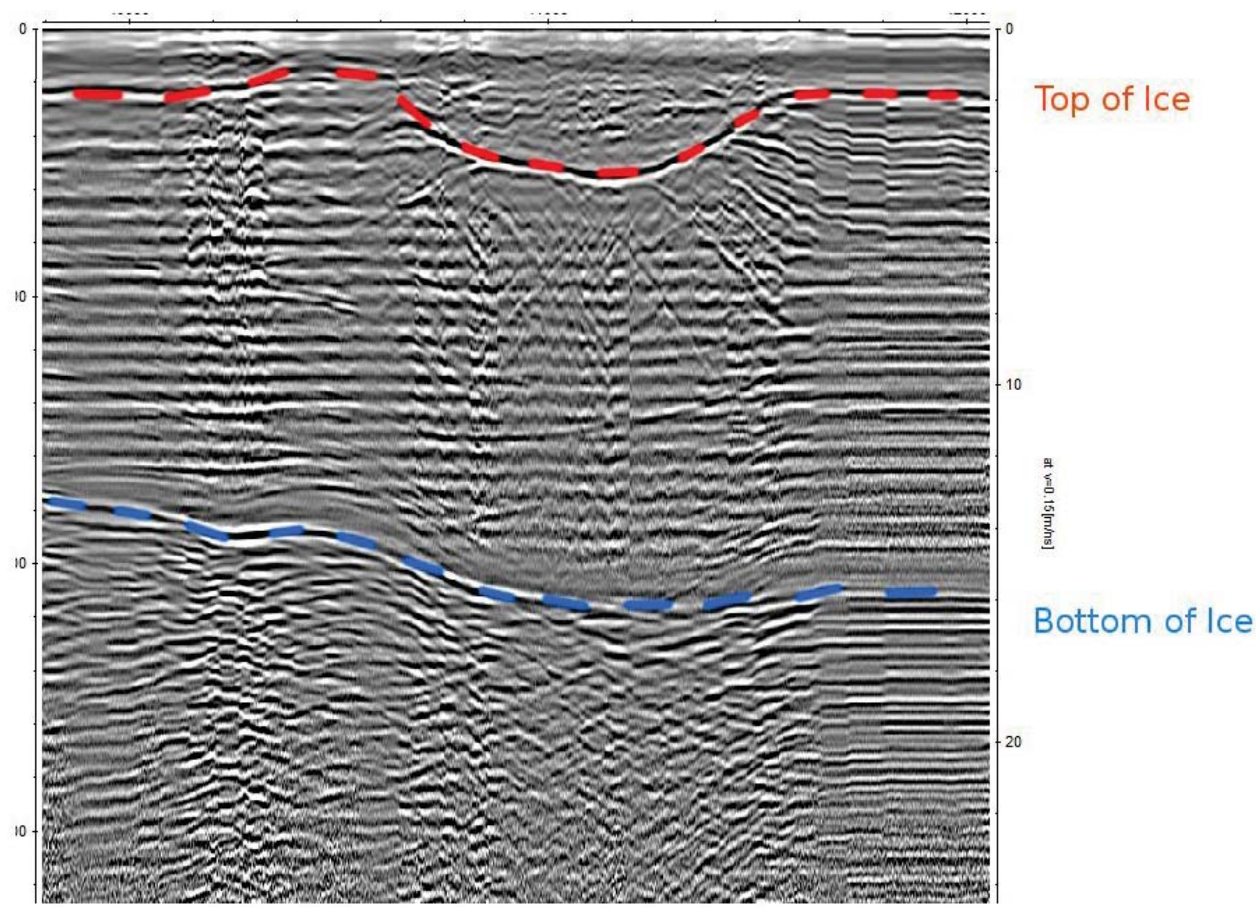


Figure 2: Interpreted georadar image showing a typical ice body

4 CONCLUSIONS

A geophysical investigation involving Georadar was carried out at the Mary River Project, Baffin Island, Nunavut.

Subsurface ice mapping was carried out at nine sites along the proposed rail alignment. Results of the survey are presented in Drawings GPR17 – MILNE INLET, GPR17 –KM19, GPR17 –KM20, GPR17 –KM39.6, GPR17 –KM49, GPR17 –KM82.2, GPR17 –KM97, GPR17 –KM100.1, GPR17 –KM109. Ice was only found in Km 49, seen in drawing GPR17-KM49.

Interpretation of the geophysical data has been performed by Mauritz van Zyl. This report has been written by Milan Situm, P.Geo.

Milan Situm, P.Geo.
Manager

APPENDIX A

Drawings GPR17 – MILNE INLET,

GPR17 –KM19,

GPR17 –KM20,

GPR17 –KM39.6,

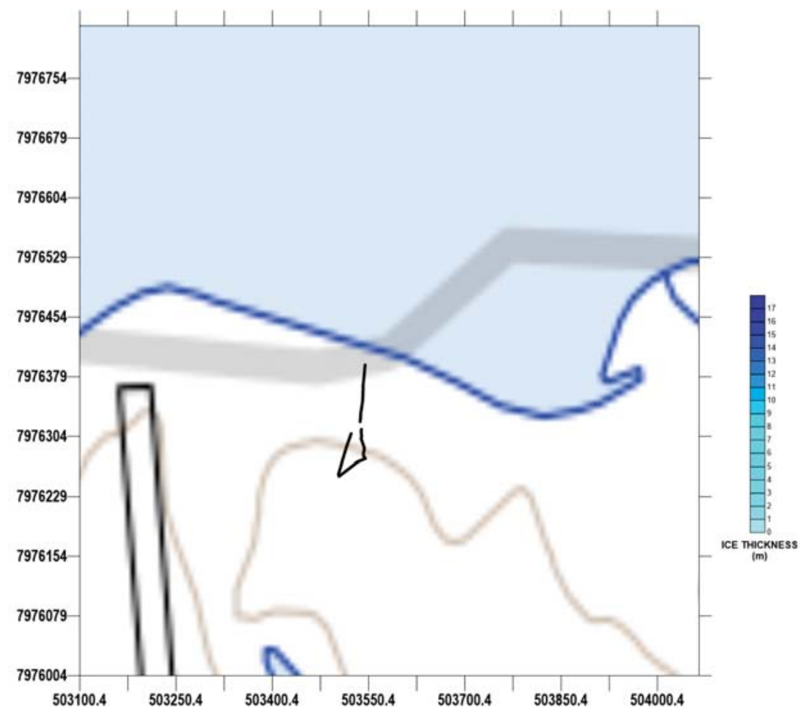
GPR17 –KM49, Ice was only found in Km 49, seen in drawing GPR17-KM49.

GPR17 –KM82.2,

GPR17 –KM97,

GPR17 –KM100.1,

GPR17 –KM109.



LEGEND

- EXISTING ROAD ALIGNMENT
- PROPOSED RAILWAY ALIGNMENT
- BH17-C002 GEOTECHNICAL BOREHOLE
- GROUND RADAR SURVEY LINE

No	NOTES
1	THE RADAR SURVEY WAS EXECUTED BY GEOPHYSICS GPR INTERNATIONAL INC. NOVEMBER 2017
2	COORDINATE SYSTEM: WGS84 UTM ZONE 17W
3	REFER TO FULL REPORT FOR DISCUSSION OF METHODOLOGIES, RESULTS AND LIMITATIONS
4	BOREHOLE DATA PROVIDED BY THE CLIENT FOR REFERENCE PURPOSES
5	
6	

No	DATE	MODIFICATIONS	GPR

SCEAU PROFESSIONNEL / PROFESSIONAL SEAL

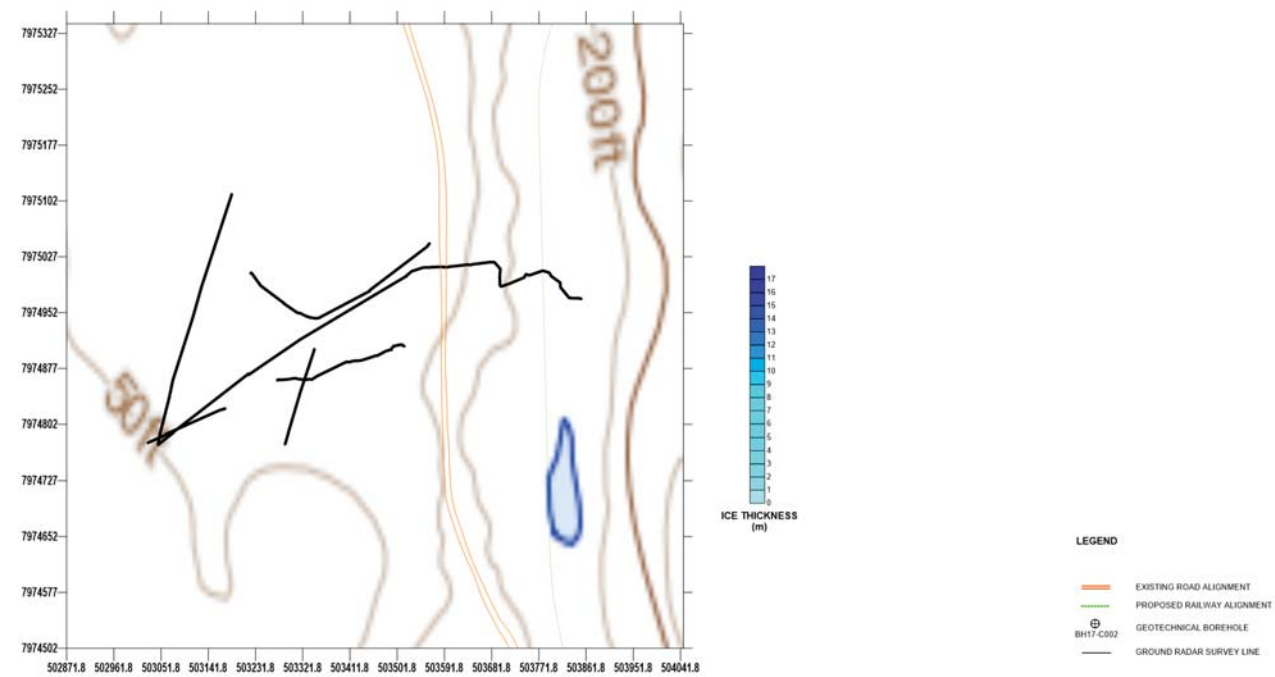
GEOPHYSICS GPR INTERNATIONAL INC.

DESSINÉ PAR / DRAWN BY	M. Van Zyl
VÉRIFIÉ PAR / CHECKED BY	
APPROUVÉ PAR / APPROVED BY	M.Sburn, P. Geo
# CONTRAT / CONTRACT #	T17001b
ÉCHELLE / SCALE	AS SHOWN
# DESSIN / DRAWING #	T17001b-A2

CLIENT: **HATCH**

PROJET / PROJECT: **BAFFINLAND EXPANSION**

TITRE / TITLE: **GROUND RADAR SURVEY GPR17-MILNE INLET**



No	NOTES
1	THE RADAR SURVEY WAS EXECUTED BY GEOPHYSICS GPR INTERNATIONAL INC. NOVEMBER 2017
2	COORDINATE SYSTEM: WGS84 UTM ZONE 17W
3	REFER TO FULL REPORT FOR DISCUSSION OF METHODOLOGIES, RESULTS AND LIMITATIONS
4	BOREHOLE DATA PROVIDED BY THE CLIENT FOR REFERENCE PURPOSES
5	
6	

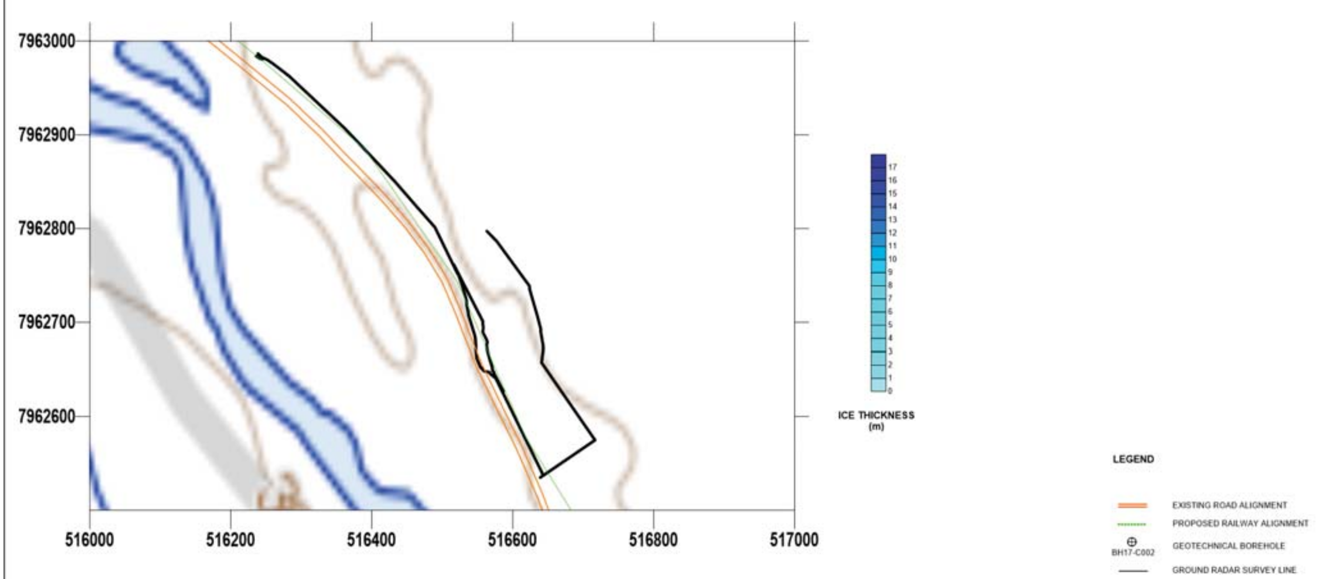
GEOPHYSICS GPR INTERNATIONAL INC.

DESSINÉ PAR / DRAWN BY	M. Van Zyl
VÉRIFIÉ PAR / CHECKED BY	
APPROUVÉ PAR / APPROVED BY	M.Silum, P. Geo
# CONTRAT / CONTRACT #	T17001b
ÉCHELLE / SCALE	AS SHOWN
# DESSIN / DRAWING #	T17001b-A2

CLIENT: HATCH

PROJET / PROJECT: BAFFINLAND EXPANSION

TITRE / TITLE: GROUND RADAR SURVEY GPR17-MILNE INLET



No	NOTES
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2	COORDINATE SYSTEM: WGS84 UTM ZONE 17W
3	REFER TO FULL REPORT FOR DISCUSSION OF METHODOLOGIES, RESULTS AND LIMITATIONS
4	BOREHOLE DATA PROVIDED BY THE CLIENT FOR REFERENCE PURPOSES
5	
6	

GEOPHYSICS GPR INTERNATIONAL INC.

M. Van Zyl

M.Sloum, P. Geo

T17001b

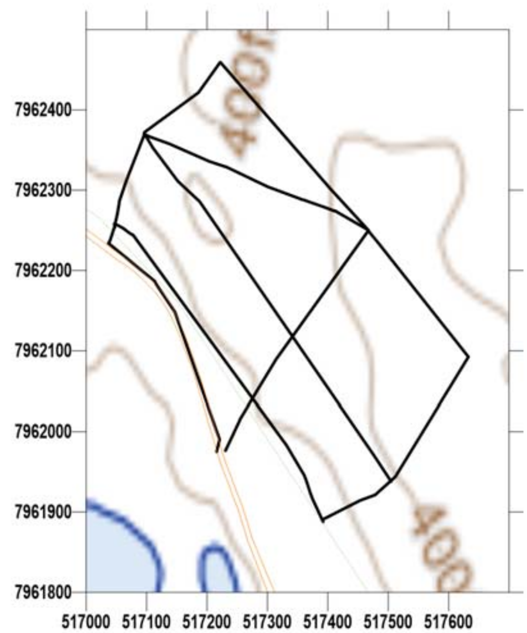
AS SHOWN

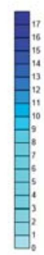
T17001b-A2

CLIENT: HATCH

PROJET / PROJECT: BAFFINLAND EXPANSION

TITRE / TITLE: GROUND RADAR SURVEY GPR17-KM19





ICE THICKNESS
(m)

LEGEND

- EXISTING ROAD ALIGNMENT
- PROPOSED RAILWAY ALIGNMENT
- BH17-C002 GEOTECHNICAL BOREHOLE
- GROUND RADAR SURVEY LINE

No	NOTES
1	THE RADAR SURVEY WAS EXECUTED BY GEOPHYSICS GPR INTERNATIONAL INC. NOVEMBER 2017
2	COORDINATE SYSTEM: WGS84 UTM ZONE 17W
3	REFER TO FULL REPORT FOR DISCUSSION OF METHODOLOGIES, RESULTS AND LIMITATIONS
4	BOREHOLE DATA PROVIDED BY THE CLIENT FOR REFERENCE PURPOSES
5	
6	

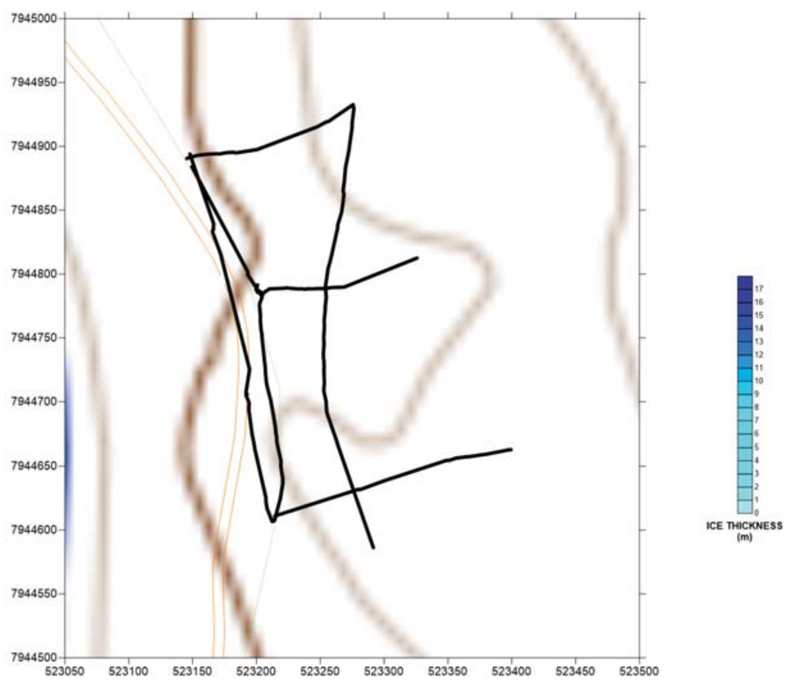
GEOPHYSICS GPR INTERNATIONAL INC.

DESSINÉ PAR / DRAWN BY	M. Van Zyl
VÉRIFIÉ PAR / CHECKED BY	
APPROUVÉ PAR / APPROVED BY	M.Sikum, P. Geo
# CONTRAT / CONTRACT #	T17001b
ÉCHELLE / SCALE	AS SHOWN
# DESSIN / DRAWING #	T17001b-A2

CLIENT: HATCH

PROJET / PROJECT: BAFFINLAND EXPANSION

TITRE / TITLE: GROUND RADAR SURVEY GPR17-KM20



LEGEND

- EXISTING ROAD ALIGNMENT
- PROPOSED RAILWAY ALIGNMENT
- BH17-C002 GEOTECHNICAL BOREHOLE
- GROUND RADAR SURVEY LINE

No	NOTES
1	THE RADAR SURVEY WAS EXECUTED BY GEOPHYSICS GPR INTERNATIONAL INC. NOVEMBER 2017
2	COORDINATE SYSTEM: WGS84 UTM ZONE 17W
3	REFER TO FULL REPORT FOR DISCUSSION OF METHODOLOGIES, RESULTS AND LIMITATIONS
4	BOREHOLE DATA PROVIDED BY THE CLIENT FOR REFERENCE PURPOSES
5	
6	

No	DATE	MODIFICATIONS	GPR

SCEAU PROFESSIONNEL / PROFESSIONAL SEAL

GEOPHYSICS GPR INTERNATIONAL INC.

DESSINÉ PAR / DRAWN BY: M. Van Zyl

VÉRIFIÉ PAR / CHECKED BY:

APPROUVÉ PAR / APPROVED BY: M.Sibum, P. Geo

CONTRAT / CONTRACT #: T17001b

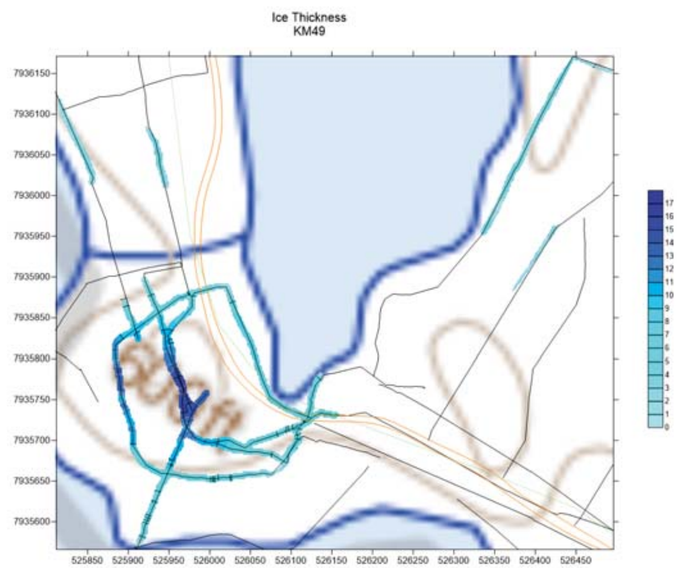
ÉCHELLE / SCALE: AS SHOWN

DESSIN / DRAWING #: T17001b-A2

CLIENT / CLIENT: HATCH

PROJET / PROJECT: BAFFINLAND EXPANSION

TITRE / TITLE: GROUND RADAR SURVEY GPR17-KM39.6



LEGEND

- EXISTING ROAD ALIGNMENT
- PROPOSED RAILWAY ALIGNMENT
- BH17-C002 GEOTECHNICAL BOREHOLE
- GROUND RADAR SURVEY LINE
- 1 INTERPRETED ICE LAYER EXTENT

PRELIMINARY

No	NOTES
1	THE RADAR SURVEY WAS EXECUTED BY GEOPHYSICS GPR INTERNATIONAL INC. NOVEMBER 2017
2	COORDINATE SYSTEM: WGS84 UTM ZONE 17W
3	REFER TO FULL REPORT FOR DISCUSSION OF METHODOLOGIES, RESULTS AND LIMITATIONS
4	BOREHOLE DATA PROVIDED BY THE CLIENT FOR REFERENCE PURPOSES
5	
6	

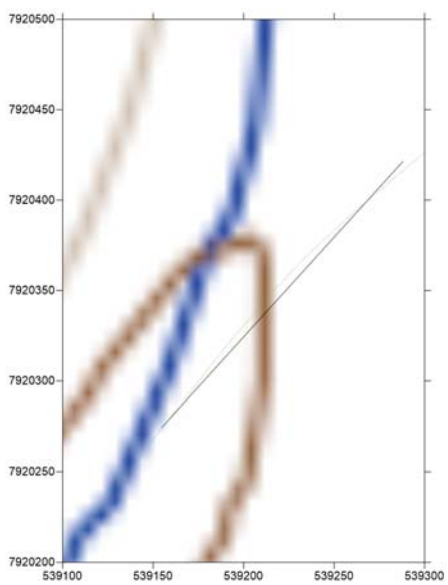
No	DATE	MODIFICATIONS	GPR / APP

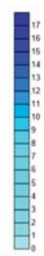
SCEAU PROFESSIONNEL / PROFESSIONAL SEAL

GEOPHYSICS GPR INTERNATIONAL INC.

DESSINÉ PAR / DRAWN BY	M. Van Zyl
VÉRIFIÉ PAR / CHECKED BY	
APPROUVÉ PAR / APPROVED BY	M.Sileum, P. Geo
# CONTRAT / CONTRACT #	T17001b
ÉCHELLE / SCALE	AS SHOWN
# DESSIN / DRAWING #	T17001b-A1-1

CLIENT / CLIENT	HATCH
PROJET / PROJECT	BAFFINLAND EXPANSION
TITRE / TITLE	GROUND RADAR SURVEY GPR17-SITE 1





ICE THICKNESS (m)

LEGEND

- EXISTING ROAD ALIGNMENT
- PROPOSED RAILWAY ALIGNMENT
- BH17-C002 GEOTECHNICAL BOREHOLE
- GROUND RADAR SURVEY LINE

PRELIMINARY

No	NOTES	No	DATE	MODIFICATIONS	APP
1	THE RADAR SURVEY WAS EXECUTED BY GEOPHYSICS GPR INTERNATIONAL INC. NOVEMBER 2017				
2	COORDINATE SYSTEM: WGS84 UTM ZONE 17W				
3	REFER TO FULL REPORT FOR DISCUSSION OF METHODOLOGIES, RESULTS AND LIMITATIONS				
4	BOREHOLE DATA PROVIDED BY THE CLIENT FOR REFERENCE PURPOSES				
5					
6					

SCEAU PROFESSIONNEL / PROFESSIONAL SEAL

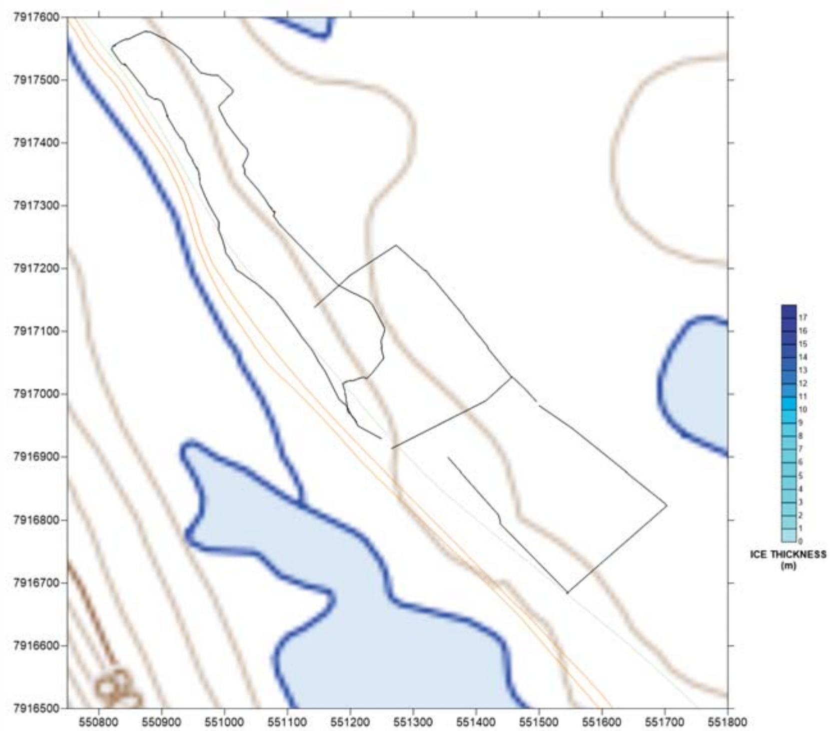
GEOPHYSICS GPR INTERNATIONAL INC.

DESSINÉ PAR / DRAWN BY	M. Van Zyl
VÉRIFIÉ PAR / CHECKED BY	
APPROUVÉ PAR / APPROVED BY	M.Sikum, P. Geo
# CONTRAT / CONTRACT #	T17001b
ÉCHELLE / SCALE	AS SHOWN
# DESSIN / DRAWING #	T17001b-A2

CLIENT / CLIENT: HATCH

PROJET / PROJECT: BAFFINLAND EXPANSION

TITRE / TITLE: GROUND RADAR SURVEY GPR17-KM82.2



LEGEND

EXISTING ROAD ALIGNMENT

PROPOSED RAILWAY ALIGNMENT

BH17-C002 GEOTECHNICAL BOREHOLE

GROUND RADAR SURVEY LINE

No.	NOTES	No.	DATE	MODIFICATIONS	GPR APP
1	THE RADAR SURVEY WAS EXECUTED BY GEOPHYSICS GPR INTERNATIONAL INC. NOVEMBER 2017				
2	COORDINATE SYSTEM: WGS84 UTM ZONE 17W				
3	REFER TO FULL REPORT FOR DISCUSSION OF METHODOLOGIES, RESULTS AND LIMITATIONS				
4	BOREHOLE DATA PROVIDED BY THE CLIENT FOR REFERENCE PURPOSES				
5					
6					

SCEAU PROFESSIONNEL / PROFESSIONAL SEAL

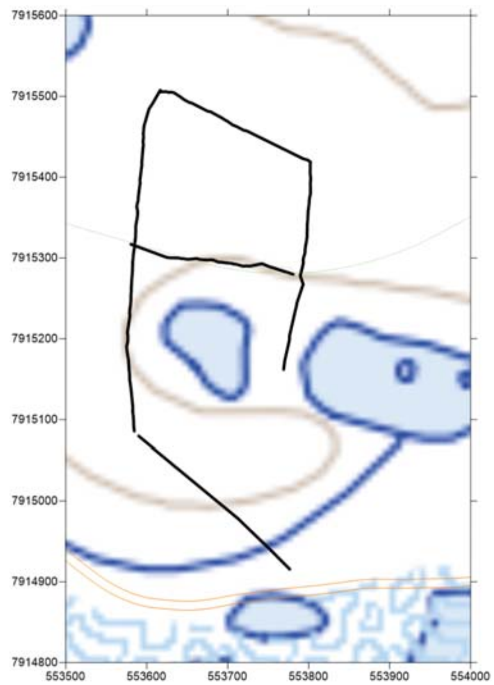
GEOPHYSICS GPR INTERNATIONAL INC.

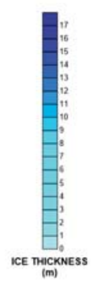
DESSINÉ PAR / DRAWN BY	M. Van Zyl
VÉRIFIÉ PAR / CHECKED BY	
APPROUVÉ PAR / APPROVED BY	M.Sliwn, P. Geo
# CONTRAT / CONTRACT #	T17001b
ÉCHELLE / SCALE	AS SHOWN
# DESSIN / DRAWING #	T17001b-A2

CLIENT: HATCH

PROJET / PROJECT: BAFFINLAND EXPANSION

TITRE / TITLE: GROUND RADAR SURVEY GPR17-KM97





LEGEND

EXISTING ROAD ALIGNMENT

PROPOSED RAILWAY ALIGNMENT

BH17-C002 GEOTECHNICAL BOREHOLE

GROUND RADAR SURVEY LINE

No	NOTES
1	THE RADAR SURVEY WAS EXECUTED BY GEOPHYSICS GPR INTERNATIONAL INC. NOVEMBER 2017
2	COORDINATE SYSTEM: WGS84 UTM ZONE 17W
3	REFER TO FULL REPORT FOR DISCUSSION OF METHODOLOGIES, RESULTS AND LIMITATIONS
4	BOREHOLE DATA PROVIDED BY THE CLIENT FOR REFERENCE PURPOSES
5	
6	

No	DATE	MODIFICATIONS	GPR

SCEAU PROFESSIONNEL / PROFESSIONAL SEAL

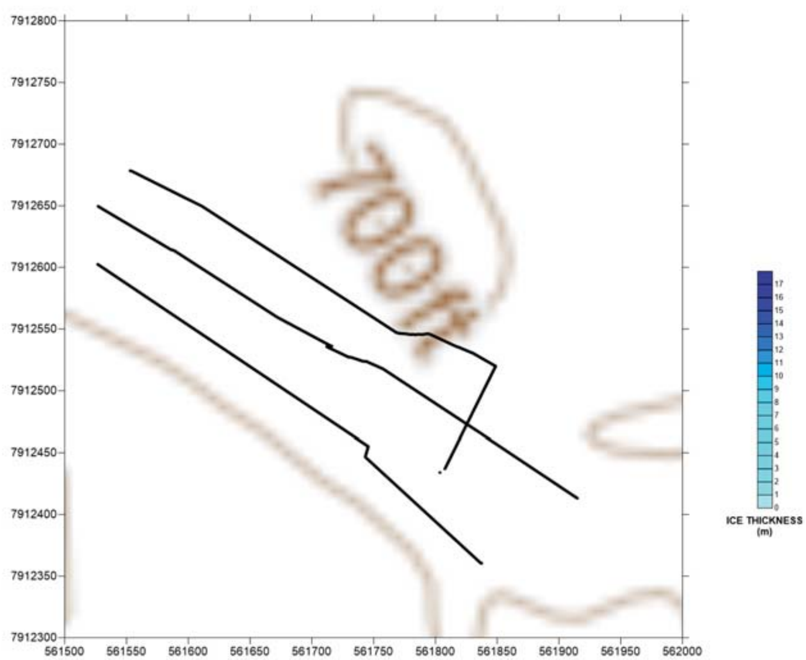
GEOPHYSICS GPR INTERNATIONAL INC.

