Parks Canada Parcs Canada

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À :

By mail to :

Parks Canada Agency Bid Receiving Unit
National Contracting Services
111 Water Street East
Cornwall ON K6H 6S2

REQUEST FOR PROPOSAL

DEMANDE DE PROPOSITION

Proposal to: Parks Canada Agency
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 or attached hereto, the goods, services and construction listed herein or on any attached sheets at the price(s) set out therefor.

Proposition à : l'Agence Parcs 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 travaux de construction énumérés ici et sur toute feuille ci-annexée, au(x) prix indiqué(s).

Issuing Office - Bureau de distribution :
Parks Canada Agency
National Contracting Services
111 Water Street East
Cornwall ON K6H 6S2

Title - Sujet : Acquisition of high-resolution digital aerial photography and airborne Lidar data	
Solicitation No. - N° de l'invitation : 5P300-19-0081-A	**Date :** May 28, 2019
Client Reference No. - N° de référence du client : 10190113	
GETS Reference No. | N° de référence du SEAG : To be confirmed	

Solicitation Closes - L'invitation prend fin : **At - à : 2:00 p.m.** **On - le : June 18, 2019**	**Time Zone - Fuseau horaire** Eastern Daylight Time

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

Address Enquiries to - Adresser toutes demande de renseignements à :
Céline Morin

Telephone No. - N° de téléphone : 613-938-5940	**Fax No. -N° de télécopieur :** N/A	**Email Address – Courriel :** Celine.morin@canada.ca

Destination of Goods, Services, and Construction - Destination des biens, services et travaux de construction :
Parks Canada
Mingan Archipelago National Park Reserve
130 rue de la Digue
Havre-Saint-Pierre QC G0G 1P0

TO BE COMPLETED BY THE BIDDER - À REMPLIR PAR LE SOUMISSIONNAIRE

Vendor/ Firm Name - Nom du fournisseur/de l'entrepreneur :	
Address - Adresse :	
Telephone No. - N° de téléphone :	**Fax No. - N° de télécopieur :**
Name of person authorized to sign on behalf of the Vendor/ Firm (type or print) - Nom de la personne autorisée à signer au nom du fournisseur/de l'entrepreneur (taper ou écrire en caractères d'imprimerie) :	
Signature :	**Date :**

Canada

Parks Canada Parcs Canada

IMPORTANT NOTICE TO BIDDERS

Direct Deposit

The Government of Canada has replaced cheques with direct deposit payment(s), an electronic transfer of funds deposited directly into a bank account. New vendors who are awarded a contract will be required to complete a Direct Deposit enrolment form in order to register their direct deposit information with Parks Canada to receive payment.

Additional information on this Government of Canada initiative is available at:
http://www.directdeposit.gc.ca

Canada

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PART 1 – GENERAL INFORMATION

1.1 Security Requirements

There is no security requirement associated with the bid solicitation.

1.2 Statement of Work

The work consists of the delivery of high-resolution digital aerial photographs and airborne laser surveys for the Mingan Archipelago National Park Reserve.

The work to be performed is detailed under Article 6.2 of the resulting contract clauses.

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 may be in writing, by telephone or in person.

1.4 Trade Agreements

The requirement is exempt from the provisions of the Canadian Free Trade Agreement (CFTA) under Annex T 1001.1b-2 Services, Section B – Excluded Coverage, Category T - Photographic, Mapping, Printing and Publications, all classes.

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) 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 (2018-05-22), Standard Instructions – Goods or Services – Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

2.2 Submission of Bids

Bids must be submitted only to Parks Canada Agency Bid Receiving Unit by the date, time and place indicated on page 1 of the bid solicitation.

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

2.3 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 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.

2.4 Applicable Laws

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

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

PART 3 – BID PREPARATION INSTRUCTIONS

3.1 Bid Preparation Instructions

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

Section I: Technical Bid (1 hard copy and 1 soft copy on USB key)

Section II: Financial Bid (1 hard copy and 1 soft copy on USB key)

Section III: Certifications (1 hard copy and 1 soft copy on USB key)

If there is a discrepancy between the wording of the soft copy and the hard copy, the wording of the hard copy will have priority over the wording of the soft 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 (https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573). To assist Canada in reaching its objectives, Bidders should:

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

2) use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

Section I: Technical Bid
In their technical bid, Bidders should explain and demonstrate how they propose to meet the requirements and how they will carry out the Work.

Section II: Financial Bid
Bidders must submit their financial bid in accordance with the Basis of Payment.

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 and financial evaluation criteria.

(b) An evaluation team composed of representatives of Canada will evaluate the bids.

4.1.1 Technical Evaluation

4.1.1.1 Mandatory Technical Criteria

Technical bids will be evaluated against the technical evaluation criteria at Annex F.

4.1.1.2 Point Rated Technical Criteria

Technical bids will be evaluated against the technical evaluation criteria at Annex F.

4.1.2 Financial Evaluation

SACC Manual clause A0220T (2014-06-26), Evaluation of Price

4.2 Basis of Selection

4.2.1 Highest Combined Rating of Technical Merit and Price

a) To be declared responsive, a bid must:

   a. comply with all the requirements of the bid solicitation; and

   b. meet all mandatory criteria; and

   c. obtain the required minimum of points for each of the technical evaluation criteria which are subject to point rating; and
   d. obtain the required minimum of 55 points overall for the technical evaluation criteria which are subject to point rating.
   The rating is performed on a scale of 85 points.

2. Bids not meeting (a), (b), (c) and (d) will be declared non-responsive.

3. The selection will be based on the highest responsive combined rating of technical merit and price. The ratio will be 60 % for the technical merit and 40 % for the price.

4. To establish the technical merit score, the overall technical score for each responsive bid will be determined as follows: total number of points obtained / maximum number of points available multiplied by the ratio of 60 %.

5. To establish the pricing score, each responsive bid will be prorated against the lowest evaluated price and the ratio of 40 %.

6. For each responsive bid, the technical merit score and the pricing score will be added to determine its combined rating.
7. Neither the responsive bid obtaining the highest technical score nor the one with the lowest evaluated price will necessarily be accepted. The responsive bid with the highest combined rating of technical merit and price will be recommended for award of a contract.

The table below illustrates **an example** where all three bids are responsive and the selection of the Contractor is determined by a 60/40 ratio of technical merit and price, respectively. The total available points equals 135 and the lowest evaluated price is $45,000 (45).

EXAMPLE - Basis of Selection - Highest Combined Rating Technical Merit (60%) and Price (40%)

		Bidder 1	**Bidder 2**	**Bidder 3**
Overall Technical Score		115/135	89/135	92/135
Bid Evaluated Price		$55,000.00	$50,000.00	$45,000.00
Calculations	**Technical Merit Score**	115/135 x 60 = 51.11	89/135 x 60 = 39.56	92/135 x 60 = 40.89
	Pricing Score	45/55 x 40 = 32.73	45/50 x 40 = 36.00	45/45 x 40 = 40.00
Combined Rating		83.84	75.56	80.89
Overall Rating		1st	3rd	2nd

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 declaration form available on the Forms for the Integrity Regime 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 provided will render the bid non-responsive.

5.2.1 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 at Annex D to Part 5 of the Bid Solicitation before contract award.

5.2.2 Integrity Provisions – Required Documentation

In accordance with the section titled Information to be provided when bidding, contracting or entering into a real procurement agreement of the Ineligibility and Suspension Policy (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.

The Bidder, regardless of their status under the Ineligibility and Suspension Policy, must submit a list of names prior to award of a contract. Bidders must provide the information requested at Annex E to Part 5 of the Bid Solicitation.

5.2.3 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 (https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html#).

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.

5.2.4 Additional Certifications Precedent to Contract Award

5.2.4.1 Status and Availability of Resources

SACC Manual clause *A3005T* (2010-08-16), Status and Availability of Resources

5.2.4.3 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.

6.1 Security Requirements

There is no security requirement applicable to the Contract.

6.2 Statement of Work

The work consists of the **acquisition of** high-resolution digital aerial photograph**y** and airborne lidar data for the Mingan Archipelago National Park Reserve.

The work to be performed is detailed at Annex A Statement of Work.

6.3 Standard Clauses and Conditions

All clauses and conditions identified in the Contract by number, date and title are set out in the *Standard Acquisition Clauses and Conditions Manual* (https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) issued by Public Works and Government Services Canada.

6.3.1 General Conditions

2010B (2018-06-21), General Conditions – Professional Services (Medium Complexity), apply to and form part of the Contract.

All reference to the Minister of Public Works and Government Services Canada shall be deleted and replaced with the Minister of the Environment for the purposes of the Parks Canada Agency. All reference to the Department of Public Works and Government Services Canada shall be deleted and replaced with the Parks Canada Agency.

6.4 Term of Contract

6.4.1 Period of the Contract

The Work is to be performed during the period from award of contract to March 31, 2020.

6.5 Authorities

6.5.1 Contracting Authority

The Contracting Authority for the Contract is:

Céline Morin
Contracting Advisor
National Contracting Services
Parks Canada Agency
111 Water Street East
Cornwall ON K6H 6S2

Telephone 613-938-5940
celine.morin@canada.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.

6.5.2 Project Authority

The Project Authority for the Contract is:

*** to be provided at contract award ***

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

6.5.3 Contractor's Representative

The Contractor's Representative for the Contract is: *** to be provided with bid ***

Representative's Name:		
Title:		
Vendor/ Firm Name:		
Address:		
City:	**Province / Territory:**	**Postal Code / ZIP Code:**
Telephone:	**Facsimile:**	
Email Address:		
Procurement Business Number (PBN) or Goods and Services Tax (GST) Number:		

6.6 Proactive Disclosure of Contracts with Former Public Servants

By providing information on its status, with respect to being a former public servant in receipt of a *Public Service Superannuation Act* (PSSA) pension, the Contractor has agreed that this information will be reported on departmental websites as part of the published proactive disclosure reports, in accordance with Contracting Policy Notice: 2012-2 of the Treasury Board Secretariat of Canada.

6.7 Payment

6.7.1 Basis of Payment – Firm Prices

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

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

6.7.2 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.

6.7.2.1 Schedule of Milestones

The schedule of milestones for which payments will be made in accordance with the Contract is as follows:

Milestone No.	Description	Tentative Due Date
1	Digital photographs in the visible colour spectral band (RGB) and in the infrared spectral band (NIR) in TIFF format including index files in “SHP”.	September 1, 2019
2	Absolute orientation parameters (Excel, text and .Par) and statistical report of the aerotriangualtion blocks results.	October 1, 2019
3	Acquisition and classification of airborne LiDAR data and reports	October 31, 2019
4	All other deliverables: 1. Individual colour (RGB) and infrared (NIR) orthophotographs in GeoTIFF format; 2. Individual colour (RGB) and infrared (NIR) orthophotographs aligned with the 2009 photos in GeoTIFF format;	No later than January 31, 2020.

	3. Twenty-nine (29) colour (RGB) and infrared (NIR) tiled orthomosaics in GeoTIFF (24 bits) and ECW format; 4. Twenty-nine (29) colour (RGB) and infrared (NIR) tiled orthomosaics aligned with the 2009 orthomosaics in GeoTIFF (24 bits) and ECW format; 5. A single colour (RGB) orthomosaic in two sectors in GeoTIFF and ECW format; 6. Technical report for the acquisition of digital aerial photos and the production of orthophotos and orthomosaics; 7. Digital terrain models (DTM) and technical report; 8. Digital terrain models (DTM) aligned with the 2009 photos.	

6.8 Invoicing Instructions

1. L'entrepreneur doit soumettre ses factures conformément à l'article intitulé « Présentation des factures » des conditions générales. Les factures ne doivent pas être soumises avant que tous les travaux identifiés sur la facture soient complétés.

2. Les factures doivent être distribuées comme suit :

    a. L'original et un (1) exemplaire doivent être envoyés à l'adresse qui apparaît à la page 1 du contrat pour attestation et paiement.

