

January 11, 2022

Dana May  
Project Coordinator  
Northern Energy Capital  
Suite 502, 151 West Hastings Street  
Vancouver, BC V6B 1H4  
Via E-mail: dmay@northernenergycapital.com



**Re: PG22002      Proposal for Geotechnical Investigation & Topographic Survey – Utility Scale Solar Facility, Naujaat, NU**

Dear Ms. May:

Adaptive Baseline Geotechnical Ltd. (ABG) is pleased to provide the following proposal for the above-noted project. It is understood that a geotechnical investigation and topographic survey are required to support the design and construction of a new utility scale solar facility, 1 MW in size, and a 1 MWh battery energy storage system.

## **1.0 Proposed Scope of Services**

---

Based on our understanding of the project requirements, ABG proposes the following scope of services:

- **Compilation and Review of Available Information:** Compile all available information related to climate, site topography, surface drainage features, and subsurface conditions. Carry out a thorough review of the information pertinent to design and construction at the site, to determine areas of interest for the field program.
- **Geotechnical Field Program:** A field engineer from ABG would visit the site and carry out the geotechnical field program as outlined herein. We recommend the field program consist of 1 day of boreholes and 1 day of test pits as outlined herein.
- **Laboratory Testing** – Carry out a laboratory testing program sufficient to properly classify the soils encountered, verify in-situ moisture/ice contents, gradations and pore water salinity.
- **Geotechnical Reporting** – A geotechnical report would be prepared summarizing our observations and findings of the geotechnical site investigation, including but not limited to a borehole location plan, surface features of interest, drainage patterns of interest, subsurface conditions encountered, laboratory test results and recommendations for the design and construction/installation of ground-mounted solar panels and a battery energy storage system.
- **Topographic Survey** – ABG will subcontract Canadrill Ltd. to visit the site and carry out a topographic survey under the direction and guidance of their in-house Canada Land Surveyor.
- **Topographic Data and Plans** – Canadrill will prepare a survey file providing the topographic survey points in a .csv file, as well as cleaned up electronic and PDF topographic survey plan.



## 2.0 Methodology

---

**Geotechnical Investigation:** We propose to drill one day of boreholes throughout the area of interest using Canadrill's local air-rotary drill, estimated at five to ten boreholes total, depending on depth to bedrock. The initial boreholes will be drilled near the corners and center of the proposed area and additional boreholes carried out if time allows and located to further evaluate stratigraphy, bedrock profile, ground temperature profile, in-situ ice-content and soil porewater salinity, in general accordance with CAN/BNQ 2501-500. The boreholes will be continued to depths of 5 to 10 meters below grade (mbg) or into sound bedrock, whichever is shallower.

ABG will also mobilize a local excavator to site and carry out one day of test pits. The purpose of the test pits is to better evaluate near surface soils in support of foundation, parking lot and driveway recommendations, as well as further evaluation of the depth and quality of any near surface rock if encountered. The test pits would be excavated to practical refusal on frozen ground or bedrock, or to the maximum reach of the excavator, whichever is shallower. The test pits would be left open for as long as is safe to evaluate groundwater seepage and inflow rates, prior to being backfilled with excavated materials and lightly compacted with the excavator bucket. The test pits are best carried out in late summer when the active layer is as near as possible to the maximum depth of thaw (August to September).

It is noted that ABG has a bedrock core drill and downhole camera, which we use to further evaluate bedrock quality (weathering, fracturing, infillings and RQD) as much as practical during geotechnical investigations in isolated communities such as this. Currently, our core drill is setup to successfully obtain bedrock core only where the bedrock surface is within approximately 1 to 2 mbg (we are working to improve our capability). Therefore, we plan obtain representative shallow bedrock core (at least 1.5 m of core from each location, if possible) from at least three locations throughout the site if near surface bedrock is encountered. Wherever bedrock is encountered and the borehole stays open at depth, ABG will carry out downhole camera inspection to confirm depth and further assess the bedrock quality as much as possible (representative scale provided by tape measure downhole).

The fieldwork would be supervised on a full-time basis by an engineer from ABG experienced with permafrost soils and air-rotary drilling. The boreholes would be logged continuously as the drilling progresses and stratigraphy estimated based on drill progress and the cuttings returned to the surface. Borehole logging will be in accordance with ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes and ASTM D4083 Standard Practice for Description of Frozen Soils (visual-manual procedure). The borehole locations will be recorded by ABG using a hand-help GPS unit. The elevation of the boreholes will either be determined using available topographic survey data for the site or referenced to depth below current grade.

Geotechnical samples of the overburden will be obtained, logged and stored in moisture tight containers for transport back to a southern laboratory. Geotechnical laboratory testing will include moisture content on all recovered samples with grain size, Atterberg and salinity on select samples. To assure accurate measurement of in-situ moisture contents, the initial weights of samples will be obtained in the field and recorded at the end of each day.



If bedrock core is obtained successfully, we will carry out additional laboratory testing on select samples, including; detailed core logging and unconfined compressive strength tests. Bedrock core sheets will be complete for each borehole where core is successfully retrieved, including detailed photos of the recovered core and these findings will be presented in our report.

One multi-bead thermistor will be installed down a borehole at the site to allow for ground temperature monitoring and evaluation of the ground temperature profile. ABG will obtain ground temperature readings from the installed thermistor from the time of installation until we demobilize from the community in an attempt to obtain stabilized readings.

**Topographic Survey:** The survey will cover the area of interest based on an approximate 5 to 10 m grid spacing and will extend at minimum of 20 meters over the property boundaries to identify onsite drainage and other considerations beyond the property lines. We will be sure to locate the high/low points and densify or spread out the grid spacing to incorporate any existing line features (i.e. top/bottom of slopes, edge of gravel roadway areas, etc.). We will include shots on the property lines within the field survey to facilitate finished grade design. Existing roadway/access will be included in the topo survey across the entire expanse of the lot and extending at least to the existing center-line to accurately design/grade the proposed access road.