DESSINÉ PAR / DRAWN BY	M. Van Zyl
VÉRIFIÉ PAR / CHECKED BY	
APPROUVÉ PAR / APPROVED BY	M.Sikum, P. Geo
# CONTRAT / CONTRACT #	T17001b
ÉCHELLE / SCALE	AS SHOWN
# DESSIN / DRAWING #	T17001b-A2

CLIENT / CLIENT: HATCH

PROJET / PROJECT: BAFFINLAND EXPANSION

TITRE / TITLE: GROUND RADAR SURVEY GPR17-KM100.1



LEGEND

- EXISTING ROAD ALIGNMENT
- PROPOSED RAILWAY ALIGNMENT
- BH17-C002 GEOTECHNICAL BOREHOLE
- GROUND RADAR SURVEY LINE

No	NOTES
1	THE RADAR SURVEY WAS EXECUTED BY GEOPHYSICS GPR INTERNATIONAL INC. NOVEMBER 2017
2	COORDINATE SYSTEM: WGS84 UTM ZONE 17N
3	REFER TO FULL REPORT FOR DISCUSSION OF METHODOLOGIES, RESULTS AND LIMITATIONS
4	BOREHOLE DATA PROVIDED BY THE CLIENT FOR REFERENCE PURPOSES
5	
6	

No	DATE	MODIFICATIONS	GPR

SCEAU PROFESSIONNEL / PROFESSIONAL SEAL

GEOPHYSICS GPR INTERNATIONAL INC.

DESSINÉ PAR / DRAWN BY	M. Van Zyl
VÉRIFIÉ PAR / CHECKED BY	
APPROUVÉ PAR / APPROVED BY	M.Situm, P. Geo
# CONTRAT / CONTRACT #	T17001b
ÉCHELLE / SCALE	AS SHOWN
# DESSIN / DRAWING #	T17001b-A2

CLIENT: **HATCH**

PROJET / PROJECT: **BAFFINLAND EXPANSION**

TITRE / TITLE: **GROUND RADAR SURVEY GPR17-KM109**

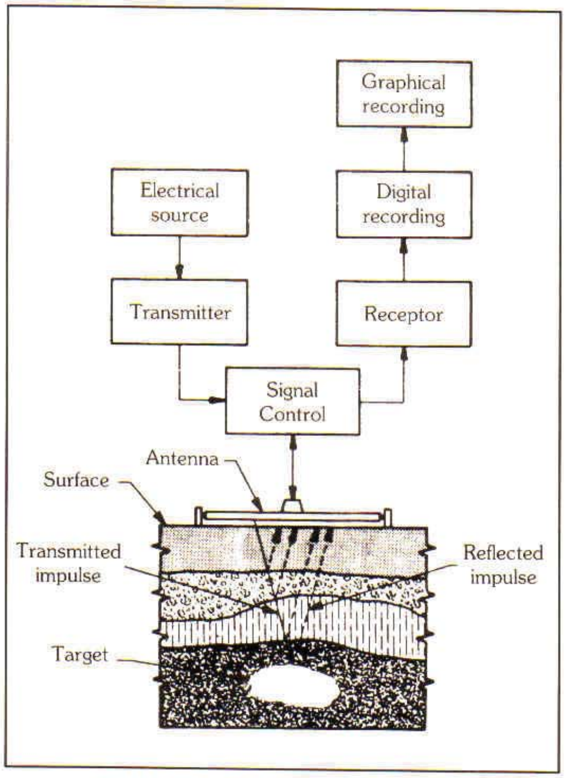
APPENDIX B

Additional Georadar information

GEOPHYSICS G P R INTERNATIONAL INC.

GEORADAR

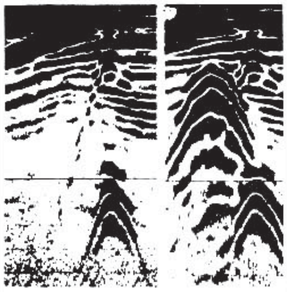
As indicated by its name, georadar combines high resolution radar with geology. The underlying principle is based on the propagation of electromagnetic wave impulses (VHF) that are reflected by anomalies in the terrain (joints, irregularities, interfaces, etc.) at different depths, and then captured by the antenna. The georadar records the time taken by each transmitted signal to complete the cycle in order to calculate the depth of the anomaly. The result is similar to a seismic reflection profile where all the reflections are displayed graphically. This technique is used to solve problems for which there had previously been no practical solution.



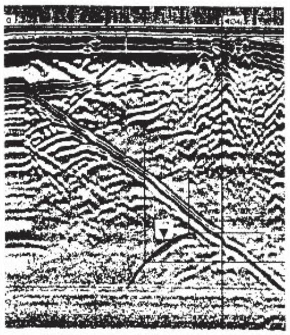
PRINCIPLES OF GEORADAR

FEATURES

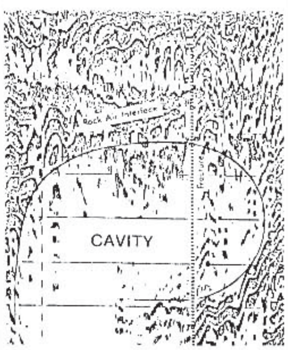
- Penetration of more than 20 metres in certain materials (penetration being inversely proportional to conductivity).
- Surveying in continuous mode.
- Identification of objects measuring only a few centimeters.
- Light and manoeuvrable equipment.
- Detection of conductivity, open spaces and/or holes (cavities).
- Detection of breaks: faults, fractures, joints, cavities.
- Results similar to seismic reflection: continuous underground profile.
- Results available immediately.
- Can be used in land, sea or airborne surveys.



PIPES



JOINTS



CAVITIES

FIELDS OF APPLICATION

Civil Engineering / Mining Exploration-Exploitation / Research / Archaeology / Environment

- Geotechnology: investigation of soils and surface deposits.
- Optimal selection of anchor bolts in mines and quarries.
- Detection of buried pipes before beginning excavation.
- Detection of liquid or gas leakage in soils.
- Detection of cracks in concrete structures.
- Checking material homogeneity.
- Detection of cavities beneath road pavement.
- Determination of water saturation level.
- Detection of girders in reinforced concrete.
- Detection of pollutant leakage in water bodies.
- Inspection of buried disposal sites and or dangerous deposits.
- Continuous measurement of ice thickness.
- Archaeological research: ancient foundations, artifacts.
- Non-destructive method for measuring road pavement thickness.
- Localization and measurement of soil's thickness (swamps, peat bogs).
- Determination of rock beddings (location and thickness).
- Bathymetric studies (depth sounding).
- Calculation of the thickness of permafrost and ice.
- Geotechnical studies for the installation of aqueducts.

SPECIAL FEATURES

The equipment is practical, easy to manoeuvre, and multi-faceted. The field of application of georadar continues to expand in various sectors, particularly in geotechnology (aqueducts), civil engineering (excavation, structures) and mining (structures).

GEOPHYSICS G P R INTERNATIONAL INC.

GUIDELINEGEO

MALÅ GroundExplorer

GROUND PENETRATING RADAR

GPR with exceptional range and resolution

MALÅ GroundExplorer (GX) is an integrated GPR solution with four MALÅ GX antenna options: GX80, GX160, GX450 and GX750. Through unique hyperstacking HDR technology, MALÅ GX offers significantly faster data acquisition rates, with outstanding signal-to-noise ratio and depth penetration. An easy-to-use GPR solution on a rugged platform, with excellent detection capabilities for a wide range of applications.

MALÅ GX CONTROLLER

Processor	1.6 GHz Intel Atom
Display	1024 x 768 mm
OS	Linux
Memory	8 GB compact Flash memory
Data output resolution	32 bit
Comms	Ethernet, WiFi (optional), USB 3.0, RS232 (serial)
GPS	Integrated support for built-in GPS, or external GPS via USB/serial port (NMEA 0183 protocol)
Power supply	Internal 12V/20.8 Ah Li-Ion battery, or any external 10-15 V DC source
Charger	Internal. Unit can also be charged from any external 12 - 15 V DC source
Power consumption	1.3 – 2.0 A
Operating time	8 – 10 h
Dimensions	326 x 216 x 92 mm including handles 326 x 216 x 52 mm excluding handles
Weight	3.2 kg
Operating temp	- 20° to + 50° C or 0° to 120° F
Environmental	IP 65

GX WIFI OPTION

Wireless standard:	IEEE802.11 g
Power consumption:	0,3 A

MALÅ

MALÅ GX ANTENNAS

MALÅ GX750 HDR

Technology	MALÅ Semi-Real- Time pat pending
Antenna center freq.	750 MHz
SNR	97 dB
No. of bits	16 bit
Scans/second	> 1290, time window 75 ns
Survey speed	460 [km/h] point distance 10 cm
Bandwidth	120%, fractional, -10 dB
Time window	75 ns
Positioning	Built-in DGPS, external GPS (NMEA 0183 protocol), wheel encoder
Operating time	5 h
Power supply	Interchangeable 12 V Li-Ion batt. or ext. 12 V DC source
Power consumption	1.3 A
Acq. mode	Wheel, time or manual
Dimensions	375 x 235 x 170 mm
Weight	3.6 kg
Operating temp.	- 20° to + 50° C or 0° to 120° F
Environmental	IP 65

MALÅ GX450 HDR

Technology	MALÅ Semi-Real-Time pat pending
Antenna center freq.	450 MHz
SNR	101 dB
No. of bits	> 16 bit
Scans/second	> 770, time window 300 ns
Survey speed	275 [km/h] point distance 10 cm
Bandwidth	>120%, fractional, -10 dB
Time window	300 ns
Positioning	Inbuilt DGPS, external GPS (NMEA 0183 protocol), wheel encoder
Operating time	5 h
Power supply	Interchangeable 12 V Li-Ion batt. or ext. 12 V DC source
Power consumption	1.3 A
Acq. mode	Wheel, time or manual
Dimensions	430 x 360 x 180 mm
Weight	5.5 kg
Operating temp.	- 20° to + 50° C or 0° to 120° F
Environmental	IP 65

MALÅ GX160 HDR

Technology	MALÅ Semi-Real-Time pat pending
Antenna center freq.	160 MHz
SNR	> 107 dB
No. of bits	> 17 bit
Scans/second	> 880, time window 625 ns
Survey speed	320 [km/h] point distance 10 cm
Bandwidth	>120 %, fractional, -10 dB
Time window	625 ns
Positioning	Inbuilt DGPS, external GPS (NMEA 0183 protocol), wheel encoder
Operating time	5 h
Power supply	Interchangeable 12 V Li-Ion batt. or ext. 12 V DC source
Power consumption	1.3 A
Acq. mode	Wheel, time or manual
Dimensions	720 x 480 x 190 mm
Weight	10.7 kg
Operating temp.	- 20° to + 50° C or 0° to 120° F
Environmental	IP 65

MALÅ GX80 HDR

Technology	MALÅ Semi-Real-Time pat pending
Antenna center freq.	80 MHz
SNR	> 114.4 dB
No. of bits	> 19 bit
Scans/second	> 1200, time window 812 ns
Survey speed	430 [km/h] point distance 10 cm
Bandwidth	>120 %, fractional, -10 dB
Time window	812 ns
Positioning	Built-in DGPS, external GPS (NMEA 0183 protocol), wheel encoder
Operating time	5 h
Power supply	Interchangeable 12 V Li-Ion batt. or ext. 12 V DC source
Power consumption	1.3 A
Acq. mode	Wheel, time or manual
Dimensions	1010 x 780 x 220 mm
Weight	24,6 kg
Operating temp.	- 20° to + 50° C or 0° to 120° F
Environmental	IP 65

ABEM | MALÅ

__Guideline Geo__ is a world-leader in geophysics and geo-technology offering sensors, software, services and support necessary to map and visualize the subsurface. Guideline Geo operates in four international market areas: Infrastructure – examination at start-up and maintenance of infrastructure, Environment – survey of environmental risks and geological hazards, Water – mapping and survey of water supplies and Minerals – efficient exploration. Our offices and regional partners serve clients in 121 countries. The Guideline Geo AB share (GGEO) is listed on NGM Equity.

GUIDELINEGEO

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Charleston, South Carolina 29492, USA
Tel: +1 843 852 5021
sales@guidelinegeo.com
www.guidelinegeo.com

Appendix J

CPT Results

PRESENTATION OF SITE INVESTIGATION RESULTS

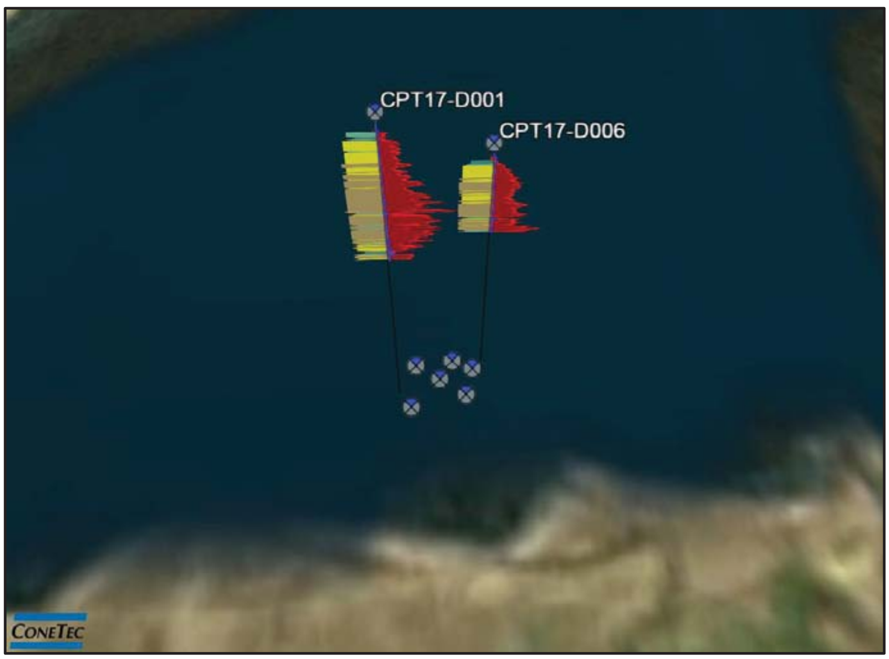
Milne Port Expansion

Prepared for:

Baffinland Iron Mines Corporation

ConeTec Job No: 17-05010

Project Start Date: 22-Mar-2017
Project End Date: 09-Apr-2017
Report Date: 13-Apr-2017
Revised Date: 21-Apr-2017



Prepared by:

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Introduction

The enclosed report presents the results of the site investigation program conducted by ConeTec Investigations Ltd. for Baffinland Iron Mines Corporation at Milne Inlet, Baffin Island, Nunavut. The program consisted of six cone penetration tests (CPT) and two seismic cone penetration tests (SCPT) carried out under the direction of Hatch Ltd.

Project Information

Project	
Client	Baffinland Iron Mines Corporation
Project	Milne Port Expansion
ConeTec project number	17-05010

A map from Google earth including the CPT and SCPT test locations is presented below.

Rig Description	Deployment System	Test Type
Boart LS100	Portable	CPT, SCPT

Coordinates		
Test Type	Collection Method	EPSG Number
CPT, SCPT	ConeTec Trimble Survey (RTK)	26917

Cone Penetration Test (CPT)	
Depth reference	Depths are referenced to the existing mudline at the time of each test.
Tip and sleeve data offset	0.1 meter This has been accounted for in the CPT data files.
Additional plots	Advanced CPT plots with Ic, Phi, and N1(60) and SCPT plots have been included.

Cone Penetrometers Used for this Project						
Cone Description	Cone Number	Cross Sectional Area (cm^2)	Sleeve Area (cm^2)	Tip Capacity (bar)	Sleeve Capacity (bar)	Pore Pressure Capacity (psi)
338:T1500F15U500	338	15	225	1500	15	500
374:T1500F15U500	374	15	225	1500	15	500
The CPT summary indicates which cone was used for each sounding.						

Interpretation Tables	
Additional information	The Soil Behaviour Type (SBT) classification chart (Robertson et al., 1986 presented by Lunne, Robertson and Powell, 1997) was used to classify the soil for this project. A detailed set of calculated CPT parameters were generated and are provided in Excel format files in the release folder. The calculated CPT parameters are based on values of corrected tip (q_t), sleeve friction (f_s) and pore pressure (u_2). Soils were classified as either drained or undrained based on the Soil Behaviour Type (SBT) classification chart (Robertson et al., 1986 presented by Lunne, Robertson and Powell, 1997). Calculations for both drained and undrained parameters were included for materials that classified as silt (zone 6).

Survey	
Tidal Fluctuations	As requested by Hatch Ltd., a survey grid was setup to monitor ice movement due to tidal fluctuation throughout the drill program. The grid was laid out around the proposed drilling area using six survey points in a 200m by 100m grid. ½ inch steel pins was installed at each point by drilling out a section of ice and freezing the rod in place. The pins were surveyed repeatedly throughout a 12-hour period to determine if the ebb and flow of the tide was moving the ice laterally. After installation they were then surveyed every couple of days.
Surveying Methodology	Due to the lack of compatibility with the onsite base station, a second base station broadcasting in the 450MHz band had to be setup to support the drill program surveying. An observed control point was surveyed in by the BIM

	surveyor onsite in datum NAD83 using an ellipsoid model. Our base station was permanently setup over the surveyed point with a vertical offset of 1.32m to the bottom of the R8 base. An existing control point, KM002, was surveyed for quality control. A second control point, PRJCNTRL, was surveyed in to allow for easy quality control when restarting the base station.
Depth Control	Significant tidal fluctuations between two and seven feet were observed on the ice throughout the drill program. Constant monitoring of the elevation of the ice was required while conducting the cone penetration tests (CPTs) to ensure the depth was correct throughout the sounding. At the beginning of the CPT, the Northing, Easting, and Elevation of the sounding was recorded along with a dip tape measurement to the sea floor. The dip tape measurement was subtracted from the ice elevation to get the sea floor elevation. Throughout the CPT, the elevation of ice was monitored and compared to the initial measurement to get an accurate depth at the end of every meter.
Ice Cracks and Survey Grid	There were large cracks in the ice near the drilling pad. They appeared to open and close as the tide went up and down. The Northing and Easting coordinates of the grid were surveyed using a continuous topo. The survey grid coordinates are not presented as part of this report.

Limitations

This report has been prepared for the exclusive use of Baffinland Iron Mines Corporation (Client) and Hatch Ltd. for the project titled “Milne Port Expansion”. The report’s contents may not be relied upon by any other party without the express written permission of ConeTec Investigations Ltd. (ConeTec). ConeTec has provided site investigation services, prepared the factual data reporting, and provided geotechnical parameter calculations consistent with current best practices. No other warranty, expressed or implied, is made.

The information presented in the report document and the accompanying data set pertain to the specific project, site conditions and objectives described to ConeTec by the Client and Hatch Ltd. In order to properly understand the factual data, assumptions and calculations, reference must be made to the documents provided and their accompanying data sets, in their entirety.

The cone penetration tests (CPTu) are conducted using an integrated electronic piezocone penetrometer and data acquisition system manufactured by Adara Systems Ltd. of Richmond, British Columbia, Canada.

ConeTec's piezocone penetrometers are compression type designs in which the tip and friction sleeve load cells are independent and have separate load capacities. The piezocones use strain gauged load cells for tip and sleeve friction and a strain gauged diaphragm type transducer for recording pore pressure. The piezocones also have a platinum resistive temperature device (RTD) for monitoring the temperature of the sensors, an accelerometer type dual axis inclinometer and a geophone sensor for recording seismic signals. All signals are amplified down hole within the cone body and the analog signals are sent to the surface through a shielded cable.

ConeTec penetrometers are manufactured with various tip, friction and pore pressure capacities in both 10 cm^2 and 15 cm^2 tip base area configurations in order to maximize signal resolution for various soil conditions. The specific piezocone used for each test is described in the CPT summary table presented in the first Appendix. The 15 cm^2 penetrometers do not require friction reducers as they have a diameter larger than the deployment rods. The 10 cm^2 piezocones use a friction reducer consisting of a rod adapter extension behind the main cone body with an enlarged cross sectional area (typically 44 mm diameter over a length of 32 mm with tapered leading and trailing edges) located at a distance of 585 mm above the cone tip.

The penetrometers are designed with equal end area friction sleeves, a net end area ratio of 0.8 and cone tips with a 60 degree apex angle.

All ConeTec piezocones can record pore pressure at various locations. Unless otherwise noted, the pore pressure filter is located directly behind the cone tip in the "u_2" position (ASTM Type 2). The filter is 6 mm thick, made of porous plastic (polyethylene) having an average pore size of 125 microns (90-160 microns). The function of the filter is to allow rapid movements of extremely small volumes of water needed to activate the pressure transducer while preventing soil ingress or blockage.

The piezocone penetrometers are manufactured with dimensions, tolerances and sensor characteristics that are in general accordance with the current ASTM D5778 standard. ConeTec's calibration criteria also meets or exceeds those of the current ASTM D5778 standard. An illustration of the piezocone penetrometer is presented in Figure CPTu.

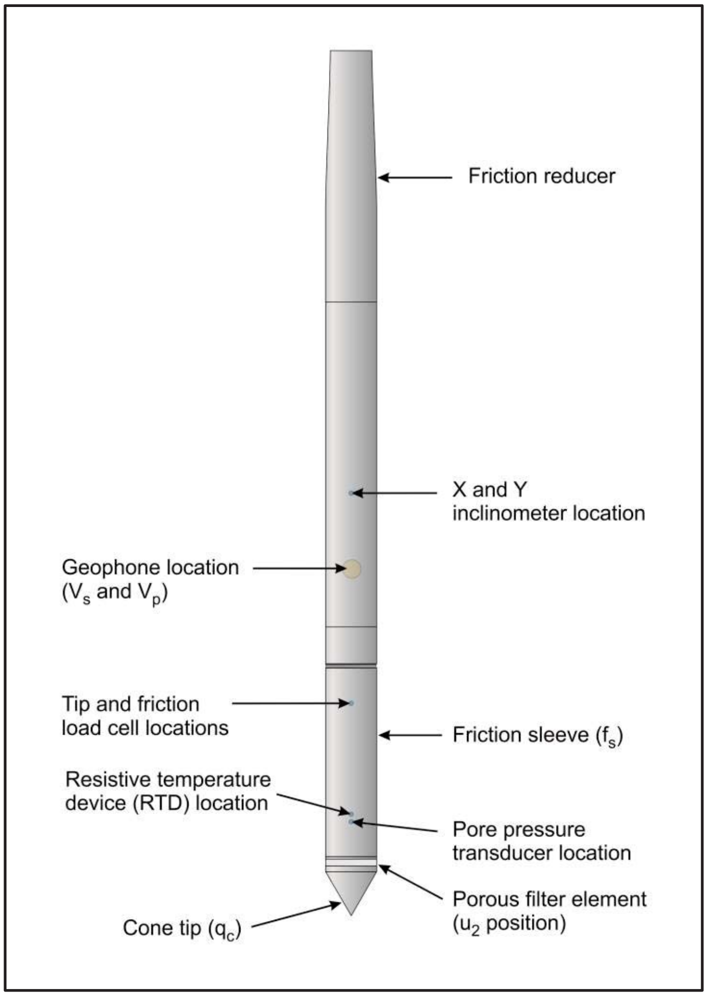

Figure CPTu. Piezocone Penetrometer (15 cm^2)

The ConeTec data acquisition systems consist of a Windows based computer and a signal conditioner and power supply interface box with a 16 bit (or greater) analog to digital (A/D) converter. The data is recorded at fixed depth increments using a depth wheel attached to the push cylinders or by using a spring loaded rubber depth wheel that is held against the cone rods. The typical recording intervals are either 2.5 cm or 5.0 cm depending on project requirements; custom recording intervals are possible. The system displays the CPTu data in real time and records the following parameters to a storage media during penetration:

- Depth
- Uncorrected tip resistance (q_c)
- Sleeve friction (f_s)
- Dynamic pore pressure (u)
- Additional sensors such as resistivity, passive gamma, ultra violet induced fluorescence, if applicable

All testing is performed in accordance to ConeTec's CPT operating procedures which are in general accordance with the current ASTM D5778 standard.

Prior to the start of a CPTu sounding a suitable cone is selected, the cone and data acquisition system are powered on, the pore pressure system is saturated with either glycerine or silicone oil and the baseline readings are recorded with the cone hanging freely in a vertical position.

The CPTu is conducted at a steady rate of 2 cm/s, within acceptable tolerances. Typically one meter length rods with an outer diameter of 1.5 inches are added to advance the cone to the sounding termination depth. After cone retraction final baselines are recorded.

Additional information pertaining to ConeTec's cone penetration testing procedures:

- Each filter is saturated in silicone oil or glycerine under vacuum pressure prior to use
- Recorded baselines are checked with an independent multi-meter
- Baseline readings are compared to previous readings
- Soundings are terminated at the client's target depth or at a depth where an obstruction is encountered, excessive rod flex occurs, excessive inclination occurs, equipment damage is likely to take place, or a dangerous working environment arises
- Differences between initial and final baselines are calculated to ensure zero load offsets have not occurred and to ensure compliance with ASTM standards

The interpretation of piezocone data for this report is based on the corrected tip resistance (q_t), sleeve friction (f_s) and pore water pressure (u). The interpretation of soil type is based on the correlations developed by Robertson (1990) and Robertson (2009). It should be noted that it is not always possible to accurately identify a soil type based on these parameters. In these situations, experience, judgment and an assessment of other parameters may be used to infer soil behaviour type.

The recorded tip resistance (q_c) is the total force acting on the piezocone tip divided by its base area. The tip resistance is corrected for pore pressure effects and termed corrected tip resistance (q_t) according to the following expression presented in Robertson et al, 1986:

$$q_t = q_c + (1\text{-}a) \bullet u_2$$

where: q_t is the corrected tip resistance
q_c is the recorded tip resistance
u_2 is the recorded dynamic pore pressure behind the tip (u_2 position)
a is the Net Area Ratio for the piezocone (0.8 for ConeTec probes)

The sleeve friction (f_s) is the frictional force on the sleeve divided by its surface area. As all ConeTec piezocones have equal end area friction sleeves, pore pressure corrections to the sleeve data are not required.

The dynamic pore pressure (u) is a measure of the pore pressures generated during cone penetration. To record equilibrium pore pressure, the penetration must be stopped to allow the dynamic pore pressures to stabilize. The rate at which this occurs is predominantly a function of the permeability of the soil and the diameter of the cone.

The friction ratio (Rf) is a calculated parameter. It is defined as the ratio of sleeve friction to the tip resistance expressed as a percentage. Generally, saturated cohesive soils have low tip resistance, high friction ratios and generate large excess pore water pressures. Cohesionless soils have higher tip resistances, lower friction ratios and do not generate significant excess pore water pressure.

A summary of the CPTu soundings along with test details and individual plots are provided in the appendices. A set of interpretation files were generated for each sounding based on published correlations and are provided in Excel format in the data release folder. Information regarding the interpretation methods used is also included in the data release folder.

For additional information on CPTu interpretations, refer to Robertson et al. (1986), Lunne et al. (1997), Robertson (2009), Mayne (2013, 2014) and Mayne and Peuchen (2012).

Shear wave velocity testing is performed in conjunction with the piezocone penetration test (SCPTu) in order to collect interval velocities. For some projects seismic compression wave (Vp) velocity is also determined.

ConeTec's piezocone penetrometers are manufactured with a horizontally active geophone (28 hertz) that is rigidly mounted in the body of the cone penetrometer, 0.2 meters behind the cone tip.

Shear waves are typically generated by using an impact hammer horizontally striking a beam that is held in place by a normal load. In some instances an auger source or an imbedded impulsive source maybe used for both shear waves and compression waves. The hammer and beam act as a contact trigger that triggers the recording of the seismic wave traces. For impulsive devices an accelerometer trigger may be used. The traces are recorded using an up-hole integrated digital oscilloscope which is part of the SCPTu data acquisition system. An illustration of the shear wave testing configuration is presented in Figure SCPTu-1.

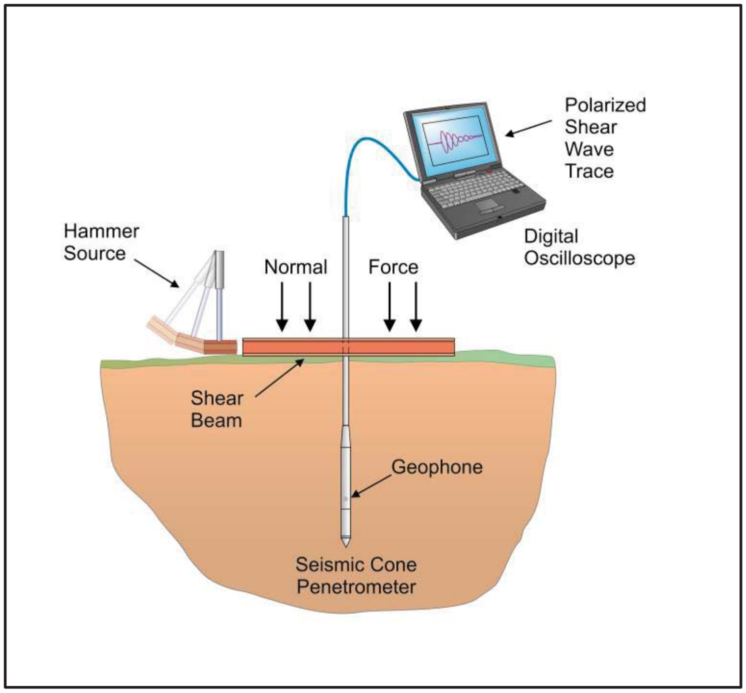

Figure SCPTu-1. Illustration of the SCPTu system

All testing is performed in accordance to ConeTec's SCPTu operating procedures.

Prior to the start of a SCPTu sounding, the procedures described in the Cone Penetration Test section are followed. In addition, the active axis of the geophone is aligned parallel to the beam (or source) and the horizontal offset between the cone and the source is measured and recorded.

Prior to recording seismic waves at each test depth, cone penetration is stopped and the rods are decoupled from the rig to avoid transmission of rig energy down the rods. Multiple wave traces are recorded for quality control purposes. After reviewing wave traces for consistency the cone is pushed to the next test depth (typically one meter intervals or as requested by the client). Figure SCPTu-2 presents an illustration of a SCPTu test.

For additional information on seismic cone penetration testing refer to Robertson et.al. (1986).

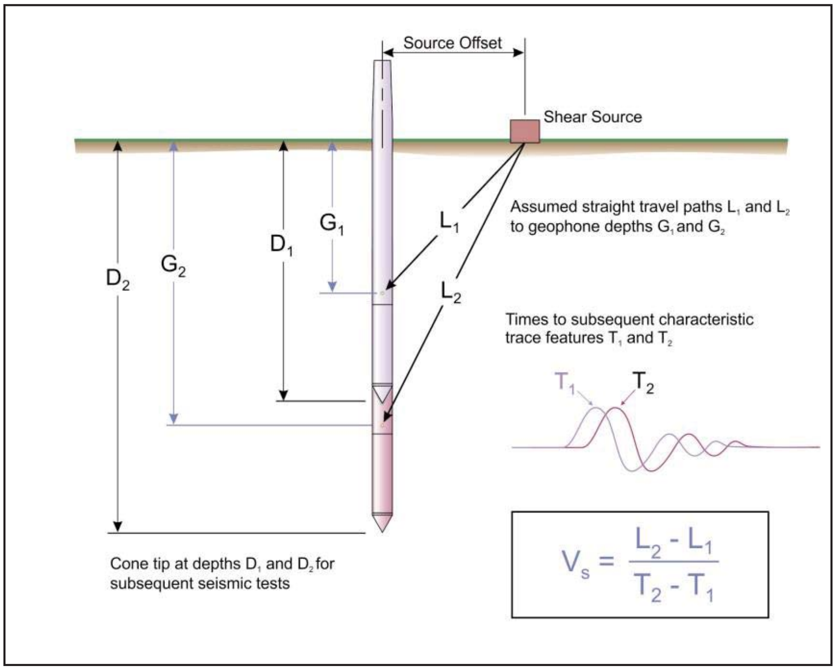

Figure SCPTu-2. Illustration of a seismic cone penetration test

Calculation of the interval velocities are performed by visually picking a common feature (e.g. the first characteristic peak, trough, or crossover) on all of the recorded wave sets and taking the difference in ray path divided by the time difference between subsequent features. Ray path is defined as the straight line distance from the seismic source to the geophone, accounting for beam offset, source depth and geophone offset from the cone tip.