6.9 Certifications and Additional Information

6.9.1 Compliance

Unless specified otherwise, the continuous compliance with the certifications provided by the Contractor in its bid or precedent to contract award, and the ongoing cooperation in providing additional information are conditions of the Contract and failure to comply will constitute the Contractor in default. Certifications are subject to verification by Canada during the entire period of the Contract.

6.10 Applicable Laws

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

6.11 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 2010B (2018-06-21), General Conditions – Professional Services (Medium Complexity);
(c) the supplementary general conditions 4007 (2010-08-16) Canada to Own Intellectual Property Rights in Foreground Information;
(d) Annex A, Statement of Work;
(e) Annex B, Basis of Payment;
(f) Annex C, Attestation and Proof of Compliance with Occupational Health and Safety (OHS);
(g) the Contractor's bid dated *** to be inserted at contract award ***.

6.12 SACC Manual Clauses

A9068C (2010-01-11), Government Site Regulations

6.13 Insurance – No Specific Requirements

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.

6.14 Inspection and Acceptance

The Project Authority is the Inspection Authority. All reports, deliverable items, documents, goods and all services rendered under the Contract are subject to inspection by the Inspection Authority or representative. Should any report, document, good or service not be in accordance with the requirements of the Statement of Work and to the satisfaction of the Inspection Authority, as submitted, the Inspection Authority will have the right to reject it or require its correction at the sole expense of the Contractor before recommending payment.

6.15 Optional Goods or Services

The Contractor grants to Canada the irrevocable option to acquire the goods, services or both described in sections 3.2.3 and 4.1 of Annex A Statement of Work under the same conditions and at the prices and/or rates stated in the Contract. The option may only be exercised by the Contracting Authority and will be evidenced, for administrative purposes only, through a contract amendment.

The Contracting Authority may exercise the option at any time before the expiry of the Contract by sending a written notice to the Contractor.

6.16 Basis for Canada's Ownership of Intellectual Property

Parks Canada has determined that any intellectual property rights arising from the performance of the Work under the resulting contract will belong to Canada, for the following reasons, as set out in the *Policy on Title to Intellectual Property Arising Under Crown Procurement Contracts*: the main purpose of the Contract, or of the deliverables contracted for, is to generate knowledge and information for public dissemination;

ANNEX A

STATEMENT OF WORK

ACQUISITION OF HIGH RESOLUTION DIGITAL AERIAL PHOTOGRAPHY AND AIRBORNE LIDAR DATA

IN THE MINGAN ARCHIPELAGO NATIONAL PARK RESERVE

1. BACKGROUND

The Mingan Archipelago National Park Reserve (MANPR) is an island territory of approximately 100 km^2, including more than 1000 islands and inlets, extending over a distance of 152 km. To enable Parks Canada to fulfill its mandate, spatially referenced data covering this territory are essential. Furthermore, the acquisition of topographic LiDAR data will provide an opportunity to study ecosystem structures (forest, shrub and grass structures, shoreline profiles, forest gaps, etc.) and to gain a very precise elevation model.

The contractor will be expected to communicate with the Project Authority in French.

2. GOAL

a. Taking of high resolution digital aerial photographs (30 cm), that are multispectral (RGB) and infrared (NIR), on a vertical axis, geo-positioned for the MANPR territory;

b. Production of photogrammetric models associated with aerial photos;

c. Production of multispectral (RGB) and infrared (NIR) orthomosaics from digital photographs for the MANPR territory;

d. Collection and classification of topographic airborne laser survey data (LiDAR) of a portion of the MANPR territory;

e. Production of a digital terrain model (DTM).

3. DIGITAL AERIAL PHOTOGRAPHS

3.1 General Requirements

3.1.1 Territory to be Covered

The territory to be covered is divided into 29 groups of separate islands (ANNEX 1) extended over a length of 152 km. This territory includes all the islands and inlets located between Île aux Perroquets and the mouth of the Aguanus River. Certain tiles also include a portion of the continental mainland. Including the islands, marine surface and mainland, the territory measures approximately 772 km^2.

Before work begins, the contractor must providea flight plan in the form of an index (PDF and SHP formats). It must take into account the specifications given for the following sections.

Note: Two digital map files (in Shapefile format) providing details of the territory to be covered (contours of the islands, Limite_Reserve_Archipel_de_Mingan) and tile boundaries, Tuiles_Photos_RPNAM_2019) will be provided by Parks Canada.

3.1.2 Acquisition period

The period targeted for the acquisition of digital aerial photos (RGB and NIR) is from July 10 to August 15, 2019.

The contractor will need to consult with the Parks Canada Project Authority to agree on a flight window and to obtain authorization to begin the work.

3.1.3 Map Projection and Geodetic Reference System

The data must be provided in the UTM projection, zone 20N and horizontal datum reference NAD83 CSRS98 epoch 1997 (UTM NAD83 zone 20N CSRS98). The horizontal reference system is the CGVD2013.

3.2 Nature and Technical Specifications of the Work

3.2.1 High-resolution, vertical digital aerial photographs for MANPR

Parameters for the taking of aerial photographs:

The contractor must produce the images in accordance with the following specifications:

- Digital photographs (without scanning) in the visible spectral bands (RGB, 24 bits: Red/Green/Blue at 8 bits each);
- Digital photographs (without scanning) in the near infrared band (NIR, 8 bits with 256 shades of grey);
- Vertical photographs;
- Photographs must be perfectly clear, with no fuzzy areas and with even brightness;
- Ground spatial resolution of 30 cm before post-processing (± 3%). The images cannot be resampled at a pixel size that is larger or smaller;
- Forward overlap of 60% (± 4%);
- When more than one line is required to cover a tile, the lateral overlap required is 30% (± 5 %);
- Complete stereoscopic coverage of the territory to be covered.

Acquisition Specifications

Aerial photograph acquisition must be completed:

- Using an aircraft specially designed to take aerial shots for photogrammetric surveys;
- Using a high-resolution digital aerial camera (e.g. UltraCam) which will make it possible to satisfy the specifications in this contract. The bidder must specify the type of camera as well as its optical and electronic characteristics (lens format, focal length, aperture angle, digital sensor sensitivity, etc.). The contractor must also provide a calibration report for the camera being used that is no older than two years. The camera calibration must have been completed by the manufacturer or a duly-authorized authority;
- Using a kinematic airborne GPS and a system making it possible to measure the camera's orientation parameters (e.g. GPS/IMU);
- In clear weather, with no clouds or smoke and with minimum water vapour in the air (absence of atmospheric haze);
- When the wind speed is less than 20 km/h (10.8 knots) except when it is coming from open water, in which case it must be less than 13 km/h (7.02 knots). The Windy site (https://www.windyty.com/) can be used as a planning/decision-making tool;
- When wave height is ≤ 1 m. The Windy site (https://www.windyty.com/) can again be used as a planning/decision-making tool;
- Less than two hours from low tide;
- With a minimum solar altitude angle of 40^0 to the horizon, preferably 45^0;
- With a flight height respecting the resolution requested (± 3%);
- With flight lines in an east-west orientation.

In the event several flights are required, the contractor must make sure that the conditions are similar so that the colours are homogeneous throughout the images.

The use of forward motion compensation is recommended. However, if the contractor proposes using another type of camera, he must explain why and therefore is responsible for the quality of the photographs delivered to Parks Canada's satisfaction.

The images must be of good quality, adequate precision and deemed acceptable by the Project Authority.

Following the acquisition of the photos, and for each flight line, a few “test photos” will be submitted to the Project Authority for certain verifications and to ensure their compliance (e.g. image quality, resolution, overlap, solar angle). In the event the requirements above are not respected, the contractor must redo the work or make the required corrections before resubmitting the work for a new inspection.

Rules for Numbering Aerial Photos

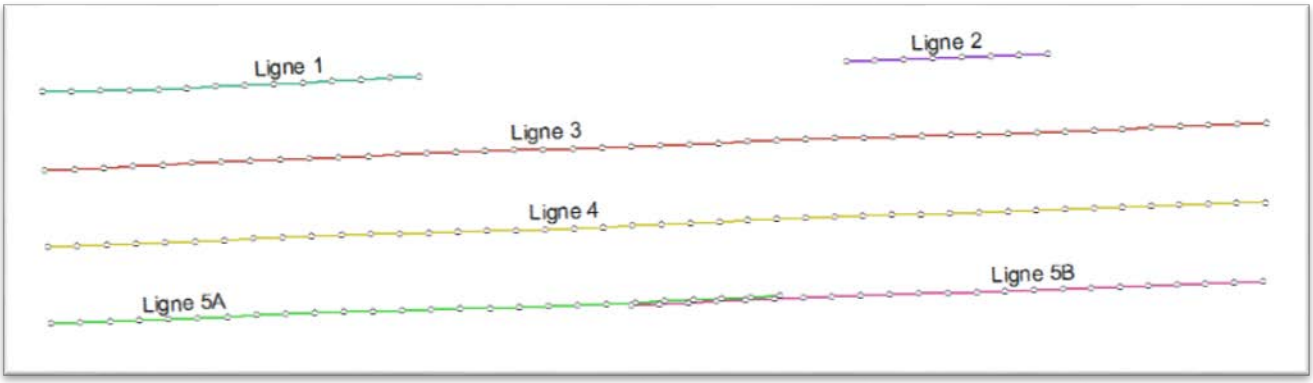
The following rules must be respected when numbering aerial photos:

- Photograph numbering shall start at 1;
- Two photographs may not have the same number;
- Photograph numbers must increase chronologically by flight line.

Rules for Numbering Flight Lines

The following rules must be respected when numbering flight lines:

- Flight line numbering shall start at 1;
- Two flight lines may not have the same number;
- In the event a retake was made on a flight line, all sections from this flight line will carry the same flight line number. However, a letter must be added to the flight line number to identify each of the sections. See the example below, Lign_no = 5A and Lign_no = 5B



Photograph Identification

Digital files must be identified as follows:

- Line number;
- Photo number;
- Spectral band (colour = RGB and infrared = NIR);
- Year taken;
- Extension identifying the format type.

E.g. 01_45_RGB_2019.TIF (corresponding to line 01, colour photo 45, taken in 2019, recorded in TIFF format).

Format of Aerial Photographs

The digital images must be saved in the following format:

- The image must be pre-oriented (top of the images must be north) and must not require any adjustment before being used;
- The images must be saved in TIFF format, as non-compressed, tiled pyramids.

Flight Report

A flight report must be generated. For this, it is required to complete the “Air Photography Report” (an interactive PDF file will be provided by Parks Canada). No other flight report format will be accepted. An example of this form is presented in ANNEX 4.

Flight Index

A flight index is also required in two formats:

1. Flight index on a printable colour map;
2. Flight index in ShapeFile format meeting the standards set out below.

1. Flight Index on a Printable Colour Map

The colour map flight index must use the Mingan Archipelago file (Limite_Reserve_Archipel_de_Mingan.shp) provided by Parks Canada as well as any other acceptable file for representing the coastal elements (e.g. Basemap available on ArcGis).

The following items must appear in the printable flight index:

- Number of the start and end photos for each flight line and all photos numbers that are multiples of 2;
- Point-type graphic entities, which are the centres of photographs, for the start and end of each flight line and all photos numbers that are a multiple of 2;
- Line-type graphic entities, which are the flight lines;
- Flight line number.

The printable flight index shall be submitted in PDF format.

2. Flight index in ShapeFile format

Three file types shall be created to produce the flight index in ShapeFile format:

- “Point” ShapeFile for the centres of the photos (Centre_Photos_2019);
- “Line” ShapeFile for the flight lines (Lines_Vol_2019);
- “Polygon” ShapeFile for the area covered by the photos (Contour_photos_2019).

ShapeFile files containing all the attributes described above, with the appropriate attribute type and format, are available from Parks Canada.