The topographical survey plan will cover the lot(s) and the road(s) with both contours at 0.25 meter intervals and surveyed points with their Northing, Easting and Elevation. At a minimum the surveys will indicate the following:

- Rock outcrops;
- All watercourses;
- Culverts and pipes, including sizes and inverts;
- Ditches, including bottom and top of slopes;
- Power and communication poles and guys;
- Road centerline and edges;
- Existing buildings and sheds;
- Additional site features of interest to design and construction.

### **3.0 Corporate Background and Experience**

---

Adaptive Baseline Geotechnical Ltd. (ABG) is a continuation of Canadrill Geotechnical Division (CGD), which was originally founded by Mr. Jason Smith, P.Eng. in cooperation with Mr. Cody Dean, President of Canadrill in April 2017. ABG was established in September 2021 to provide clear separation between Canadrill and Mr. Smith's engineering services; however, the level of cooperation between Canadrill and our team will continue, with Mr. Smith remaining on as the current Vice President of Canadrill. ABG's current business/registration numbers are as follows:



- Canadian Business Number – 778512707NS0001
- Nunavut Registration Number – ET 12177

Since 2004, Mr. Smith has worked as a geotechnical consultant focused on northern construction, permafrost engineering and the challenges and advantages that permafrost soils present for geotechnical engineering and foundation design in general. Over the past 17 years ABG leadership and personnel (prior to being assembled) have proven capable of completing projects of all sizes on time and on budget in even the harshest Arctic conditions. As such, ABG has developed and maintains meaningful relations with the owners, designers, stakeholders and prime contractors currently operating throughout Nunavut.

It is our vision that through these relations we can provide the most efficient and cost-effective geotechnical field programs to owners throughout Nunavut, by sharing costs internally in a manner that has not existed previously. It is our mission to promote increased understanding on the actual effects of climate change and the current state of permafrost throughout the north, as these items are key factors in properly assessing development strategies moving forward. Furthermore, we consider it crucial to develop meaningful adaptations to traditional foundation construction techniques and overall design throughout the north to better address the challenges resulting from ongoing climate change and associated increasing costs to foundations and building construction over time.

For this endeavor, ABG proposes to draw from our wealth of expertise in the field of arctic engineering, particularly geotechnical/permafrost engineering and our long history with northern logistics and foundation installations in Nunavut. Our primary point of contact will be Mr. Jason Smith, with support provided by our in-house team of geotechnical engineers, which is currently comprised of 2 senior engineers, 3 intermediate engineers and 4 junior engineers.

Our geotechnical engineering team is 100% focused on the Arctic and currently provide the following NAPEG registered services:

- Geotechnical investigations/assessments;
- Practical pile design and fully monitored/certified pile installation;
- Subgrade inspection, backfill monitoring, compaction control and certified concrete testing; and
- Aggregate resource studies and crusher control.

## 4.0 Cost Estimate and Schedule

---

The fixed lump sum cost to provide a Geotechnical Investigation and Topographic Survey as outlined herein is as follows:

- |                              |                                  |
|------------------------------|----------------------------------|
| • Geotechnical Investigation | \$49,900.00, plus tax (lump sum) |
| • Topographic Survey         | \$24,900.00, plus tax (lump sum) |

The above costs are broken down into greater detail on the attached Tables 1 and 2.



ABG Proposal No.: PG22002  
Client: Northern Energy Capital  
Project: Geotechnical Investigation & Topographic Survey  
Location: Naujaat, NU

**Geotechnical Investigation Schedule:** We estimate three days to complete the field program. Northern Energy Capital has requested for work to be completed mid to late summer 2022, which should not be an issue if the surface conditions allow good access. The exact timing of the field work will be agreed between both parties, as it may be more appropriate to time our proposed borehole program for late winter 2022, just prior to thaw or early winter 2022, just after initial freeze back of the active layer to ensure good access is available for the drill rig. The test pit program would be most informative in late summer 2022 when the active layer is near the maximum depth of thaw. Preliminary borehole and test pit findings (draft logs and location plan) can be provided within a week of field work completion. The final geotechnical report can be provided within three to four weeks of field work completion, depending on sample shipment and laboratory analyses timelines.

**Topographic Survey Schedule:** We estimate three days to complete the field program and it is envisioned that the field work can be carried out within 1 to 3 weeks of the snow melting off the area of interest (late June to early July). The topographic data and plan can be provided within 2 to 3 weeks of the field work completion.

## 5.0 Closure

---

We thank you for considering Adaptive Baseline Geotechnical Ltd. for your specialized northern engineering services on this project. Please contact the undersigned with any questions or to discuss this opportunity further.

Sincerely,

Jason A. Smith, P.Eng.  
Senior Permafrost & Geotechnical Engineer  
jsmith@adaptivegeotechnical.com

**ATTACHMENTS:** Table 1 – Detailed Cost Breakdown Geotechnical Investigation  
Table 2 – Detailed Cost Breakdown Topographic Survey  
Senior Geotechnical Engineer CV  
Work Authorization Form & General Terms and Conditions



ABG Proposal No.: PG22002  
 Client: Northern Energy Capital  
 Project: Geotechnical Investigation & Topographic Survey  
 Location: Naujaat, NU

**WORK AUTHORIZATION**

<b>Client Name:</b>	Northern Energy Capital		
<b>Address:</b>	Suite 502, 151 West Hastings Street, Vancouver, BC V6B 1H4		
<b>Attention:</b>	Dana May - Project Coordinator		
<b>Contact Email:</b>	dmay@northernenergycapital.com	<b>Client ID Number:</b>	
<b>Contact Phone:</b>	(403) 968-1516	<b>Contact Fax:</b>	
<b>Adaptive Baseline Geotechnical Ltd.</b> ("CONSULTANT") is authorized to provide services at:			
<b>Project Name:</b>	Geotechnical Investigation & Topographic Survey – Utility Scale Solar Facility		
<b>Project Location:</b>	Naujaat, NU		
The services to be performed are limited to: PG22002			
<b>Project Manager:</b>	<b>Jason Smith, P.Eng</b>		
Charges for the services: Geotechnical Investigation = \$49,900.00 plus tax (lump sum); Topographic Survey = \$24,900 plus tax (lump sum)			
Please return <b>signed</b> copy of this form as your authorization for Adaptive Baseline Geotechnical Ltd to proceed.			
<b>TERMS AND CONDITIONS</b>			
Services to be provided in accordance with the Terms and Conditions and Proposal attached.			
<b>Adaptive Baseline Geotechnical Ltd.</b>		<b>Northern Energy Capital</b>	
<i>Signature:</i>		<i>Signature:</i>	
<i>Print Name:</i>	Jason A. Smith, P.Eng.	<i>Print Name:</i>	
<i>Date:</i>	11 - January - 2021	<i>Date:</i>	

All invoices are Payable upon receipt. Interest will be charged at 1.5% per month (18% per annum) on any balance after 30 days.