The average shear wave velocity to a depth of 30 meters (V_{s30}) has been calculated and provided for all applicable soundings using an equation presented in Crow et al., 2012.

$$V_{s30} = \frac{total\ thickness\ of\ all\ layers\ (30m)}{\sum(layer\ traveltimes)}$$

The layer travel times refers to the travel times propagating in the vertical direction, not the measured travel times from an offset source.

Tabular results and SCPTu plots are presented in the relevant appendix.

The cone penetration test is halted at specific depths to carry out pore pressure dissipation (PPD) tests, shown in Figure PPD-1. For each dissipation test the cone and rods are decoupled from the rig and the data acquisition system measures and records the variation of the pore pressure (u) with time (t).

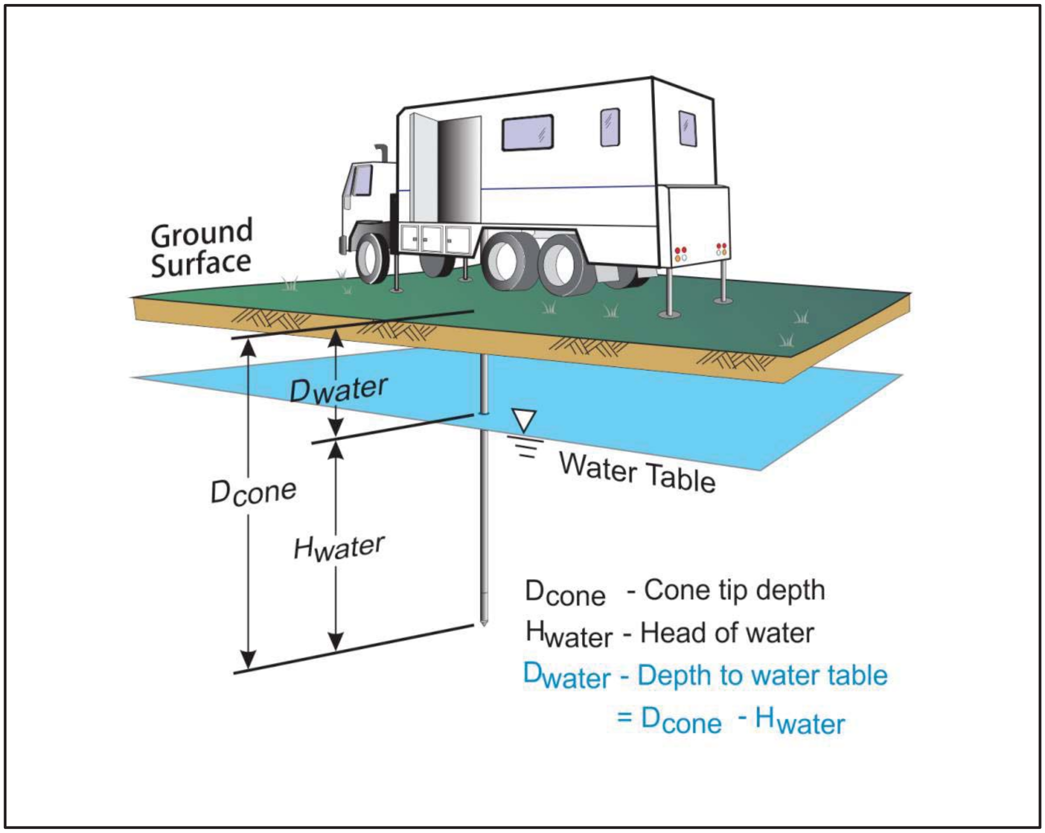

Figure PPD-1. Pore pressure dissipation test setup

Pore pressure dissipation data can be interpreted to provide estimates of ground water conditions, permeability, consolidation characteristics and soil behaviour.

The typical shapes of dissipation curves shown in Figure PPD-2 are very useful in assessing soil type, drainage, in situ pore pressure and soil properties. A flat curve that stabilizes quickly is typical of a freely draining sand. Undrained soils such as clays will typically show positive excess pore pressure and have long dissipation times. Dilative soils will often exhibit dynamic pore pressures below equilibrium that then rise over time. Overconsolidated fine-grained soils will often exhibit an initial dilatory response where there is an initial rise in pore pressure before reaching a peak and dissipating.

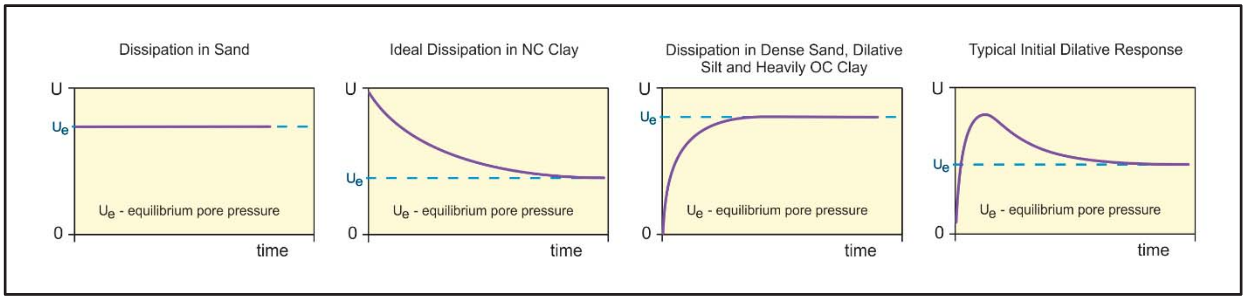

Figure PPD-2. Pore pressure dissipation curve examples

In order to interpret the equilibrium pore pressure (u_{eq}) and the apparent phreatic surface, the pore pressure should be monitored until such time as there is no variation in pore pressure with time as shown for each curve of Figure PPD-2.

In fine grained deposits the point at which 100% of the excess pore pressure has dissipated is known as t_{100}. In some cases this can take an excessive amount of time and it may be impractical to take the dissipation to t_{100}. A theoretical analysis of pore pressure dissipations by Teh and Houlsby (1991) showed that a single curve relating degree of dissipation versus theoretical time factor (T*) may be used to calculate the coefficient of consolidation (c_h) at various degrees of dissipation resulting in the expression for c_h shown below.

$$c_h = \frac{T^* \cdot a^2 \cdot \sqrt{I_r}}{t}$$

Where:

T^* is the dimensionless time factor (Table Time Factor)
a is the radius of the cone
I_r is the rigidity index
t is the time at the degree of consolidation

Table Time Factor. T* versus degree of dissipation (Teh and Houlsby, 1991)

Degree of Dissipation (%)	20	30	40	50	60	70	80
T* (u_2)	0.038	0.078	0.142	0.245	0.439	0.804	1.60

The coefficient of consolidation is typically analyzed using the time (t_{50}) corresponding to a degree of dissipation of 50% (u_{50}). In order to determine t_{50}, dissipation tests must be taken to a pressure less than u_{50}. The u_{50} value is half way between the initial maximum pore pressure and the equilibrium pore pressure value, known as u_{100}. To estimate u_{50}, both the initial maximum pore pressure and u_{100} must be known or estimated. Other degrees of dissipations may be considered, particularly for extremely long dissipations.

At any specific degree of dissipation the equilibrium pore pressure (u at t_{100}) must be estimated at the depth of interest. The equilibrium value may be determined from one or more sources such as measuring the value directly (u_{100}), estimating it from other dissipations in the same profile, estimating the phreatic surface and assuming hydrostatic conditions, from nearby soundings, from client provided information, from site observations and/or past experience, or from other site instrumentation.

For calculations of c_h (Teh and Houlsby, 1991), t_{50} values are estimated from the corresponding pore pressure dissipation curve and a rigidity index (I_r) is assumed. For curves having an initial dilatory response in which an initial rise in pore pressure occurs before reaching a peak, the relative time from the peak value is used in determining t_{50}. In cases where the time to peak is excessive, t_{50} values are not calculated.

Due to possible inherent uncertainties in estimating I_r, the equilibrium pore pressure and the effect of an initial dilatory response on calculating t_{50}, other methods should be applied to confirm the results for c_h.

Additional published methods for estimating the coefficient of consolidation from a piezocone test are described in Burns and Mayne (1998, 2002), Jones and Van Zyl (1981), Robertson et al. (1992) and Sully et al. (1999).

A summary of the pore pressure dissipation tests and dissipation plots are presented in the relevant appendix.

ASTM D5778-12, 2012, "Standard Test Method for Performing Electronic Friction Cone and Piezocone Penetration Testing of Soils", ASTM, West Conshohocken, US.

Burns, S.E. and Mayne, P.W., 1998, "Monotonic and dilatory pore pressure decay during piezocone tests", Canadian Geotechnical Journal 26 (4): 1063-1073.

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Crow, H.L., Hunter, J.A., Bobrowsky, P.T., 2012, "National shear wave measurement guidelines for Canadian seismic site assessment", GeoManitoba 2012, Sept 30 to Oct 2, Winnipeg, Manitoba.

Jones, G.A. and Van Zyl, D.J.A., 1981, "The piezometer probe: a useful investigation tool", Proceedings, 10th International Conference on Soil Mechanics and Foundation Engineering, Vol. 3, Stockholm: 489-495.

Lunne, T., Robertson, P.K. and Powell, J. J. M., 1997, "Cone Penetration Testing in Geotechnical Practice", Blackie Academic and Professional.

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Mayne, P.W., 2014, "Interpretation of geotechnical parameters from seismic piezocone tests", CPT'14 Keynote Address, Las Vegas, NV, May 2014.

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Robertson, P.K., 1990, "Soil Classification Using the Cone Penetration Test", Canadian Geotechnical Journal, Volume 27: 151-158.

Robertson, P.K., 2009, "Interpretation of cone penetration tests – a unified approach", Canadian Geotechnical Journal, Volume 46: 1337-1355.

Robertson, P.K., Campanella, R.G., Gillespie, D. and Greig, J., 1986, "Use of Piezometer Cone Data", Proceedings of InSitu 86, ASCE Specialty Conference, Blacksburg, Virginia.

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Robertson, P.K., Sully, J.P., Woeller, D.J., Lunne, T., Powell, J.J.M. and Gillespie, D.G., 1992, "Estimating coefficient of consolidation from piezocone tests", Canadian Geotechnical Journal, 29(4): 551-557.

Sully, J.P., Robertson, P.K., Campanella, R.G. and Woeller, D.J., 1999, "An approach to evaluation of field CPTU dissipation data in overconsolidated fine-grained soils", Canadian Geotechnical Journal, 36(2): 369-381.

Teh, C.I., and Houlsby, G.T., 1991, “An analytical study of the cone penetration test in clay”, Geotechnique, 41(1): 17-34.

The following appendices listed below are included in the report:

- Cone Penetration Test Summary and Standard Cone Penetration Test Plots
- Advanced Cone Penetration Test Plots with Ic, Phi, and N1(60)
- Seismic Cone Penetration Test Tabular Results
- Seismic Cone Penetration Test Plots
- Pore Pressure Dissipation Summary and Pore Pressure Dissipation Plots

Cone Penetration Test Summary and
Standard Cone Penetration Test Plots

ConeTec

Job No: 17-05010
Client: Baffinland Iron Mines Corporation
Project: Milne Port Expansion
Start Date: 03-Apr-2017
End Date: 07-Apr-2017

CONE PENETRATION TEST SUMMARY

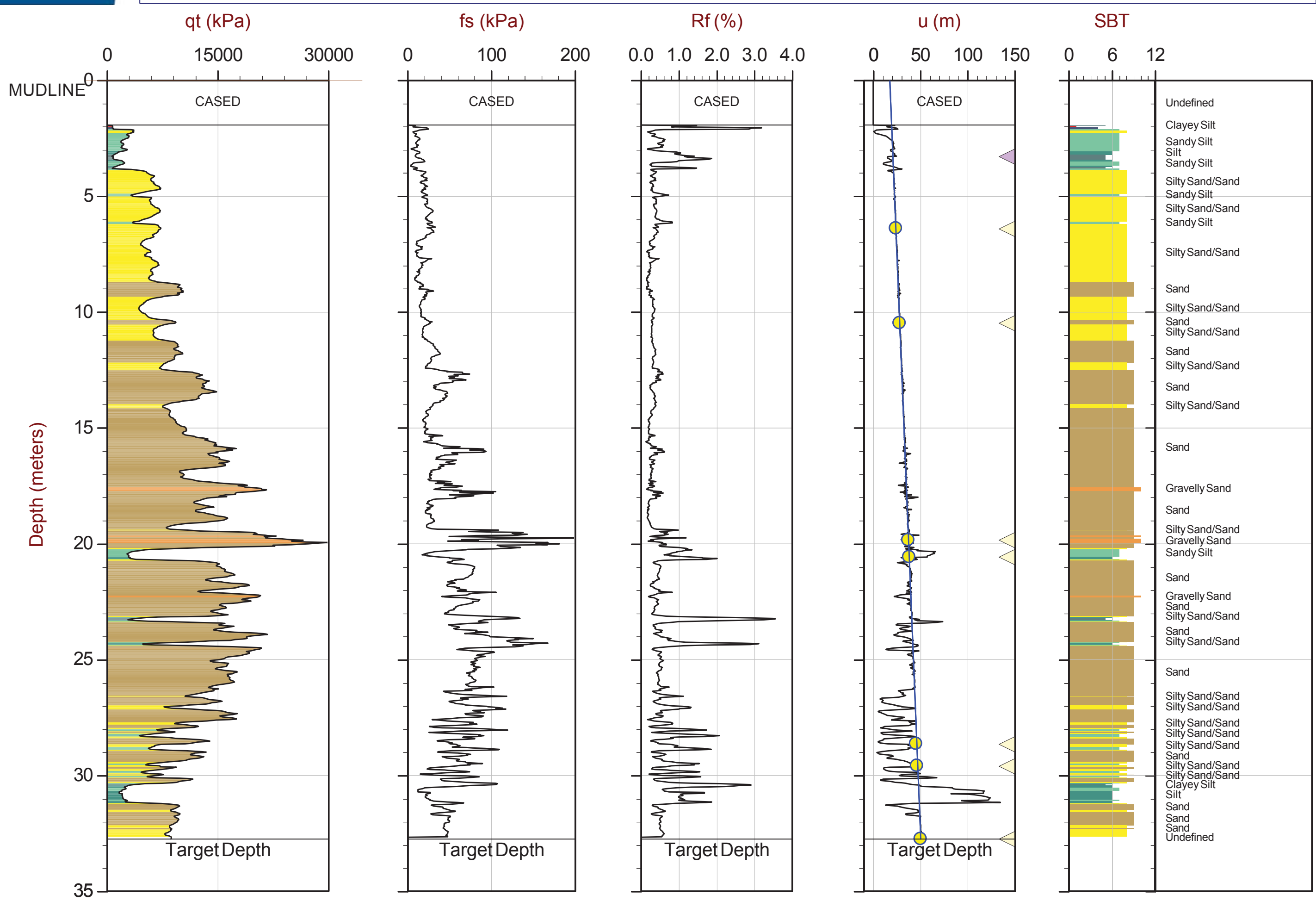
Sounding ID	File Name	Date	Cone	Assumed Phreatic Surface[1] (m)	Final Depth[2] (m)	Northing[3] (m)	Easting (m)	Elevation (m)	Refer to Notation Number
CPT17-D001	17-05010_CPD001	05-Apr-2017	338:T1500F15U500	-17.6	32.750	7976717.62	503607.38	-16.97	
SCPT17-D002	17-05010_SPD002	05-Apr-2017	338:T1500F15U500	-16.9	39.475	7976728.05	503705.30	-16.12	
CPT17-D003	17-05010_CPD003	06-Apr-2017	338:T1500F15U500	-23.2	30.425	7976757.71	503785.39	-22.68	
SCPT17-D004	17-05010_SPD004	04-Apr-2017	338:T1500F15U500	-27.3	32.050	7976768.10	503646.44	-26.59	
CPT17-D005	17-05010_CPD005	03-Apr-2017	338:T1500F15U500	-26.0	25.125	7976780.84	503736.09	-24.98	
CPT17-D006	17-05010_CPD006	06-Apr-2017	374:T1500F15U500	-32.0	20.575	7976808.43	503807.55	-31.32	
CPT17-D007	17-05010_CPD007	07-Apr-2017	374:T1500F15U501	-4.7	30.200	7976683.63	503767.46	-4.23	
CPT17-D008	17-05010_CPD008	07-Apr-2017	374:T1500F15U502	-1.4	30.000	7976650.76	503635.99	-1.80	

1. The assumed phreatic surface was based on pore pressure dissipation tests. Hydrostatic conditions were assumed for the interpretation tables.
2. Depth is referenced from the mudline at the time of testing.
3. Coordinates and elevations were acquired using ConeTec Trimble Survey in datum NAD 83 / UTM Zone 17 North. Elevation is of the mudline at the time of testing.

Baffinland

Job No: 17-05010
Date: 2017-04-05 09:17
Site: Milne Port Expansion

Sounding: CPT17-D001
Cone: 338:T1500F15U500



Max Depth: 32.750 m / 107.45 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 17-05010_CPD001.COR
Unit Wt: SBT (R&C1986)

SBT: Robertson and Campanella, 1986
Coords: UTM17N N: 7976717.62m E: 503607.38m Elev: -16.97m

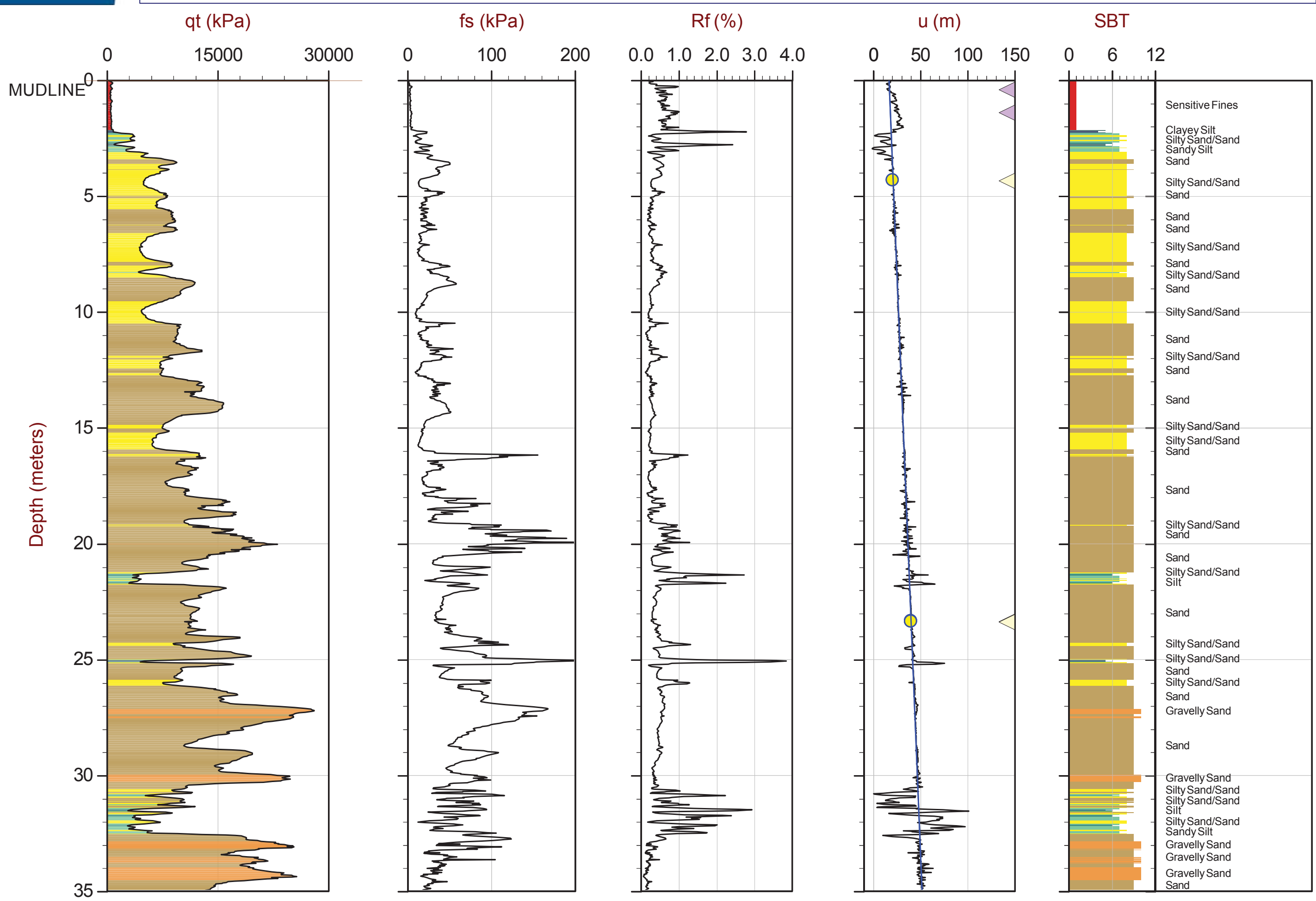
Equilibrium Pore Pressure (Ueq) | Dissipation, Ueq not achieved | Dissipation, Ueq achieved | Hydrostatic Line

ConeTec

Baffinland

Job No: 17-05010
Date: 2017-04-05 20:44
Site: Milne Port Expansion

Sounding: SCPT17-D002
Cone: 338:T1500F15U500



Max Depth: 39.475 m / 129.51 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 17-05010_SPD002.COR
Unit Wt: SBT (R&C1986)

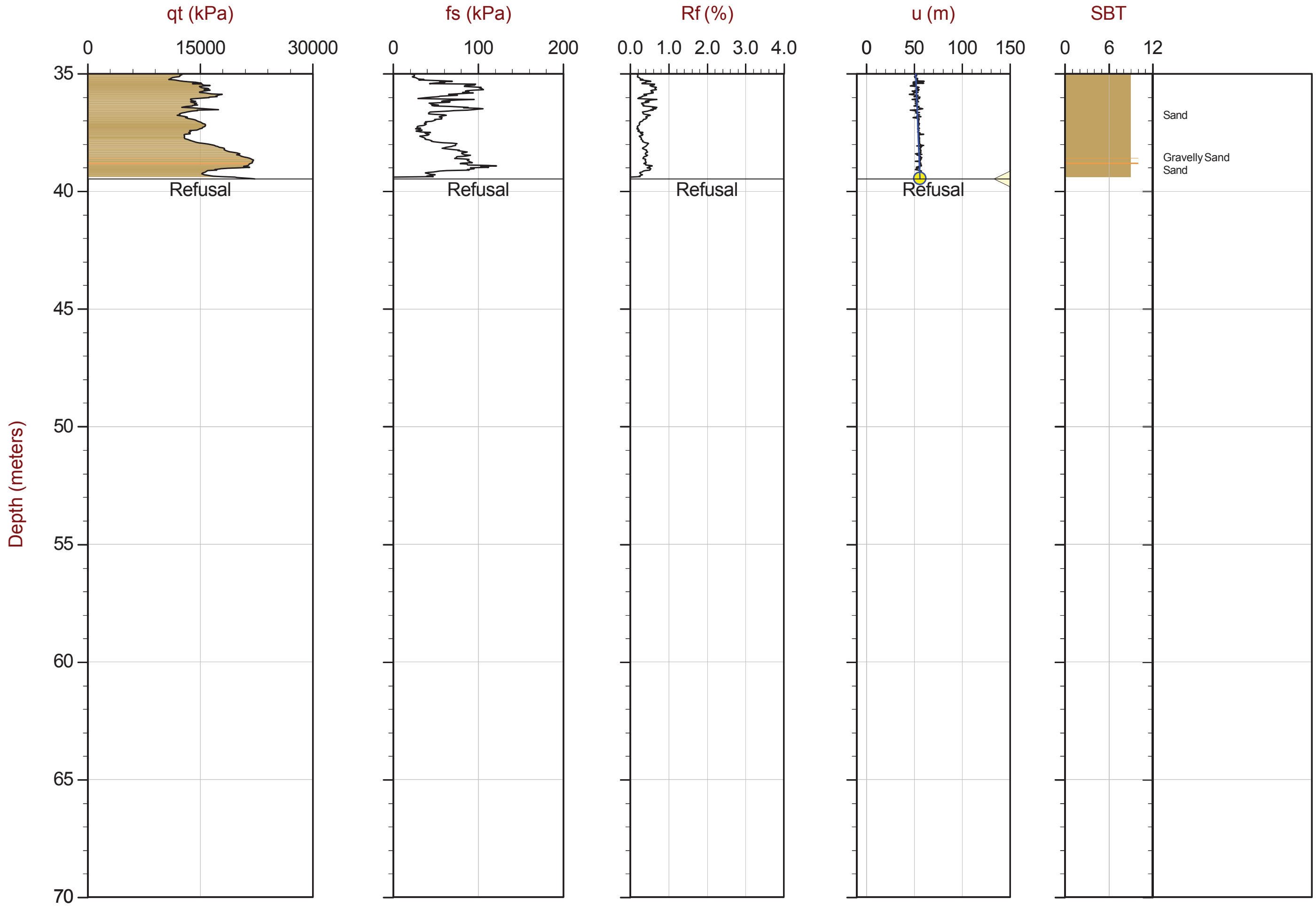
SBT: Robertson and Campanella, 1986
Coords: UTM17N N: 7976728.05m E: 503705.30m Elev: -16.12m

Equilibrium Pore Pressure (Ueq) Dissipation, Ueq not achieved Dissipation, Ueq achieved Hydrostatic Line

Baffinland

Job No: 17-05010
Date: 2017-04-05 20:44
Site: Milne Port Expansion

Sounding: SCPT17-D002
Cone: 338:T1500F15U500



Max Depth: 39.475 m / 129.51 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 17-05010_SPD002.COR
Unit Wt: SBT (R&C1986)

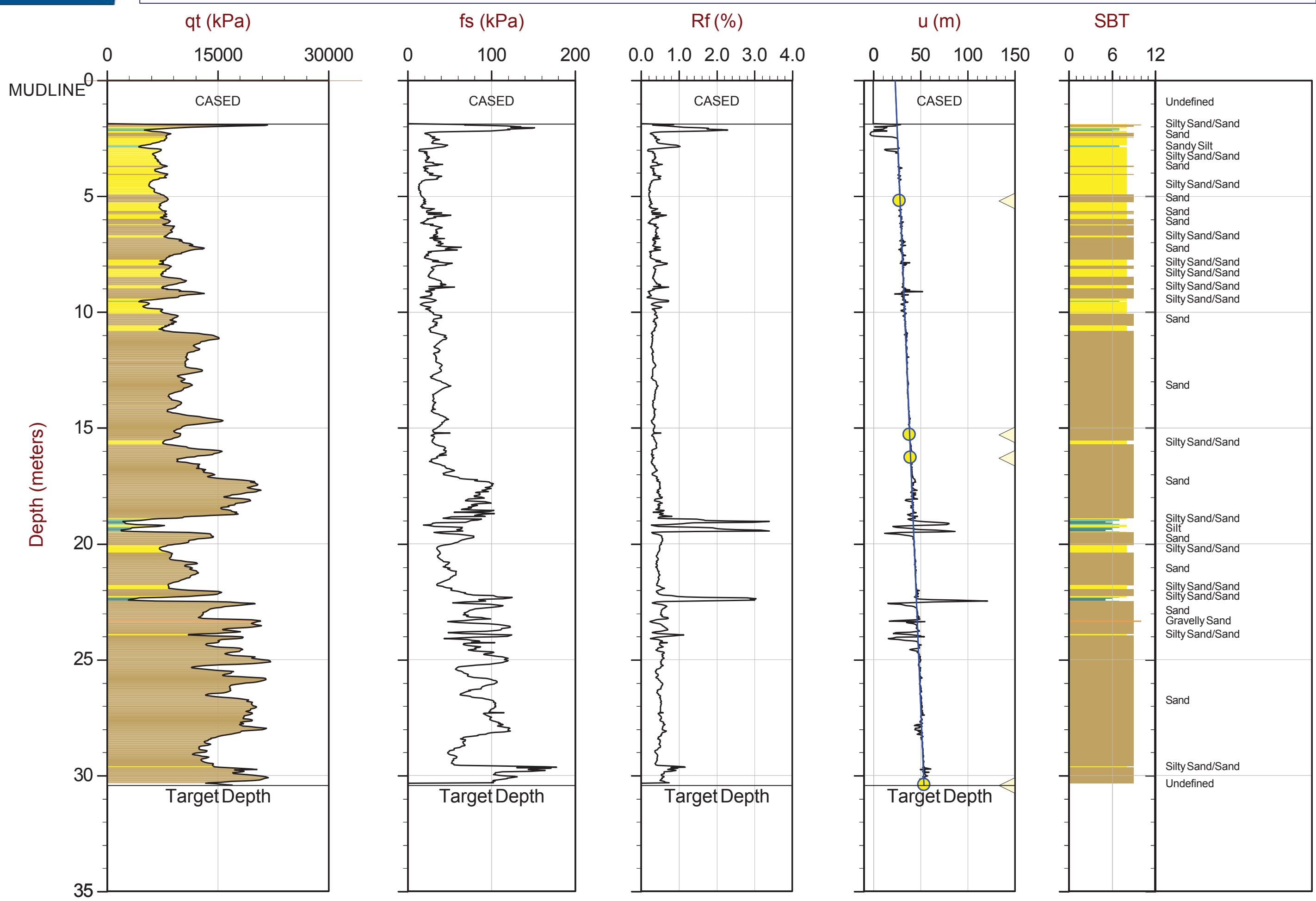
SBT: Robertson and Campanella, 1986
Coords: UTM17N N: 7976728.05m E: 503705.30m Elev: -16.12m

Equilibrium Pore Pressure (Ueq) · Dissipation, Ueq not achieved · Dissipation, Ueq achieved · Hydrostatic Line

Baffinland

Job No: 17-05010
Date: 2017-04-06 13:34
Site: Milne Port Expansion

Sounding: CPT17-D003
Cone: 338:T1500F15U500



Max Depth: 30.425 m / 99.82 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

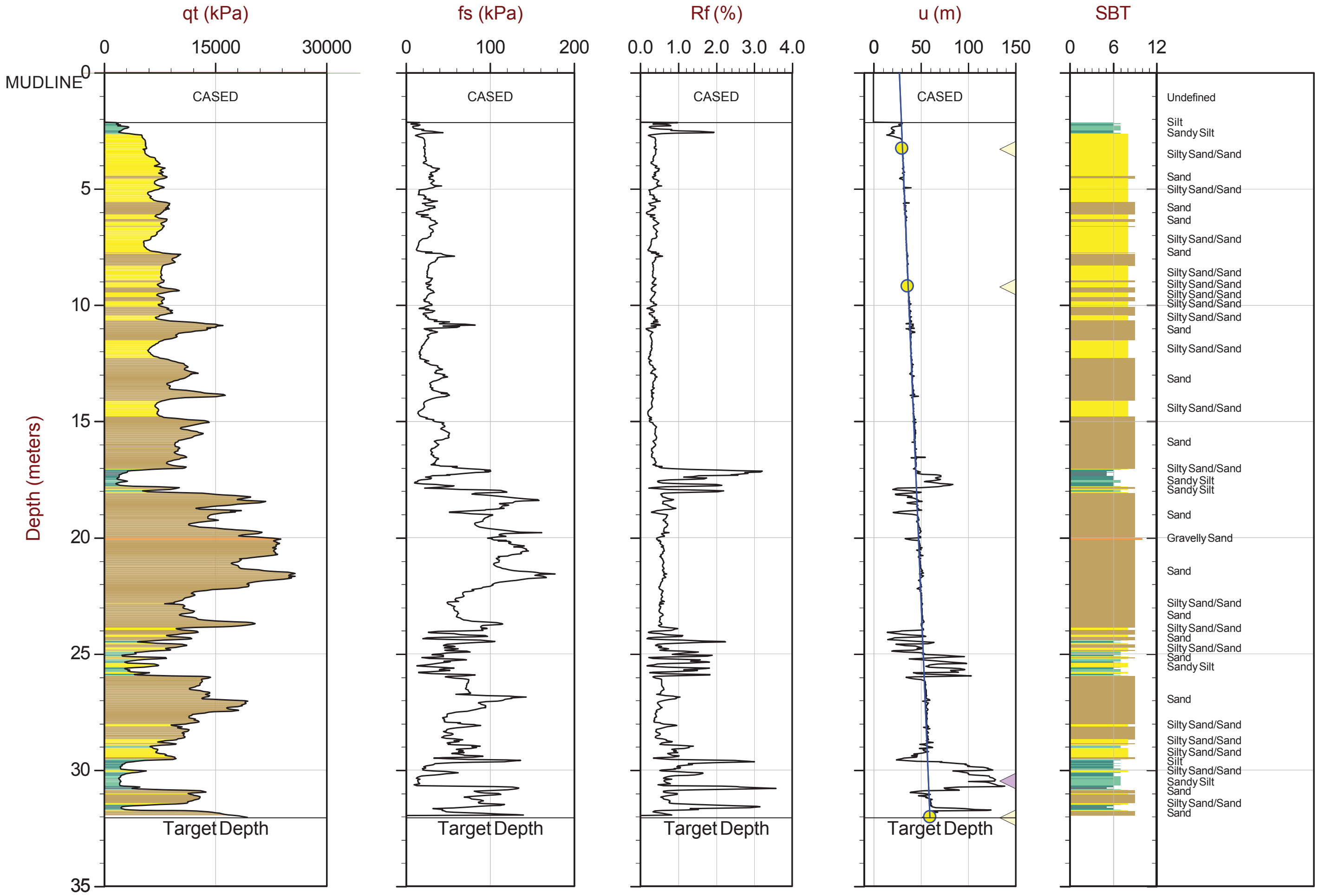
File: 17-05010_CPD003.COR
Unit Wt: SBT (R&C1986)