"Point" shapefile

The "Point" shapefile marks centres of aerial photographs and must include the following attributes:

Shapefile name: Centre_Photos_2019.shp		
Attribute name	**Data type**	**Description**
PHOTO_NO	Digital	Photo number
LIGNE_NO	Text	Flight line number
PHOTO_DATE	Text	Date taken, format: YYYY-MM-DD, e.g.: 2012-07-05
PHOTO_HEUR	Text	GMT/UTC time when photo taken, in format: HH:MM:SS, e.g.: 19:49:39
PHOTO_RES	Text	Photo resolution in centimetres, e.g.: 30cm (Please note: Do not add spaces)
LAT_GI	Digital	Latitude, in decimal degrees, of the centre of the photograph according to the GPS/IMU system (10 digits after decimal point)
LONG_ GI	Digital	Longitude, in decimal degrees, of the centre of the photograph according to the GPS/IMU system (10 digits after decimal point)
HELLIPS_ GI	Digital	Ellipsoidal height, in metres, of the centre of the photograph according to the GPS/IMU system (3 digits after decimal point)
EST_ GI	Digital	East coordinate, in metres, of the centre of the photograph according to the GPS/IMU system (3 digits after decimal point)
NORD_ GI	Digital	North coordinate, in metres, of the centre of the photograph according to the GPS/IMU system (3 digits after decimal point)
HORTHO_ GI	Digital	Orthometric height, in metres, of the centre of the photograph according to the GPS/IMU system (3 digits after decimal point)
OMEGA_ GI	Digital	Omega orientation value, in decimal degrees, of the centre of the photograph according to the GPS/IMU system (5 digits after decimal point)
PHI_ GI	Digital	Phi orientation value, in decimal degrees, of the centre of the photograph according to the GPS/IMU system (5 digits after decimal point)
KAPPA_ GI	Digital	Kappa orientation value, in decimal degrees, of the centre of the photograph according to the GPS/IMU system (5 digits after decimal point)
DATUM_HORI	Text	Geodetic horizontal datum, e.g.: NAD83(CSRS)
DATUM_VERT	Text	Geodetic vertical datum, e.g.: CGVD28/HT2
PRJ_CARTO	Text	Map projection used, e.g.: MTM07
NOM_IMAGE	Text	TIF file name of photos
PHOTO_REM	Text	Comments, if needed.

"Line" shapefile

The "Line" shapefile is for flight lines. Each flight line must be comprised of segments connecting all points of the shapefile "Centre_Photos_2019.shp". Each line-type graphic entity starts at the first photo in the flight line and ends at the last photo in the flight line.

Shapefile name: Lignes_Vol_2019.shp		
Attribute Name	**Data type**	**Description**
LIGNE_NO	Text	Flight line number
LIGNE_DATE	Text	Date taken, format: YYYY-MM-DD, e.g.: 2012-07-05
LIGNE_ORI	Text	Orientation of the flight line, e.g.: NE, SW, W
LIGNE_GIS	Digital	Flight line bearing rounded to the nearest degree, e.g.: 136
PHOTO_RES	Text	Photo resolution in centimetres, e.g.: 30cm (Please note: Do not add spaces.)
PHOTO_DEBU	Digital	Number of the first photo in the flight line
PHOTO_FIN	Digital	Number of the last photo in the flight line
HEURE_DEBU	Text	GMT/UTC time when shooting started, in format: HH:MM:SS, e.g.: 19:49:39
HEURE_FIN	Text	GMT/UTC time when shooting ended, in format: HH:MM:SS, e.g.: 19:49:39
LIGNE_ALT	Digital	Altitude of the flight line in metres
LIGNE_REM	Text	Comments, if needed.

"Polygon" shapefiles

"Polygon" shapefiles represents the contour of each aerial photo. Therefore, for each photo, a polygon shall be created and its attributes correctly populated. "Polygon" shapefiles must include the following attributes:

Shapefile name: Contour_Photos_2019.shp		
Attribute Name	**Data type**	**Description**
PHOTO_NO	Digital	Photo number
LIGNE_NO	Text	Flight line number
PHOTO_DATE	Text	Date taken, format: YYYY-MM-DD, e.g.: 2012-07-05
PHOTO_HEUR	Text	GMT/UTC time when photo taken, in format: HH:MM:SS, e.g.: 19:49:39
PHOTO_RES	Text	Photo resolution in centimetres, e.g.: 30cm (Please note: Do not add spaces).
LAT_GI	Digital	Latitude, in decimal degrees, of the centre of the photograph according to the GPS/IMU system (10 digits after decimal point)
LONG_ GI	Digital	Longitude, in decimal degrees, of the centre of the photograph according to the GPS/IMU system (10 digits after decimal point)
HELLIPS_ GI	Digital	Ellipsoidal height, in metres, of the centre of the photograph according to the GPS/IMU system (3 digits after decimal point)
HORTHO_ GI	Digital	Orthometric height, in metres, of the centre of the photograph according to the GPS/IMU system (3 digits after decimal point)
OMEGA_ GI	Digital	Omega orientation value, in decimal degrees, of the centre of the photograph according to the GPS/IMU system (5 digits after decimal point)
PHI_ GI	Digital	Phi orientation value, in decimal degrees, of the centre of the photograph according to the GPS/IMU system (5 digits after decimal point)
KAPPA_ GI	Digital	Kappa orientation value, in decimal degrees, of the centre of the photograph according to the GPS/IMU system (5 digits after decimal point)
DATUM_HORI	Text	Geodetic horizontal datum, e.g.: NAD83(CSRS)
DATUM_VERT	Text	Geodetic vertical datum, e.g.: CGVD28/HT2
PRJ_CARTO	Text	Map projection used, e.g.: MTM07
NOM_IMAGE	Text	TIF file name of photos
PHOTO_REM	Text	Comments, if needed.

3.2.2 Production of Photogrammetric Models

Even if aerial photographs are oriented beforehand using an inertial positioning system and kinematic GPS, the contractor shall still perform aerotriangulation.

The contractor shall use compensation software that can use GPS-calculated data as support points for compensation, and that enables calculation of rotation angles for each photo.

It is necessary to maximize use of the lake levelling option wherever sufficiently large water bodies are encountered.

When possible, each aerotriangulation block must contain at least 3 checkpoints (vertical and horizontal) distributed evenly in the block. Checkpoints may be pre-defined control points or new points.

Photogrammetric models (using *.TIF and *.PAR) must have uniform vertical and

horizontal precision. There must be no parallaxes in Y.

The absolute accuracy of the results will be evaluated using check points; the RMS of residuals at the check points shall be $\leq 30\mu m$ on the photo scale.

<u>The contractor must provide:</u>

- An Excel file containing the orientation parameters for the photographs (X, Y, Z, Omega, Phi, Kappa) from the GPS/IMU system.
- Text file of the complete statistical report on the aerotriangulation blocks containing the tie points, control and/or check points as well as the residuals and RMS of these points.
- Files for the absolute orientation parameters of each photograph obtained using the photogrammetric models in text and .PAR format.

In collaboration with Natural Resources Canada, Parks Canada will put in place on the ground a limited number of control points for the flyover (depending on the density of the point required, the location of the points, the type of marker to be used, etc.). The details regarding the installation of control points on the ground will be discussed with the contractor after the contract has been awarded

3.2.3 Production of Multispectral Digital Orthophotographs (colour and infrared)

a) **Production of Individual Orthophotographs**

- Complete an orthorectification of all photographs (24 bits for colour images [RGB at 8 bits each] and at 8 bits for the infrared signal images [NIR, with 256 shades of grey] using the geopositioning defined when producing the photogrammetric models and the calibration parameters of the flight camera.
- The digital photographs must be orthorectified at a resolution of 30 cm on the ground without any deterioration of the original photograph.
- From one orthophotograph to the next, there must be continuity and perfect alignment of the permanent physical details (banks of the waterways, rivers, shorelines, axis and orientation of the trees, etc.).
- In a subsequent step, the contractor must produce orthophotos that will be superimposed as perfectly as possible on individual orthophotos from 2009 provided by the park. The digital terrain models from 2009 will be provided and must be used as a basis for the production of orthophotos. The pixels must be exactly the same size and same position as the orthophotos from 2009 with minimal deterioration of the original photo.

<u>File Identification</u>

Orthophotograph files must be identified as follows:

- Line number;
- Photo number;
- Spectral band (colour = RGB and infrared = NIR);
- Year taken;
- Letters in uppercase OR.

  E.g. 01_425_RGB_2019_OR.TIF

The orthophotograph files aligned with those from 2009 must be identified as follows:

- Line number;
- Photo number;
- Spectral band (colour = RGB and infrared = NIR);
- Year taken;
- Letters in uppercase JXT.

  E.g. 01_425_RGB_2019_JXT.TIF

Flight Index for Contours

A flight index is also required in ShapeFile format (.shp) meeting the standards set out below.

A “polygon” type shapefile representing the contour of the initial individual orthophotographs (Contour_orthophotos_2019) and the contour of the orthophotographs aligned with the 2009 orthophotos (Contour_orthophotos_2019_JXT).

ShapeFile files containing all the attributes described above, with the appropriate attribute type and format, are available from Parks Canada.

"Polygon" shapefiles
"Polygon" shapefiles represent the contour of each orthophoto. Therefore, for each orthophoto, a polygon shall be created and its attributes correctly populated. "Polygon" shapefiles must include the following attributes:

ShapeFile file name: Contour_orthophotos_2019.shp or Contour_orthophotos_2019_JXT.shp		
Attribute name	**Data type**	**Description**
PHOTO_NO	Digital	Photo number
LIGNE_NO	Texte	Flight line number
PHOTO_DATE	Text	Date taken, format: YYYY-MM-DD, e.g.: 2012-07-05
PHOTO_HEUR	Text	GMT/UTC time when photo taken, in format: HH:MM:SS, e.g.: 19:49:39
PHOTO_RES	Text	Photo resolution in centimetres, e.g.: 30cm (Please note: Do not add any spaces)
LAT_AT	Digital	Latitude, in decimal degrees, of the centre of the photograph from aerotriangulation (10 digits after decimal point)
LONG_ AT	Digital	Longitude, in decimal degrees, of the centre of the photograph from aerotriangulation (10 digits after decimal point)
HELLIPS_ AT	Digital	Ellipsoidal height, in metres, of the centre of the photograph from aerotriangulation (3 digits after decimal point)
HORTHO_ AT	Digital	Orthometric height, in metres, of the centre of the photograph from aerotriangulation (3 digits after decimal point)
OMEGA_ AT	Digital	Omega orientation value, in decimal degrees, of the centre of the photograph from aerotriangulation (5 digits after decimal point)
PHI_ AT	Digital	Phi orientation value, in decimal degrees, of the centre of the photograph from aerotriangulation (5 digits after decimal point)
KAPPA_ AT	Digital	Kappa orientation value, in decimal degrees, of the centre of the photograph from aerotriangulation (5 digits after decimal point)
DATUM_HORI	Text	Geodetic horizontal datum, e.g.: NAD83(CSRS)
DATUM_VERT	Text	Geodetic vertical datum, e.g.: CGVD28/HT2
PRJ_CARTO	Text	Map projection used, e.g.: MTM07
NOM_IMAGE	Text	TIF file name of photos
PHOTO_REM	Text	Comments, if needed.

B) Production of Tiled Orthomosaics

Images of the covered territory must be delivered in the form of orthomosaics. Using the individual orthophotographs, the contractor must produce:

- 29 orthomosaics in colour (RGB), 24 bits.
- 29 orthomosaics in black and white (NIR), 8 bits.

Annex 1 indicates the 29 tiles for which orthomosaics must be produced.