The CLIENT acknowledges and agrees that Adaptive Baseline Geotechnical Ltd.. may, at its sole discretion, hold back issuance of final reports and Certification of Completion Letters (including Schedule C's) until payment of all past due amounts has been received by Adaptive Baseline Geotechnical Ltd.



Proposal No.:	PG22002
Project Description:	Geotechnical Investigation - Solar Facility
Project Location:	Naujaat, NU
Client:	Northern Energy Capital
Client Address:	Suite 502, 151 West Hastings St. Vancouver, BC
Client Contact:	Dana May, Project Coordinator
Client Email:	dmay@northernenergycapital.com
Proposal Date:	January 11, 2022

**TABLE 1: Breakdown of Cost Estimate - Geotechnical Investigation and Factual Reporting**

<b>1.0 – Geotechnical Personnel</b>	<b>Fees</b>	<b>Units</b>	<b>Qty</b>	<b>SubTotal</b>
Project Management and Technical Direction	\$ 1,495	lump sum	1	\$ 1,495.00
Field Engineer Preparation and Travel	\$ 2,600	per trip	1	\$ 2,600.00
Field Engineer Field Work	\$ 1,200	day	3	\$ 3,600.00
Geotechnical Report Preparation	\$ 7,500	lump sum	1	\$ 7,500.00
<b>Sub-Total of 1.0</b>				<b>\$ 15,195.00</b>
<b>2.0 – Disbursements</b>	<b>Cost</b>	<b>Units</b>	<b>Qty</b>	<b>SubTotal</b>
Drill Rig - Mob/Demob	\$ 12,000	lump sum	1	\$ 12,000.00
Drill Rig - Daily Drill Rate Crew & Equipment	\$ 7,500	lump sum	1	\$ 7,500.00
Excavator/Backhoe - Crew & Equipment	\$ 400	hour	10	\$ 4,000.00
Field Engineer - Flights	\$ 2,500	lump sum	1	\$ 2,500.00
Field Engineer - Accommodations & Meals	\$ 400	day	4	\$ 1,600.00
Field Engineer - Truck Rental	\$ 250	day	3	\$ 750.00
Geotechnical Laboratory Testing Program - moistures, gradations, porewater salinity	\$ 1,500	lump sum	1	\$ 1,500.00
Thermistors	\$ 1,200	each	1	\$ 1,200.00
Freight & Misc. Allowance (sample shipment)	\$ 500	lump sum	1	\$ 500.00
Markup & Contingency	10%	lump sum	1	\$ 3,155.00
<b>Sub-Total of 2.0</b>				<b>\$ 34,705.00</b>
<b>TOTAL (excluding tax)</b>				<b>\$ 49,900.00</b>

- 1) SCOPE OF WORK:** ABG will coordinate borehole locations and requirements with Northern Energy Capital, provide full-time experienced engineering supervision of the drill program onsite, log all borehole findings, obtain representative soil samples, ship samples back to our laboratory, carry out testing to properly classify soils encountered and prepare recommendations and preliminary design for foundation or anchor systems.
- 2) SCHEDULE:** Northern Energy Capital has requested for work to be completed mid to late summer 2022. Exact timing to be agreed between both parties, as it may be more appropriate to time our proposed borehole program for late winter, just prior to thaw or early winter, just after initial freeze back of the active layer to ensure good access is available for the drill rig.



Proposal No.:	PG22002
Project Description:	Topographic Survey - Solar Facility
Project Location:	Naujaat, NU
Client:	Northern Energy Capital
Client Address:	Suite 502, 151 West Hastings St. Vancouver, BC
Client Contact:	Dana May, Project Coordinator
Client Email:	dmay@northernenergycapital.com
Proposal Date:	January 11, 2022

**TABLE 2: Breakdown of Cost Estimate - Topographic Survey**

<b>1.0 – Survey Personnel</b>	<b>Fees</b>	<b>Units</b>	<b>Qty</b>	<b>SubTotal</b>
Project Management, Technical Direction & Calls	\$ 1,550	lump sum	1	\$ 1,550.00
Surveyor - Preparation & Travel	\$ 3,200	round trip	1	\$ 3,200.00
Field Surveyor - Topographic Survey	\$ 1,600	day	3	\$ 4,800.00
Data Analyses	\$ 2,500	lump sum	1	\$ 2,500.00
Topographic Plan Preparation	\$ 6,000	each	1	\$ 6,000.00
<b>Sub-Total of 1.0</b>				<b>\$ 18,050.00</b>
<b>2.0 – Disbursements</b>	<b>Cost</b>	<b>Units</b>	<b>Qty</b>	<b>SubTotal</b>
Field Surveyor - Flights	\$ 2,500	lump sum	1	\$ 2,500.00
Field Surveyor - Accommodations and meals	\$ 400	day	4	\$ 1,600.00
Field Surveyor - Truck	\$ 250	day	3	\$ 750.00
GPS Equipment	\$ 500	day	3	\$ 1,500.00
Frieght & Misc. Allowance	\$ 500	lump sum	1	\$ 500.00
Markup & Contingency	10%			\$ 685.00
<b>Sub-Total of 2.0</b>				<b>\$ 6,850.00</b>
<b>TOTAL (excluding tax)</b>				<b>\$ 24,900.00</b>