SBT: Robertson and Campanella, 1986
Coords: UTM17N N:7976757.71m E:503785.39m Elev: -22.68m

Equilibrium Pore Pressure (Ueq) Dissipation, Ueq not achieved Dissipation, Ueq achieved Hydrostatic Line

Baffinland

Job No: 17-05010
Date: 2017-04-04 16:44
Site: Milne Port Expansion
Sounding: SCPT17-D004
Cone: 338:T1500F15U500



Max Depth: 32.050 m / 105.15 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 17-05010_SPD004.COR
Unit Wt: SBT (R&C1986)

SBT: Robertson and Campanella, 1986
Coords: UTM17N N: 7976768.10m E: 503646.44m Elev: -26.59m

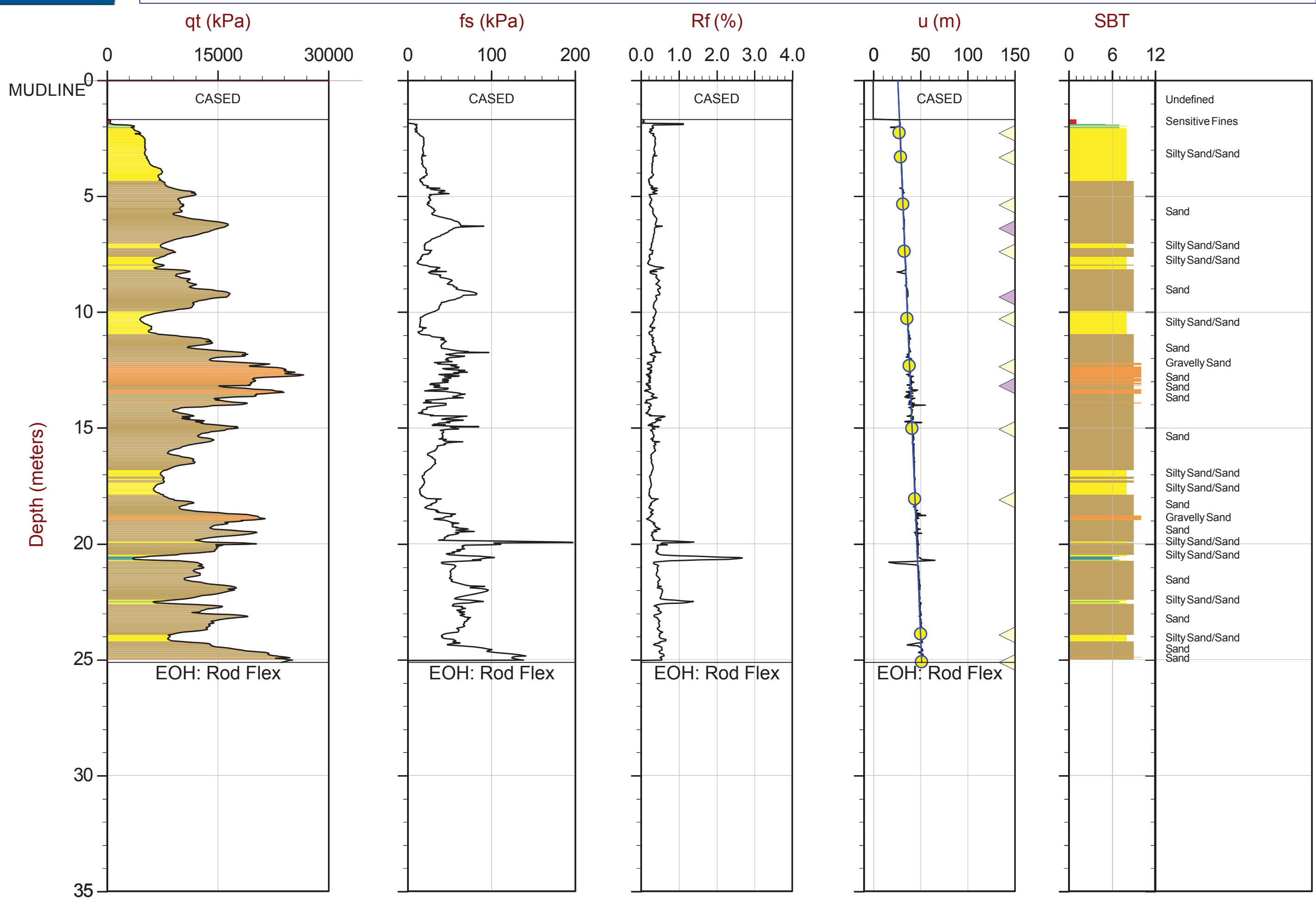
Equilibrium Pore Pressure (Ueq)
Dissipation, Ueq not achieved
Dissipation, Ueq achieved
Hydrostatic Line

ConeTec

Baffinland

Job No: 17-05010
Date: 2017-04-03 02:19
Site: Milne Port Expansion

Sounding: CPT17-D005
Cone: 338:T1500F15U500



Max Depth: 25.125 m / 82.43 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 17-05010_CPD005.COR
Unit Wt: SBT (R&C1986)

SBT: Robertson and Campanella, 1986
Coords: UTM17N N: 7976780.84m E: 503736.09m Elev: -24.98m

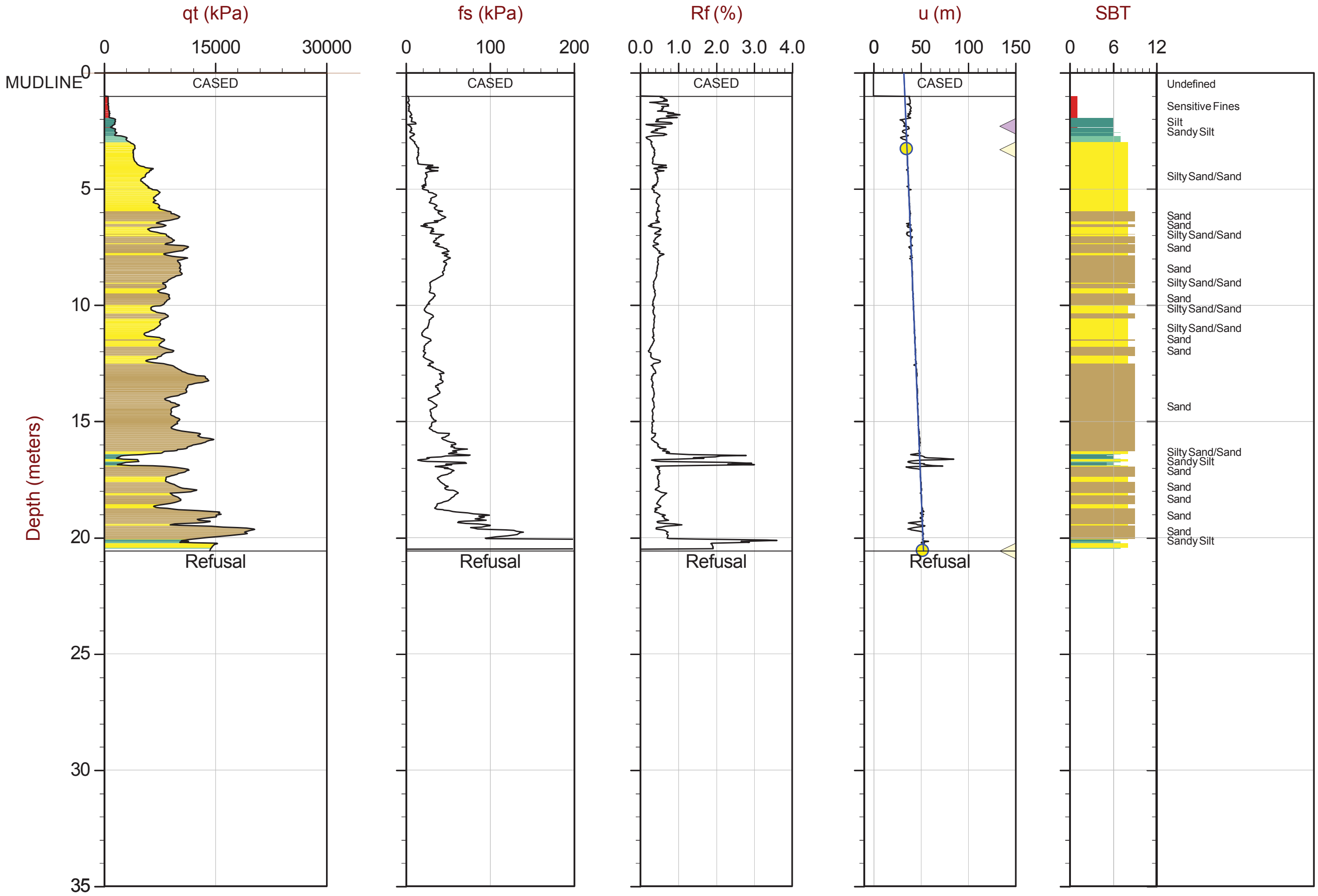
Equilibrium Pore Pressure (Ueq) — Dissipation, Ueq not achieved — Dissipation, Ueq achieved — Hydrostatic Line

CONETEC

Baffinland

Job No: 17-05010
Date: 2017-04-06 23:59
Site: Milne Port Expansion

Sounding: CPT17-D006
Cone: 374:T1500F15U500



Max Depth: 20.575 m / 67.50 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 17-05010_CPD006.COR
Unit Wt: SBT (R&C1986)

SBT: Robertson and Campanella, 1986
Coords: UTM17N N: 7976808.43m E: 503807.55m Elev: -31.32m

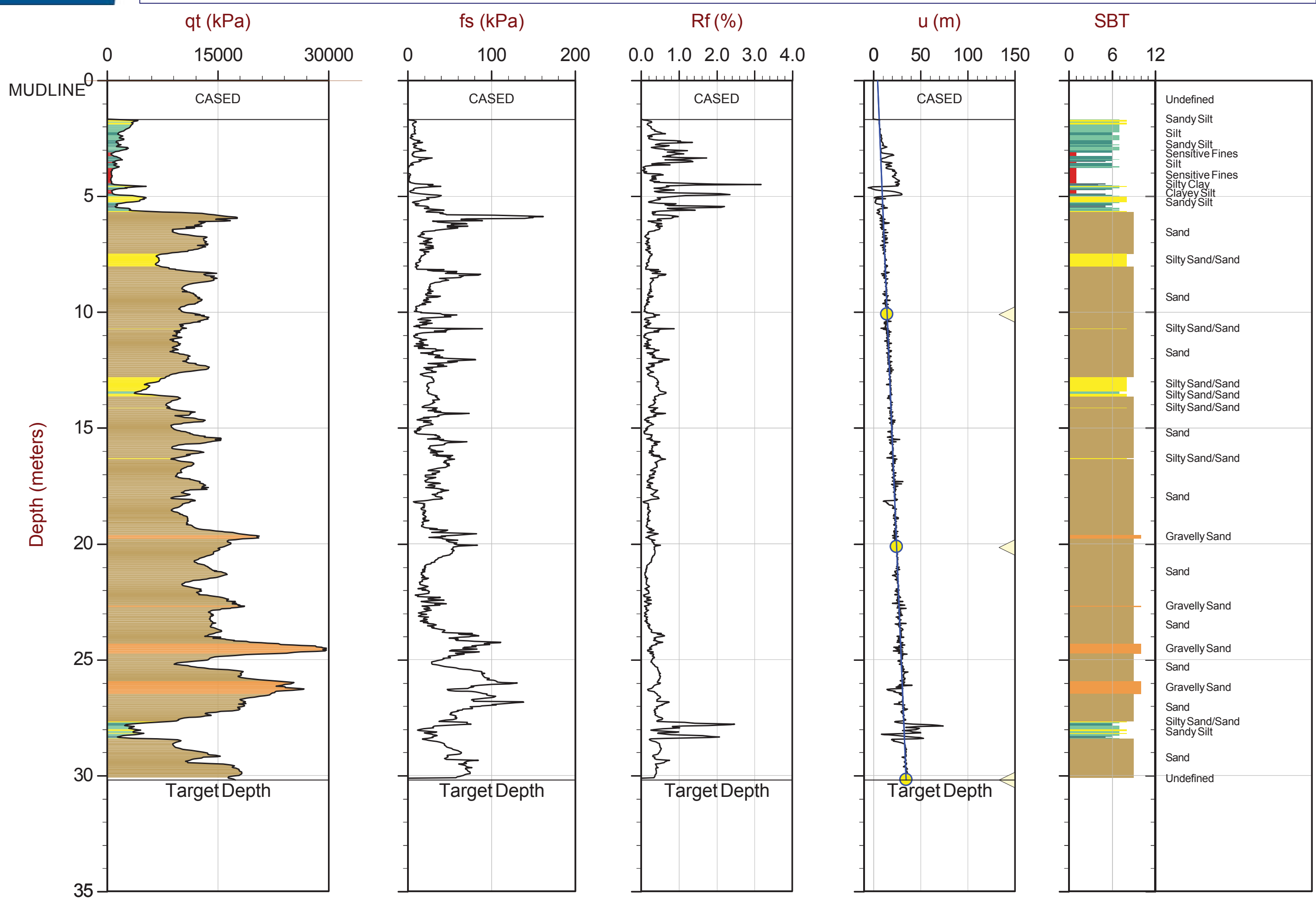
Equilibrium Pore Pressure (Ueq) Dissipation, Ueq not achieved Dissipation, Ueq achieved Hydrostatic Line

ConeTec

Baffinland

Job No: 17-05010
Date: 2017-04-07 11:27
Site: Milne Port Expansion

Sounding: CPT17-D007
Cone: 374:T1500F15U500



Max Depth: 30.200 m / 99.08 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 17-05010_CPD007.COR
Unit Wt: SBT (R&C1986)

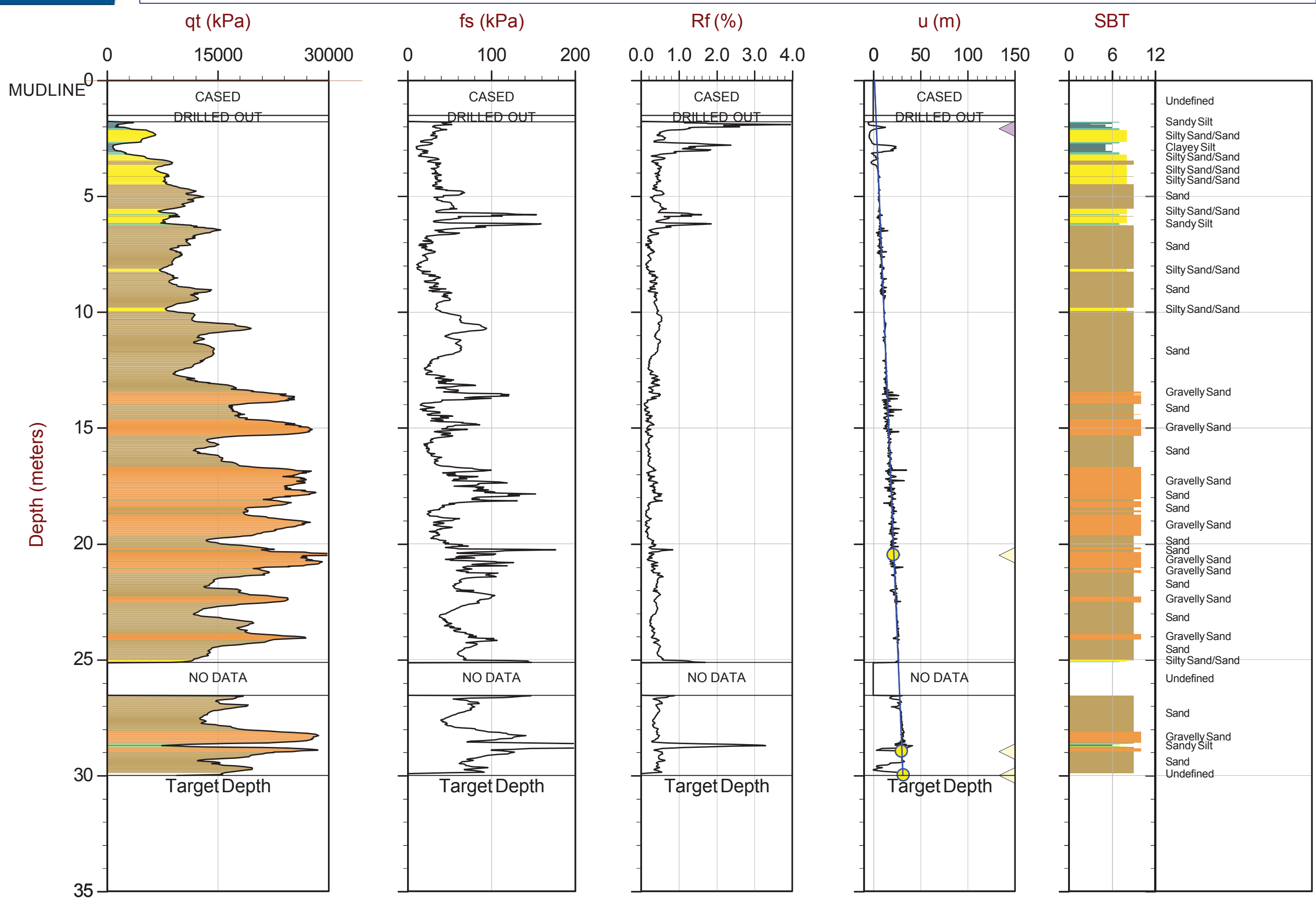
SBT: Robertson and Campanella, 1986
Coords: UTM17N N: 7976683.63m E: 503767.46m Elev: -4.23m

Equilibrium Pore Pressure (Ueq) | Dissipation, Ueq not achieved | Dissipation, Ueq achieved | Hydrostatic Line

Baffinland

Job No: 17-05010
Date: 2017-04-07 16:47
Site: Milne Port Expansion

Sounding: CPT17-D008
Cone: 374:T1500F15U500



Max Depth: 30.000 m / 98.42 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 17-05010_CPD008.COR
Unit Wt: SBT (R&C1986)

SBT: Robertson and Campanella, 1986
Coords: UTM17N N: 7976650.76m E: 503635.99m Elev: -1.80m

Equilibrium Pore Pressure (Ueq)
Dissipation, Ueq not achieved
Dissipation, Ueq achieved
Hydrostatic Line

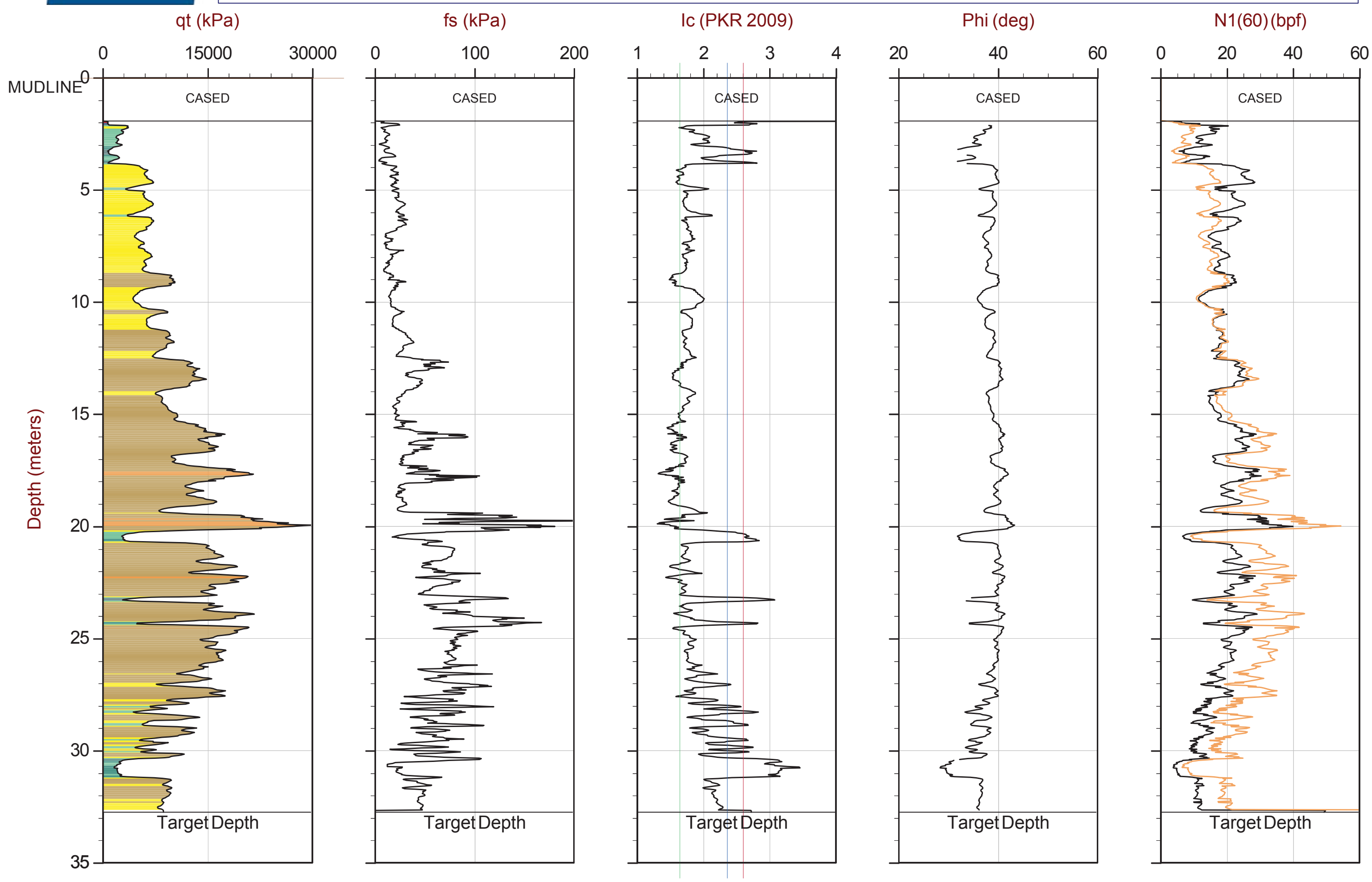
Advanced Cone Penetration Test Plots with Ic, Phi, and N1(60)

CONETEC

Baffinland

Job No: 17-05010
Date: 2017-04-05 09:17
Site: Milne Port Expansion

Sounding: CPT17-D001
Cone: 338:T1500F15U500



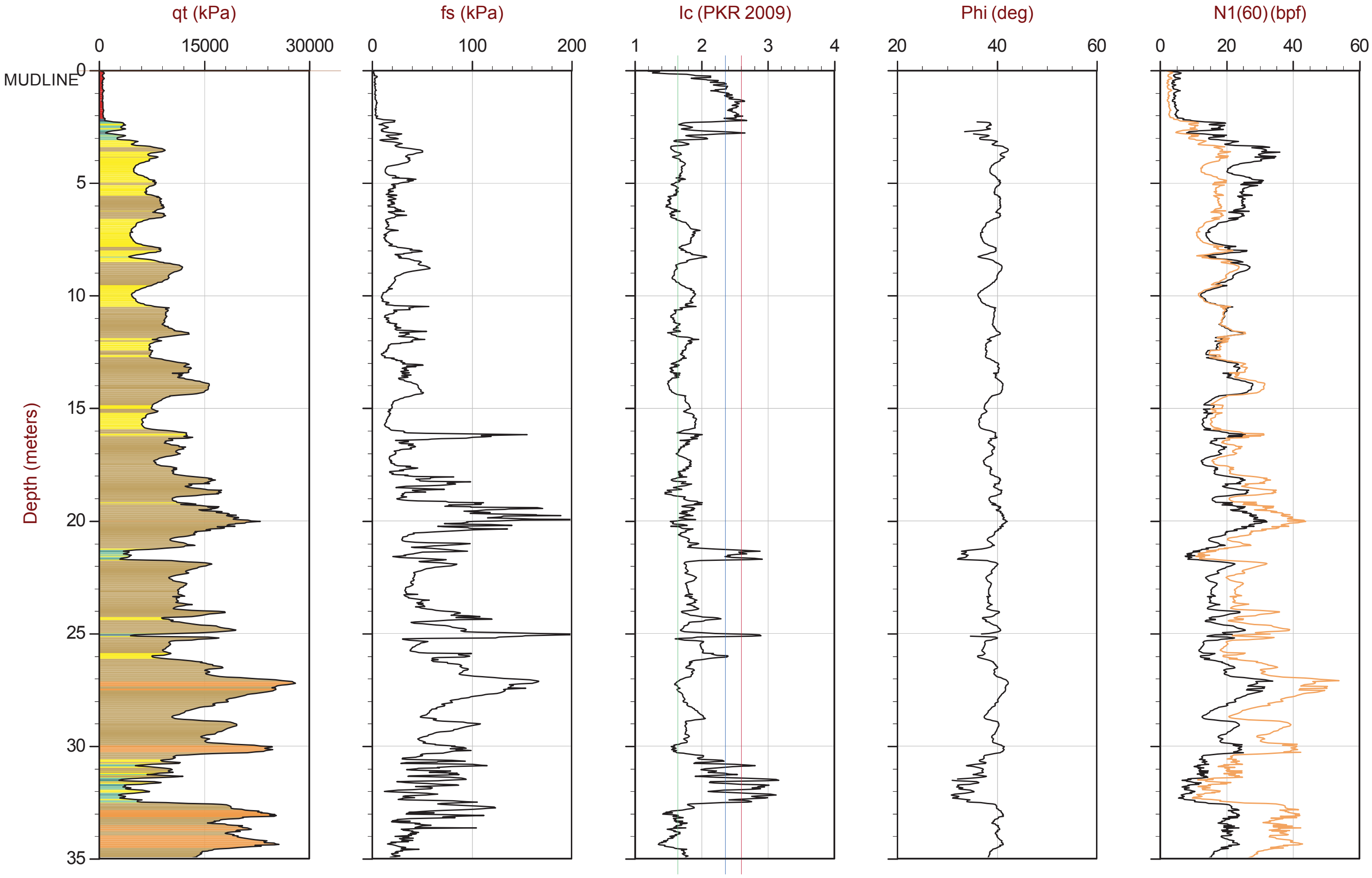
Max Depth: 32.750 m / 107.45 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point
N(60) (bpf)

File: 17-05010_CPD001.COR
Unit Wt: SBT (R&C1986)

SBT: Robertson and Campanella, 1986
Coords: UTM17N N: 7976717.62m E: 503607.38m Elev: -16.97m

Job No: 17-05010	Sounding: SCPT17-D002
Date: 2017-04-05 20:44	Cone: 338:T1500F15U500
Site: Milne Port Expansion	

Baffinland



Max Depth: 39.475 m / 129.51 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point
N(60) (bpf)

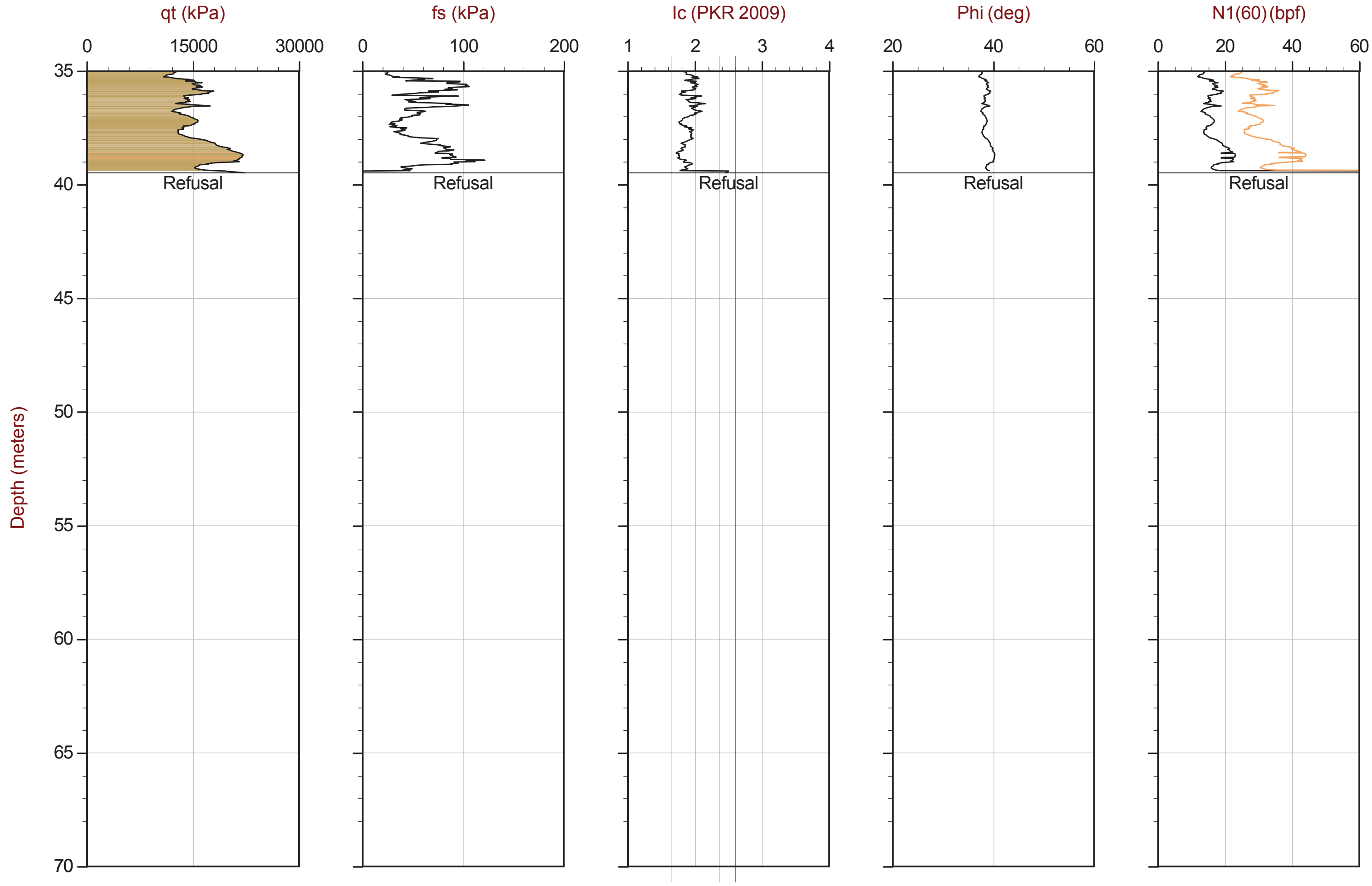
File: 17-05010_SPD002.COR
Unit Wt: SBT (R&C1986)

SBT: Robertson and Campanella, 1986
Coords: UTM17N N: 7976728.05m E: 503705.30m Elev: -16.12m