- In a subsequent step, the orthomosaics must aligned as perfectly as possible with individual orthophotos from 2009 provided by the park. The digital terrain models from 2009 will be provided by Parks Canada and must be used as a basis for the production of orthophotos. The pixels must be exactly the same size and same position as the orthophotos from 2009 with minimal deterioration of the original photo.
- The orthomosaics must be uniform in colour, after harmonization of the colours and shades (radiometric calibration) in order to ensure the greatest continuity possible in the images from different flights. The cut lines cannot be visible.
- The orthomosaics must have a pixel equivalent to 30 cm on the ground without any deterioration of the original photograph.
- From one orthophotograph to the next, there must be continuity and perfect alignment of the permanent physical details (banks of the waterways, rivers, shorelines, axis and orientation of the trees, etc.).
- The specular reflections from water surfaces must be avoided as much as possible when selecting the orthophotographs to be used. In the event that the reflection cannot be avoided, the affected water surface must be retouched so that it harmonizes with the other water surfaces from the other photos. Great care must be taken when retouching the water surfaces for reflections.
- The tiles must not have any blank spots around the orthomosaics or empty pixels (no data).

A “test tile” must be delivered for approval by the Project Authority for validation before completing the mosaic from all the data. In the event the requirements above are not respected, the contractor must redo the work or make the required corrections before resubmitting the work for a new inspection.

<u>File Identification</u>

The orthomosaic files must be identified as follows:

- The word “Secteur” followed by its number (in accordance with ANNEX 1);
- Spectral band (colour = RGB and infrared = NIR);
- Year the photo was taken;

E.g. Secteur01_RGB_2019.TIF

The orthomosaic files aligned with those from 2009 must be identified as follows:

- The word “secteur” followed by its number (in accordance with ANNEX 1);
- Spectral band (colour = RGB and infrared = NIR);
- Year the photo was taken;
- Letters in uppercase JXT;

E.g. Secteur01_RGB_2009_JXT.TIF

C) Production of Single Orthomosaics (for the entire territory, in two sectors)

The contractor must also produce:

- Two colour orthomosaics (RGB) for the entire MANPR territory (assembly into a single file per sector):
  a. West sector: all of the territory covered by tiles 1 to 13-2; and
  b. East sector: all of the territory covered by tiles 14 -1 to 14-12 (east sector).

- The orthomosaics must have a pixel equivalent to 30 cm on the ground without any deterioration of the original photograph.

- The orthomosaics must be uniform in colour, after harmonization of the colours and shades (radiometric calibration) in order to ensure the greatest continuity possible in the images from different flights. The cut lines cannot be visible.

- From one orthophotograph to the next, there must be continuity and perfect alignment of the permanent physical details (banks of the waterways, rivers, shorelines, etc.).

- The specular reflections from water surfaces must be avoided as much as possible when selecting the orthophotographs to be used. In the event that the reflection cannot be avoided, the affected water surface must be retouched so that it harmonizes with the other water surfaces from the other photos. Great care must be taken when retouching the water surfaces for reflections.

<u>File Identification</u>

The orthomosaic files must be identified as follows:

- The word “RPNAM”;
- The word “east” or “ouest” depending on the sector represented;
- The type of spectral band (colour = RGB);
- Year the photo was taken;

E.g. RPNAM_ouest_RGB_2019

Optional Services

The following services could be required on demand:

- Production of two continuous colour (RGB) orthomosaics with no blank spots encompassing the entire territory covered during the flight (assembly into a single file per sector without blank spots).
- The two orthomosaics must respond to the requirements above ***(Production of Single Orthomosaics)***

Refer to ANNEX 2 (based on the aerial coverage from 2009) to set the boundaries for the sectors.

Format of Orthomosaic Files (individual, tiled and single)

- Orthophotograph files must be tiled, pyramids built and must not be compressed.
- Files must be saved in “GeoTIF” format and accompanied by a “TFW” positioning file. The “TFW” file must be filed in the same directory as the image file and have the same name. Geo-referencing information for TIFF images (projection, coordinate system, date, etc.) must be integrated in GeoTIFF images in accordance with standards established for this image format.
- Tiled and single orthomosaic files must also be saved in .ECW format.

3.2.4 Production of Metadata

The contractor must provide a data dictionary that is an integral part of the Shapefiles and images in accordance with the standards of the North American Profile of the ISO19115:2003 Register for:

- Indexes;
- Orthomosaics (individual, tiled and single).

Refer to ANNEX 5 for the list of minimum elements to be provided.

3.2.5 Technical Report

The contractor will prepare a technical report, providing a detailed description of the work completed. As a minimum, it must present the following sections and elements (if applicable):

1. *Project Description*
   - General presentation of the project;
   - List of the project steps;
   - List of technical parameters for every sector photographed: surface area of sectors photographed, photo type (colour, infrared, etc.), date and time, flight line number, distance between the two images on the same line and distance

between two flight lines, flight height, size of image on the ground, lateral and forward overlap, number of photos taken, number of models, camera used, calibration steps, photograph resolution, geodetic horizontal datum, map projection and geodetic vertical datum.

2. *Aerial Shooting*
   - Description of the type of aircraft used;
   - Description of the type of camera and its technical specifications (these specifications may come from the manufacturer and be in English);
   - Description of the navigation system used, e.g. Accuphoto;
   - Description of the software used during shooting, e.g. Grafnav;
   - Description of inertial platform used, e.g. Applanix;
   - Description of the ground GPS reference database(s) used to calculate the coordinates for the perspective centre of the photos. The contractor shall indicate the coordinates of the GPS reference database(s) used and explain where these coordinates come from (geodetic datum, RBA network point, SmartNet network point, new point calculated in PPP mode, etc.). If a new point is calculated, the result of the calculation shall be provided in an ANNEX. If the contractor uses an existing point, it shall provide the descriptive sheet on this point in an ANNEX.
   - Evaluation of the precision of orientation parameters and coordinates originating from the GPS/IMU system;
   - Description of specific equipment adjustments if applicable;
   - Other comments that the contractor deems relevant.

3. *Field Control*
   - List of the following for each sector photographed:
     - Geodetic horizontal datum, e.g. NAD83(CSRS);
     - Map projection, e.g. MTM07;
     - Geodetic vertical datum, e.g. CGVD28/HT2;
     - Coordinate conversions performed;
   - List of the following, in table form, for each control point:
     - Control point number;
     - Control point number used by the aerotriangulation software;
     - Control point coordinates used by the contractor to perform aerotriangulation (North, East and Orthometric Height);
     - Point status: used or rejected and reason for rejection;
   - Other comments that the contractor deems relevant.

4. *Aerotriangulation*
   - Description of the methodology used (use of control points, perspective centres originating from the GPS/IMU system, lake levelling, tie points, etc.);
   - Software used;
   - Adjustment method, e.g. BUNDLE;

- Weight, in centimetres, attributed during aerotriangulation for GPS perspective centres, control points, etc.;
- Presentation, in table form, of the residuals obtained at all control points used and the mean squared error for each aerotriangulation block;
- Indication of the aerotriangulation results;
- Brief analysis of the aerotriangulation results;
- Brief comparative analysis of control points measured in new stereoscopic models and the control points measured in the field;
- Other comments that the contractor deems relevant.

5. Orthomosaicing of Photos
   - Description of the pre-processing and methodology used (e.g. radiometric corrections, etc.);
   - Report detailing the manipulations completed during the orthomosaicking (including the steps for harmonizing the colours and shades, quality control, etc.);
   - Problems encountered and means taken to correct them;
   - Other comments that the contractor deems relevant.

6. *Conclusion*
   - General project feedback;
   - Problems encountered during the project and solutions implemented;
   - Summary of the aerotriangulation results;
   - Possible improvements for future projects;
   - Other comments that the contractor deems relevant.

3.3 Deliverables

The contractor must provide the following deliverables:

1. Flight report in PDF format;
2. Photograph index files in “SHP” format (photo flight lines, points and polygons) and “PDF” format;
3. Digital photographs in the visible colour spectral band (RGB) in TIFF format;
4. Digital photographs in the infrared spectral band (NIR) in TIFF format;
5. Excel file containing the orientation parameters for the photographs (X, Y, Z, Omega, Phi, Kappa) from the GPS/IMU system;
6. Text file of the complete statistical report on the aerotriangualtion blocks containing the tie points, control and/or check points as well as the residuals and RMS of these points;
7. Files for the absolute orientation parameters of the photogrammetric models in text and .PAR format;
8. Individual colour (RGB) and infrared (NIR) orthophotographs in GeoTIFF format;
9. Individual colour (RGB) and infrared (NIR) orthophotographs aligned with the 2009 photos in GeoTIFF format;
10. Individual orthophotograph index files in “SHP” format (Contour_orthophotos_2019 and Contour_orthophotos_2019_JXT);
11. Twenty-nine (29) colour (RGB) and infrared (NIR) tiled orthomosaics in GeoTIFF (24 bits) and ECW format;
12. Twenty-nine (29) colour (RGB) and infrared (NIR) tiled orthomosaics aligned with the 2009 orthomosaics in GeoTIFF (24 bits) and ECW format;
13. A single colour (RGB) orthomosaic in two sectors in GeoTIFF and ECW format;
14. Technical report for the acquisition of digital aerial photos and the production of orthophotos and orthomosaics.

3.4 Completion and Delivery Dates

Aerial Photographs

The acquisition of the aerial photos must be completed by **August 15, 2019**. However, the contractor agrees to do everything it can to acquire photos starting July 10, 2019 the moment conditions permit and the moment it gets approval from Parks Canada to start the work.

As soon as possible after the flight, “test photos” will be submitted to the Project Authority in order to conduct certain verifications and to ensure compliance. In the event the requirements above are not respected, the contractor will have to redo the work or make the required corrections before resubmitting the work for a new inspection.

All digital aerial photographs (RGB, NIR), the index and the flight report must be delivered to the Project Authority for inspection within a maximum timeframe of 7 calendar days following the inspection and confirmation that the “test photos” have been accepted.

Aerotriangulation

The aerotriangulation results must be delivered to the Project Authority for inspection within a maximum timeframe of 21 calendar days following the inspection and confirmation that the digital aerial photographs have been accepted.

Orthophotos

All orthophotos (individual, tiled and single), the index and the technical report must be delivered to the Project Authority for inspection within a maximum timeframe of 60 calendar days following the inspection and confirmation that the photogrammetric models have been accepted.

3.5 Available Materials Provided by Parks Canada

The following documents will be provided by Parks Canada:

- ***The interactive PDF form for completing the flight report;***
- ***The Shapefile (.SHP) files of the territory to be covered and tile boundaries;***
- ***The template “SHP” files for the flight indexes (point, line, polygon) containing the structure of all attributes requested;***
- ***The 2009 digital aerial orthophotos and orthomosaics of the MANPR.***

4. ACQUISITION AND CLASSIFICATION OF TOPOGRAPHIC AIRBORNE LIDAR DATA

4.1 General requirements

Area of Interest

The Data Collection Area of Interest (DCAOI) for the acquisition of LiDAR data includes three islands of the park covering approximately 50 km^2 (ANNEX 2). According to the price proposed by the contractor, optional services for the acquisition and classification of LiDAR data for additional areas could be requested (ANNEX 2, options 2, 3 or 4).

A detailed polygon of the DCAOI to be covered will be provided in a Shapefile document (ZICD_DCAOI_RPNAM.shp).

Acquisition period

The data must be collected between July 10 and August 15, 2019.

It is the contractor's responsibility to ensure that the LiDAR data is acquired during ideal conditions. He must consult Parks' Canada Project Authority in order to settle on the best flight window and to obtain his approbation before starting data acquisition.

Map projection and Geodesic datum

Data must be in the map projection Universal Transverse Mercator (UTM) zone 20N and with the Geodetic horizontal datum NAD83 (CSRS98) (NAD83 CSRS98 UTM Zone 20N). The Geodetic vertical datum is CGVD2013.

4.2 Technical specifications

The requirements for the acquisition of airborne LiDAR data are based on the *Federal Airborne LiDAR Data Acquisition Guideline, version 2.0*. This guideline is an integral part of this Statement of Work. However, some requirements of the guide have been modified in order to fulfil specific needs of the present project and are presented in Table 1.

