectual Property Arising Under Crown Procurement Contracts](#)

1. Where the main purpose of the Crown Procurement Contract, or the deliverables contracted for, is:
 - 4.1 To generate knowledge and information for public dissemination.
 - 4.2 To augment an existing body of Crown Background as a prerequisite to the transfer of the expanded Background to the private sector, through licensing or assignment of ownership (not necessarily to the original contractor), for the purposes of Commercial Exploitation.

2.8 Bid Challenge and Recourse Mechanisms

- (a) Several mechanisms are available to potential suppliers to challenge aspects of the procurement process up to and including contract award.
- (b) Canada encourages suppliers to first bring their concerns to the attention of the Contracting Authority. Canada's [Buy and Sell](#) website, under the heading "[Bid Challenge and Recourse Mechanisms](#)" contains information on potential complaint bodies such as:
 - Office of the Procurement Ombudsman (OPO)
 - Canadian International Trade Tribunal (CITT)
- (c) Suppliers should note that there are **strict deadlines** for filing complaints, and the time periods vary depending on the complaint body in question. Suppliers should therefore act quickly when they want to challenge any aspect of the procurement process.



PART 3 - BID PREPARATION INSTRUCTIONS

3.1 Bid Preparation Instructions

- If the Bidder chooses to submit its bid electronically, Canada requests that the Bidder submits its bid in accordance with section 08 of the 2003 standard instructions. The CPC Connect system has a limit of 1GB per single message posted and a limit of 20GB per conversation.

Canada requests that the Bidder submits its bid in separately bound sections as follows:

Section I: Technical Bid
Section II: Financial Bid
Section III: Certifications

If the Bidder is simultaneously providing copies of its bid using multiple acceptable delivery methods, and if there is a discrepancy between the wording of any of these copies and the electronic copy provided through CPC Connect service, the wording of the electronic copy provided through CPC Connect service will have priority over the wording of the other copies.

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

In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process [Policy on Green Procurement](https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573) (https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573). To assist Canada in reaching its objectives, bidders should:

- 1) Include all environmental certification(s) relevant to your organization (e.g., ISO 14001, Leadership in Energy and Environmental Design (LEED), Carbon Disclosure Project, etc.)
- 2) Include all environmental certification(s) or Environmental Product Declaration(s) (EPD) specific to your product/service (e.g., Forest Stewardship Council (FSC), ENERGYSTAR, etc.)

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 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: Financial Bid

3.1.1 Bidders must submit their financial bid in accordance with the Financial Bid Presentation Sheet in Appendix B.

Section III: Certifications

Bidders must submit the certifications and additional information required under Part 5.



PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

4.1 Evaluation Procedures

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

4.1.1 Technical Evaluation

Mandatory evaluation criteria are included in Appendix "A" – Evaluation Criteria.

4.2 Basis of Selection

4.2.1 Mandatory Technical Criteria

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



PART 5 – CERTIFICATIONS AND ADDITIONAL INFORMATION

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

The certifications provided by Bidders to Canada are subject to verification by Canada at all times. Unless specified otherwise, Canada will declare a bid non-responsive, or will declare a contractor in default if any certification made by the Bidder is found to be untrue, whether made knowingly or unknowingly, during the bid evaluation period or during the contract period.

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

5.1 Certifications Required with the Bid

Bidders must submit the following duly completed certifications as part of their bid.

5.1.1 Integrity Provisions - Declaration of Convicted Offences

In accordance with the Integrity Provisions of the Standard Instructions, all bidders must provide with their bid, **if applicable**, the Integrity declaration form available on the [Forms for the Integrity Regime](http://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html) website (<http://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html>), to be given further consideration in the procurement process.

5.2 Certifications Precedent to Contract Award and Additional Information

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

5.2.1 Integrity Provisions – Required Documentation

In accordance with the section titled Information to be provided when bidding, contracting or entering into a real property agreement of the [Ineligibility and Suspension Policy](http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html) (<http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html>), the Bidder must provide the required documentation, as applicable, to be given further consideration in the procurement process.

- Bidders who are incorporated, including those bidding as a joint venture, must provide a complete list of names of all individuals who are currently directors of the Bidder or, in the case of a private company, the owners of the company.
- Bidders bidding as sole proprietorship, as well as those bidding as a joint venture, must provide the name of the owner(s).
- Bidders bidding as partnerships do not need to provide lists of names.



Name of Bidder: _____

OR

Name of each member of the joint venture:

Member 1: _____

Member 2: _____

Member 3: _____

Member 4: _____

Identification of the administrators/owners:

SURNAME	NAME	TITLE

5.2.2 Federal Contractors Program for Employment Equity - Bid Certification

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "FCP Limited Eligibility to Bid" list available at the bottom of the page of the [Employment and Social Development Canada \(ESDC\) - Labour's](#) website.