Baffinland

Job No: 17-05010
Date: 2017-04-05 20:44
Site: Milne Port Expansion

Sounding: SCPT17-D002
Cone: 338:T1500F15U500

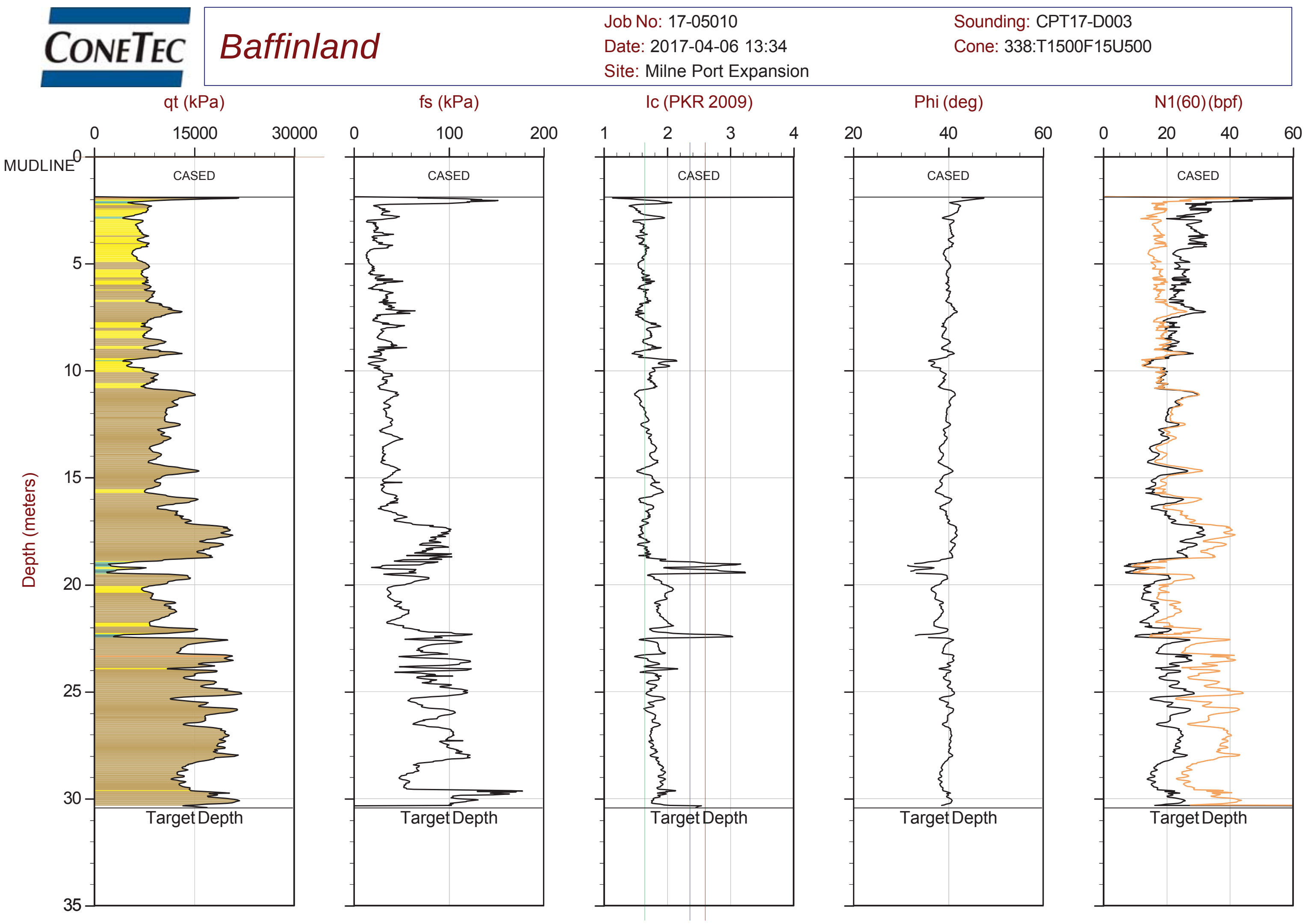


Max Depth: 39.475 m / 129.51 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point
N(60) (bpf)

File: 17-05010_SPD002.COR
Unit Wt: SBT (R&C1986)

SBT: Robertson and Campanella, 1986
Coords: UTM17N N: 7976728.05m E: 503705.30m Elev: -16.12m

Job No: 17-05010
Date: 2017-04-06 13:34
Site: Milne Port Expansion
Sounding: CPT17-D003
Cone: 338:T1500F15U500



Max Depth: 30.425 m / 99.82 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point
N(60) (bpf)

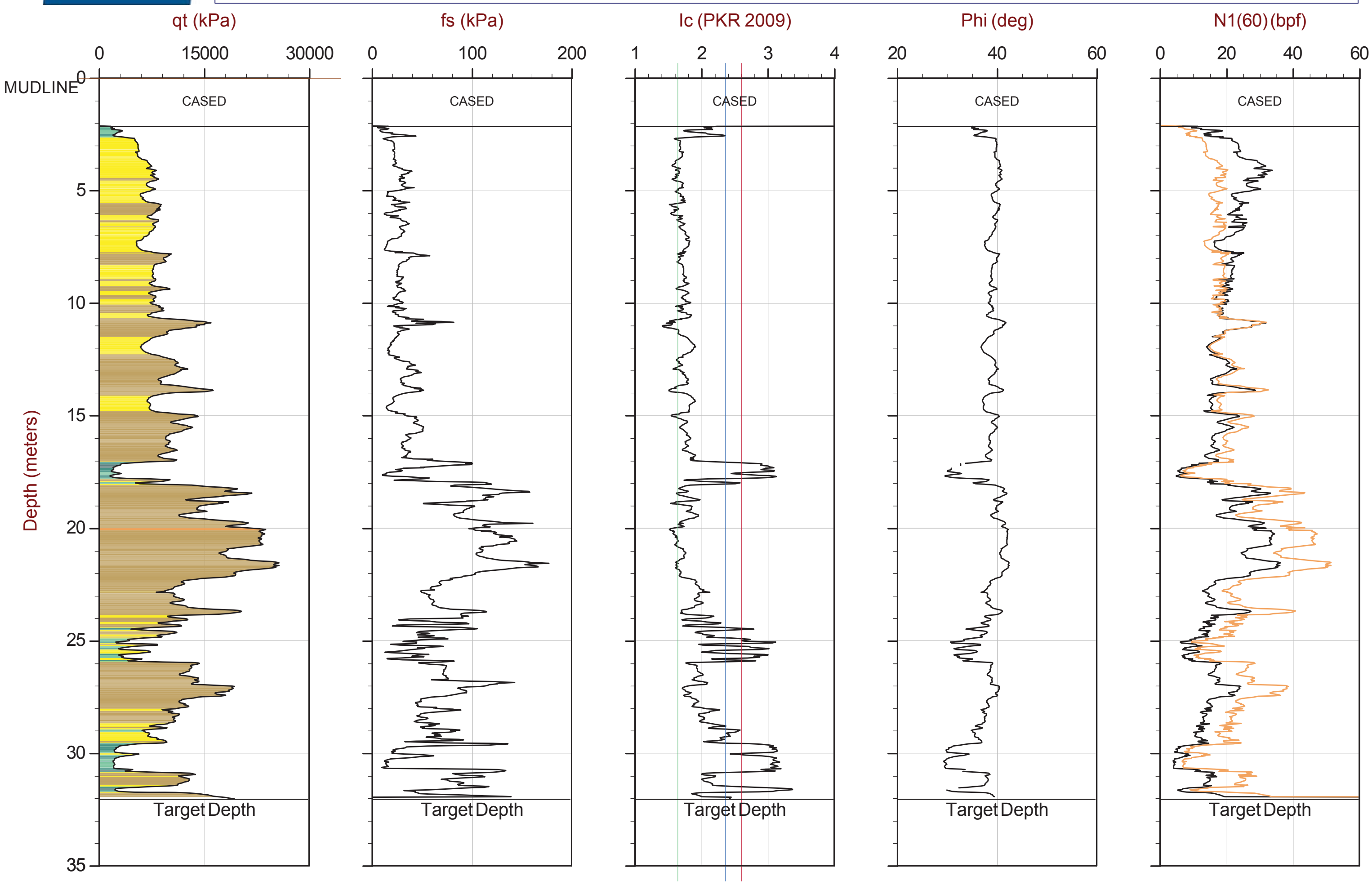
File: 17-05010_CPD003.COR
Unit Wt: SBT (R&C1986)

SBT: Robertson and Campanella, 1986
Coords: UTM17N N: 7976757.71m E: 503785.39m Elev: -22.68m

Baffinland

Job No: 17-05010
Date: 2017-04-04 16:44
Site: Milne Port Expansion

Sounding: SCPT17-D004
Cone: 338:T1500F15U500



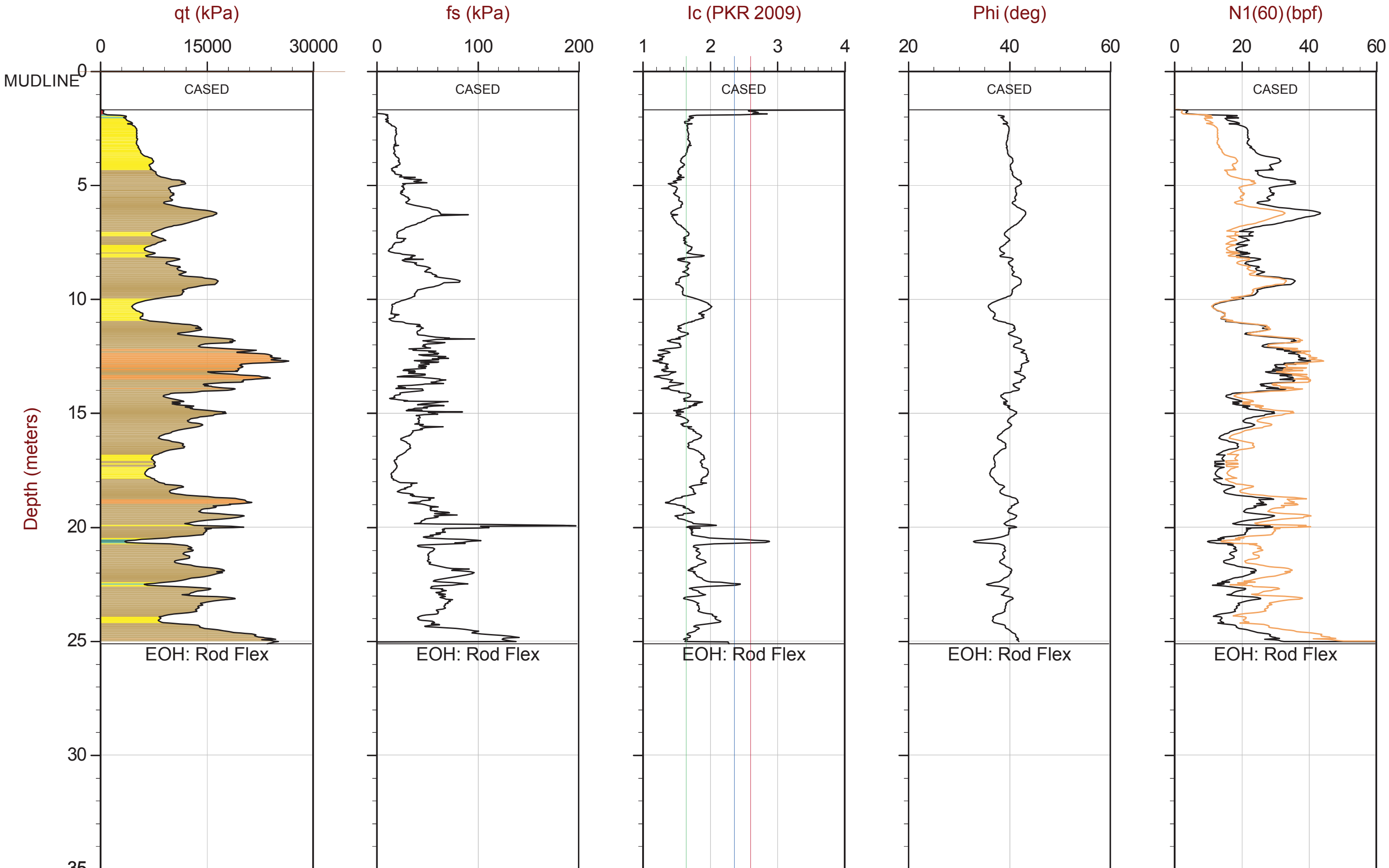
Max Depth: 32.050 m / 105.15 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point
N(60) (bpf)

File: 17-05010_SPD004.COR
Unit Wt: SBT (R&C1986)

SBT: Robertson and Campanella, 1986
Coords: UTM17N N: 7976768.10m E: 503646.44m Elev: -26.59m

ConeTec **Baffinland**

Job No: 17-05010
Date: 2017-04-03 02:19
Site: Milne Port Expansion
Sounding: CPT17-D005
Cone: 338:T1500F15U500



Max Depth: 25.125 m / 82.43 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point
N(60) (bpf)

File: 17-05010_CPD005.COR
Unit Wt: SBT (R&C1986)

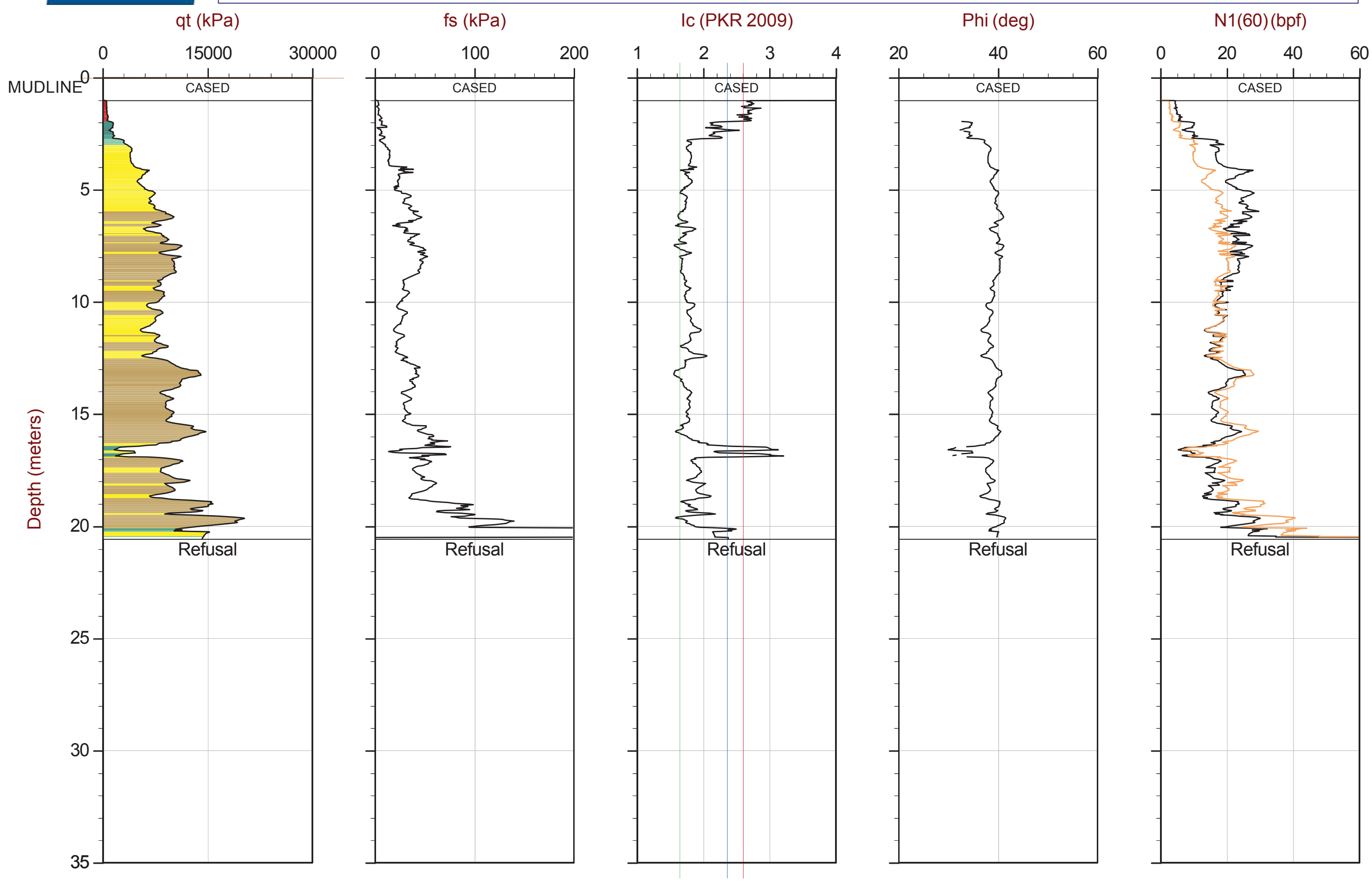
SBT: Robertson and Campanella, 1986
Coords: UTM17N N: 7976780.84m E: 503736.09m Elev: -24.98m

ConeTec

Baffinland

Job No: 17-05010
Date: 2017-04-06 23:59
Site: Milne Port Expansion

Sounding: CPT17-D006
Cone: 374:T1500F15U500



Max Depth: 20.575 m / 67.50 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point
N(60) (bpf)

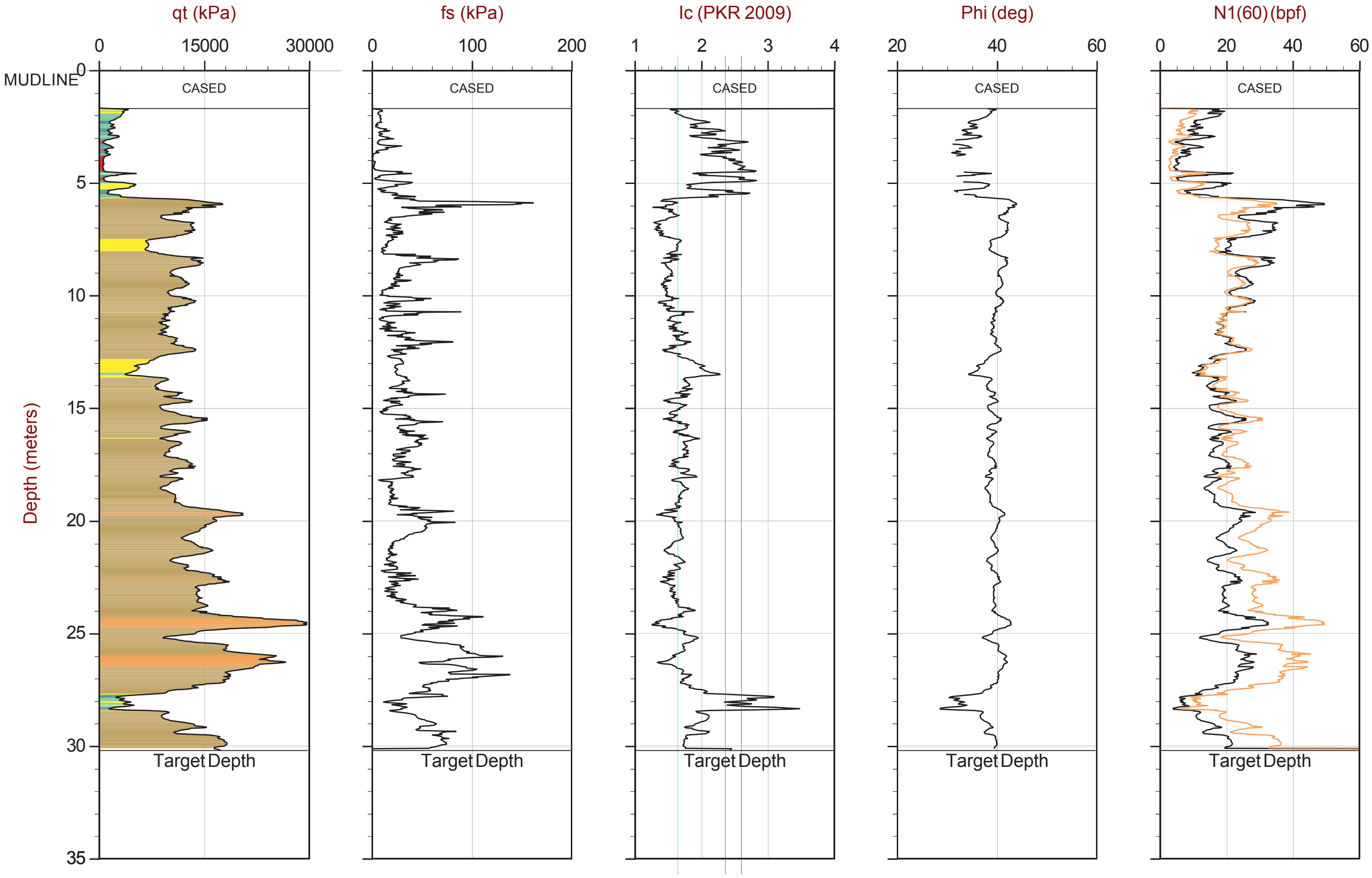
File: 17-05010_CPD006.COR
Unit Wt: SBT (R&C1986)

SBT: Robertson and Campanella, 1986
Coords: UTM17N N: 7976808.43m E: 503807.55m Elev: -31.32m

Baffinland

Job No: 17-05010
Date: 2017-04-07 11:27
Site: Milne Port Expansion

Sounding: CPT17-D007
Cone: 374:T1500F15U500



Max Depth: 30.200 m / 99.08 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point
N(60) (bpf)

File: 17-05010_CPD007.COR
Unit Wt: SBT (R&C1986)

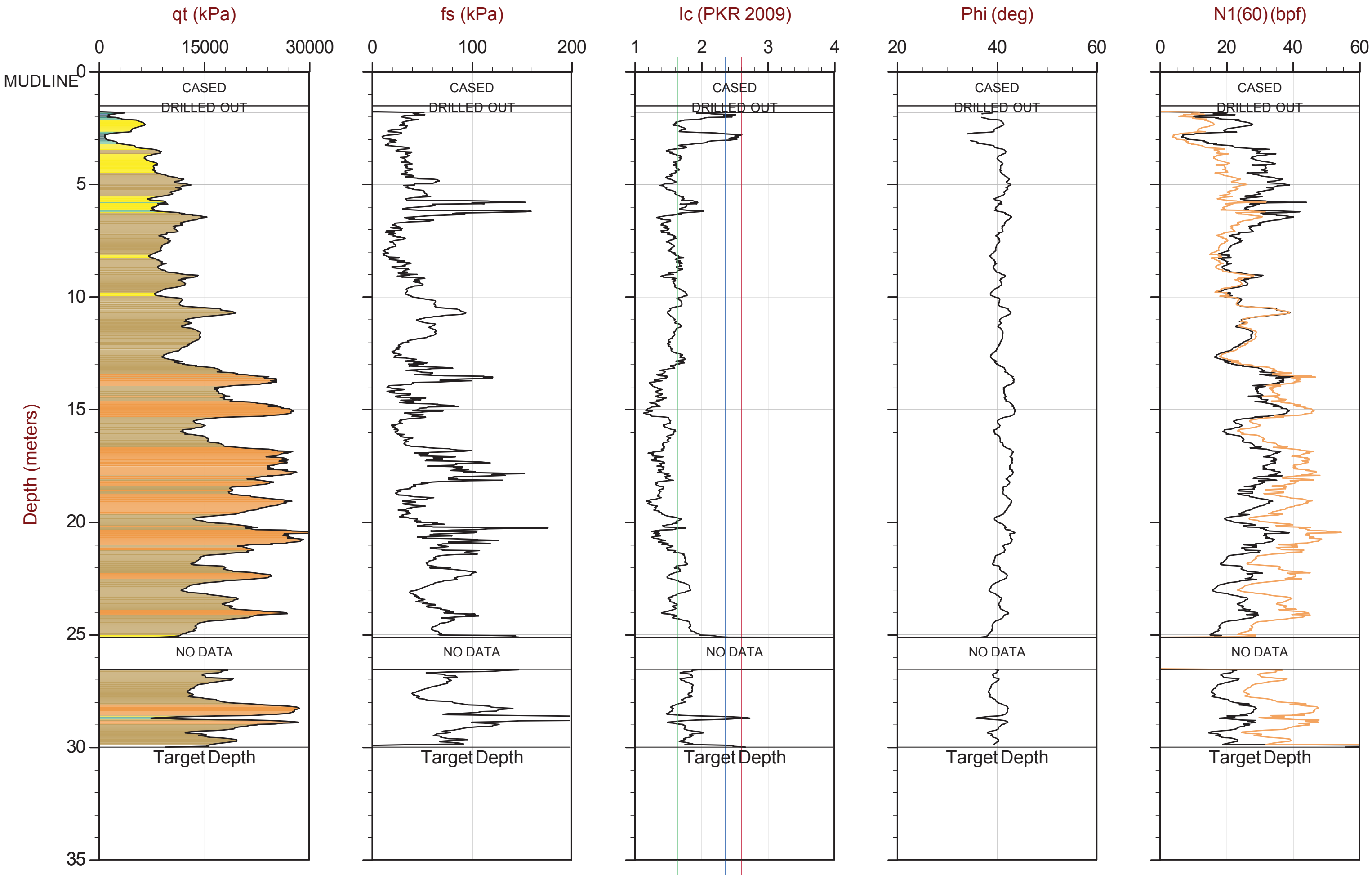
SBT: Robertson and Campanella, 1986
Coords: UTM17N N: 7976683.63m E: 503767.46m Elev: -4.23m

CONETEC

Baffinland

Job No: 17-05010
Date: 2017-04-07 16:47
Site: Milne Port Expansion

Sounding: CPT17-D008
Cone: 374:T1500F15U500



Max Depth: 30.000 m / 98.42 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point
N(60) (bpf)

File: 17-05010_CPD008.COR
Unit Wt: SBT (R&C1986)

SBT: Robertson and Campanella, 1986
Coords: UTM17N N: 7976650.76m E: 503635.99m Elev: -1.80m

Seismic Cone Penetration Test Tabular Results

Job No: 17-05010
Client: Baffinland Iron Mines Corporation
Project: Milne Port Expansion
Sounding ID: SCPT17-D002
Date: 05-Apr-2017

Seismic Source: Auto-seismic
Source Offset (m): 4.30
Source Depth (m): 0.00
Geophone Offset (m): 0.20

SCPTu SHEAR WAVE VELOCITY TEST RESULTS - Vs

Tip Depth (m)	Geophone Depth (m)	Ray Path (m)	Ray Path Difference (m)	Travel Time Interval (ms)	Interval Velocity (m/s)
3.38	3.18	5.35			
5.38	5.18	6.73	1.38	8.94	155
6.35	6.15	7.50	0.77	4.62	167
7.40	7.20	8.39	0.88	5.00	177
8.38	8.18	9.24	0.86	4.38	195
9.40	9.20	10.16	0.91	5.21	175
10.38	10.18	11.05	0.90	4.78	187
11.38	11.18	11.98	0.93	5.35	173
12.40	12.20	12.94	0.96	4.82	198
13.43	13.23	13.91	0.98	4.81	203
14.43	14.23	14.87	0.95	4.70	203
15.43	15.23	15.83	0.96	4.39	219
16.43	16.23	16.79	0.96	4.40	219
17.40	17.20	17.73	0.94	4.13	228
18.45	18.25	18.75	1.02	4.54	225
19.40	19.20	19.68	0.93	3.87	239
20.35	20.15	20.60	0.93	3.91	238
21.35	21.15	21.58	0.98	4.50	217
22.35	22.15	22.56	0.98	4.44	221
23.35	23.15	23.55	0.98	4.67	210
24.27	24.07	24.45	0.91	4.13	219
25.30	25.10	25.47	1.01	4.00	254
26.27	26.07	26.42	0.96	3.80	252

Job No: 17-05010
Client: Baffinland Iron Mines Corporation
Project: Milne Port Expansion
Sounding ID: SCPT17-D002
Date: 05-Apr-2017

Seismic Source: Auto-seismic
Source Offset (m): 4.30
Source Depth (m): 0.00
Geophone Offset (m): 0.20

SCPTu SHEAR WAVE VELOCITY TEST RESULTS - Vs

Tip Depth (m)	Geophone Depth (m)	Ray Path (m)	Ray Path Difference (m)	Travel Time Interval (ms)	Interval Velocity (m/s)
27.32	27.12	27.46	1.04	4.08	254
28.38	28.18	28.51	1.05	3.93	267
29.43	29.23	29.54	1.04	4.08	254
30.40	30.20	30.50	0.96	3.54	271
31.40	31.20	31.49	0.99	3.55	279
32.38	32.18	32.47	0.97	3.59	270
33.38	33.18	33.46	0.99	3.56	279
34.40	34.20	34.47	1.01	3.63	279
35.40	35.20	35.46	0.99	3.60	276
36.40	36.20	36.45	0.99	3.75	265
37.40	37.20	37.45	0.99	3.87	257
38.40	38.20	38.44	0.99	3.81	261
39.40	39.20	39.44	0.99	3.81	261

Job No: 17-05010
Client: Baffinland Iron Mines Corporation
Project: Milne Port Expansion
Sounding ID: SCPT17-D004
Date: 04-Apr-2017

Seismic Source: Auto-seismic
Source Offset (m): 3.40
Source Depth (m): 0.00
Geophone Offset (m): 0.20

SCPTu SHEAR WAVE VELOCITY TEST RESULTS - Vs

Tip Depth (m)	Geophone Depth (m)	Ray Path (m)	Ray Path Difference (m)	Travel Time Interval (ms)	Interval Velocity (m/s)
4.30	4.10	5.33			
5.30	5.10	6.13	0.80	4.48	179
6.20	6.00	6.90	0.77	3.86	198
7.20	7.00	7.78	0.89	3.86	229
8.20	8.00	8.69	0.91	4.17	218
9.20	9.00	9.62	0.93	4.33	214
10.95	10.75	11.27	1.65	7.11	233
11.93	11.73	12.21	0.94	3.87	243
12.93	12.73	13.18	0.96	4.33	223
13.95	13.75	14.16	0.99	4.10	241
14.88	14.68	15.07	0.90	3.75	241
15.88	15.68	16.04	0.98	4.50	217
16.88	16.68	17.02	0.98	4.05	242
17.85	17.65	17.97	0.95	4.80	198
18.85	18.65	18.96	0.98	3.75	262
19.88	19.68	19.97	1.01	4.21	241
20.90	20.70	20.98	1.01	3.94	255
21.82	21.62	21.89	0.91	3.18	286
22.82	22.62	22.87	0.99	3.63	272
23.85	23.65	23.89	1.02	4.39	232
24.80	24.60	24.83	0.94	3.63	259
25.80	25.60	25.82	0.99	4.09	242
26.80	26.60	26.82	0.99	3.63	273

Job No: 17-05010
Client: Baffinland Iron Mines Corporation
Project: Milne Port Expansion
Sounding ID: SCPT17-D004
Date: 04-Apr-2017

Seismic Source: Auto-seismic
Source Offset (m): 3.40
Source Depth (m): 0.00
Geophone Offset (m): 0.20

SCPTu SHEAR WAVE VELOCITY TEST RESULTS - Vs

Tip Depth (m)	Geophone Depth (m)	Ray Path (m)	Ray Path Difference (m)	Travel Time Interval (ms)	Interval Velocity (m/s)
27.82	27.62	27.83	1.01	3.63	278
28.82	28.62	28.82	0.99	3.94	252
29.82	29.62	29.81	0.99	3.79	262
30.77	30.57	30.76	0.94	3.48	271
31.80	31.60	31.78	1.02	3.79	270
32.05	31.85	32.03	0.25	0.91	274