Table 1:
Summary of requirements for LiDAR data

Requirements	Value
Aggregate Nominal Pulse Density (ANPD)	6 pulses/m^2 *according to the price proposed by the contractor, the ANPD required could be 8 pulses/m^2.
Aggregate Nominal Pulse Spacing (ANPS)	≤ 0.41 m for 6 pulses/m^2 *≤ 0.35 m for 8 pulses/m^2
Non-vegetated Vertical Accuracy (NVA)	
Vertical Root Mean Square Error ($RMSE_Z$)	≤ 10 cm
Vertical Accuracy – 95% confidence level (≈ 1.96 * $RMSE_Z$)	≤ 19.6 cm
Vegetated Vertical Accuracy (VVA) – 95th percentile	≤ 29.4 cm
Calculated Horizontal Accuracy (CHA)	≤ 60,0 cm
Relative Vertical Accuracy	
Intraswath (smooth surface repeatability) - $RMSD_Z$	≤ 6,0 cm
Interswath (swath overlap difference) – $RMSD_Z$	≤ 8,0 cm
Horizontal Datum	NAD83 SCRS, epoch 1997
Vertical Datum	CGVD 2013
Geoid Model	CGG2013
Map Projection	Universal Transverse Mercator (UTM)
Minimum Swath Overlap	15 %
Pulse Returns	Minimum 3 returns (First and Last). Intermediates are optional.
Classification	1 – Traité mais non classifié 2 – Sol 7 – Points bas (bruit) 9 – Eau 18 – Bruit élevé
Intensity Value	Required
Data Format	LAS 1.4 R-13, Point data record format 6
Maximum scan angle	25 degrees
Breaklines	Not required

Note: Refer to the Guideline's glossary for definitions

4.2.1 Specifications and Standards for the LiDAR data

In order to meet the specifications described above, the contractor must follow the requirements described in section 6-Guideline of the Federal Airborne LiDAR Data Acquisition Guideline.

a) Project Planning

The contractor must proceed to the Project Planning in accordance with section 6.1-Project Planning of the Federal Airborne LiDAR Data Acquisition Guideline.

b) Data Collection

The contractor must proceed to the Data Collection in accordance with section 6.2-Data Collection of the Federal Airborne LiDAR Data Acquisition Guideline. Dynamic values must be replaced by values shown in the table 1 (section 4.2) of this Statement of Work.

For the section 6.2.1 – Conditions, the below conditions must also be respected :
Data collection must be done when the weather is calm:

- The wind speed must be less than 20 km/h (10.8 knots) EXCEPT when it is coming from offshore, then it must be less than 13 km/h (7.02 knots). The website Windy (https://www.windyty.com/) could be used as a planning/decision tool.
- The wave height must be ≤ 1 m for the area. The website Windy (https://www.windyty.com/) could be used as a planning/decision tool.

c) Data Processing and Management

The contractor must meet the requirements detailed in the section 6.3-Data Processing and Management of the *Federal Airborne LiDAR Data Acquisition Guideline.* Dynamic values must be replaced by values shown in the table 1 (section 4.2) of this Statement of Work.

d) Data Validation

The contractor must meet the requirements set out in section 6.4-Data Validation of the Federal Airborne LiDAR Data Acquisition Guideline. Dynamic values must be replaced by values shown in the table 1 (section 4.2) of this present Statement of Work.

The Project Authority will require control points only for vertical accuracy validation (NVA and VVA). Parks Canada will evaluate the horizontal accuracy through the Calculated Horizontal Accuracy (CHA) based on the following ASPRS formula:

$$LiDAR\ Horizontal\ Error\ (RMSEr) = \sqrt{(GNSS\ positional\ error)\text{^}2\ \ + (\tan(IMU\ error)/0.5594170\ \ x\ flying\ altitude)\text{^}2}$$

4.3 Project Deliverables

The contractor must provide the Project Deliverables in accordance with the following, which are based on section 6.5-Project Deliverables of the *Federal Airborne LiDAR Data Acquisition Guideline.*

Table 2: List of reports included in the deliverables

Item	Description
Project Planning	Content must include the following: • Project method details (Section 6.1.1) • Instrumentation details (Section 6.1.2) • Data collection (Section 6.1.3)
Progress Reports	During the acquisition, progress reports shall be provided at a frequency stipulated during the kick-off meeting by the contract authority. • On/off schedule • Status of collection (% completion) and location • Any changes to the collection plan including changes related to people or instrumentation • Any current issues causing delay • Any issues anticipated that will affect data collection, budget, or schedule
Project Deliverables	Project deliverable reporting items will include the following: • Field notes for surveying and flight logs. • The Data Quality Assurance report with details on data validation for vertical and horizontal accuracy, check points collection, classification accuracy check, regularity and pulse density check, calculations and results. • The Deliverable Report contains an assembly of information related to all deliverables produced as well as processing tasks, data list, and metadata. It should contain sufficient detail to demonstrate the specifications have been met for each pulse data collected.
Data Inventory List	A data inventory and dictionary describing all the data and documentation collected in the project will be provided in a structured table list. It will include file name, creation date, description and a contact responsible for the items.

Table 3: List of auxiliary data included in deliverables

Item	Description	Format
Survey Control	• Active or passive station data including location and any monument station, date time stamp. GNSS data collected should be included. • Control points used to calibrate and process the pulse data. • Photos of survey control and a map of the base station locations.	**RINEX or PDF**
Flight	• Flight trajectory – SBET files – including any tie lines or calibration flights. A shapefile with all the trajectory, orientation, time, date information should be provided. Flights should be separated by lifts and by logical separation such as flight blocks.	**Shapefile (.shp)**
In-situ Validation	• Check point measurements. • All GNSS field and control data including parameters for collection. • Photographs of site of measurement areas - both ground and site views. • Map of the locations of the check point areas and the classification checks.	**Required in variable formats: Excel, RINEX, MS Word-PDF, TIFF/JPG, PDF/JPG**
Metadata	Metadata will be provided for the field data. The structure of the metadata will use XML format using ISO 19115:2003 standard.	**Xml**

Table 4: LiDAR data to be delivered

Item	Description	Format
Point Cloud Data	Classified point cloud data in tiles using naming conventions	**LAZ**
Index File	Index file of point cloud data with date, naming convention, project name, location as vector file	**Shapefile (.shp)**
Raw data	**Not required for delivery**. Contractor must retain a master copy of the raw data for a period of 6 months from the date of delivery.	**Not required**
Metadata	Metadata on the data delivery using NRCan metadata template.	**Required using the template provided (XML format) and Excel (Supplemental information on the LiDAR acquisition)**

Table 5 : Data Validation Deliverables

Item	Description	Format
Spatial Distribution and Regularity	Results from distribution pulse data verifications	**Excel and PDF**
Relative Accuracy	Calculation of relative accuracy including all data used for: • Intraswath comparison • Interswath comparison	**Excel, GeoTiff, PDF**
Pulse Density	Visual grid and histogram - calculated result from applying the pulse density grid	**GeoTiff**
Data Voids	Results from conducting a data void check.	**Excel, GeoTiff, and PDF**
Pulse Classification	Summary of classification results	**Excel, GeoTiff and PDF**
Positional Accuracy	The results of positional accuracy assessment, including all data used for the creation of vertical and horizontal verifications points– NVA, VVA, FHA and CHA will be provided.	**Excel, GeoTiff and PDF**

4.4 Completion and Delivery Date

Project planning report (table 2) must be provided before LiDAR data acquisition. It must be submitted to the Project Authority no later than 10 calendar days after the kick-off meeting.

The data must be collected no later than August 15, 2019. However, the contractor must do everything possible to acquire LiDAR data as soon as July 10, 2019 when the conditions are suitable and with Parks Canada's approbation to start the work.

As soon as data acquisition is complete but before processing the entire tile set, a «Test tile» must be submitted to the Project Authority for inspection and approval. If the data does not respect the present work statement requirements, the contractor will have to start over the acquisition or apply necessary corrections and submit again the deliverables for inspection and approbation.

All project deliverables must be provided within a maximum delay of 60 calendar days after inspection and approval of the «Test tile».

All data will be validated according to requirements found in the *Federal Airborne LiDAR Data Acquisition Guideline* and the section 4.2 of the present Statement of Work.

4.5 Material available and provided by Parks Canada

The following documents will be provided by Parks Canada:

- A shapefile document, ZICD_DCAOI_RPNAM.shp, representing the Data Collection Area of Interest (DCAOI) for LiDAR data acquisition and classification ;
- Federal Airborne LiDAR Data Acquisition Guideline, version 2.0 ;
- NRCan metadata template (NRCan_LiDARMetadataTemplate).

5. DIGITAL TERRAIN MODELS (DTM)

In order to generate the digital terrain models (DTM), the contractor must use the photo autocorrelation algorithm and possibly external data (with the Project Authority's approval).

5.1 Nature and Technical Specifications of the Work

- The contractor will use autocorrelation techniques on the photogrammetric captures taken to generate the DTMs for all the tiles (29) in ANNEX 1. Slope change lines could also be captured to refine the models.
- The contractor must also produce DTMs for all the tiles in ANNEX 1, set side by side with the DTMs produced in 2009. The 2009 DTMs will be provided by Parks Canada.

The following specifications must be respected:

- Each DTM must correspond to a sector illustrated in ANNEX 1 (e.g. Secteur 01);
- 8 bits;
- 30 cm of spatial resolution;
- The contractor must validate the DTMs produced in order to make sure they properly represent the terrain's topography;
- There must not be any empty pixels (no data);
- The horizontal and vertical unit of measurement to be used is the metre. It must be expressed as a floating point number (three digits after the decimal point);
- The data must be provided in the UTM projection, zone 20N and horizontal datum reference NAD83 CSRS98 epoch 1997 (UTM NAD83 zone 20N CSRS98). The geodetic vertical datum system is the CGVD2013;
- The digital files must be identified as follows:
  - The word "MNT";
  - The word "secteur" followed by its number (in accordance with ANNEX 1);
  - Year the photo was taken;

  E.g. MNT_ Secteur01_2019

- For the DTM aligned with those from 2009, the following uppercase letters must be added: JXT

  E.g. MNT_ Secteur01_2019_JXT

- The DTM format is the “ASCII grid” type and compatible with ArcGis10;

- In the event the DTM file exceeds 2 GB (gigabyte), it must be tiled and identified using the Project Authority’s specifications.

5.2 Production of Metadata

The contractor must provide a data dictionary for each DTM grid that is an integral part of the files in accordance with the standards of the North American Profile of the ISO19115:2003 Register.

Refer to ANNEX 5 for the list of minimum elements to be provided.

5.3 Technical Report

The contractor will prepare a technical report, providing a detailed description of the work completed:

As a minimum, it must present the following sections and elements (if applicable):

- Software used;
- Description of the methodology used (source of the data and method used to produce the model, pre-processing, quality control procedure);
- Adjustment method;
- Problems encountered and means taken to correct them;
- Other comments that the contractor deems relevant.

5.4 Deliverables

The contractor must provide the following deliverables:

- The digital terrain models in “ASCII grid” format
- Technical report

5.5 Completion and Delivery Dates

The production of digital terrain models and the preparation of the report must be completed within 60 calendar days following the inspection and confirmation that the photogrammetric models have been accepted.

6. QUALITY CONTROL

The contractor agrees to ensure quality control in accordance with the process that it presented in its service offer and based on this Statement of Work. This process includes auto-verification activities that guarantee the quality of the work and enforce the contractor's responsibility in the event of errors.

Over the course of the contract period, in the event of technical problems, they must be promptly reported in writing to the Project Authority. The Project Authority will then inform the contractor in writing regarding the measures to be taken.

The aerial photographs, LiDAR data and documents produced will be inspected by the Project Authority in order to make sure that the requirements explained above are respected. If it becomes evident that the work is not compliant with the requirements or that the contractor is not engaging in appropriate quality control in the production of the images/data, the inspection will end and the contractor will need to redo the work or make the required corrections. The contractor will then be required to re-submit the work for a new inspection.