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



PART 6 – SECURITY, FINANCIAL AND OTHER REQUIREMENTS

6.1 Security Requirements

There are no security requirements associated with this procurement.



PART 7 - RESULTING CONTRACT CLAUSES

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

7.1 Statement of Work

The Contractor must perform the Work in accordance with the Statement of Work at Annex "____" and the Contractor's technical bid entitled _____, dated _____. (*to be completed at contract award*)

7.2 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.

7.2.1 General Conditions

[2010B \(2022-12-01\)](#), General Conditions - Medium Complexity – Professional Services, apply to and form part of the Contract [If applicable, replace references to Public Works and Government Services Canada (PWGSC) with Natural Resources Canada (NRCan)]

7.2.2 Supplemental General Conditions

[4007 \(2022-12-01\)](#), Canada to Own Intellectual Property Rights in Foreground Information

7.3 Security Requirements

7.3.1 There is no security requirement applicable to the Contract.

7.4 Term of Contract

7.4.1 Period of the Contract

The period of the Contract is from date of Contract to **March 31, 2026 inclusive**

7.5 Authorities

7.5.1 Contracting Authority

The Contracting Authority for the Contract is:

Name: Shazeen Dhanani
Title: Procurement Specialist
Natural Resources Canada (NRCan)
Procurement Services Unit
Telephone: 343-575-6324
E-mail address: Shazeen.Dhanani@NRCan-RNCan.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.

7.5.2 Project or Technical Authority *(to be inserted at contract award)*

The Project Authority for the Contract is:

Name: _____

Title: _____

Organization: _____

Address: _____

Telephone: ____ - ____ - _____

Facsimile: ____ - ____ - _____

E-mail address: _____

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

7.5.3 Contractor's Representative *(to be inserted at Contract Award)*

7.6 Payment

7.6.1 Basis of Payment

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid a firm price of \$ _____. Customs duties are included and Applicable Taxes are extra.

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

7.6.2 Method of Payment

Milestone Payments

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

- a. an accurate and complete claim for payment, and any other document required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
- b. all work associated with the milestone and as applicable any deliverable required has been completed and accepted by Canada.



7.7 Invoicing Instructions

Invoices shall be submitted using **the following method**:

E-mail:

Invoicing-Facturation@nrcan-rncan.gc.ca

Note: Attach "PDF" file. No other formats will be accepted

Please do not submit invoices using more than one method as this will not expedite payment.

Invoices and all documents relating to a contract must be submitted on the Contractor's own form and shall bear the Contract number: _____

Invoicing Instructions to suppliers: <http://www.nrcan.gc.ca/procurement/3485>

7.8 Applicable Laws

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

7.9 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 2010C (2022-12-01)
- (c) Annex A, Statement of Work
- (d) Annex B, Basis of Payment;
- (e) Annex C, Security Requirements Check List
- (f) the Contractor's bid dated _____, (*insert date of bid at contract award*)

7.10 Insurance

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

7.11 Dispute Resolution

The parties agree to maintain open and honest communication about the Work throughout and after the performance of the contract.

- (a) The parties agree to consult and co-operate with each other in the furtherance of the contract and promptly notify the other party or parties and attempt to resolve problems or differences that may arise.



- (b) If the parties cannot resolve a dispute through consultation and cooperation, the parties agree to consult a neutral third party offering alternative dispute resolution services to attempt to address the dispute.
- (c) Options of alternative dispute resolution services can be found on Canada's Buy and Sell website under the heading "[Dispute Resolution](#)".



ANNEX “A”

STATEMENT OF WORK

SW.1.0 TITLE

Identifying the influence of environmental factors and steel surface conditions on hydrogen uptake under high-pressure hydrogen transportation and storage conditions

SW.2.0 BACKGROUND

Hydrogen, as a high energy density fuel, can contribute to a resilient, sustainable energy future because it can be produced from low-carbon energy sources, and used without direct emissions of air pollutants or greenhouse gases. The global demand for hydrogen, whether in the form of pure gas or as a part of gas mixture, have remarkably increased in the past few years. Using existing natural gas pipeline networks to transport high pressure hydrogen to various industrial users is considered as a cost-competitive practice. Moreover, for the purpose of bridging major seasonal changes in electricity supply or heat demand, or providing system resilience, pressurized hydrogen needs to be safely stored at geological formations at large-scale.