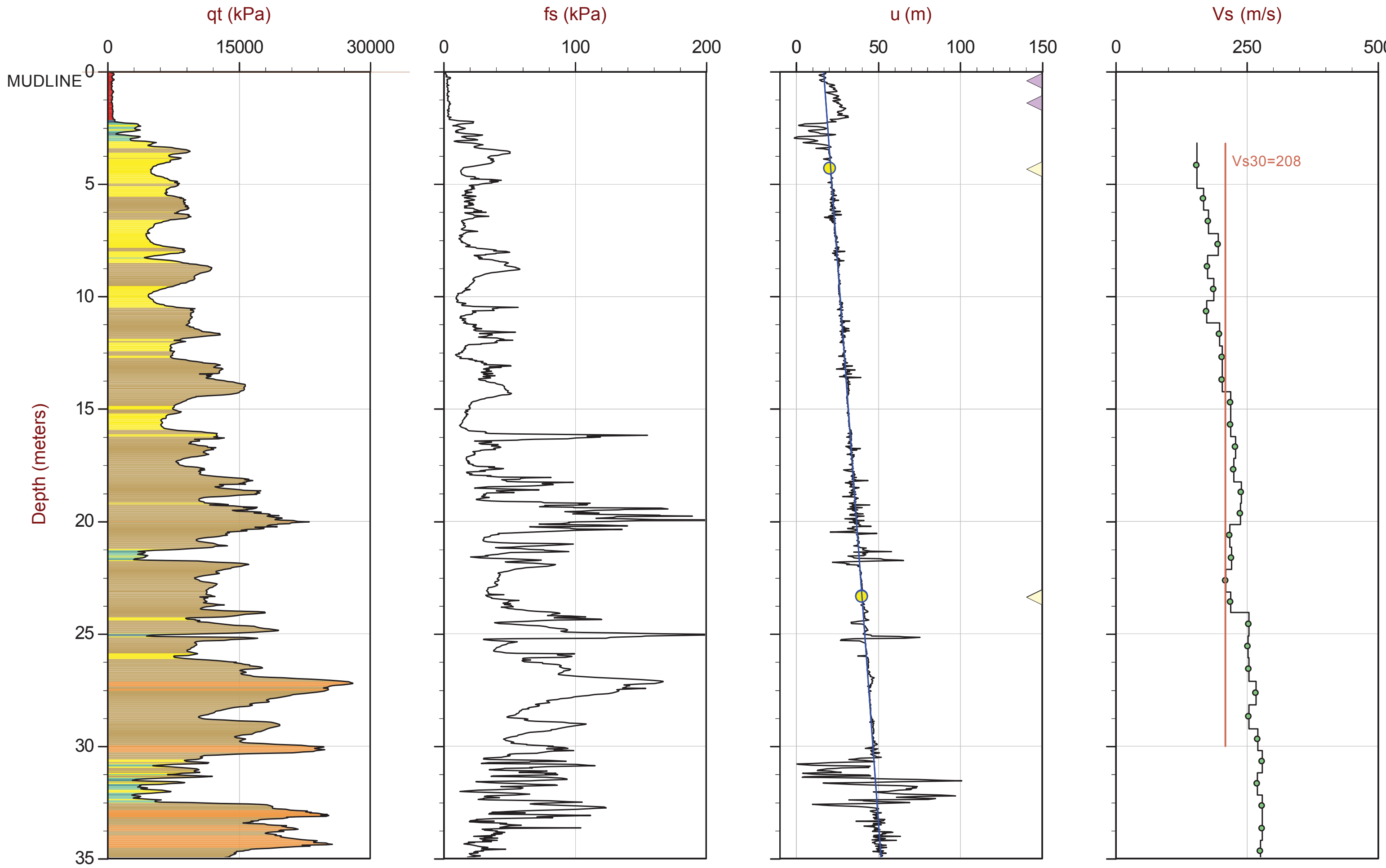
Seismic Cone Penetration Test Plots

CONETEC

Baffinland

Job No: 17-05010
Date: 2017-04-05 20:44
Site: Milne Port Expansion

Sounding: SCPT17-D002
Cone: 338:T1500F15U500



Max Depth: 39.475 m / 129.51 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 17-05010_SPD002.COR
Unit Wt: SBT (R&C1986)

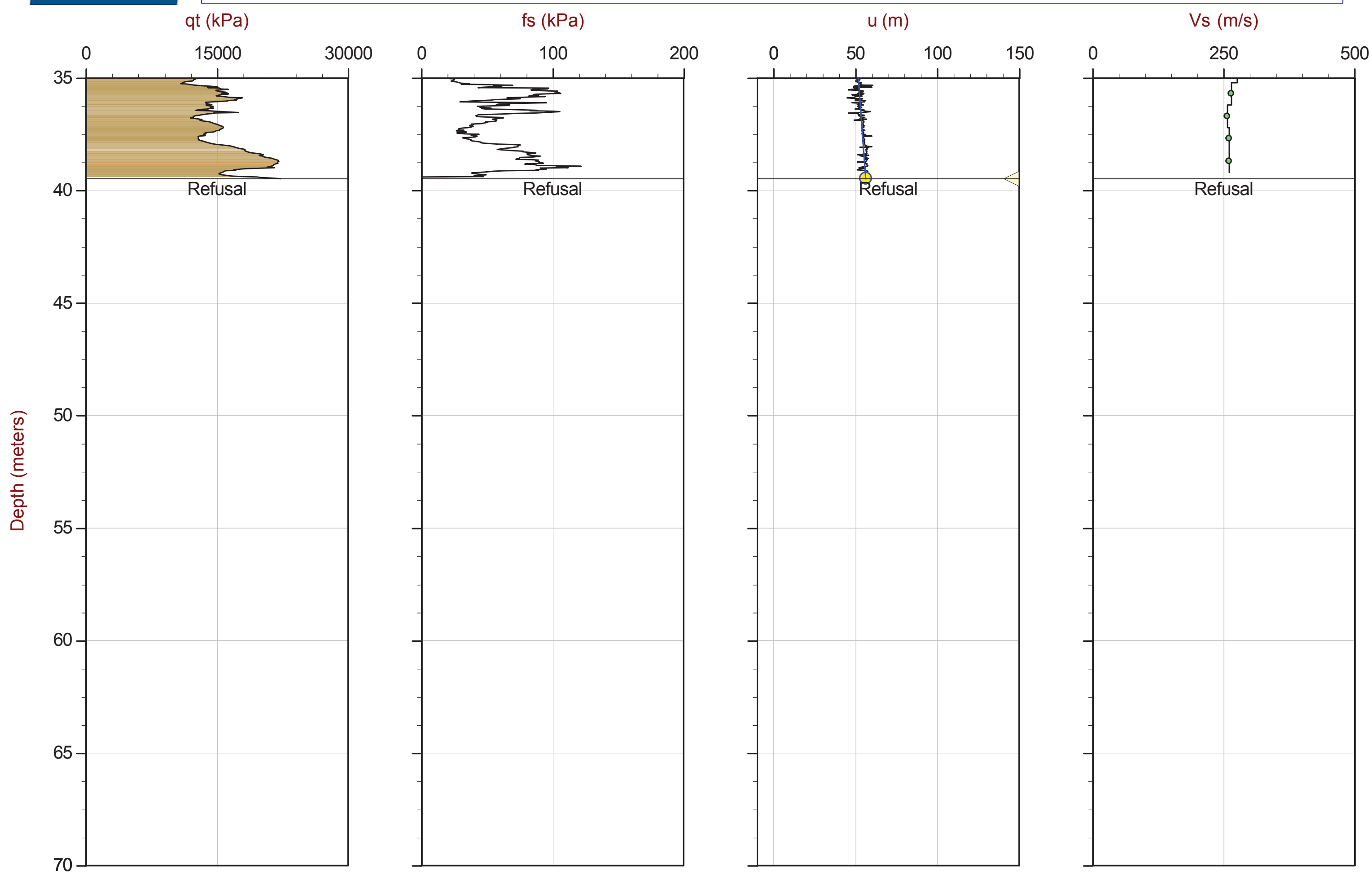
SBT: Robertson and Campanella, 1986
Coords: UTM17N N:7976728.05m E:503705.30m Elev:-16.12m

Equilibrium Pore Pressure (Ueq)
Dissipation, Ueq not achieved
Dissipation, Ueq achieved
Hydrostatic Line

Baffinland

Job No: 17-05010
Date: 2017-04-05 20:44
Site: Milne Port Expansion

Sounding: SCPT17-D002
Cone: 338:T1500F15U500



Max Depth: 39.475 m / 129.51 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 17-05010_SPD002.COR
Unit Wt: SBT (R&C1986)

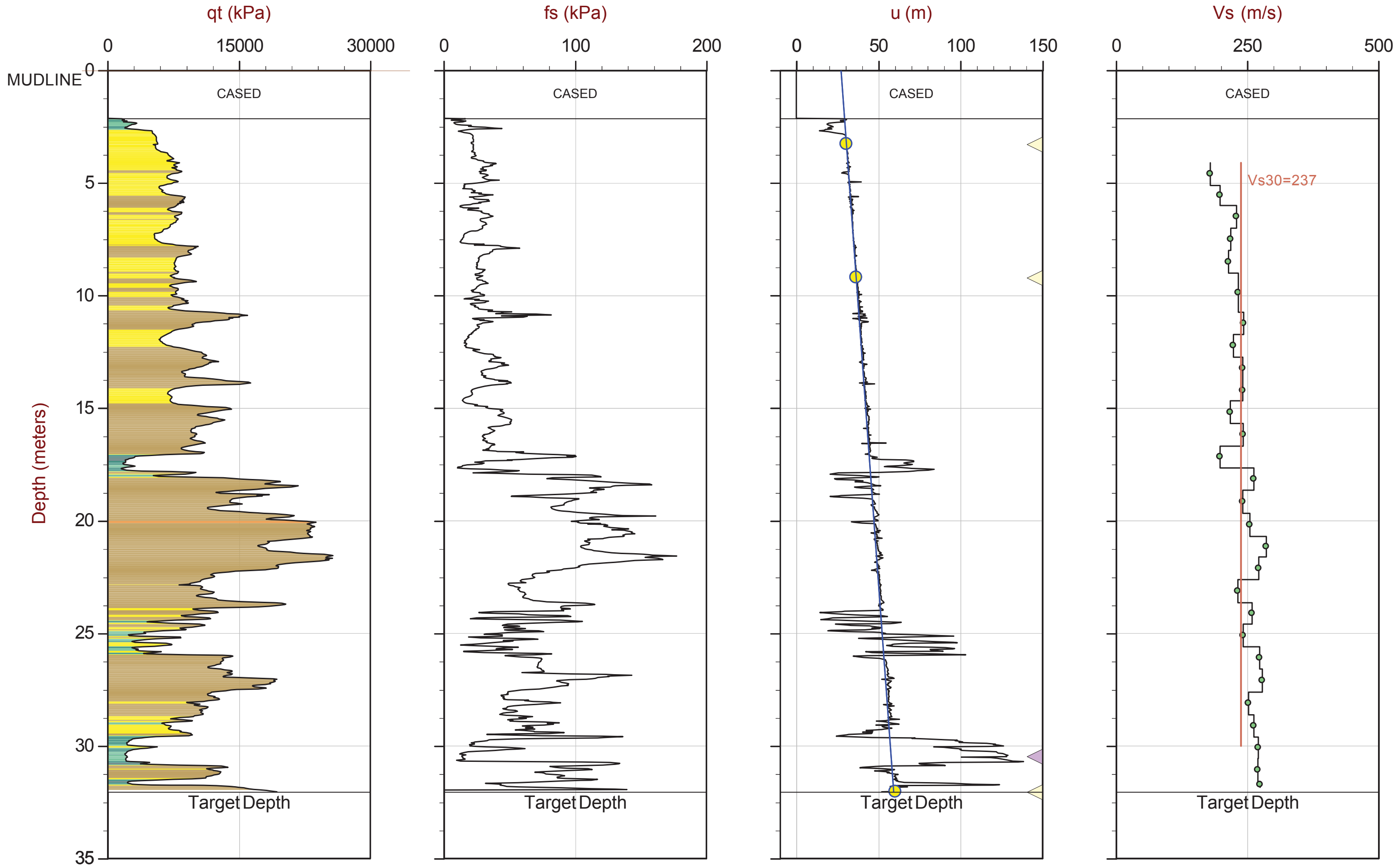
SBT: Robertson and Campanella, 1986
Coords: UTM17N N: 7976728.05m E: 503705.30m Elev: -16.12m

Equilibrium Pore Pressure (Ueq) | Dissipation, Ueq not achieved | Dissipation, Ueq achieved | Hydrostatic Line

Baffinland

Job No: 17-05010
Date: 2017-04-04 16:44
Site: Milne Port Expansion

Sounding: SCPT17-D004
Cone: 338:T1500F15U500



Max Depth: 32.050 m / 105.15 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 17-05010_SPD004.COR
Unit Wt: SBT (R&C1986)

SBT: Robertson and Campanella, 1986
Coords: UTM17N N: 7976768.10m E: 503646.44m Elev: -26.59m

Equilibrium Pore Pressure (Ueq) | Dissipation, Ueq not achieved | Dissipation, Ueq achieved | Hydrostatic Line

Pore Pressure Dissipation Summary and
Pore Pressure Dissipation Plots

Job No: 17-05010
Client: Baffinland Iron Mines Corporation
Project: Milne Port Expansion
Start Date: 03-Apr-2017
End Date: 07-Apr-2017

CPTu PORE PRESSURE DISSIPATION SUMMARY

Sounding ID	File Name	Cone Area (cm^2)	Duration (s)	Test Depth (m)	Estimated Equilibrium Pore Pressure U_{eq} (m)	Calculated Phreatic Surface (m)
CPT17-D001	17-05010_CPD001	15	260	3.275	Not Achieved	
CPT17-D001	17-05010_CPD001	15	95	6.400	24.0	-17.6
CPT17-D001	17-05010_CPD001	15	300	10.475	28.1	-17.6
CPT17-D001	17-05010_CPD001	15	100	19.850	37.5	-17.6
CPT17-D001	17-05010_CPD001	15	400	20.575	38.5	-17.9
CPT17-D001	17-05010_CPD001	15	95	28.650	45.6	-16.9
CPT17-D001	17-05010_CPD001	15	150	29.600	46.7	-17.1
CPT17-D001	17-05010_CPD001	15	400	32.750	50.4	-17.7
SCPT17-D002	17-05010_SPD002	15	105	0.400	Not Achieved	
SCPT17-D002	17-05010_SPD002	15	110	1.375	Not Achieved	
SCPT17-D002	17-05010_SPD002	15	150	4.325	20.7	-16.4
SCPT17-D002	17-05010_SPD002	15	600	23.350	40.2	-16.9
SCPT17-D002	17-05010_SPD002	15	275	23.375	40.4	-17.0
SCPT17-D002	17-05010_SPD002	15	200	39.475	56.6	-17.1
CPT17-D003	17-05010_CPD003	15	110	5.200	28.2	-23.0
CPT17-D003	17-05010_CPD003	15	400	15.300	38.5	-23.2
CPT17-D003	17-05010_CPD003	15	105	16.300	39.6	-23.3
CPT17-D003	17-05010_CPD003	15	1200	30.425	54.1	-23.7
SCPT17-D004	17-05010_SPD004	15	95	3.275	30.4	-27.1
SCPT17-D004	17-05010_SPD004	15	300	9.200	36.5	-27.3
SCPT17-D004	17-05010_SPD004	15	600	30.475	Not Achieved	
SCPT17-D004	17-05010_SPD004	15	300	32.050	60.3	-28.2
CPT17-D005	17-05010_CPD005	15	1340	2.275	28.3	-26.0
CPT17-D005	17-05010_CPD005	15	110	3.325	29.5	-26.2
CPT17-D005	17-05010_CPD005	15	95	5.375	31.8	-26.4
CPT17-D005	17-05010_CPD005	15	145	6.375	Not Achieved	
CPT17-D005	17-05010_CPD005	15	110	7.400	33.5	-26.1
CPT17-D005	17-05010_CPD005	15	125	9.350	Not Achieved	
CPT17-D005	17-05010_CPD005	15	300	10.300	36.5	-26.2

Job No: 17-05010
Client: Baffinland Iron Mines Corporation
Project: Milne Port Expansion
Start Date: 03-Apr-2017
End Date: 07-Apr-2017

CPTu PORE PRESSURE DISSIPATION SUMMARY

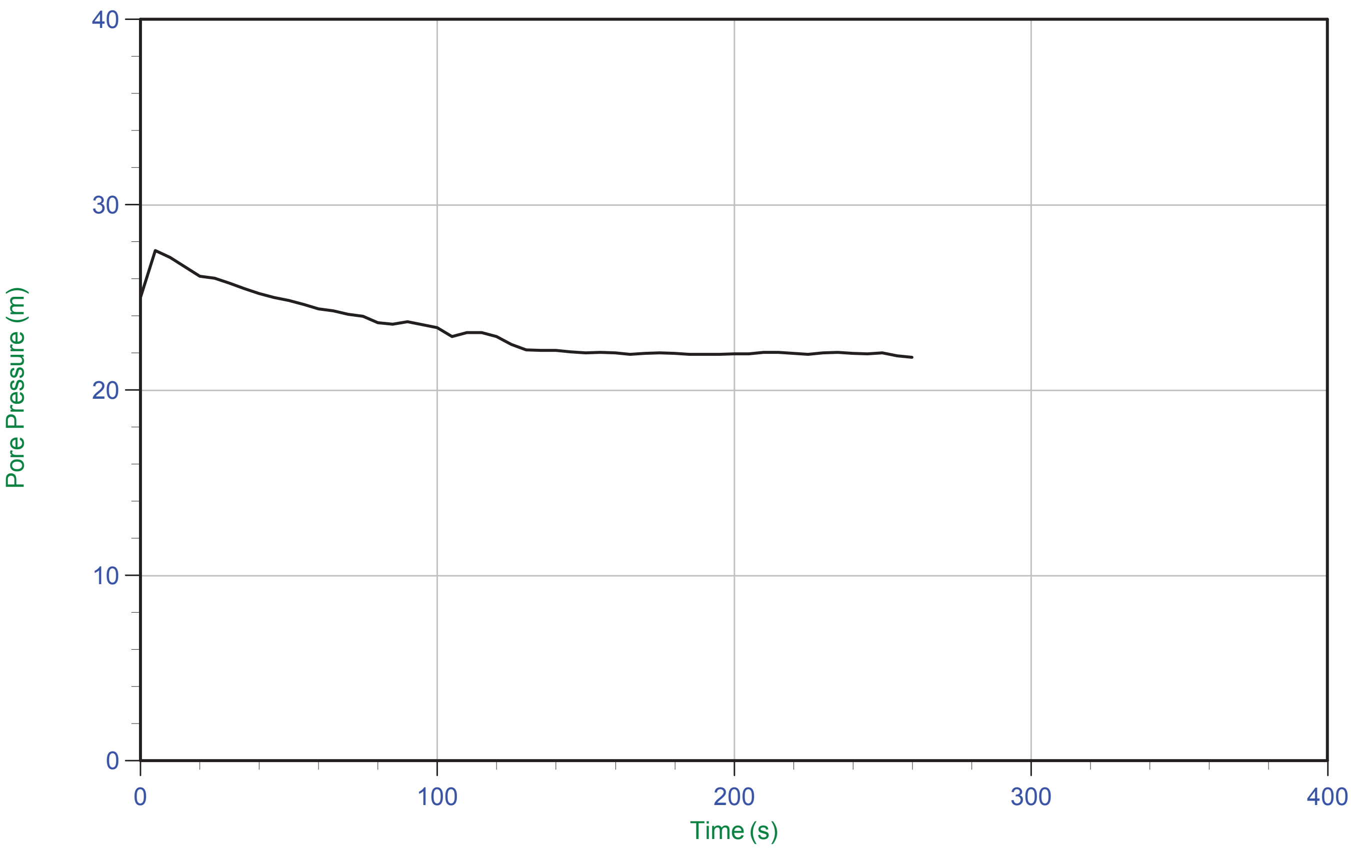
Sounding ID	File Name	Cone Area (cm^2)	Duration (s)	Test Depth (m)	Estimated Equilibrium Pore Pressure U_{eq} (m)	Calculated Phreatic Surface (m)
CPT17-D005	17-05010_CPD005	15	1460	12.350	38.8	-26.4
CPT17-D005	17-05010_CPD005	15	275	13.175	Not Achieved	
CPT17-D005	17-05010_CPD005	15	305	15.050	41.7	-26.6
CPT17-D005	17-05010_CPD005	15	165	18.100	44.7	-26.6
CPT17-D005	17-05010_CPD005	15	130	23.925	50.7	-26.8
CPT17-D005	17-05010_CPD005	15	300	25.125	51.9	-26.8
CPT17-D006	17-05010_CPD006	15	105	2.300	Not Achieved	
CPT17-D006	17-05010_CPD006	15	2100	3.300	35.3	-32.0
CPT17-D006	17-05010_CPD006	15	300	20.575	52.4	-31.8
CPT17-D007	17-05010_CPD007	15	200	10.100	14.8	-4.7
CPT17-D007	17-05010_CPD007	15	200	20.150	25.1	-5.0
CPT17-D007	17-05010_CPD007	15	200	30.200	35.5	-5.3
CPT17-D008	17-05010_CPD008	15	180	2.075	Not Achieved	
CPT17-D008	17-05010_CPD008	15	200	20.500	21.9	-1.4
CPT17-D008	17-05010_CPD008	15	120	28.975	30.4	-1.4
CPT17-D008	17-05010_CPD008	15	405	30.000	32.2	-2.2

ConeTec

Baffinland

Job No: 17-05010
Date: 04/05/2017 09:17
Site: Milne Port Expansion

Sounding: CPT17-D001
Cone: 338:T1500F15U500 Area=15 cm²

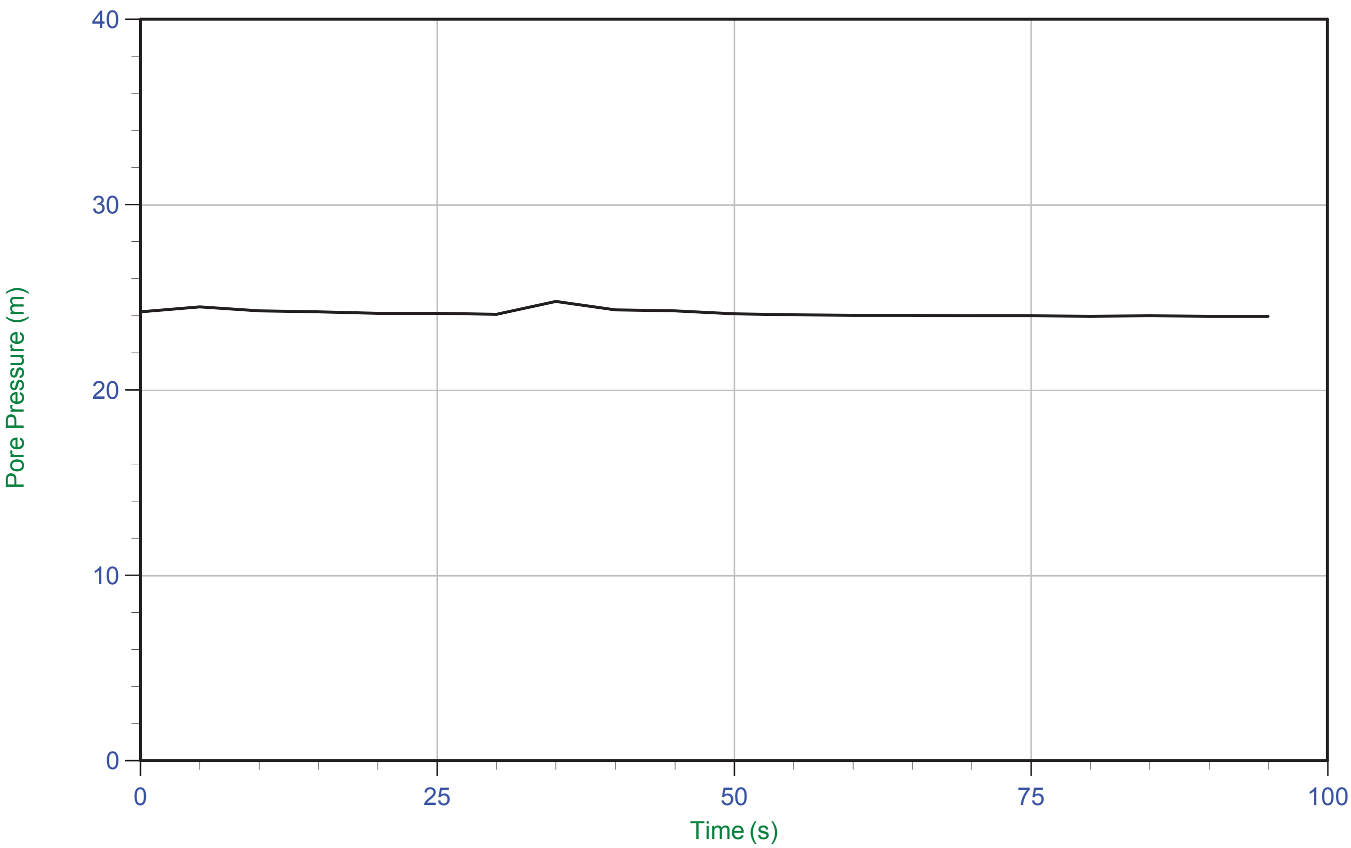


Trace Summary:

Filename: 17-05010_CPD001.PPF
Depth: 3.275 m / 10.745 ft
Duration: 260.0 s

U Min: 21.8 m
U Max: 27.5 m

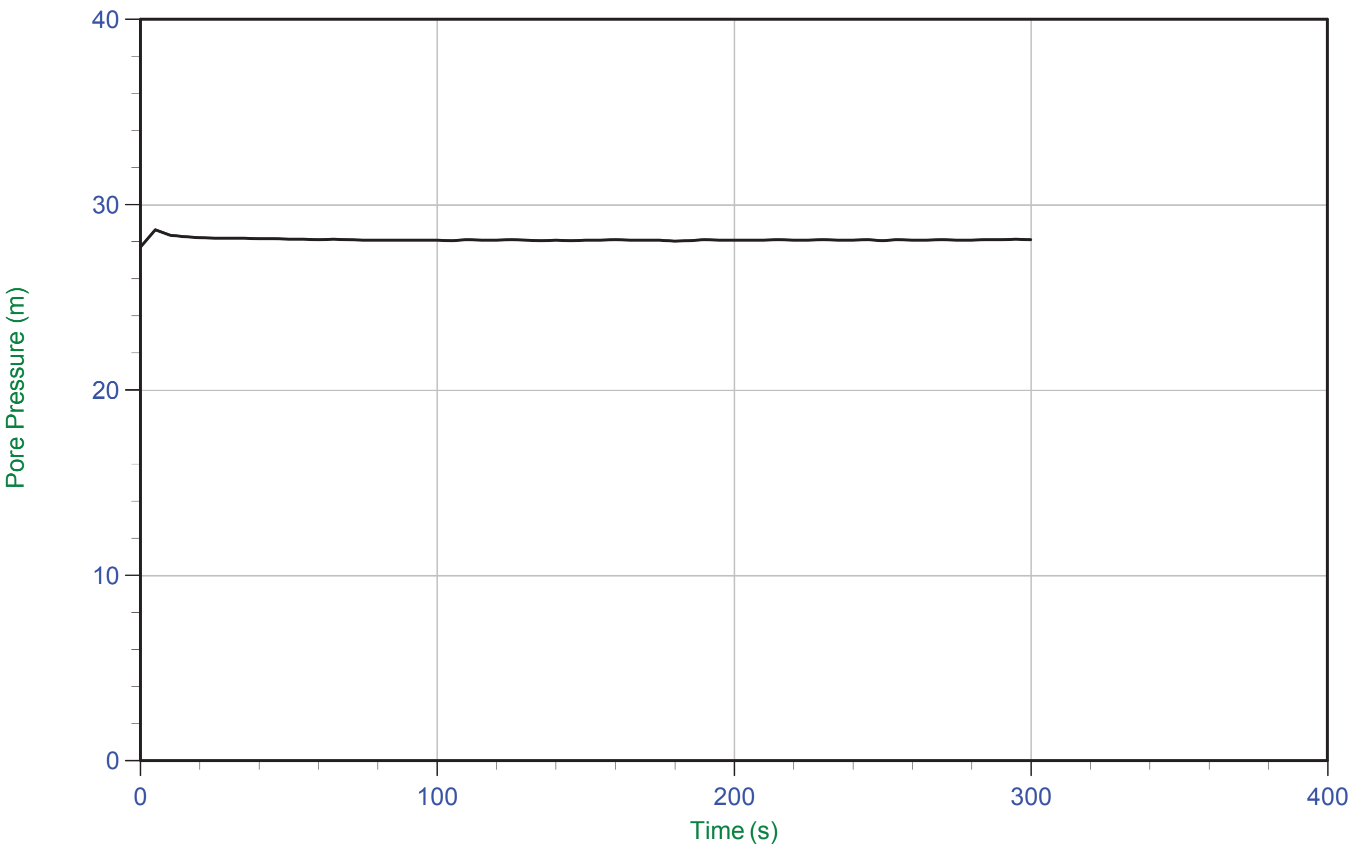
CONETEC	Baffinland	Job No: 17-05010 Date: 04/05/2017 09:17 Site: Milne Port Expansion	Sounding: CPT17-D001 Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_CPD001.PPF	U Min: 24.0 m	WT: -17.600 m / -57.742 ft
Depth: 6.400 m / 20.997 ft	U Max: 24.8 m	Ueq: 24.0 m
Duration: 95.0 s		

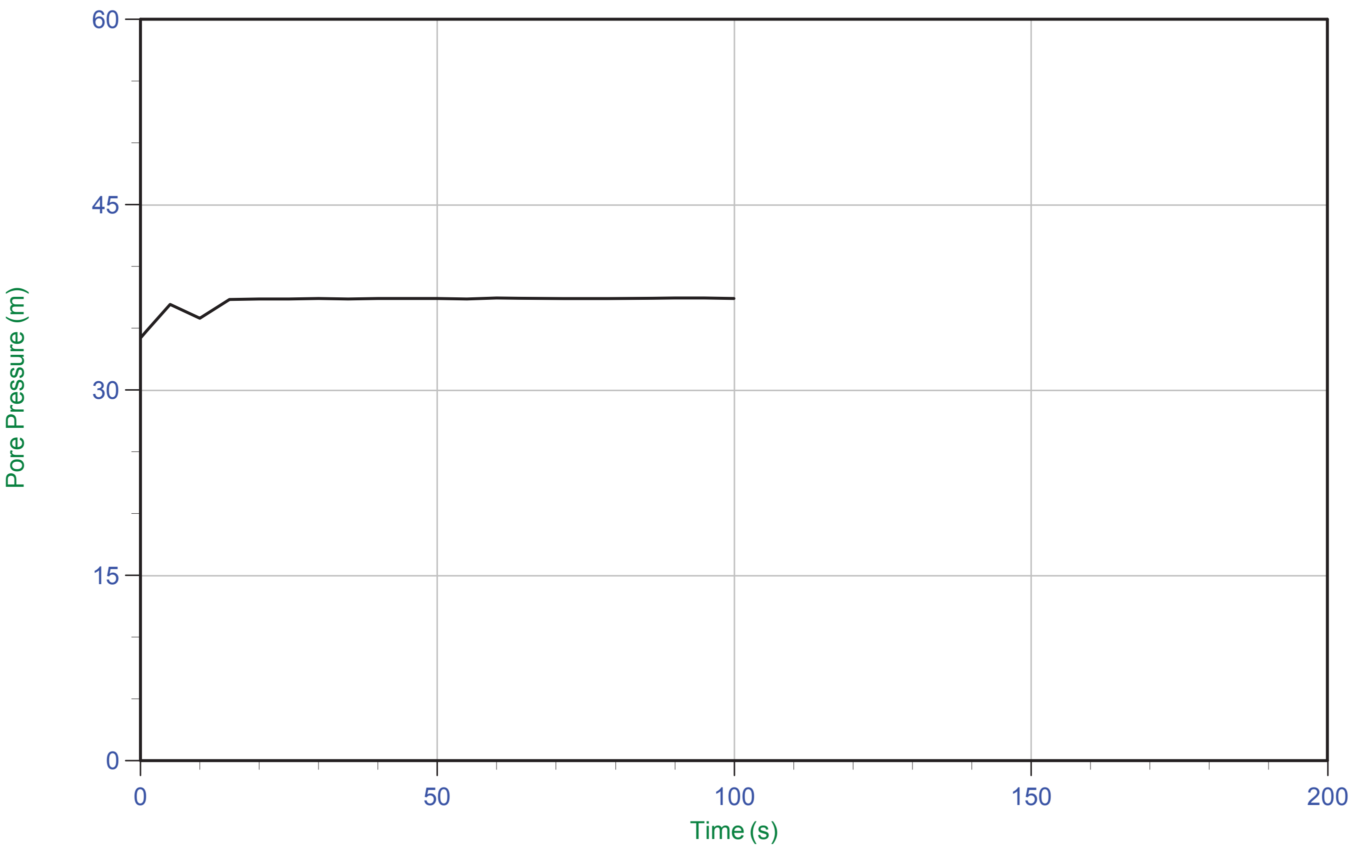
CONETEC	*Baffinland*	Job No: 17-05010 Date: 04/05/2017 09:17 Site: Milne Port Expansion	Sounding: CPT17-D001 Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_CPD001.PPF	U Min: 27.7 m	WT: -17.646 m / -57.893 ft
Depth: 10.475 m / 34.366 ft	U Max: 28.6 m	Ueq: 28.1 m
Duration: 300.0 s		

Baffinland	Job No: 17-05010 Date: 04/05/2017 09:17 Site: Milne Port Expansion	Sounding: CPT17-D001 Cone: 338:T1500F15U500 Area=15 cm²