## TERMS AND CONDITIONS

1. **AUTHORIZATION TO PROCEED.** The signing of this Agreement by the CLIENT and CONSULTANT will serve as written authorization for CONSULTANT to proceed with the services called for in this Agreement.
2. **EXTENT OF AGREEMENT.** This Agreement, including attachments incorporated herein by reference, represents the entire agreement between CONSULTANT and CLIENT and supersedes all prior negotiations, representations, or agreements, either written or oral. This Agreement may be altered only by written instrument signed by authorized representatives of both CLIENT and CONSULTANT.
3. **CHANGES.** Work beyond the scope of Services or redoing any part of the Services through no fault of CONSULTANT, shall constitute extra work and shall be paid for on a time and material basis in addition to any other payment provided for in this Agreement. In the event, CONSULTANT's work is interrupted due to delays other than delays caused by CONSULTANT, CONSULTANT shall be compensated based on CONSULTANT's current Fee Schedule for the additional labour or other charges associated with maintaining its work force for CLIENT's benefit during the delay, or at the option of the CLIENT, for charges incurred by CONSULTANT for demobilization and subsequent remobilization. If, during the course of performance of this agreement, conditions or circumstances are discovered which were not contemplated by CONSULTANT at the commencement of this Agreement, CONSULTANT shall notify CLIENT in writing of the newly discovered conditions or circumstances and the impact on the Agreement. CLIENT and CONSULTANT agree to negotiate in good faith any changes to the price, terms and conditions, or schedule of this Agreement. Written notice of changes will be provided by CONSULTANT to the CLIENT by Change Order for the CLIENT's approval.
4. **PAYMENT.** CONSULTANT shall invoice CLIENT periodically for the services performed under this Agreement. CLIENT shall pay such invoice upon receipt. Invoices not paid within thirty (30) days of the invoice date shall be subject to a late payment charge of 1.5% per month (18% per year) from the date of billing until paid. The invoice amounts shall be presumed to be correct unless CLIENT notifies CONSULTANT in writing within fourteen (14) days of receipt. Progress billings, when paid, represent acceptance by CLIENT of the invoiced services performed by CONSULTANT. The CLIENT agrees to pay legal fees and costs necessary to collect on past due accounts. If CLIENT fails to pay an invoice when due, CONSULTANT may suspend all services until such invoice is paid in full.
5. **PERMITS, UTILITIES AND ACCESS.** Unless otherwise provided, the CLIENT shall apply for and obtain all required permits and licenses. The CLIENT warrants that it has made all necessary arrangements for right to entry to provide CONSULTANT access to the site for all equipment and personnel at no charge to CONSULTANT. The CLIENT shall also provide CONSULTANT with the location of all underground utilities and structures in the vicinity of the work area, unless otherwise agreed in writing. While CONSULTANT will take all reasonable precautions to minimize any damage to the property, the CLIENT agrees to hold CONSULTANT harmless for any damages to any underground subsurface structures or any damage required for right of entry.
6. **COST ESTIMATES.** If CONSULTANT provides an estimate of probable costs or a budget for the Work that is developed by CONSULTANT during the performance of the Scope of Services, the CLIENT hereby acknowledges that neither CONSULTANT nor CLIENT has control over other professional fees, land development, or other costs related to the entire Project. Therefore CONSULTANT does not warrant or represent the Project costs will not vary from the Project Budget. Neither CONSULTANT nor the CLIENT has control over the cost of labour, materials or equipment, over the contractor's methods of determining bid prices, or over competitive bidding, market, or negotiating conditions. CONSULTANT therefore does not warrant or represent that bids or negotiated prices will not vary from the estimate of probable construction cost.
7. **DISPUTES.** Any dispute arising under this Agreement shall first be resolved by taking the following steps. A successive step shall be taken if the issue is not resolved at the preceding step: 1) by the technical and contractual personnel for each Party, 2) by executive management of each Party, 3) by mediation, 4) by arbitration if both Parties agree or 5) through the court system in the Province of Ontario. .



8. **STANDARD OF CARE.** CONSULTANT shall perform its services in a manner consistent with the standard of care and skill ordinarily exercised by members of the profession practicing under similar conditions in the geographic vicinity and at the time the services are performed. This Agreement neither makes nor intends a warranty or guarantee, express or implied.
9. **INDEMNITY.** Notwithstanding any other provision of this Agreement, the CLIENT agrees to indemnify, defend and hold harmless CONSULTANT, its officers, directors, employees and subconsultants (collectively "CONSULTANT") against all damages, liabilities or costs including reasonable legal fees and defense costs arising out of or in any way connected with this Project or the performance of the services under this Agreement, excepting those damages, liabilities or costs attributable to the negligent acts or omissions by CONSULTANT.
10. **LIMITATION OF LIABILITY.** Notwithstanding any other provision of this Agreement, the total liability of CONSULTANT, its officers, directors and employees, to the CLIENT and anyone claiming by or through the CLIENT, for any and all claims, losses, costs or damages from any cause in any way related to the project or the Agreement, shall not exceed the fees paid to the CONSULTANT. CONSULTANT shall not be liable for any incidental, indirect or consequential damages arising out of or connected in any way to the Project or this Agreement.
11. **RESPONSIBILITY.** CONSULTANT is not responsible for the completion or quality of work that is dependent upon information provided by or services performed by the CLIENT or third parties not under the direct control of CONSULTANT. CONSULTANT is not responsible for the acts or omissions or for any damages resulting from the actions of such parties. CONSULTANT does not assert control or assume responsibility for a Contractor not retained directly by CONSULTANT or over a CLIENT's employees, work site, work methods or property.
12. **OWNERSHIP AND CONFIDENTIALITY.** Unless otherwise agreed to by the parties in writing, all documents (including reports, drawings and specifications, and electronic or digital copies) required to be prepared by or on behalf of CONSULTANT in connection with the Services will become the property of the CLIENT upon full and final payment of the Compensation. The copyright and all intellectual property in the documents and designs shall be retained by CONSULTANT. CONSULTANT hereby grants to CLIENT a non-exclusive right and royalty-free license to use, disclose and reproduce the documents solely for the purpose of the project. CLIENT will not distribute or convey CONSULTANT's reports or recommendations to any person or organization other than those identified in the project description without CONSULTANT's written authorization. CLIENT releases CONSULTANT from liability and agrees to defend, indemnify, protect and hold harmless CONSULTANT from any and all claims, liability, damages or expenses arising, in whole or in part, from unauthorized use. Information provided by either party with respect to the project's design, supplies, management, costs, description or other pertinent information are confidential. The parties agree not to disclose such information to third parties unless necessary to the project's execution or already a matter of public knowledge.
13. **FIELD REPRESENTATION.** The presence of CONSULTANT's or its subcontractors' field personnel, may be required for the purpose of providing project administration, assessment, observation and/or field testing. Should a contractor(s) not retained by CONSULTANT be involved in the project, CLIENT will advise such contractor(s) that CONSULTANT's services do not include supervision or direction of the means, methods or actual work of the contractor(s), its employees or agents. CLIENT will also inform contractor that the presence of CONSULTANT's field representative for project administration, assessment, observation or testing, will not relieve the Contractor of its responsibilities for performing the work in accordance with applicable regulations, or in accordance with project plans and specifications. If a contractor is involved on the project, CLIENT agrees CONSULTANT shall not be responsible for working conditions on the job site including the safety and security of persons or property.
14. **ENVIRONMENTAL CONDITIONS.** CLIENT shall have responsibility and liability for the environmental conditions on the site. CLIENT shall be responsible for and promptly pay for the removal and lawful disposal of contaminants, hazardous materials, asbestos, samples and cuttings unless otherwise agreed in writing. The discovery of such conditions on the site shall result in the issuance of a Change Order to the extent that the services of CONSULTANT are impacted.