Significant material knowledge gaps need to be addressed for safe and cost-effective transportation and storage of high pressure hydrogen due to serious hydrogen-induced cracking (HIC) risk. The hydrogen uptake process has been recognized as the first and one of the most important steps in determining the steel HIC susceptibility. CanmetMATERIALS (CMAT) has been recently funded by the NRCan Hydrogen Program to identify the effects of steel surface conditions and environmental factors on hydrogen uptake into representative pipeline steel (API X65) and casing steel (P110) under desired near-pure hydrogen transportation and storage conditions. However, very limited information is reported regarding the explosion and toxicity in the transportation and storage of high pressure hydrogen streams with impurities, causing serious safety concerns on conducting the planned lab testing work at CMAT. Moreover, fundamental concepts about the interaction of pressurized H₂ molecules with specific steel surface morphologies (such as defects, alloying elements and microstructures) and the roles of impurities (H₂O, CO and H₂S, etc.) present in the transported H₂ streams on H₂ uptake into steels have not yet been developed. Therefore, due to our limited capacity and safe lab operation concern, CMAT urgently needs external support (1) to develop in-depth theoretical models to precisely describe H₂ adsorption/dissociation/absorption/trapping processes on different steel surfaces under designated operating conditions; and (2) to help with formulating safe and reliable high pressure hydrogen absorption and permeation testing procedures. This service will significantly help CMAT on the definition of optimum near-pure hydrogen transposition/storage parameters (such as temperature, pressure, maximum allowable impurity contents, etc.) and explore promising inhibitors to reduce hydrogen uptake into the steels in a timely fashion.

SW.3.0 OBJECTIVES

The main objectives of this service contract are (1) to investigate the effect of surface conditions of X65 pipeline steel and P110 casing steel on hydrogen uptake under high pressure conditions based on theoretical analyses and laboratory validation, (2) to understand the role of operating parameters in hydrogen uptake with or without the consideration of steel surface conditions, and (3) to seek practical solutions to effectively reduce hydrogen uptake.



SW.4.0 PROJECT REQUIREMENTS

SW.4.1 Tasks, Deliverables, Milestones and Schedule

Milestone No.	Tasks	Deliverables	Delivery Date
1	Experimental characterization of surface defects, microstructure and corrosion layers in X65 and P110 steels; DFT calculations of the effects of alloying elements and surface trapping sites on adsorption, dissociation, and absorption of hydrogen molecules.	A confidential technical report including thorough literature review, experimental observations of surface characterization and theoretical calculation of influence of alloying and surface trapping sites on hydrogen uptake	March 31, 2023
2	Perform DFT calculation on effects of type of carbides on hydrogen uptake; examine how surface stress condition would affect adsorption, and dissociation energies; develop a thermodynamic model to take into account steel surface condition on hydrogen uptake; perform hydrogen permeation tests with different steel surface conditions (i.e., corrosion layers) to verify the model.	A confidential technical report including a thermodynamic model to predict hydrogen uptake and experimental verification for model improvement	February 29, 2024
3	Perform molecular dynamics simulation to investigate hydrogen uptake process at the atomic level; improve the thermodynamic prediction model in supercritical hydrogen fluid condition; perform hydrogen permeation tests in wide range of temperature and pressure to verify the model.	A confidential technical report including how environmental factors such as operating temperature and pressure along with steel surface condition impact on hydrogen uptake	February 28, 2025
4	Perform DFT calculations to examine the effects of impurity gases (e.g., H ₂ O, H ₂ S, CH ₄ , SO ₂ , etc.) on hydrogen uptake; conduct hydrogen permeation tests to verify the theoretical observations and further improve the prediction model.	Final report including (1) effects of surface defects, corrosion products, and impurity gases on hydrogen uptake under high pressure conditions; (2) experimental verifications; (3) thermodynamic model to predict hydrogen uptake; and (4) strategy to limit and minimize HE from the point of view of hydrogen uptake	February 28, 2026

SW.4.2 Reporting Requirements

Bi-weekly meetings will be required between the Contractor and CMAT for progress tracking purpose. Meetings can be coincided with the date when a report is due. A report that summarizes the accomplished work corresponding to the tasks/activities will be required for submission on or before the scheduled time.

SW.4.3 Method and Source of Acceptance

All deliverables and services rendered under any contract are subject to inspection by the Project Authority. The Project Authority shall have the right to reject any deliverables that are not considered satisfactory, or require their correction before payment will be authorized.

SW.5.0 OTHER TERMS AND CONDITIONS OF THE SOW

SW.5.1 Contractor's Obligations

The Contractor shall:

- 1) Keep all documents and proprietary information confidential;
- 2) Return all materials belonging to NRCan upon completion of the Contract;
- 3) Submit all written reports in hard copy and electronic Microsoft Office Word or Corel WordPerfect format;
- 4) Participate in teleconferences, as needed.

SW.5.2 Location of Work, Work Site and Delivery Point

The work is expected to be completed at Contractor's place of business and the deliverables will be delivered to CanmetMATERIALS by email.