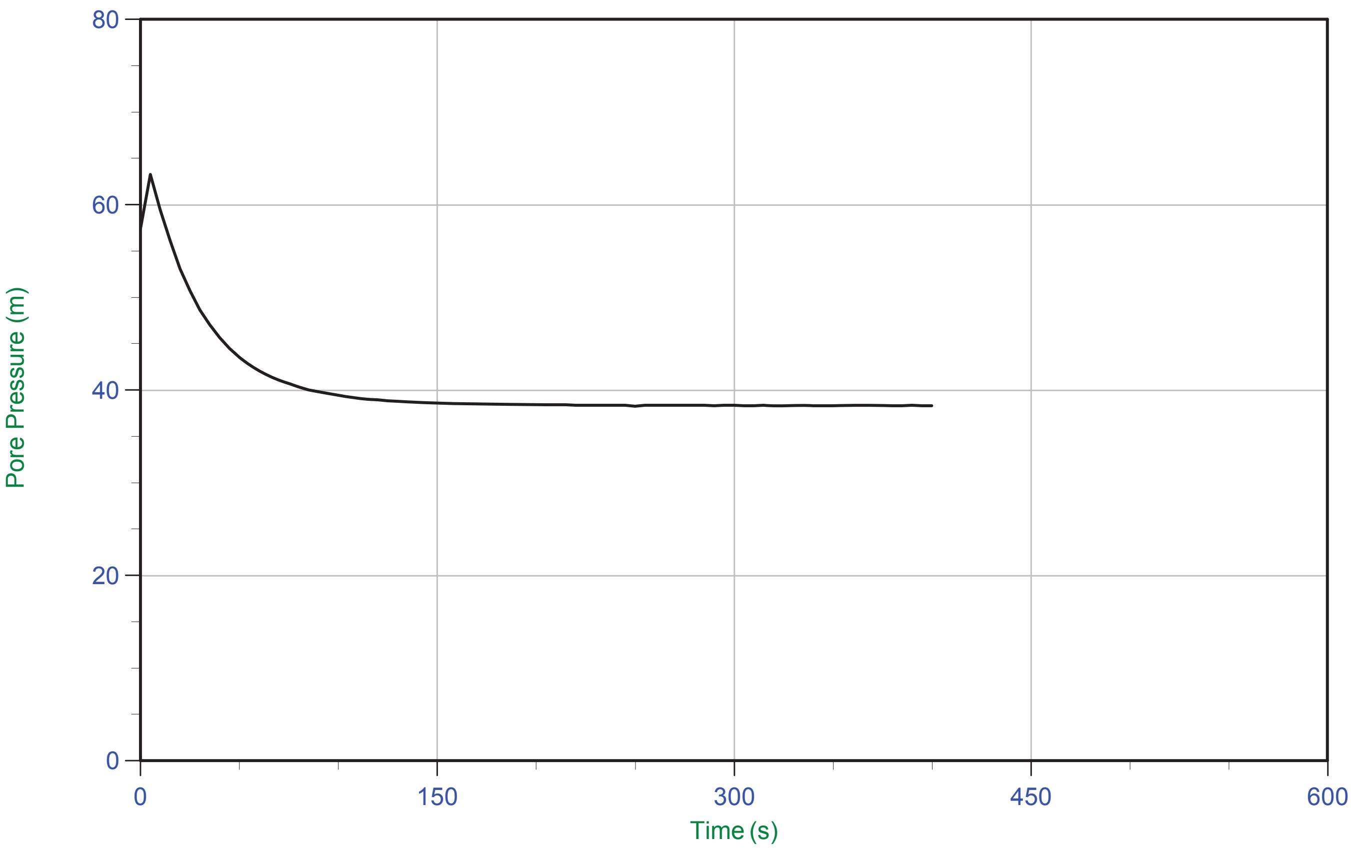
Trace Summary:

Filename: 17-05010_CPD001.PPF	U Min: 34.2 m	WT: -17.605 m / -57.758 ft
Depth: 19.850 m / 65.124 ft	U Max: 37.5 m	Ueq: 37.5 m
Duration: 100.0 s		

Baffinland

Job No: 17-05010
Date: 04/05/2017 09:17
Site: Milne Port Expansion

Sounding: CPT17-D001
Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_CPD001.PPF
Depth: 20.575 m / 67.502 ft
Duration: 400.0 s

U Min: 38.3 m
U Max: 63.3 m

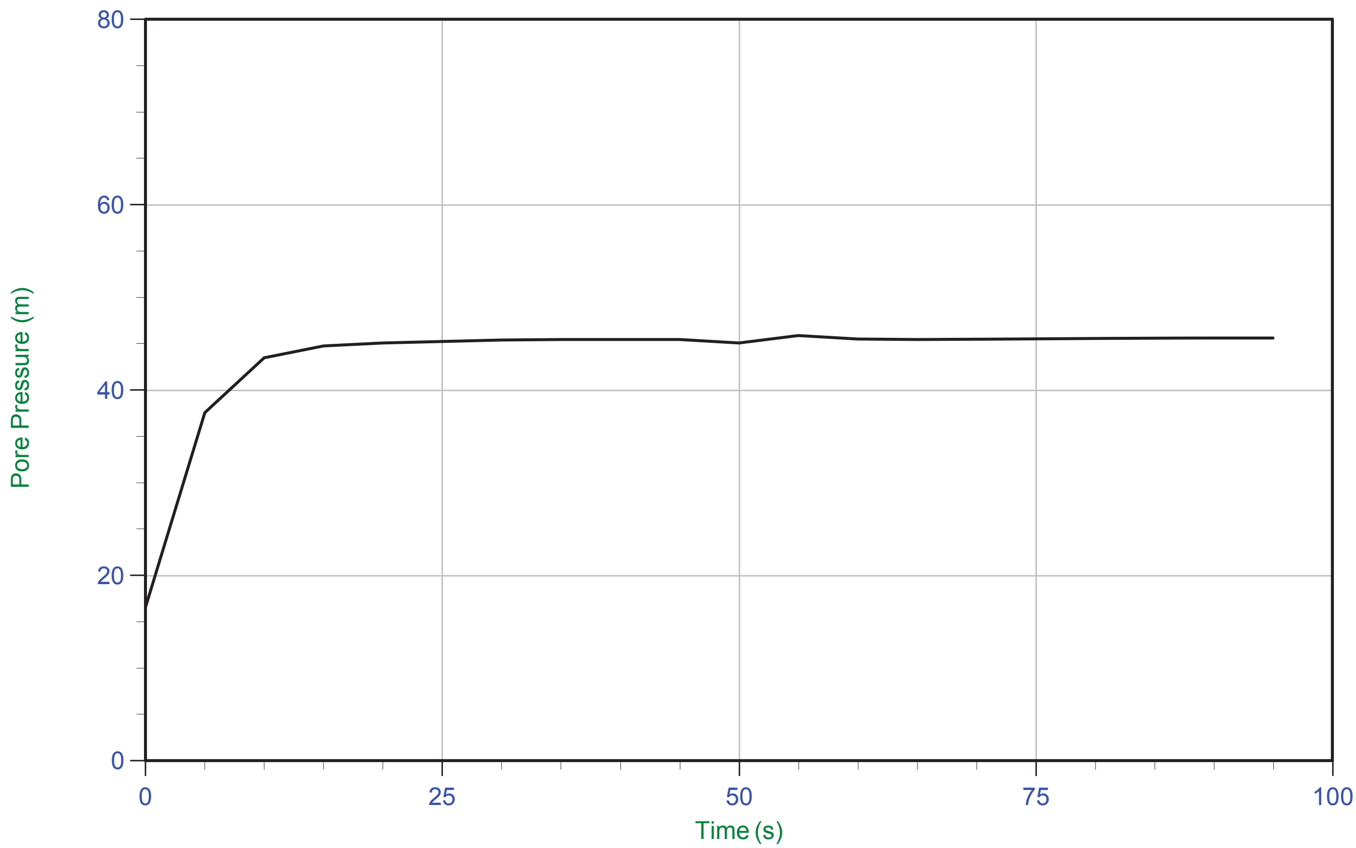
WT: -17.890 m / -58.694 ft
Ueq: 38.5 m

ConeTec

Baffinland

Job No: 17-05010
Date: 04/05/2017 09:17
Site: Milne Port Expansion

Sounding: CPT17-D001
Cone: 338:T1500F15U500 Area=15 cm²



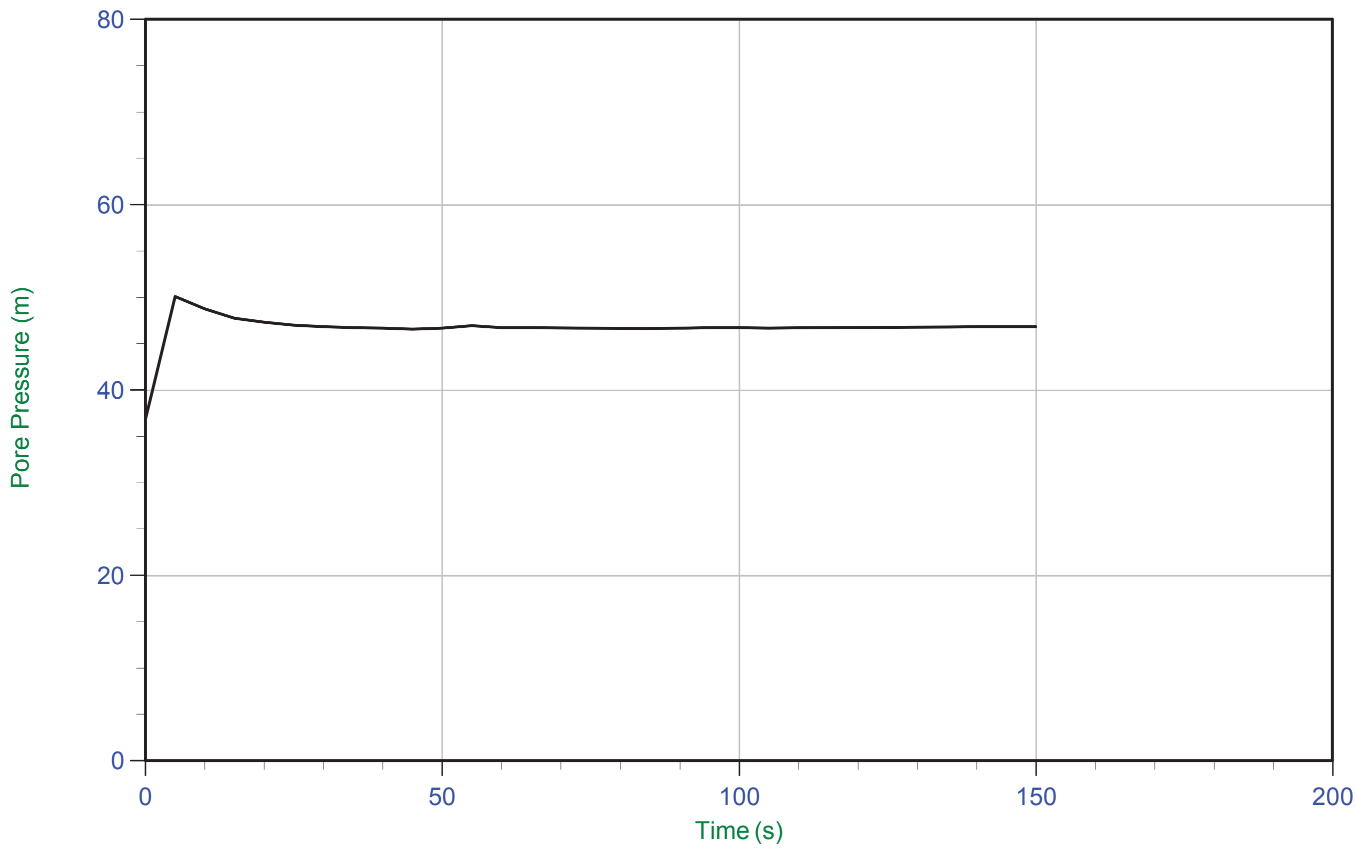
Trace Summary:

Filename: 17-05010_CPD001.PPF
Depth: 28.650 m / 93.995 ft
Duration: 95.0 s

U Min: 16.6 m
U Max: 45.9 m

WT: -16.926 m / -55.531 ft
Ueq: 45.6 m

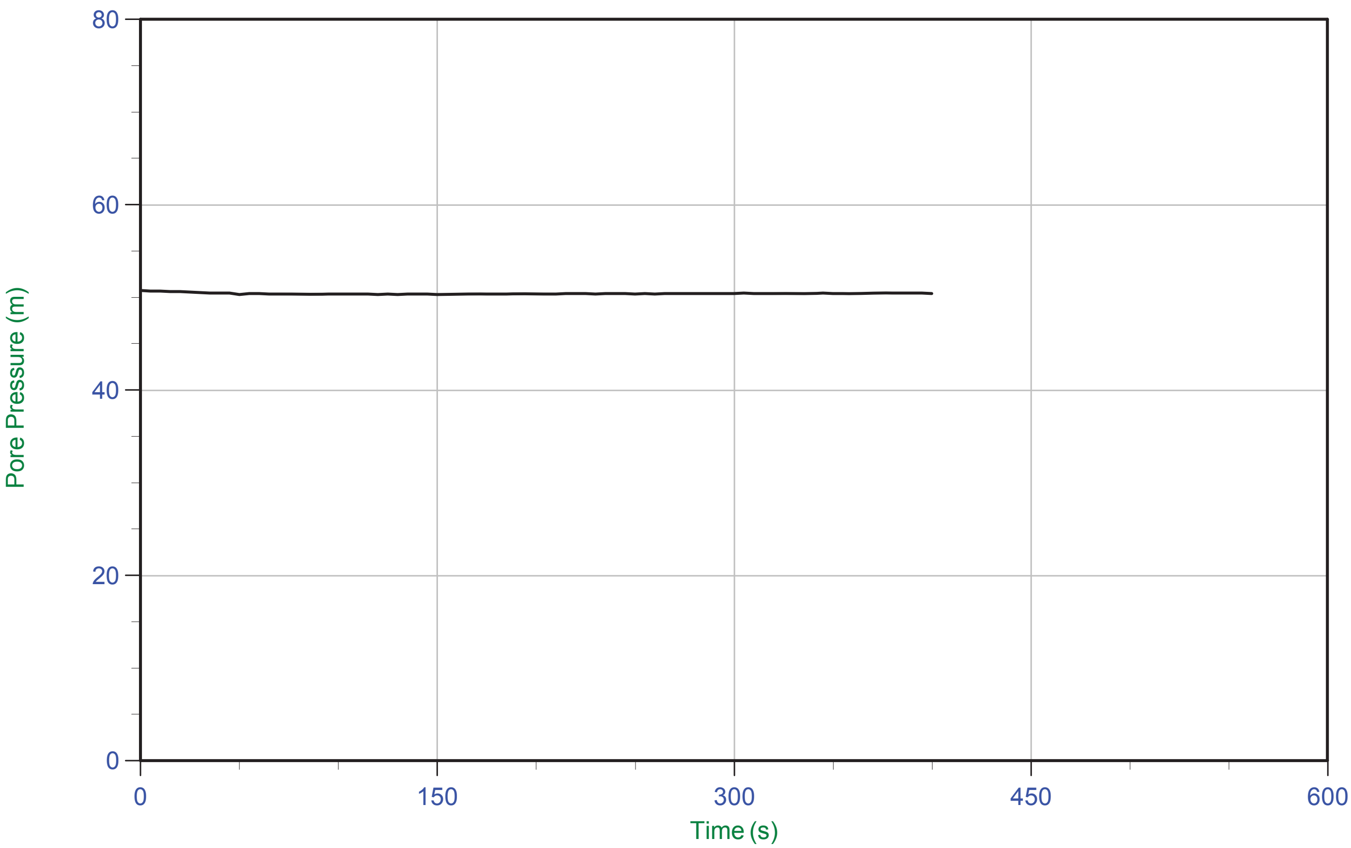
CONETEC	*Baffinland*	Job No: 17-05010 Date: 04/05/2017 09:17 Site: Milne Port Expansion	Sounding: CPT17-D001 Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_CPD001.PPF	U Min: 36.9 m	WT: -17.107 m / -56.125 ft
Depth: 29.600 m / 97.112 ft	U Max: 50.1 m	Ueq: 46.7 m
Duration: 150.0 s		

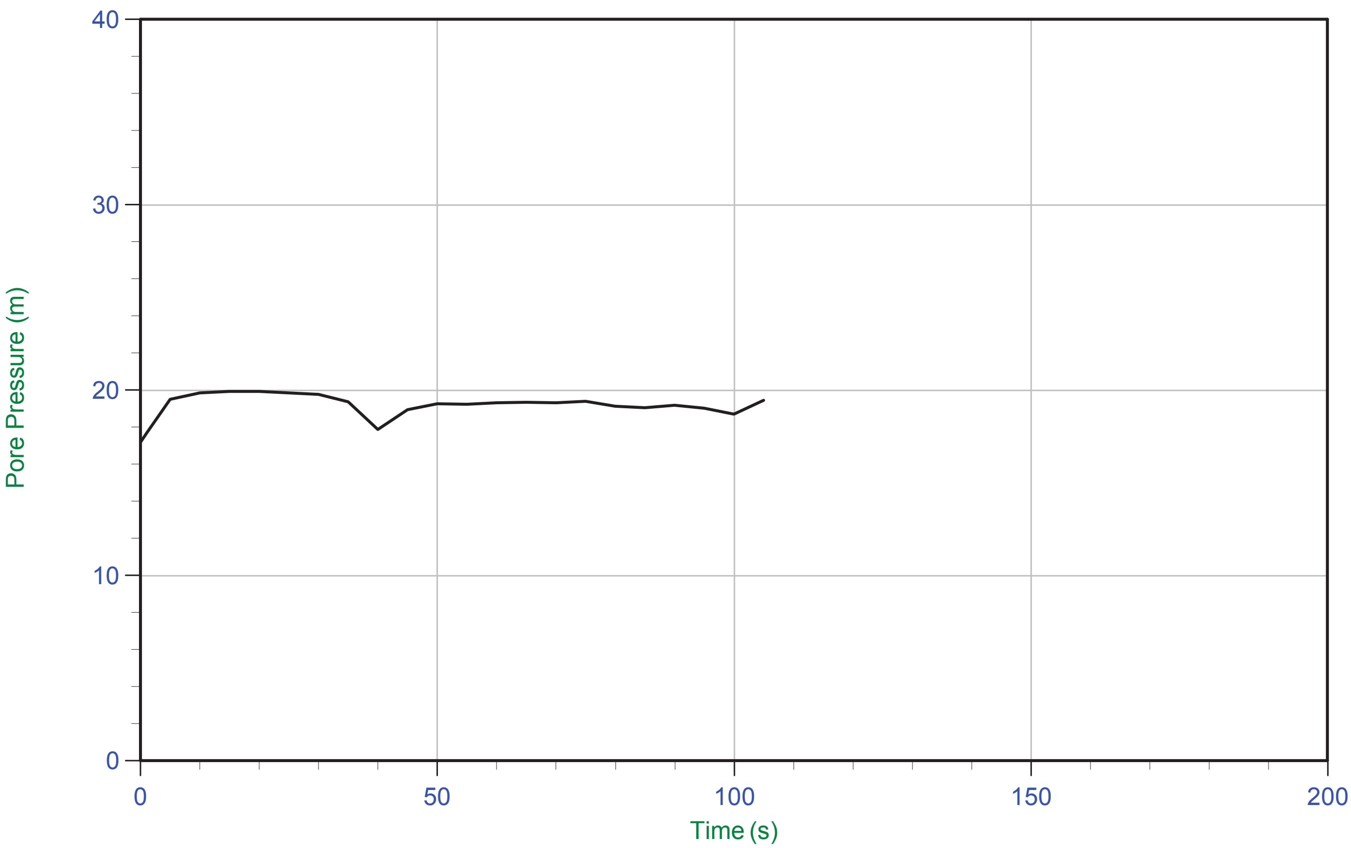
CONETEC	Baffinland	Job No: 17-05010 Date: 04/05/2017 09:17 Site: Milne Port Expansion	Sounding: CPT17-D001 Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_CPD001.PPF	U Min: 50.3 m	WT: -17.674 m / -57.985 ft
Depth: 32.750 m / 107.446 ft	U Max: 50.7 m	Ueq: 50.4 m
Duration: 400.0 s		

CONETEC	Baffinland	Job No: 17-05010 Date: 04/05/2017 20:44 Site: Milne Port Expansion	Sounding: SCPT17-D002 Cone: 338:T1500F15U500 Area=15 cm²



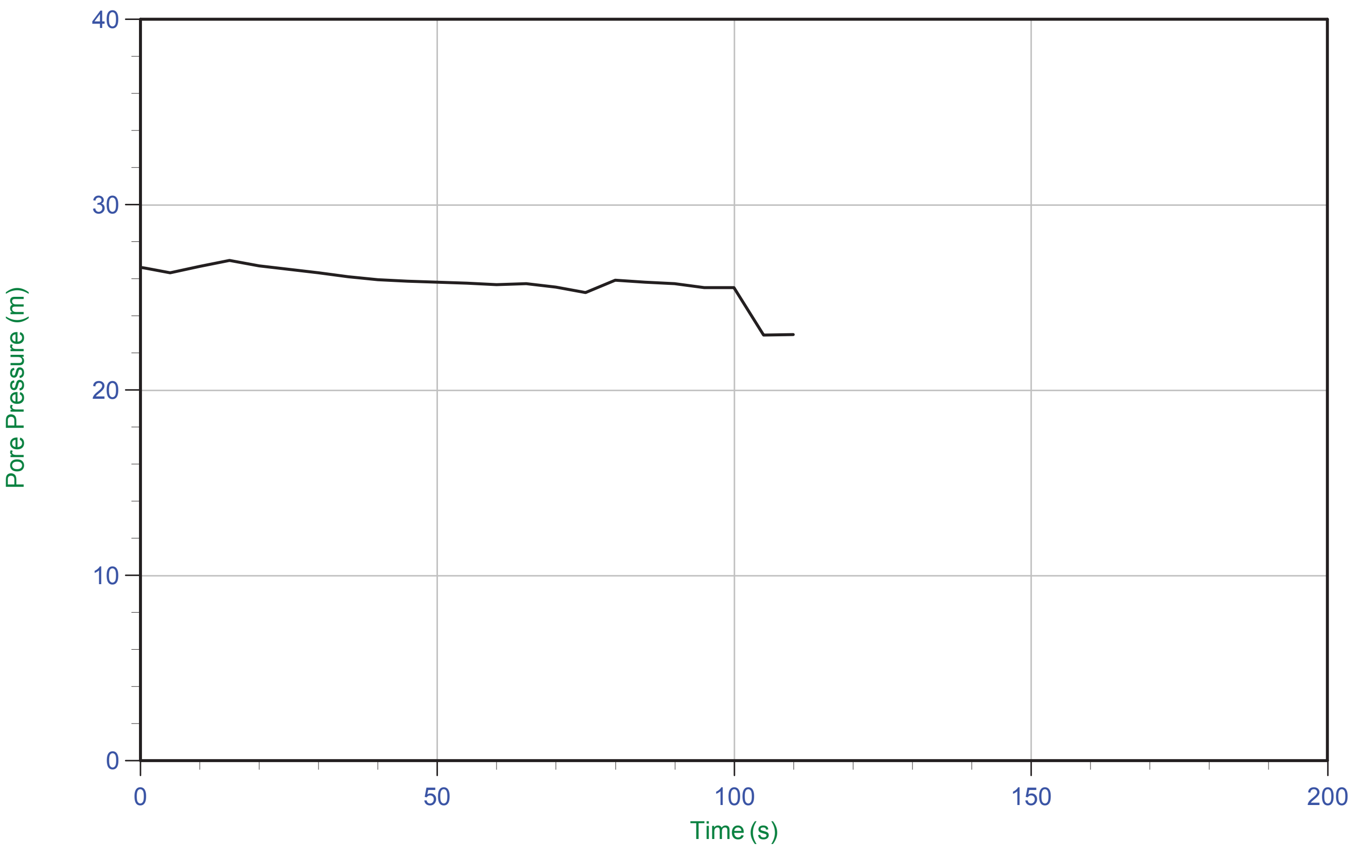
Trace Summary:

Filename: 17-05010_SPD002.PPF
Depth: 0.400 m / 1.312 ft
Duration: 105.0 s

U Min: 17.2 m
U Max: 19.9 m

ConeTec

Baffinland	Job No: 17-05010 Date: 04/05/2017 20:44 Site: Milne Port Expansion	Sounding: SCPT17-D002 Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_SPD002.PPF
Depth: 1.375 m / 4.511 ft
Duration: 110.0 s

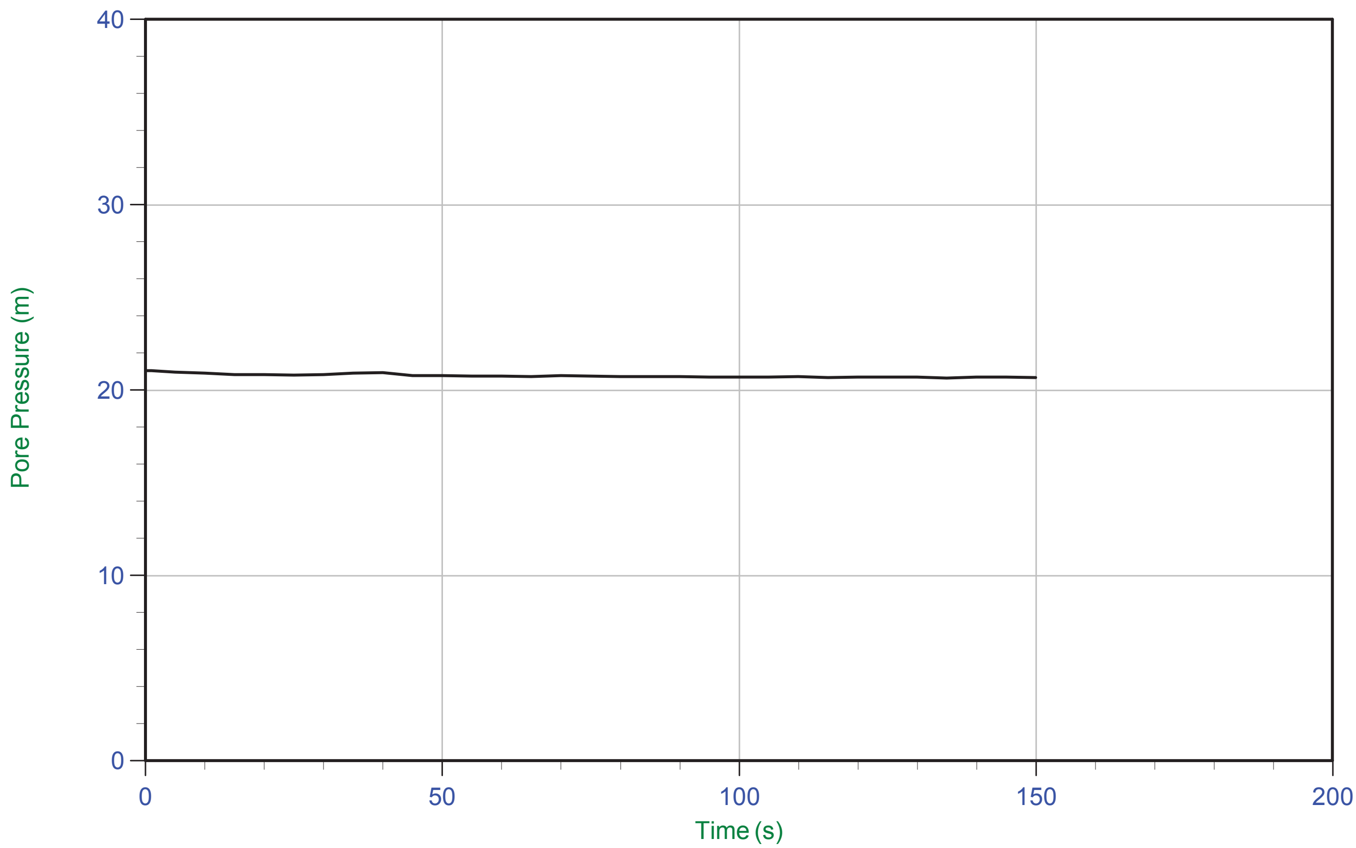
U Min: 23.0 m
U Max: 27.0 m

CONETEC

Baffinland

Job No: 17-05010
Date: 04/05/2017 20:44
Site: Milne Port Expansion

Sounding: SCPT17-D002
Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_SPD002.PPF
Depth: 4.325 m / 14.189 ft
Duration: 150.0 s

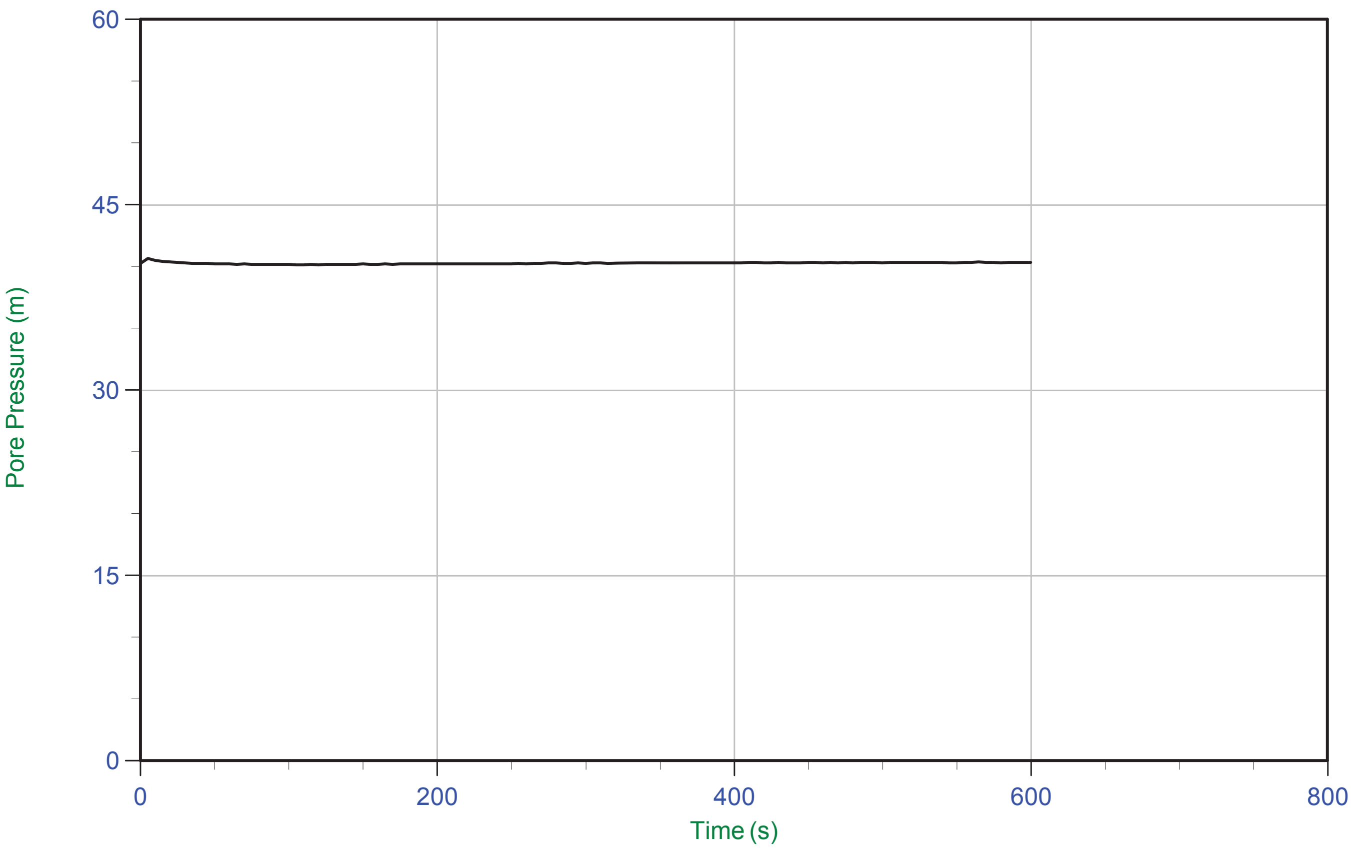
U Min: 20.7 m
U Max: 21.1 m

WT: -16.362 m / -53.680 ft
Ueq: 20.7 m

Baffinland

Job No: 17-05010
Date: 04/05/2017 20:44
Site: Milne Port Expansion

Sounding: SCPT17-D002
Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_SPD002.PPF
Depth: 23.350 m / 76.607 ft
Duration: 600.0 s