ABG Proposal No.: PG22002  
Client: Northern Energy Capital  
Project: Geotechnical Investigation & Topographic Survey  
Location: Naujaat, NU

15. **TERMINATION.** This Agreement may be terminated by either party upon ten (10) days written notice to the other. In the event of termination, CLIENT shall pay for all charges for work performed and demobilization by CONSULTANT. The limitation of liability and indemnity obligations of this Agreement shall be binding notwithstanding any termination of this Agreement.
16. **SOLICITATION.** Neither Party will, directly or indirectly, for a period of two years from the expiration date of this Agreement, solicit for employment or any other engagement the services of any person who is now employed by the other Party or any affiliate, except in the course of general recruitment efforts.
17. **ASSIGNMENT.** Neither CLIENT nor CONSULTANT shall assign its interest in this Agreement without the written consent of the other.
18. **GOVERNING LAW.** This Agreement is governed by the laws of the Province of Ontario.

# Jason Smith, P. Eng.

## Senior Permafrost & Geotechnical Engineer

### AREAS OF EXPERTISE

- ▶ Permafrost Engineering
- ▶ Geotechnical Engineering
- ▶ Construction Monitoring
- ▶ Project Management
- ▶ Northern Logistics



**Years of Experience: 17**

### Education

Bachelor of Engineering (Civil),  
Dalhousie University, Halifax,  
Nova Scotia, 2004

Permafrost Engineering Short-  
Course, University of Alberta,  
Calgary, Alberta, 2007

Geostudio Software Workshop,  
Banff, Alberta, 2010

### PROFESSIONAL SUMMARY

Mr. Smith is a geotechnical engineer with over seventeen years of experience in consulting. Since 2004, his career has been focused on northern construction, permafrost engineering and the challenges and advantages that permafrost soils present for geotechnical engineering and foundation design in general. To date, he has personally carried out and/or managed 100's of geotechnical investigations and 1,000's of pile installations throughout the Northwest Territories and Nunavut.

Throughout his career, Jason has been involved in geotechnical investigations and construction monitoring projects for mine site infrastructure at Snap Lake Diamond Mine and Diavik Diamond Mine, NT, as well as projects at Voisey's Bay Mine and Bloom Lake Mine, NL; borrow source investigations for numerous North Warning Sites and communities throughout NT and NU; borrow source delineation and construction QC for DEW Line site decommissionings; geotechnical assessments and investigations of existing buildings in distress throughout NT, NU and NL, and various other geotechnical investigations and/or construction monitoring programs for power plants, sewage treatment plants, industrial buildings, process plants, dams, tank farms, warehouses and subdivisions throughout the Northwest Territories, Nunavut, Ontario and Atlantic Canada.

Mr. Smith has extensive experience with northern logistics, safety, permafrost engineering, project management, site investigations, construction monitoring, analysis of field and lab data, shallow and deep foundation design, anchor design, slope stability analyses and report preparation.

### EMPLOYMENT HISTORY

- ▶ Adaptive Baseline Geotechnical Limited, Founder & President, Elmsdale, NS, 2021-CURRENT
- ▶ Canadrill Limited, Geotechnical Division Founder & Vice President, Iqaluit, NU, 2017-CURRENT.
- ▶ Exp Services Limited, Senior Geotechnical Engineer & Northern Lead, Ottawa, ON, 2013-2017
- ▶ Stantec Consulting Inc., Senior Geotechnical Engineer & Northern Lead, Dartmouth, NS, 2009-2013
- ▶ EBA Engineering Consultants Limited, Geotechnical Engineer, Yellowknife, NT, 2005-2009.
- ▶ MGI Limited, Geotechnical Engineer, Dartmouth, NS, Feb 2005- Nov 2005.
- ▶ EBA Engineering Consultants Limited, Geotechnical Engineer, Nanaimo, BC, May 2004-Sep 2004
- ▶ Dexter Construction, Field Engineer, Bedford, NS, Sep 2003-Jan 2004
- ▶ Halifax Regional Water Commission, Field Engineer, Halifax, NS, Apr 2003-Sep 2003

### Professional Qualifications

Professional Engineer #L2106,  
Northwest Territories and  
Nunavut Association of  
Professional Engineers and  
Geoscientists

Professional Engineer,  
Association of Professional  
Engineers of Yukon

PWGSG Security Clearance,  
Reliability Status No. 95891952  
(exp. April 1, 2026)