ANNEX “B”

BASIS OF PAYMENT

(To be inserted at Contract Award)

APPENDIX “A” - EVALUATION CRITERIA

Bidders are advised to address these criteria in the following order and in sufficient depth in their proposals to enable a thorough assessment. NRCan’s assessment will be based solely on the information contained within the proposal. NRCan may confirm information or seek clarification from bidders.

Bidders are advised that only listing experience without providing any supporting data to describe responsibilities, duties and relevance to the criteria will not be considered demonstrated for the purpose of this evaluation.

The Bidder should provide complete details as to where, when (month and year) and how (through which activities/ responsibilities) the stated qualifications/experience were obtained. Experience gained during formal education shall not be considered work experience. All criteria for work experience shall be obtained in a legitimate work environment as opposed to an educational setting. Co-op terms are considered work experience provided they are related to the required services.

Bidders are also advised that the month(s) of experience listed for a project whose time frame overlaps that of another referenced project will only be counted once. For example: project one time frame is July 2001 to December 2001; project two time frame is October 2001 to January 2002; the total months of experience for these two project references is seven (7) months.

1. Technical Criteria

1.1 Mandatory Evaluation Criteria

The Mandatory Criteria listed below will be evaluated on a simple pass/fail basis. Proposals which fail to meet the mandatory criteria will be deemed non-responsive.

Criterion ID	Mandatory Criteria	Proposal Page #	Pass/Fail
Mandatory Criteria for molecular simulation			
<p>M1</p>	<p>The Proposed Resource(s) must have at least 10 years in the last 15 years of experience conducting molecular simulation related research.</p> <p>To demonstrate this experience, bidders must provide at least one of the following:</p> <ul style="list-style-type: none"> - Projects they have led - Scientific journal papers they have published - Technical reports they have published 		
<p>M2</p>	<p>The Proposed Resource(s) must have experience investigating the interaction between hydrogen and surface defects of steel(s) using molecular simulation</p> <p>To demonstrate this experience, bidders must provide at least one of the following:</p> <ul style="list-style-type: none"> - Projects they have led - Scientific journal papers they have published - Technical reports they have published 		

Criterion ID	Mandatory Criteria	Proposal Page #	Pass/Fail
M3	The contractor must own or have access to simulation packages to perform theoretical simulation and calculations. The name(s) of modeling simulation packages and license # (if applicable) must be provided in the proposal.		
Mandatory criteria for experimental verification			
M4	<p>The Proposed Resource(s) must have at least 10 years in the last 15 years of experience on materials corrosion, with solid knowledge of hydrogen induced corrosion such as hydrogen embrittlement.</p> <p>To demonstrate this experience, bidders must provide at least one of the following:</p> <ul style="list-style-type: none"> - Projects they have led - Scientific journal papers they have published - Technical reports they have published 		
M5	<p>The contractor must provide clear images to demonstrate that they have the necessary high pressure facility to complete the experimental tasks as required.</p> <p>The image should provide the following:</p> <ol style="list-style-type: none"> 1. An overview of the entire facility 2. Associated information such as manufacturer, model #, series #, temperature and pressure rating 		
M6	The contractor must own or have access to facilities to characterize surface defects and measure mechanical properties, such as scanning electron microscope with energy dispersive X-ray spectroscopy and electron backscatter diffraction, transmission electron microscopy, and tensile testing machine. The names and images of these advanced characterization facilities must be provided in the proposal.		

APPENDIX “B” - FINANCIAL BID PRESENTATION SHEET

1. Firm Price - Milestone Payments

Bidder tendered all-inclusive firm price to perform the work is in Canadian funds, applicable taxes excluded. Any Travel and Living Expenses and other miscellaneous expenses must be included in the firm price.

The bidder must complete the schedule below indicating the firm proposed amounts for each step according to the indicated percentages.

Milestone #	Description of Milestone	Firm Price (Applicable Taxes Excluded)
1	<i>Year 1 – 2022/2023</i> - A confidential technical report including thorough literature review, experimental observations of surface characterization and theoretical calculation of influence of alloying and surface trapping sites on hydrogen uptake	\$ _____
2	<i>Year 2 – 2023/2024</i> - A confidential technical report including a thermodynamic model to predict hydrogen uptake and experimental verification for model improvement	\$ _____
3	<i>Year 3 – 2024/2025</i> - A confidential technical report including how environmental factors such as operating temperature and pressure along with steel surface condition impact on hydrogen uptake	\$ _____
4	<i>Year 4 – 2025/2026</i> - Final report including (1) effects of surface defects, corrosion products, and impurity gases on hydrogen uptake under high pressure conditions; (2) experimental verifications; (3) thermodynamic model to predict hydrogen uptake; and (4) strategy to limit and minimize HE from the point of view of hydrogen uptake	\$ _____
Total Firm Price for Financial Proposal Evaluation:		\$ _____