The contractor must not under any circumstances use reference data from the Base de données topographique du Québec (BDTQ) or the National Topographic Data Base (NTDB) to geoposition or orthorectify the images.

7. OTHER MODALITIES

7.1 Transfer of Deliverables

All the documents provided must be placed on an external hard drive purchased by the contractor. The hard drive must be new and compatible with a "USB 3.0" connection, it must have sufficient storage capacity to contain all the documents in this contract and will remain the property of Parks Canada. In the event that an external hard drive was defective, the contractor agrees to assume responsibility for the manufacturer's warranty and to replace the lost data, covering a period of six months following the final delivery. The contractor must keep a copy of the digital products that it has produced as part of this contract for the duration of the mandate and up to one year after the final acceptance of the work by Parks Canada.

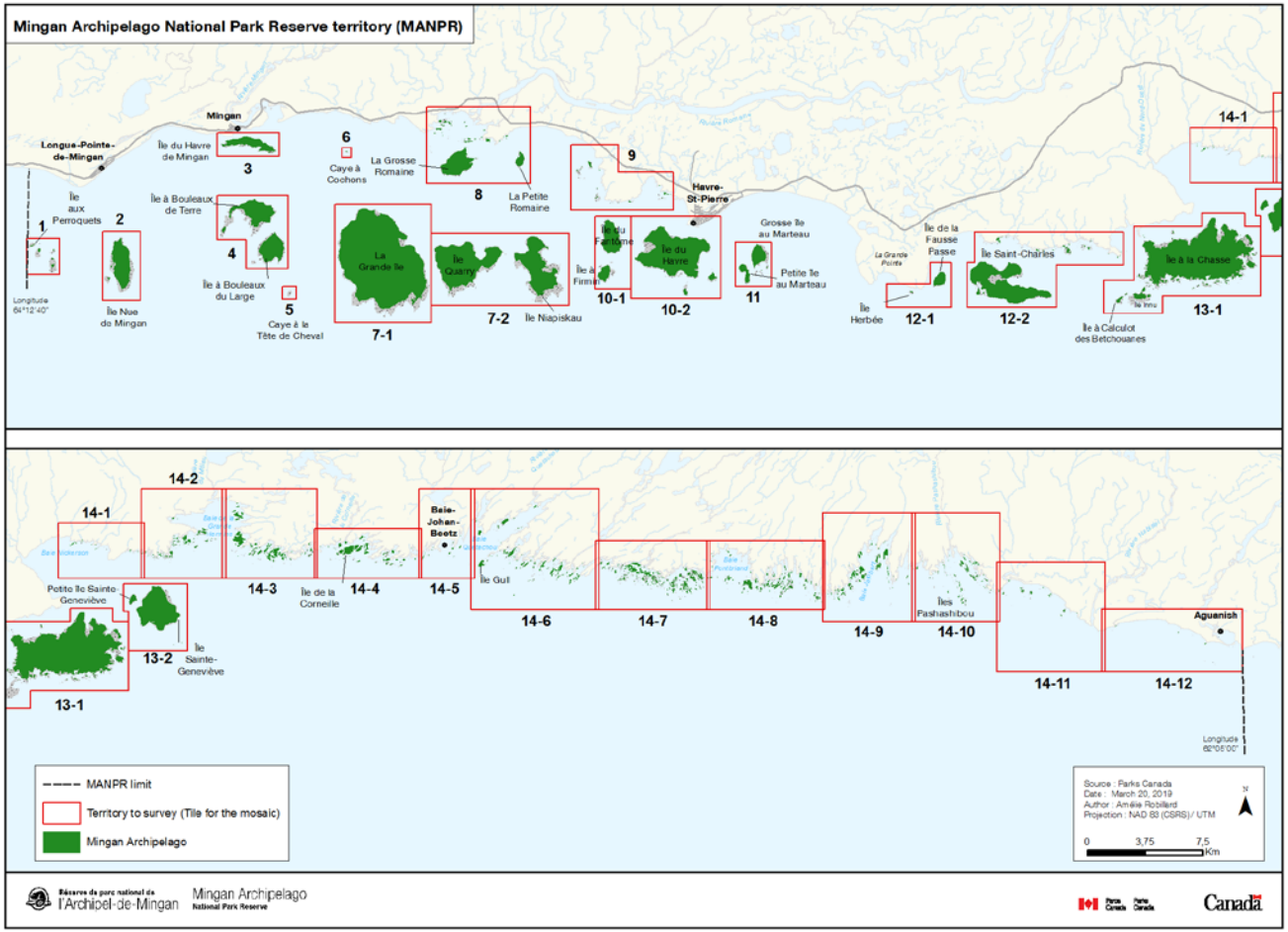
7.2 Kick-off Meeting

After the contract has been awarded, a kick-off meeting will be held as soon as possible between the Parks Canada team and the contractor's work team. The purpose of this meeting will be to review the statement of work, to define the work schedule with the contractor and to review the cost breakdown provided by the contractor at the time of the meeting. This meeting can be held virtually.

The contractor will consider as an integral part of the contract all verbal or written instructions, subsequent to the consultations, that do not increase the scope of the task but that improve the final product.

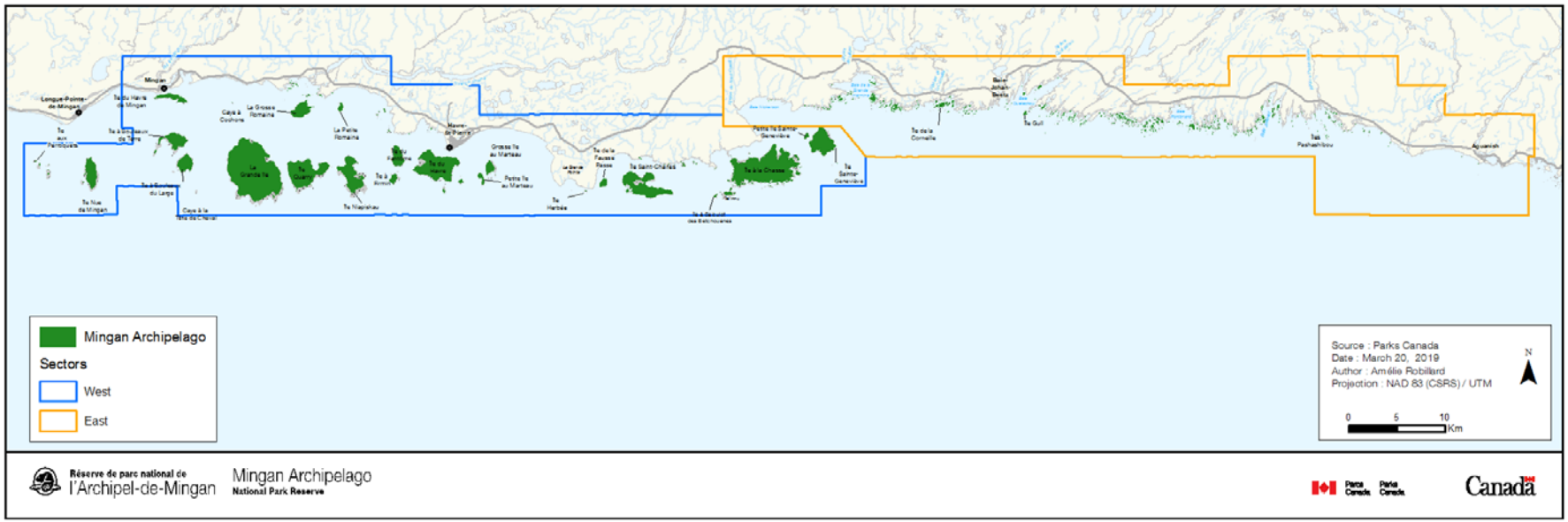
ANNEX 1

Mingan Archipelago National Park Reserve territory (MANPR)



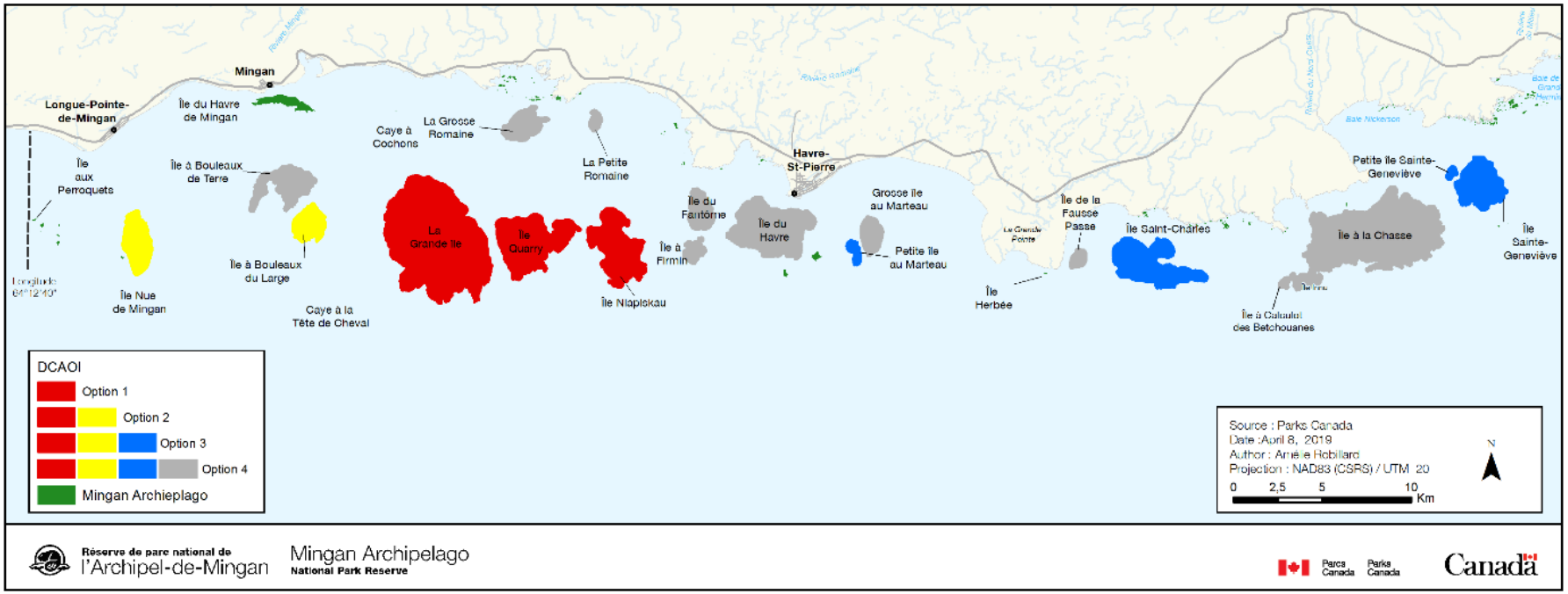
ANNEX 2

Example of territory covered by the unique continuous orthomosaic tile.



ANNEX 3

The Data Collection Area of Interest (DCAOI) for the acquisition of LiDAR data in the Mingan Archipelago National Park Reserve. The minimum territory to survey covers Grande île, Île Quarry and Île Niapiskau (Option 1).