### Location

Iqaluit, NU / Halifax, NS



---

## **PROJECT EXPERIENCE**

### **Permafrost & Geotechnical/Canadrill**

- ▶ Geotechnical Desktop Assessment and Pile Monitoring, NHC Units, 7 Communities, NU (2021)
- ▶ Geotechnical Desktop Assessment and Pile Monitoring, NHC Units, 7 Communities, NU (2020)
- ▶ Geotechnical Desktop Assessment and Pile Monitoring, NHC Housing, 10 Communities, NU (2019)
- ▶ Geotechnical Desktop Assessment and Pile Installations, NHC Housing, 13 Communities, NU (2018)
- ▶ Geotechnical Desktop Assessment and Pile Monitoring, 7 Residential Houses, Iqaluit, NU (2020)
- ▶ Geotechnical Desktop Assessment and Pile Monitoring, 5 Apartment Buildings, Iqaluit, NU (2020)
- ▶ Geotechnical Desktop Assessment and Pile Monitoring, 18 Plexes, Iqaluit, NU (2019)
- ▶ Geotechnical Desktop Assessment and Pile Monitoring, 5 Plex Sites, Iqaluit, NU (2019)
- ▶ Geotechnical Desktop Assessment and Pile Monitoring, 4 Residential Houses, Iqaluit, NU (2021)
- ▶ Geotechnical Investigation, Heritage Building Movement Issues, Baker Lake, NU (2021)
- ▶ Geotechnical Investigation, New Bulk Fuel Storage Facility, Arviat, NU (2021)
- ▶ Geotechnical Investigation, New Sewage Lagoon, Naujaat, NU (2021)
- ▶ Pile Monitoring, New RCMP Headquarters, Pangnirtung, NU (2021)
- ▶ Geotechnical Assessment and Stabilization of Soft Subgrade Issues, QEC Headquarters, Baker Lake, NU (2021)
- ▶ Geotechnical Investigation, Area 5, Phase 3B Residential Subdivision, Rankin Inlet, NU (2021)
- ▶ Geotechnical Investigation (Phase 2 – On Ice), New Small Craft Harbour and Port, Clyde River, NU (2021)
- ▶ Geotechnical Investigation, New Sewage Lagoon, Sanikiluaq, NU (2021)
- ▶ Geotechnical Assessment and Construction Monitoring, Heat Distribution Utilidor, Sanikiluaq, NU (2021)
- ▶ Geotechnical Investigation, New Power Plant, Kugluktuk, NU (2020)
- ▶ Geotechnical Investigation (Phase 1 – On Land), New Small Craft Harbour and Port, Clyde River, NU (2020)
- ▶ Geotechnical Investigation, New Government Building, 3 Potential Sites, Clyde River, NU (2020)
- ▶ Geotechnical Investigation, Water Storage Tank Farm Settlement Issues, Grise Fiord, NU (2020)
- ▶ Geotechnical Investigation, Pool Building Settlement Issues, Taloyoak, NU (2020)
- ▶ Geotechnical Investigation, New QEC Facility, Taloyoak, NU (2020)
- ▶ Geotechnical Investigation, New QEC Facility, Gjoa Haven, NU (2020)
- ▶ Geotechnical Investigation, New QEC Facility, Whale Cove, NU (2020)
- ▶ Geotechnical Investigation, New Warehouse, Baker Lake, NU (2020)
- ▶ Desktop Assessment and Geotechnical Investigation, New Mooring Bollards, Pangnirtung, NU (2020)
- ▶ Geotechnical Investigation, Airport Taxiway/Apron Settlement Issues, Iqaluit, NU (2020)



- ▶ Geotechnical Investigation, New Wellness Center, Iqaluit, NU (2020)
- ▶ Geotechnical Investigation, New Government Building, 2 Potential Sites, Iqaluit, NU (2020)
- ▶ Geotechnical Investigation, New Government Building, 3 Potential Sites, Iqaluit, NU (2020)
- ▶ Geotechnical Investigation, New Fire Training Building, Iqaluit, NU (2020)
- ▶ Geotechnical Investigation, New Warehouses, 3 Potential Sites, Iqaluit, NU (2020)
- ▶ Geotechnical Investigation, New Canadian North Storage Facility, Iqaluit, NU (2020)
- ▶ Geotechnical Investigation, French School Expansion, Iqaluit, NU (2020)
- ▶ Geotechnical Desktop Assessment, New Warehouses, 3 Communities, NU (2020)
- ▶ Geotechnical Desktop Assessment and Pile Monitoring, Mooring Bollards, 4 Communities, NU (2020)
- ▶ Geotechnical Desktop Assessment, Warehouses, 3 Communities, NU (2020)
- ▶ Construction Monitoring and QC, New Power Plant, Arctic Bay, NU (2020)
- ▶ Construction Monitoring and QC, Sewer Line Replacement, Iqaluit, NU (2020)
- ▶ Geotechnical Investigation, New Sewage Lagoon, Kimmirut, NU (2019)
- ▶ Geotechnical Investigation, Iqaluit Airport Taxiway, Iqaluit, NU (2019)
- ▶ Geotechnical Investigation, Solid Waste Facility, Resolute, Igloodik, Hall Beach, Rankin Inlet, Sanikiluaq, NU (2019)
- ▶ Geotechnical Investigation, New Wildlife Office, Arctic Bay, NU (2019)
- ▶ Geotechnical Investigation, New QEC Facility, Whale Cove, NU (2019)
- ▶ Geotechnical Investigation, Geraldine Dam Safety Assessment, Iqaluit, NU (2019)
- ▶ Geotechnical Investigation, Hamlet Garage Expansion, Rankin Inlet, NU (2019)
- ▶ Geotechnical Investigation and Pile Monitoring, Apartment Building, Iqaluit, NU (2019)
- ▶ Geotechnical Desktop Assessment and Pile Monitoring, Warehouse, Iqaluit, NU (2019)
- ▶ Geotechnical Desktop Assessment and Pile Monitoring, 8 Plex, Cambridge Bay, NU (2019)
- ▶ Geotechnical Investigation, Office Building, Baker Lake, NU (2019)
- ▶ Geotechnical Desktop Assessment and Pile Monitoring, Campus Building, Cambridge Bay, NU (2019)
- ▶ Geotechnical Investigation and Pile Monitoring, Office Building, Iqaluit, NU (2019)
- ▶ Geotechnical Investigation and Pile Monitoring, Jehovahs Witness Building, Iqaluit, NU (2019)
- ▶ Geotechnical Desktop Assessment and Pile Monitoring, Hotel Expansion, Pond Inlet, NU (2019)
- ▶ Supervision of Adfreeze Pile Installations, Cell Tower Foundations, Arctic Bay and Qikiqtarjuaq, NU (2019)
- ▶ Supervision of Adfreeze Pile Installations, Cell Tower Anchors, Iqaluit, NU (2019)
- ▶ Supervision of Adfreeze Pile Installations, New Ramp, Iqaluit, NU (2019)
- ▶ Construction Monitoring and QC, Buried Piping for Heat Exchanger System, Iqaluit, NU (2018)
- ▶ Aggregate Resource Study, LAB-2, NL (2018)



- ▶ Aggregate Resource Study, FOX-3, NU (2018)
- ▶ Construction Monitoring and QC, Garage Expansion, Gjoa Haven, NU (2018)
- ▶ Construction Monitoring and QC, Water Board Building, Gjoa Haven, NU (2018)
- ▶ Geotechnical Investigation, New Marine Bollard, Gjoa Haven, NU (2018)
- ▶ Construction Monitoring and QC, Fuel Tank Farm Upgrade, Iqaluit, NU (2018)
- ▶ Construction Monitoring and QC, Spaceframe Pad Placement, Cambridge Bay and Gjoa Haven, NU (2018)
- ▶ Geotechnical Investigation, Garage Expansion, Cape Dorset, NU (2018)
- ▶ Geotechnical Desktop Assessment, New Multi-Use Building, Rankin Inlet, NU (2018)
- ▶ Supervision of Grouted or Adfreeze Pile Installations, Satellite Antennas, 16 Communities, NU (2018)
- ▶ Supervision of Grouted or Adfreeze Pile Installations, Cell Towers, 17 Communities, NU (2018)
- ▶ Supervision of Grouted Pile Installations, New Office Building, Inuvik, NT (2018)
- ▶ Geotechnical Investigation, New Warehouse, Iqaluit, NU (2018)
- ▶ Geotechnical Desktop Assessment, New Community Learning Center, Grise Fiord, NU (2018)
- ▶ Geotechnical Desktop Assessment, New NHC Housing, 13 communities, NU (2018)
- ▶ Geotechnical Desktop Assessment, New Satellite Antenna, 16 Communities, NU (2018)
- ▶ Geotechnical Desktop Assessment, New Cell Tower, 17 Communities, NU (2017)
- ▶ Supervision of Rock Socket Pile Installations, New 5-Plex Units, Hall Beach, NU (2017)
- ▶ Construction Monitoring, Town Garage Slab Upgrade, Baker Lake, NU (2017)
- ▶ Construction Monitoring, Granular Pad Placement, Gjoa Haven, Taloyoak & Cambridge Bay, NU (2017)
- ▶ Desktop Geotechnical Assessment, Satellite Antenna Sites, Pond Inlet & Iqaluit, NU (2017)
- ▶ Construction Monitoring, LHO Office and Maintenance Complex, Baker Lake, NU (2017)
- ▶ Adfreeze Pile Installation Monitoring, Arctic Co-Op Retail Store, Pangnirtung, NU (2017)
- ▶ Desktop Geotechnical Assessment, Telecom Building, Iqaluit, NU (2017)
- ▶ Rock Socket Pile Installation Monitoring and Construction Monitoring, North Mart Addition, Iqaluit, NU (2017)
- ▶ Desktop Geotechnical Assessment, New Power Plant, Grise Fiord, NU (2017)
- ▶ Desktop Geotechnical Assessment, New NHC Garage, Gjoa Haven, NU (2017)
- ▶ Construction Monitoring, Liquor Warehouse Addition, Iqaluit, NU (2017)
- ▶ Rock Socket Pile Installation Monitoring, LHO Office and Maintenance Complex, Baker Lake, NU (2017)
- ▶ Desktop Geotechnical Assessment, Arctic Co-Op Retail Store, Pangnirtung, NU (2017)
- ▶ Desktop Geotechnical Assessment, LEG Building Generator Room Addition, Iqaluit, NU (2017)



---

**Permafrost & Geotechnical/exp Services**

- ▶ Geotechnical Investigation, Water Reservoir and Treatment Plant Expansion, Arviat, NU (2016)
- ▶ Geotechnical Investigation and Assessment, First Air Hanger Settlement Issues, Iqaluit, NU (2016)
- ▶ Aggregate Resource Investigation, North Warning Site, BAF-3, NU (2016)
- ▶ Geotechnical Investigation, Arena, Rankin Inlet, NU (2016)
- ▶ Geotechnical Investigation and Assessment, 900 Block Retaining Wall Replacement, Iqaluit, NU (2016)
- ▶ Geotechnical Investigation, LHO Office and Maintenance Garage, Baker Lake, NU (2016)
- ▶ Geotechnical Investigation, Qikiqtani Healing Facility, Iqaluit, NU (2016)
- ▶ Geotechnical Investigation, Water Storage Tank and Treatment Plant Expansion, Sanikiluaq, NU (2016)
- ▶ Geotechnical Investigation, New Communication Tower, Iqaluit, NU (2016)
- ▶ Geotechnical Desktop Study, Mooring Bollards, Pond Inlet, NU (2016)
- ▶ Geotechnical Investigation, APEX Subdivision Phase B and Jaomie Court, Iqaluit, NU (2016)
- ▶ Geotechnical Investigation, New Tower, Inuvik, NT (2016)
- ▶ Geotechnical Desktop Study, New Communication Tower, Cape Dorset, NU (2016)
- ▶ Geotechnical Investigation, New Power Plant Module, Cambridge Bay, NU (2016)
- ▶ Geotechnical Desktop Study, New Communication Tower, Kugluktuk, NU (2016)
- ▶ Geotechnical Investigation, New Hotel, Iqaluit, NU (2016)
- ▶ Geotechnical Investigation, New Liquor Depot, Iqaluit, NU (2016)
- ▶ Geotechnical Investigation, New Office Building, Iqaluit, NU (2016)
- ▶ Construction Monitoring and QC, RCMP Building, Arviat, NU (2016)
- ▶ Construction Monitoring and QC, Sewage Lagoon Expansion, Igloolik, NU (2016)
- ▶ Supervision of Rock Socket Pile Installation, PCSP, Resolute Bay, NU (2016)
- ▶ Construction Monitoring and QC, Sewage Lagoon Expansion, Whale Cove, NU (2016)
- ▶ Supervision of Rock Socket Pile Installation, Water Truck Fill Station, Naujaat, NU (2016)
- ▶ Supervision of Rock Socket Pile Installation, Cultural Center, Cape Dorset, NU (2016)
- ▶ Aggregate Production Monitoring and QC, Meladine Mine, Rankin Inlet, NU (2016)
- ▶ Construction Monitoring and QC, CHARS Project, Cambridge Bay, NU (2016)
- ▶ Construction Monitoring QA, Water Storage Building, Alert, NU (2016)
- ▶ Supervision of Rock Socket Pile Installation, Kivalliq Visit Center, Rankin Inlet, NU (2016)
- ▶ Supervision of Adfreeze Pile Installation, RCMP DuPlex, Pangnirtung, NU (2015)
- ▶ Supervision of Adfreeze Pile Installation, Water Treatment Plant, Cambridge Bay, NU (2015)