ANNEX 4
Sample flight report – CILA 2

Ressources naturelles Canada / Natural Resources Canada

PAGE 1 OF/DE 1

CONTRACTOR'S JOB NO. / N° DE TRAVAIL DE L'ENTRE.	AIR PHOTOGRAPHY REPORT / RAPPORT DE PHOTOGRAPHIE AÉRIENNE	NRCAN JOB NO. / N° DE TRAVAIL DE NRCAN
C15-554-MAP		2015-04-011

CAMERA TYPE / TYPE DE CAMÉRA	JOB LOCATION / LIEU		FEDERAL ROLL NO. / N° DU ROULEAU (FED)
UCX-SX-1-70912643	UASHAT / MALIOTÉNAM		201504011
LENS NO. / LENTILLE N°	FORWARD LAP / RECOUVREMENT LONGITUDINAL	NUMBER OF PHOTOS / NOMBRE DE PHOTOGRAPHIES	CONTRACTOR'S ROLL NO. / N° DU ROULEAU DE L'ENTREPRENEUR
70214391	60%	57	PXL15-156
CALIBRATED F.L. / D.F. ÉTALONNÉE	SIDE LAP / RECOUVREMENT LATÉRAL	NUMBER OF FLIGHT LINES / NOMBRE DE LIGNE DE VOL	SCALE OR RESOLUTION / ÉCHELLE OU RÉSOLUTION
100.5 mm	30%	6	15 CM

DATE (AAAA-MM-JJ)	ANNOTED NEG NOS. N° DES NEG. ANNOTÉS	LINE NO. & DIRECTION NUMÉRO ET DIRECTION DE LA LIGNE	EXPOSURE NO. N° DE PRISES DE VUE START DÉBUT	EXPOSURE NO. N° DE PRISES DE VUE FINISH FIN	GMT TU START DÉBUT	GMT TU FINISH FIN	TRUE ALT. ABOVE SEA LEVEL (m) ALTITUDE VRAIE AU-DESSUS DU NIV. DE LA MER (m)	CAMERA EXPOSURE EXPOSITION DE LA CAMÉRA	REMARKS REMARQUES
									UASHAT
2015-05-05	6 - 12	1 - E	6	12	15:01	15:01	2515	8 1/175	COMPLETE
2015-05-05	13 - 21	2 - W	13	21	15:09	15:10	2515	8 1/175	COMPLETE
2015-05-05	22 - 30	3 - E	22	30	15:11	15:11	2515	8 1/175	COMPLETE
									MALIOTÉNAM
2015-05-06	31 - 37	4 - W	31	37	15:30	15:31	2515	8 1/175	COMPLETE
2015-05-06	38 - 49	5 - E	38	49	15:33	15:34	2515	8 1/175	COMPLETE
2015-05-06	50 - 61	6 - W	50	61	15:37	15:38	2515	8 1/175	COMPLETE

DATE (AAAA-MM-JJ)	2015-05-05		2015-05-06				AUTOPILOT PILOTE AUTOMATIQUE
	TAKEOFF FROM LIEU DE DÉCOLLAGE	LAND AT LIEU D'ATTERRISSAGE	TAKEOFF FROM LIEU DE DÉCOLLAGE.	LAND AT LIEU D'ATTERRISSAGE	TAKEOFF FROM LIEU DE DÉCOLLAGE.	LAND AT LIEU D'ATTERRISSAGE	YES OUI ●
BASE	CYZV	CYZV	CYZV	CYZV			NO NON ○
TIME HEURE	14:45 GMT TU	15:35 GMT TU	15:14 GMT TU	15:55 GMT TU	GMT TU	GMT TU	

AIRCRAFT REGISTRATION IMMATRICULATION DE L'AÉRONEF	C-GPSR	CONTRACTOR ENTREPRENEUR	MANITOU AIR PHOTO CORP	NAVIGATOR NAVIGATEUR	R. LEBRUN
TYPE	CESSNA 441			PHOTOGRAPHER PHOTOGRAPHE	G. DESGAGNÉS
CAMERA PORT CATEGORY CATÉGORIE DU HUBLOT DE LA CAMÉRA	A			PILOT PILOTE	R. LEBRUN
CAMERA PORT NO. N° DU HUBLOT DE LA CAMÉRA	178				
AIR PHOTO FORM NRCAN-SGB-QKO 2015 v1.0 / FORMULAIRE RAPPORT DE VOL NRCAN-DAG-RKQ 2015 v1.0		ALTIMETER NO. ALTIMÈTRE N°	MAPC-42		

ANNEX 5

List of essential fields in the data dictionary for Shapefile files.

List of fields	Description
Title	Name given to the resource (file name).
Summary	Summary of the file's purpose.
Description	Characteristics of the data as a whole, including its planned use and its limits.
Credits	Name of the organization or person who designed the data.
Subject and keywords	Words or sentences summarizing an aspect of the data as a whole. Categories of themes and locations.
Creation date	Date associated with an event in the lifecycle of the resource, in this case, the creation (when was the file created?).
Point of contact	Party responsible for the information.
Quality (localization precision)	Data quality. Evaluation of the precision of the position of spatial objects.
Lineage (procedure and source of the data)	Information on the events, parameters and source data that constitute the data as a whole and information on the parties responsible. Problems encountered.
Fields	Description of entities, attributes, values of the associated attributes and characteristics, coded for the data as a whole. Include the source for the definition of the entities and attributes.

ANNEX B

BASIS OF PAYMENT

1. Bidders must provide pricing in the format specified in this Annex B – Basis of Payment. **Failure to provide prices in the format specified will render the quotation non-responsive.**

2. Bidders must provide pricing for services described in Annex A Statement of Work. They must provide all-inclusive prices. Taxes are excluded.

3. The prices must include specialized labour, equipment, permits, transportation costs and time, administration and insurance costs, insurance and other incidentals for the completion of the work.

4. The allocated budget for this project is $95,000.00 for all deliverables identified in Table A only (mandatory work).

5. *Prices provided in Table B – Optional Services, will be taken into consideration in bid evaluation, but do not represent a commitment by Canada that Canada's future usage of the services described in the bid solicitation will be consistent with this data.

Annex B – Basis of Payment (cont'd)

TABLE A – Mandatory Work

Description of Deliverables	Lump Sum Price
1) Digital photographs in the visible colour spectral band (RGB) and the infrared spectral band (NIR) in TIFF format including the index files in "SHP".	$ _____
2) Orientation parameters for the photogrammetric models (*.PAR and Excel).	$ _____
3) Statistical report for the aerotriangualtion blocks results.	$ _____
4) Individual colour (RGB) and infrared (NIR) orthophotographs in GeoTIFF format.	$ _____
5) Individual colour (RGB) and infrared (NIR) orthophotographs aligned with the 2009 orthophotos in GeoTIFF format.	$ _____
6) Twenty-nine (29) colour (RGB) and infrared (NIR) tiled orthomosaics after harmonization of the colours and shades in GeoTIFF and ECW format.	$ _____
7) Twenty-nine (29) colour (RGB) and infrared (NIR) tiled orthomosaics aligned with the 2009 orthomosaics after harmonization of the colours and shades in GeoTIFF and ECW format.	$ _____
8) A single colour (RGB) orthomosaic in two sectors for the entire territory after harmonization of the colours and shades in GeoTIFF and ECW format (ANNEXE2) – Tiles of the orthomosaics	$ _____
9) Technical report for the acquisition of digital aerial photos and the production of orthophotos and orthomosaics.	$ _____
10) Acquisition and classification of topographic airborne LiDAR data for the areas presented in ANNEXE3 in LAS format. - 6 pules/ m^2 for the Option 1 DCAOI	**Option 1** $ _____
11) Digital terrain models.	$ _____
12) Digital terrain models aligned with the DTMs produced in 2009.	$ _____
13) Other costs (please describe)	$ _____
SUB-TOTAL TABLE A – MANDATORY WORK (BEFORE TAXES)	$ _____

Annex B – Basis of Payment (cont'd)

TABLE B – *Optional Services

Description of deliverables	Lump Sum Price	
1. Continuous colour (RGB) orthomosaics with no blank areas Single colour (RGB) orthomosaic in two sectors in GeoTIFF and ECW format (ANNEXE2).	$ _____	
2. Acquisition and classification of topographic airborne LiDAR data for the areas presented in ANNEX 3 in LAS format *Option 2 : DCAOI option 1 with a ANPD of 8 pulses/ m^2* *Option 3 : DCAOI option 2 with a ANPD of 6 pulses/ m^2* *Option 4 : DCAOI option 2 with a ANPD of 8 pulses/ m^2* *Option 5 : DCAOI option 3 with a ANPD of 6 pulses/ m^2* *Option 6 : DCAOI option 3 with a ANPD of 8 pulses/ m^2* *Option 7 : DCAOI option 4 with a ANPD of 6 pulses/ m^2* *Option 8 : DCAOI option 4 with a ANPD of 8 pulses/ m^2*	**Option 2**	**$**
	Option 3	**$**
	Option 4	**$**
	Option 5	**$**
	Option 6	**$**
	Option 7	**$**
	Option 8	**$**
SUB-TOTAL TABLE B–OPTIONAL SERVICES (BEFORE TAXES)	_____ **$**	

SUMMARY

1	**SUB-TOTAL TABLE A MANDATORY WORK**	**$**_____
2	**SUB-TOTAL TABLE B OPTIONAL SERVICES**	**$**_____
3	**GRAND TOTAL OF BID (TAXES EXCLUDED)**	**$** _____

ANNEX C

ATTESTATION AND PROOF OF COMPLIANCE WITH OCCUPATIONAL HEALTH AND SAFETY (OHS)

The following form must be completed and signed prior to commencing work on Parks Canada Sites.

Submission of this completed form, satisfactory to Parks Canada, is a condition of gaining access to the work place.

Parks Canada recognizes that federal OHS legislation places certain specific responsibilities upon Parks Canada as owner of the work place. In order to meet those responsibilities, Parks Canada is implementing a contractor safety regime that will ensure that roles and responsibilities assigned under Part II of the *Canada Labour Code* and the *Canada Occupational Health and Safety Regulations* are implemented and observed when involving contractor(s) to undertake works in Parks Canada work places.

Parks Canada Responsible Authority/Project Lead	**Address**	**Contact Information**
Project Manager/Contracting Authority		
Prime Contractor		
Subcontractor(s) (add additional fields as required)		

Location of Work

General Description of Work to be Completed

Mark "Yes" where applicable.

	A meeting has been held to discuss hazards and access to the work place and all known and foreseeable hazards have been identified to the contractor and/or subcontractor(s)
	The contractor and/or its subcontractor(s) will comply with all federal and provincial/territorial legislation and Parks Canada's policies and procedures, regarding occupational health and safety.
	The contractor and/or its subcontractor(s) will provide all prescribed safety materials, equipment, devices and clothing.
	The contractor and/or its subcontractor(s) will ensure that its employees are familiar with and use all prescribed safety materials, equipment, devices and clothing at all times.
	The contractor and/or its subcontractor(s) will ensure that its activities do not endanger the health and safety of Parks Canada employees.
	The contractor and/or its subcontractor(s) has inspected the site and has carried out a hazard assessment and has put in place a health and safety plan and informed its employees accordingly, prior to the commencement of the work.
	Where a contractor and/or its subcontractor(s) will be storing, handling or using hazardous substances in the work place, it will place warning signs at access points warning persons of the presence of the substances and any precautions to be taken to prevent or reduce any hazard of injury or death.
	The contractor and/or its subcontractor(s) will ensure that its employees are instructed in respect of any emergency procedures applicable to the site.

I, _____ (contractor), certify that I have read, understood and attest that my firm, employees and all sub-contractors will comply with the requirements set out in this document and the terms and conditions of the contract.

Name **Signature** **Date**

ANNEX D to PART 5 OF THE BID SOLICITATION

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: 2012-2 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.

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 Applicable Taxes.

ANNEX E to PART 5 OF THE BID SOLICITATION

LIST OF NAMES FOR INTEGRITY VERIFICATION FORM

Requirements

Section 17 of the *Ineligibility and Suspension Policy* (the Policy) requires suppliers, regardless of their status under the Policy, to submit a list of names when participating in a procurement process. The required list differs depending on the bidder or offeror's organizational structure:

- Suppliers including those bidding as joint ventures, whether incorporated or not, must provide a complete list of the names of all current directors.
- Privately owned corporations must provide a list of the owners' names.
- Suppliers bidding as sole proprietors, including sole proprietors bidding as joint ventures, whether incorporated or not, must provide a complete list of the names of all owners.
- Suppliers that are a partnership do not need to provide a list of names.