- ▶ Supervision of Rock Socket Pile Installation, 5-Plex, Sanikiluaq, NU (2015)
- ▶ Supervision of Rock Socket Pile Installation, 5-Plex, Whale Cove, NU (2015)
- ▶ Geotechnical Investigation, Northmart Renovation and Additions, Iqaluit, NU (2015)
- ▶ Geotechnical Investigation, New Sewage Lagoon, Taloyoak, NU (2015)
- ▶ Geotechnical Desktop Study, RCMP Communication Tower, Iqaluit, NU (2015)
- ▶ Geotechnical Desktop Study, RCMP Duplex, Pangnirtung, NU (2015)
- ▶ Geotechnical Investigation, Northwest Granular Deposit Assessment, Iqaluit, NU. (2015)
- ▶ Geotechnical Assessment, Temporary Dam, Iqaluit, NU (2015)
- ▶ Supervision of Rock Socket Pile Installation, CHARs Project, Cambridge Bay, NU (2014)
- ▶ Supervision of Rock Socket Pile Installation, 10-Plex, Repulse Bay, NU (2014)
- ▶ Supervision of Rock Socket Pile Installation, 5-Plex, Igloolik, NU (2014)
- ▶ Supervision of Rock Socket Pile Installation, 2-Plex, Chesterfield Inlet, NU (2014)
- ▶ Supervision of Rock Socket Pile Installation, 2-Plex, Whale Cove, NU (2014)
- ▶ Supervision of Adfreeze Pile Installation, 2-Plex, Arviat, NU (2014)
- ▶ Supervision of Rock Socket Pile Installation, Aquatic Center, Iqaluit, NU (2014)
- ▶ Geotechnical Investigation, Hall Beach Sewage Lagoon Upgrades, Hall Beach, NU. (2014)
- ▶ Geotechnical Investigation, Water Storage Building Stabilization, Alert, NU. (2014)
- ▶ Geotechnical Investigation, Community Wide Hazard Assessment in Sporadic Discontinuous Permafrost, Nain, NL. (2014)
- ▶ Geotechnical Desktop Study, New Hotel, Clyde River, NU (2014)
- ▶ Geotechnical Engineering Services, Housing Risk Assessment to evaluate issues with existing homes and develop/monitor prototype home in sporadic discontinuous permafrost, Makkovik, Hopedale and Nain, NL. (2014)

#### **Permafrost & Geotechnical/Stantec**

- ▶ Geotechnical Investigations, Numerous Buildings, Highways and Bridges, Various Locations, NS (2009 – 2013)
- ▶ Construction Monitoring, Numerous Buildings, Highways and Bridges, Various Locations, NS (2009 – 2013)
- ▶ Geotechnical Investigation, Sewage Lagoon, Deline, NT (2013)
- ▶ Geotechnical Investigation, Torngasok Cultural Center, Nain, NL (2013)
- ▶ Geotechnical Desktop Study, Communications Tower, Near Fort Simpson, T (2012)
- ▶ Geotechnical Investigation, Port Facility Upgrade, Nanisivik Naval Facility, Baffin Island, NU (2012)
- ▶ Construction Monitoring, Fuel Tank Farm, FOX-3, Baffin Island, NU (2012)
- ▶ Geotechnical Desktop Study, Sydney Tar Ponds Remediation Project, Cape Breton, NS (2012)

**Jason Smith, P.Eng.**  
**Senior Permafrost & Geotechnical Engineer**  
**Founder and President**



- 
- ▶ Construction Monitoring of Micro-Piles, West River Bridge, Antigonish, NS (2011)
  - ▶ Deep Monitoring Well Installations for Open Pit Expansion, Voisey's Bay Nickel Mine, NL (2011)
  - ▶ Construction Monitoring, New Dolphin/Mooring Bollard Construction, Mulgrave, NS (2011)
  - ▶ Geotechnical Investigation, Highway 125 Twinning Project, Sydney, NS (2009/2010)
  - ▶ Geotechnical Investigation and Construction QC, Civic Center, Truro, NS (2009/2012)

**Permafrost & Geotechnical/EBA Engineering**

- ▶ Geotechnical Investigations, Numerous Federal/Commercial Buildings, Various Communities, NT (2005-2009)
- ▶ Construction Monitoring, Numerous Federal/Commercial Buildings, Various Communities, NT (2005-2009)
- ▶ Construction Monitoring and Borrow Source Evaluation, Landfills, FOX-2, Baffin Island, NU (2009)
- ▶ Construction Monitoring and Borrow Source Evaluation, Landfills, Cape Christian, Baffin Island, NU (2009)
- ▶ Geotechnical Investigations and Construction Monitoring, Diavik Diamond Mine, NT, (2007-2009)
- ▶ Geotechnical Investigations and Construction Monitoring, Snap Lake Diamond Mine, NT (2005-2007)