Suppliers may use this form to provide the required list of names with their bid or offer submission. Failure to submit this information with a bid or offer, where required, will render a bid or offer non-responsive, or the supplier otherwise disqualified for award of a contract or real property agreement. Please refer to Information Bulletin: Required information to submit a bid or offer for additional details.

Supplier Information

Supplier's Legal Name:		
Organizational Structure:	( ) Corporate Entity ( ) Privately Owned Corporation ( ) Sole Proprietor ( ) Partnership	
Supplier's Legal Address:		
City:	**Province / Territory:**	**Postal Code / ZIP Code:**
Supplier's Procurement Business Number (optional):		

List of Names

Name	Title

Declaration

I, (name) _____, (position) _____, of

(supplier's name) _____, declare that the information provided in this Form is, to the best of my knowledge and belief, true, accurate and complete. I am aware that failing to provide the list of names will render a bid or offer non-responsive, or I will be otherwise disqualified for award of a contract or real property agreement. I am aware that during the bid or offer evaluation stage, I must, within 10 working days, inform the contracting authority in writing of any changes affecting the list of names submitted. I am also aware that after contract award I must inform the Registrar of Ineligibility and Suspension within 10 working days of any changes to the list of names submitted.

Signature **Date**

Please include with your bid or offer.

ANNEX F

TECHNICAL EVALUATION

Notes

1. It is recommended that bidders address these criteria in the same order as provided and in such a way as to enable a thorough assessment. Assessment will be based solely on the information provided in the proposal.

2. Bidders are advised that simply stating experience without providing supporting information describing responsibilities, duties and relevance to the criteria will not be considered as meeting the evaluation criteria.

3. 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 will not be considered work experience. For all criteria related to work experience, the experience will have been 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.

4. Any month(s) of experience for a project which overlap those of another referenced project will only be counted once. For example: Project 1 time frame is July 2001 to December 2001; Project 2 time frame is October 2001 to January 2002; the total number of months of experience for these two projects is seven (7) months.

1. TECHNICAL CRITERIA

1.1 MANDATORY TECHNICAL CRITERIA

The bid must meet the mandatory technical criteria specified below. The Bidder must provide the necessary documentation to support compliance with this requirement.

Any bid which fails to meet the mandatory technical criteria will be declared non-responsive. Each mandatory technical criterion must be addressed separately.

Criteria No	Mandatory Requirement	Proposal Page No.	Met/Not met
O1	**EQUIPMENT - CAMERAS** The bidder MUST possess and deliver a valid calibration report for the proposed cameras. The calibration report should not be more than two years old and must have been created by the manufacturer. **A copy of this report must be included in this proposal.**		
O2	**EQUIPMENT – SENSORS** The bidder MUST possess and deliver a valid calibration report for the proposed LiDAR sensors (including manufacturer, model and year). The calibration report should not be more than two years old and must have been performed by the manufacturer. **A copy of this report must be included in this proposal.**		
O3	**RESOURCES** The work must be performed under the supervision of a Quebec land surveyor, a Canada Land Surveyor or a surveyor registered under the Québec Land Surveyors Association. **Proof of this certification MUST be included in this proposal.**		

Criteria No	Mandatory Requirement	Proposal Page No.	Met/Not met
O4	**Experience in digital aerial photography and aerial triangulation** The bidder **must** show that they have completed a minimum of t**wo (2) projects** related to digital aerial photography and aerial triangulation at a resolution equal to or less than 30 cm in the last five (5) years. In order to prove that their company possesses the required experience, the bidder must provide the following information: - Name of the project - Name of the company - Contact name and information (references) - Dates - Area covered - Resolution - Summary of the project → If the information provided does not prove that the project fulfills the above requirements, the proposal will be deemed non-responsive. **Please note**: If needed, references will be contacted to confirm the information provided.		

O5	**Experience in airborne topographic LiDAR data acquisition** The bidder **must** demonstrates that they have experience in the completion of at least **<u>two (2) projects</u>** of airborne topographic LiDAR data acquisition covering an area larger than 250 km^2 for an aggregate nominal pulse density (ANPD) of at least 2 pulses/m^2 on 90% of the territory (excluding water surfaces). Data must have been acquired with a Vertical Accuracy of 19,6 cm or better in non-vegetated areas (NVA) at a 95% confidence level. In order to prove that their company possesses the required experience, the bidder must provide the following information: - Name of the project - Name of the company - Contact name and information(references) - Dates - Area covered (km2) - Aggregate nominal pulse density (ANPD) - Non-vegetated Vertical Accuracy (NVA) at a 95% confidence level - Summary of the project → If the information provided does not prove that the project fulfills the requirements, the proposal will be deemed non-responsive. **Note:** The Aggregate Nominal Pulse Density (ANPD) is a variant of the nominal pulse density that expresses the total expected or actual density of pulses occurring in a specified unit area resulting from multiple passes of the light detection and ranging (LiDAR) instrument, or a single pass of a platform with multiple LiDAR instruments, over the same target area. In all other respects, ANPD is identical to nominal pulse density (NPD). **Please note:** The two projects must have been completed within the last 5 years of the closing date of this proposal request. **Please note:** The requested experience in O5 et O6 could have been cumulated through the same projects. **Please note**: If needed, references will be contacted to confirm the information provided.		

O6	**Experience in airborne topographic LiDAR data classification** The bidder must demonstrates that they have experience in the completion of at least **<u>two (2) projects</u>** in airborne topographic LiDAR data classification covering an area of more than 250 km^2. The minimal classification requirements are Ground (2), Water (9) and Processed but unclassified (1). In order to prove that their company possesses the required experience, the bidder must provide the following information: - Name of the project - Name of the company - Contact name and information (references) - Date - Area covered (km2) - Classifications - Summary of the project → If the information provided does not prove that the project fulfills the requirements, the proposal will be deemed non-responsive **Please note:** The two projects must have been completed within the last 5 years of the closing date of this proposal request. **Please note:** The requested experience in O5 et O6 could have been cumulated through the same projects. **Please note**: If needed, references will be contacted to confirm the information provided.		
07	**Price** The bidder must respect the maximum budget of 95 000,00$ (taxes not included) for the execution of the **<u>planned work</u>** (ANNEX B, Table A).		
O8	**Language** The bidder **must** submit their proposal in French.		

2.2 POINT-RATED TECHNICAL CRITERIA

Bids which meet all the mandatory technical criteria will be evaluated and scored as specified in the tables inserted below.

To avoid losing points in this section, the bidder must refrain from simply copying different sections of the Statement of Work.

Bids which fail to obtain the required minimum number of points will be declared non-responsive. Each point rated technical criterion should be addressed separately.

Criterion id	Description	Proposal Page #	Maximum Points	Passing Mark
C1	**General clarity of the proposal** • Well-structured proposal, easy to read (5 points) • Completeness of the information provided (5 points) *a. Excellent (10 points)* *b. Very good (8-9 points)* *c. Good (7 points points)* *d. Poor (5-6 points)* *e. Very poor (3-4 points)* *f. Unacceptable (0-2 points)* **See the evaluation grid at the end of this APPENDIX.**	N/A	**10**	**7**
C2	**Understanding of the objectives** The objectives and the work schedule proposed for the work to be realised must clearly demonstrate that the bidder has understood the objectives and particularities of the project. *a. Excellent (10 points)* *b. Very good (8-9 points)* *c. Good (7 points)* *d. Poor (4-6 points)* *e. Very poor (1-3 points)* *f. Unacceptable (0 points)* **See the evaluation grid below the table.**		**10**	**7**

C3	**Proposed Strategy and Methodology** The bidder should clearly present the technical approach and methodology it proposes. The technical approach and methodology should be consistent, relevant to the project, complete and achievable. The technical approach should treat of the following points: • Flight plan in index form (.pdf et .shp format) • Respect of the requirements of the Statement of Work • Work plan that includes the tasks to be achieved • Products to deliver • Presentation of details that demonstrate the comprehension of the requirements • For LiDAR data, the bidder should minimally provide information regarding the sensor that will be used, flight altitude and speed, % of overlap, scan angle, positioning system (GNSS and IMU) and control points. *a. Excellent (25 points)* *b. Very good (16-24 points)* *c. Good (15 points)* *d. Acceptable (10-14 points)* *e. Poor (1-9points)* *f. Unacceptable (0 points)* **See the evaluation grid below the table.**		**25**	**15**
C4	**Resource allocation** The bidder should clearly outline how it plans to allocate resources (including equipment) to different tasks and the precise role of each of the resources for these tasks. The allocation of resources should be realistic, relevant and appropriate for the project. *a. Excellent (10 points)* *b. Very good (8-9 points)* *c. Good (7 points)* *d. Fair (4-6 points)* *e. Poor (1-3 points)* *f. Unacceptable (0 points)* **See the evaluation grid below the table.**		**10**	**7**

C5	**Quality Assurance and respect of the work schedule** The bidder should clearly describe how it proposes to assess and meet (5 points for each element): a) Data quality requirements (Maximum 5 points). **NOTE:** For LiDAR data, the bidder should minimally present his process to control positional relative accuracy (vertical and horizontal), spatial distribution and regularity, pulse density, pulse classification, and data voids. b) Project timelines (Maximum 5 points) a. Excellent (5 points) b. Very well (4 points) c. Well (3.5 points) d. Insufficient (2 points) e. Poorly (1 points) f. Unacceptable (0 points) **See the evaluation grid at the end of this APPENDIX.**		**10**	**7**
EXPERIENCE				
C6	**Project Manager's Experience** The bidder must describe the project manager's experience and should include his/her resume. a. The project manager has 12 or more years supervisory experience in projects related to aerial photography, aerotriangulation and airborne LiDAR data acquisition (15 points). b. The project manager has 10 or more years supervisory experience, but less than 12 years, in projects related to aerial photography, aerotriangulation and airborne LiDAR data acquisition (12 points). c. The project manager has 5 or more years supervisory experience, but less than 10 years, in projects related to aerial photography, aerotriangulation and airborne LiDAR data acquisition (10 points). d. The project manager has 1 or more years supervisory experience, but less than 5 years, in projects related to aerial photography, aerotriangulation and airborne LiDAR data acquisition (5 points). e. The project manager has less than 1 year supervisory experience in projects related to aerial photography, aerotriangulation and airborne LiDAR data acquisition (0 points).		**10**	**7,5**

C7	**Company experience in the last 5 years** The bidder should specify the number of projects realised related to aerial photography with a resolution equal to or less than 30 cm, aerotriangulation and airborne LiDAR data acquisition within the last five years. The bidder should list the projects, including dates and a brief description. a. 5 projects related to aerial photography at a resolution less than or equal to 30 cm, aerotriangulation and airborne LiDAR data acquisition (10 points). b. 3 projects related to aerial photography at a resolution less than or equal to 30 cm, aerotriangulation airborne LiDAR data acquisition (7 points). c. 1 project related to aerial photography at a resolution less than or equal to 30 cm, aerotriangulation and airborne LiDAR data acquisition (3 points). d. 0 project related to aerial photography at a resolution less than or equal to 30 cm, aerotriangulation and airborne LiDAR data acquisition (0 point).		**10**	**7**
	Total points		**85**	

Grid	
Excellent	*Excellent explanation, thorough and accurate. There are no gaps. The bidder demonstrates ability to respond perfectly to all elements.*
Very good	*Good explanation. There are slight gaps. The bidder shows an acceptable capacity to meet most of the elements.*
Good	*Acceptable and adequate explanation. There are several minor deficiencies.* *The bidder shows a minimum acceptable ability to meet most of the elements.*
Acceptable	*Insufficient explanation. There are considerable gaps. The bidder does not clearly demonstrate an ability to respond to major components.*
Poor	*Weak explanation. There are several important shortcomings. The bidder does not clearly demonstrate a minimum acceptable ability to meet most of the elements.*
Unacceptable	*The information provided does not meet the criteria.*