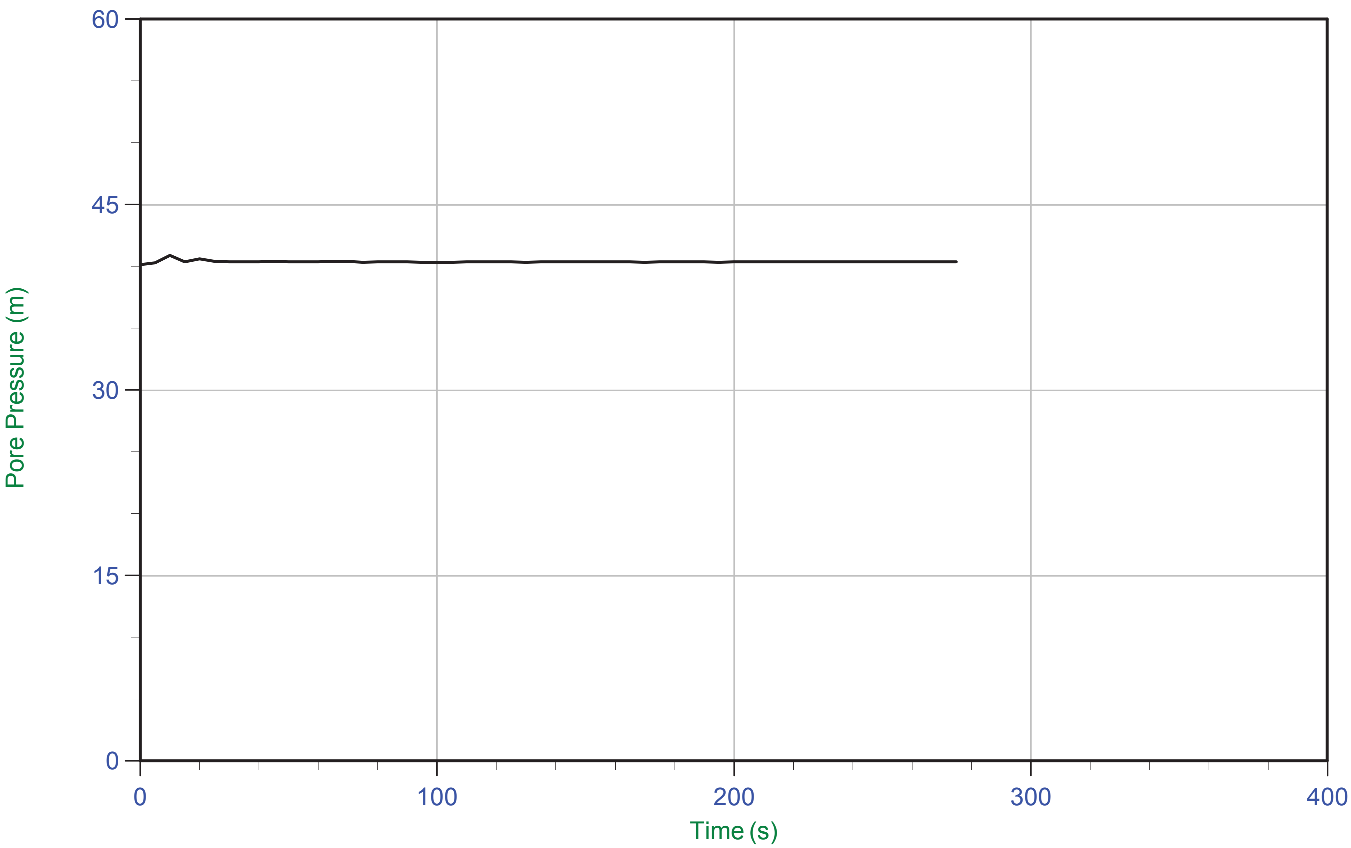
U Min: 40.1 m
U Max: 40.6 m

WT: -16.892 m / -55.419 ft
Ueq: 40.2 m

Baffinland

Job No: 17-05010
Date: 04/05/2017 20:44
Site: Milne Port Expansion

Sounding: SCPT17-D002
Cone: 338:T1500F15U500 Area=15 cm²



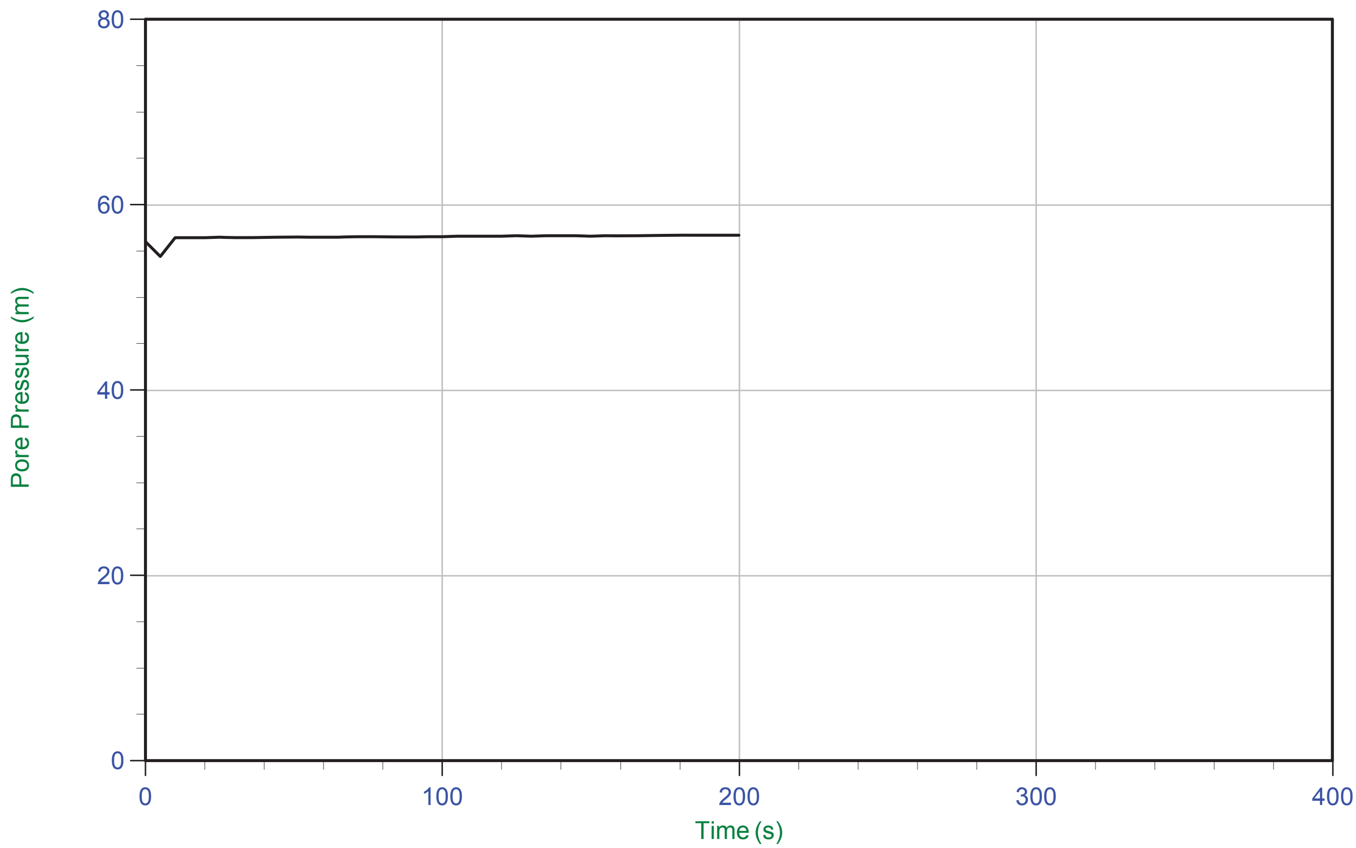
Trace Summary:

Filename: 17-05010_SPD002.PPF
Depth: 23.375 m / 76.689 ft
Duration: 275.0 s

U Min: 40.2 m
U Max: 40.9 m

WT: -16.989 m / -55.738 ft
Ueq: 40.4 m

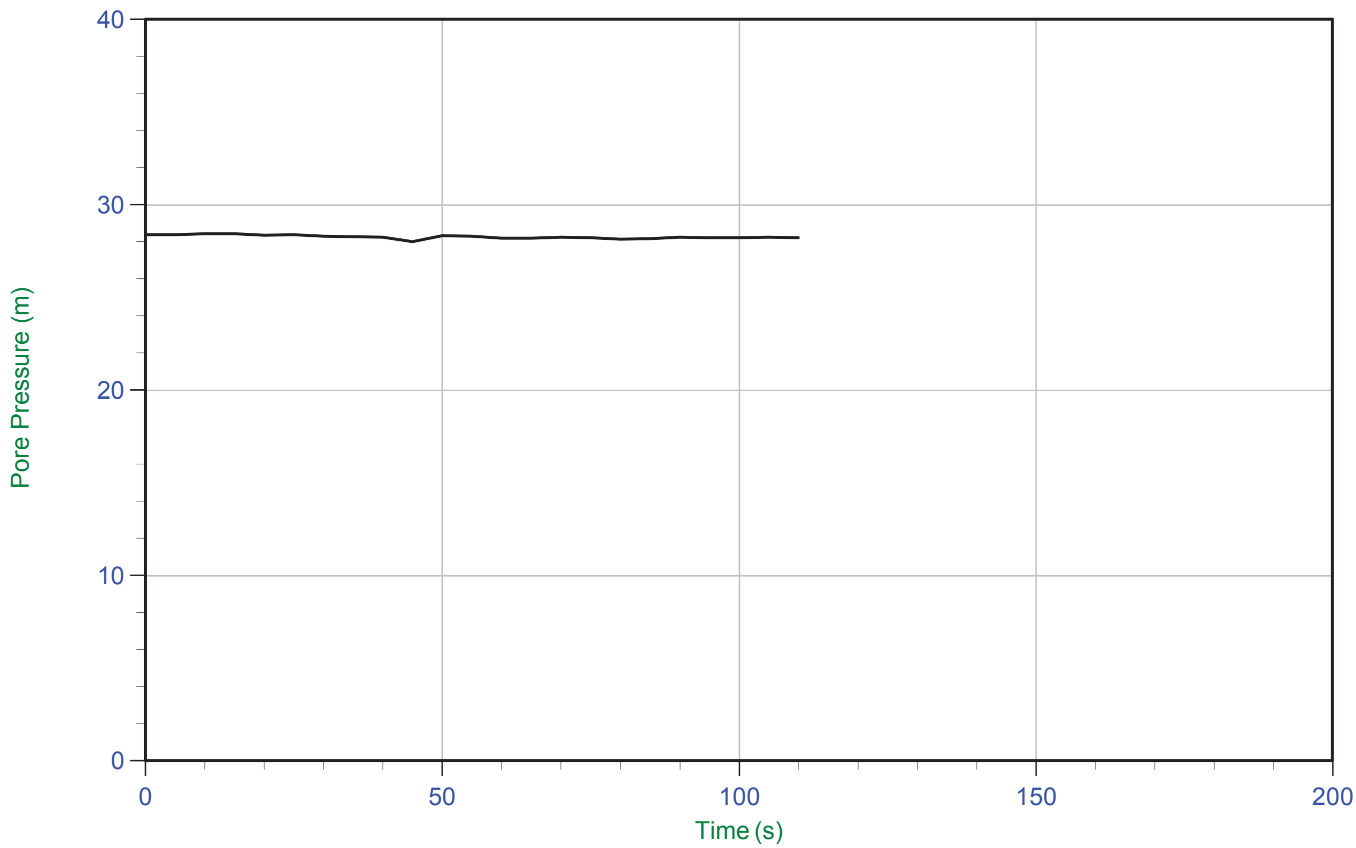
CONETEC	Baffinland	Job No: 17-05010 Date: 04/05/2017 20:44 Site: Milne Port Expansion	Sounding: SCPT17-D002 Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_SPD002.PPF	U Min: 54.4 m	WT: -17.091 m / -56.072 ft
Depth: 39.475 m / 129.510 ft	U Max: 56.7 m	Ueq: 56.6 m
Duration: 200.0 s		

	Baffinland	Job No: 17-05010 Date: 04/06/2017 13:34 Site: Milne Port Expansion	Sounding: CPT17-D003 Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_CPD003.PPF
Depth: 5.200 m / 17.060 ft
Duration: 110.0 s

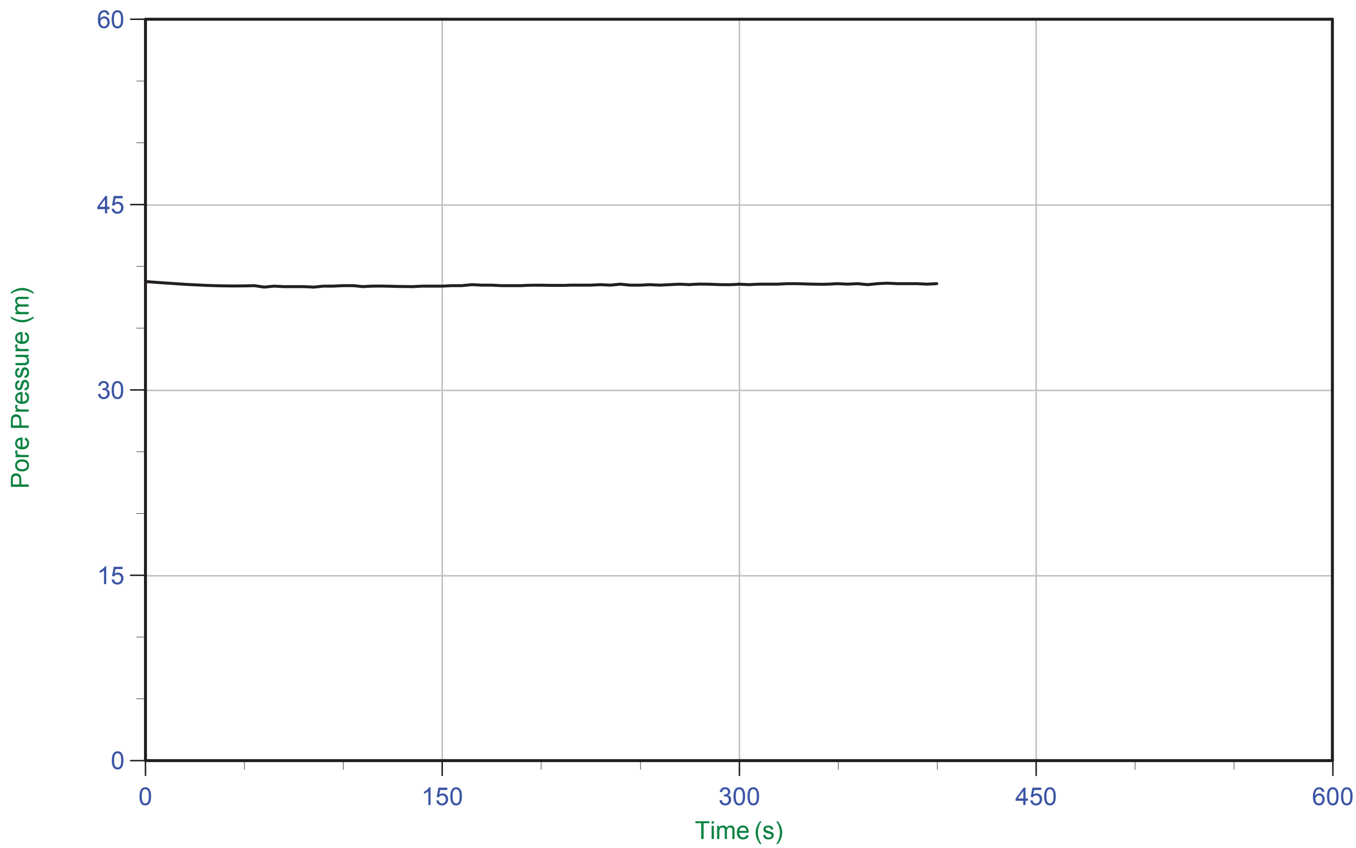
U Min: 28.0 m
U Max: 28.4 m

WT: -23.002 m / -75.465 ft
Ueq: 28.2 m

Baffinland

Job No: 17-05010
Date: 04/06/2017 13:34
Site: Milne Port Expansion

Sounding: CPT17-D003
Cone: 338:T1500F15U500 Area=15 cm²



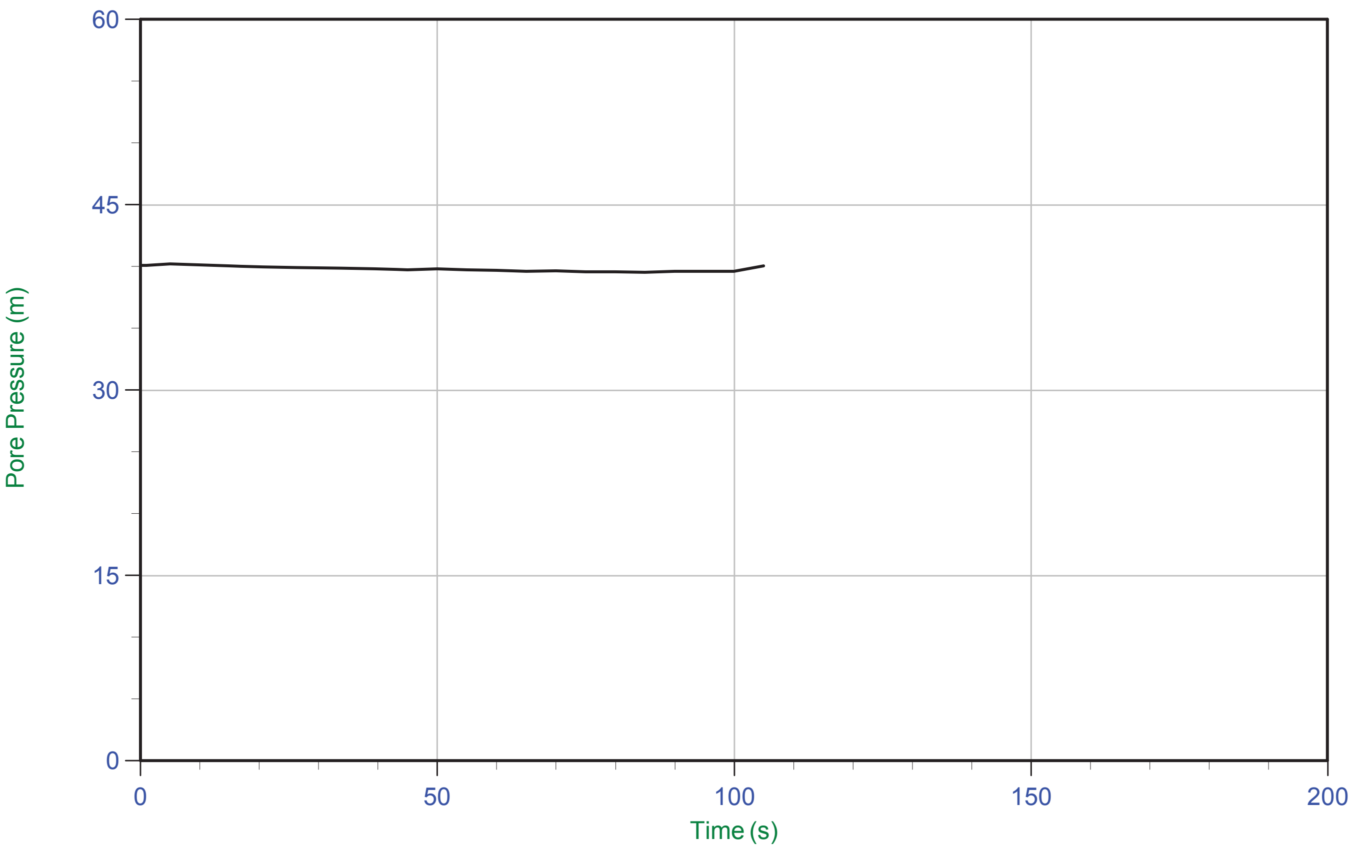
Trace Summary:

Filename: 17-05010_CPD003.PPF
Depth: 15.300 m / 50.196 ft
Duration: 400.0 s

U Min: 38.3 m
U Max: 38.8 m

WT: -23.245 m / -76.262 ft
Ueq: 38.5 m

Baffinland	Job No: 17-05010 Date: 04/06/2017 13:34 Site: Milne Port Expansion	Sounding: CPT17-D003 Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

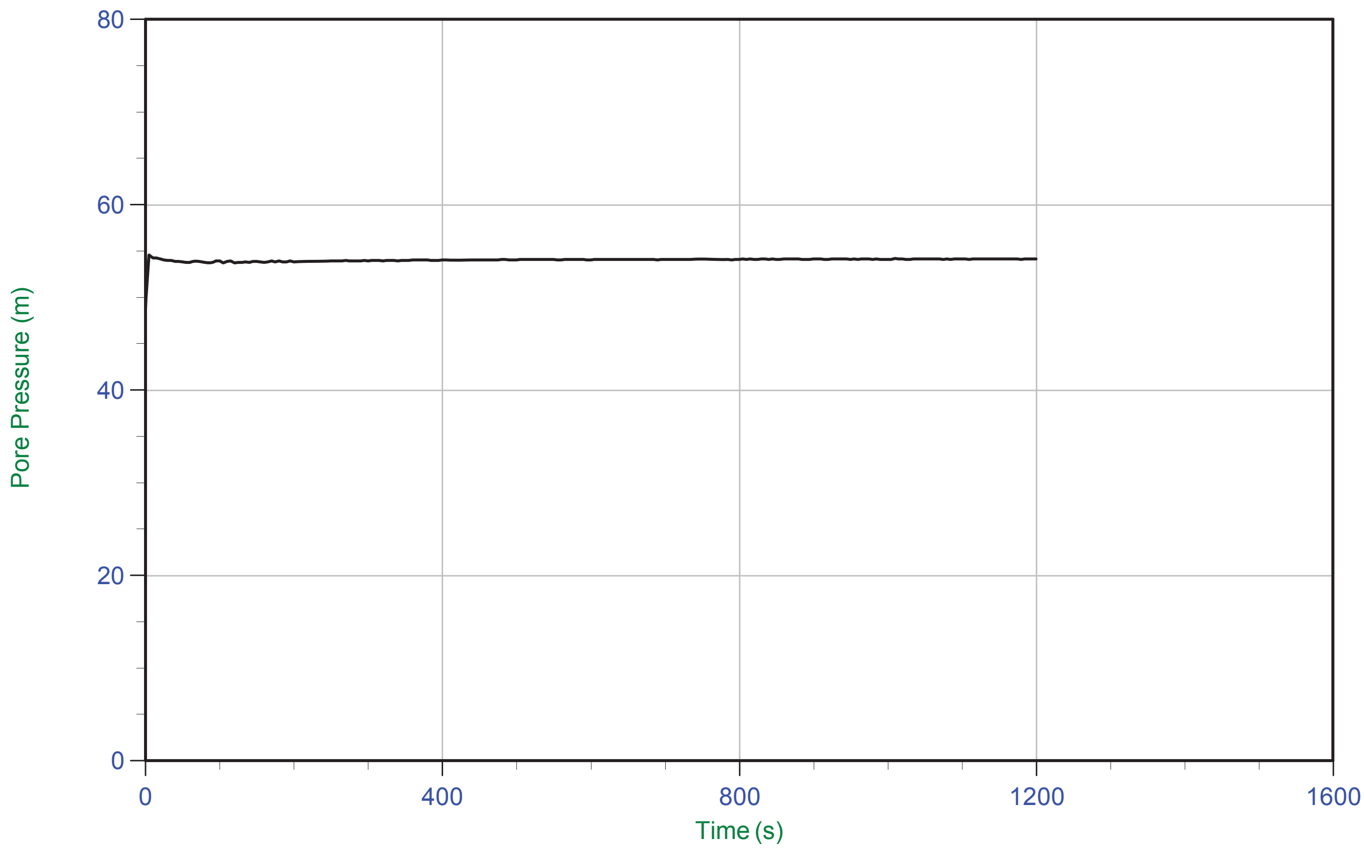
Filename: 17-05010_CPD003.PPF	U Min: 39.5 m	WT: -23.336 m / -76.561 ft
Depth: 16.300 m / 53.477 ft	U Max: 40.2 m	Ueq: 39.6 m
Duration: 105.0 s		

ConeTec

Baffinland

Job No: 17-05010
Date: 04/06/2017 13:34
Site: Milne Port Expansion

Sounding: CPT17-D003
Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_CPD003.PPF
Depth: 30.425 m / 99.818 ft
Duration: 1200.0 s

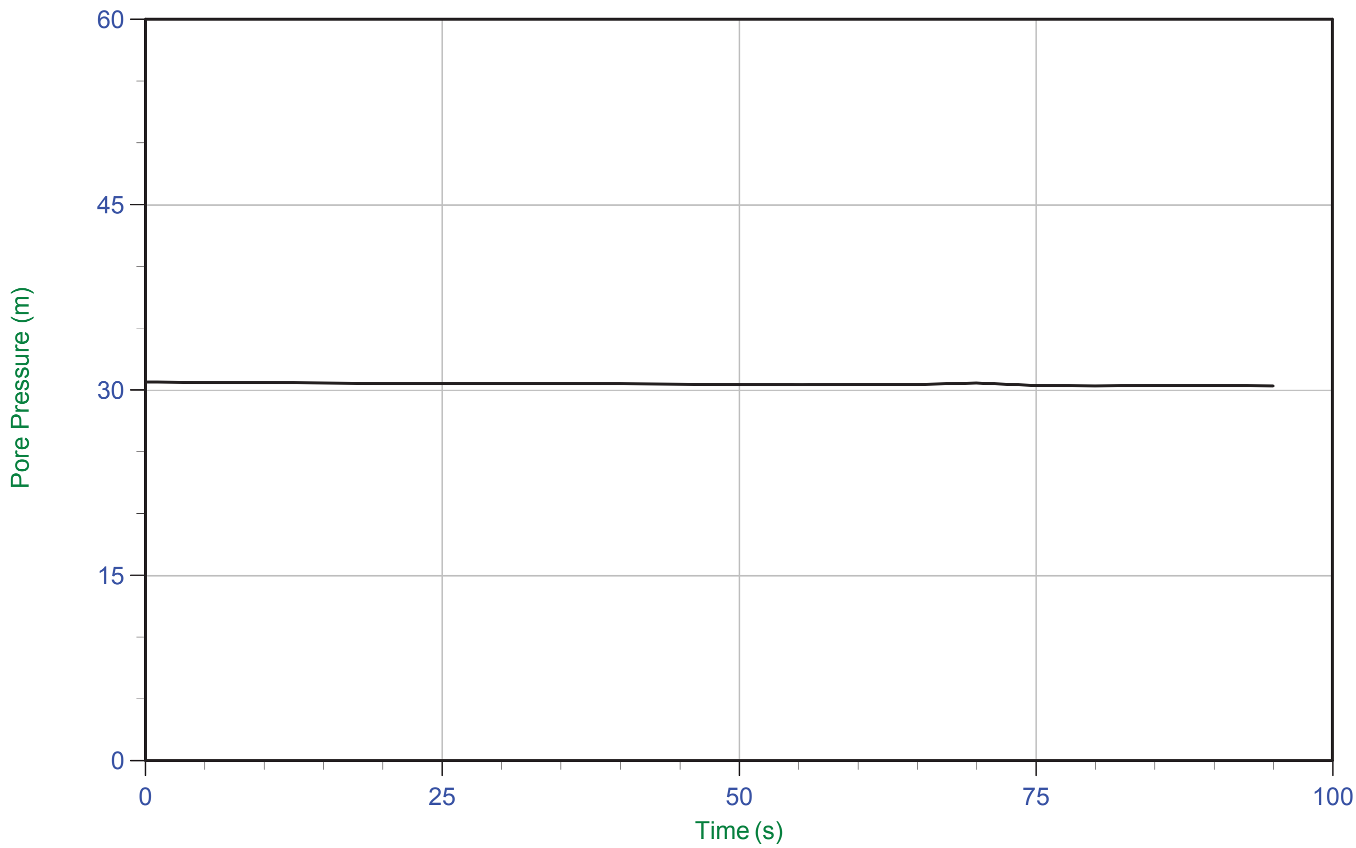
U Min: 48.8 m
U Max: 54.6 m

WT: -23.716 m / -77.807 ft
Ueq: 54.1 m

Baffinland

Job No: 17-05010
Date: 04/04/2017 16:44
Site: Milne Port Expansion

Sounding: SCPT17-D004
Cone: 338:T1500F15U500 Area=15 cm²



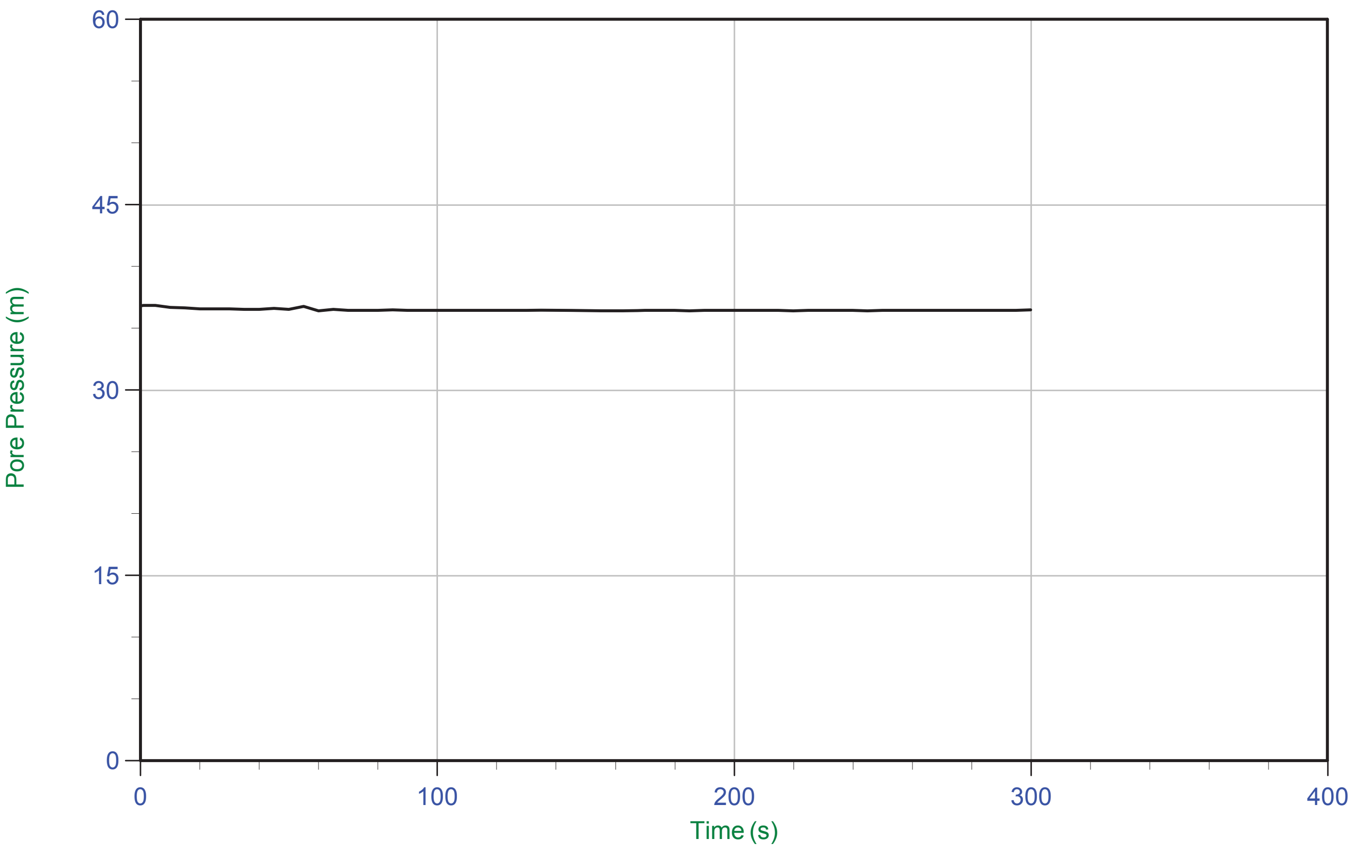
Trace Summary:

Filename: 17-05010_SPD004.PPF
Depth: 3.275 m / 10.745 ft
Duration: 95.0 s

U Min: 30.3 m
U Max: 30.7 m

WT: -27.149 m / -89.070 ft
Ueq: 30.4 m

Baffinland	Job No: 17-05010 Date: 04/04/2017 16:44 Site: Milne Port Expansion	Sounding: SCPT17-D004 Cone: 338:T1500F15U500 Area=15 cm²



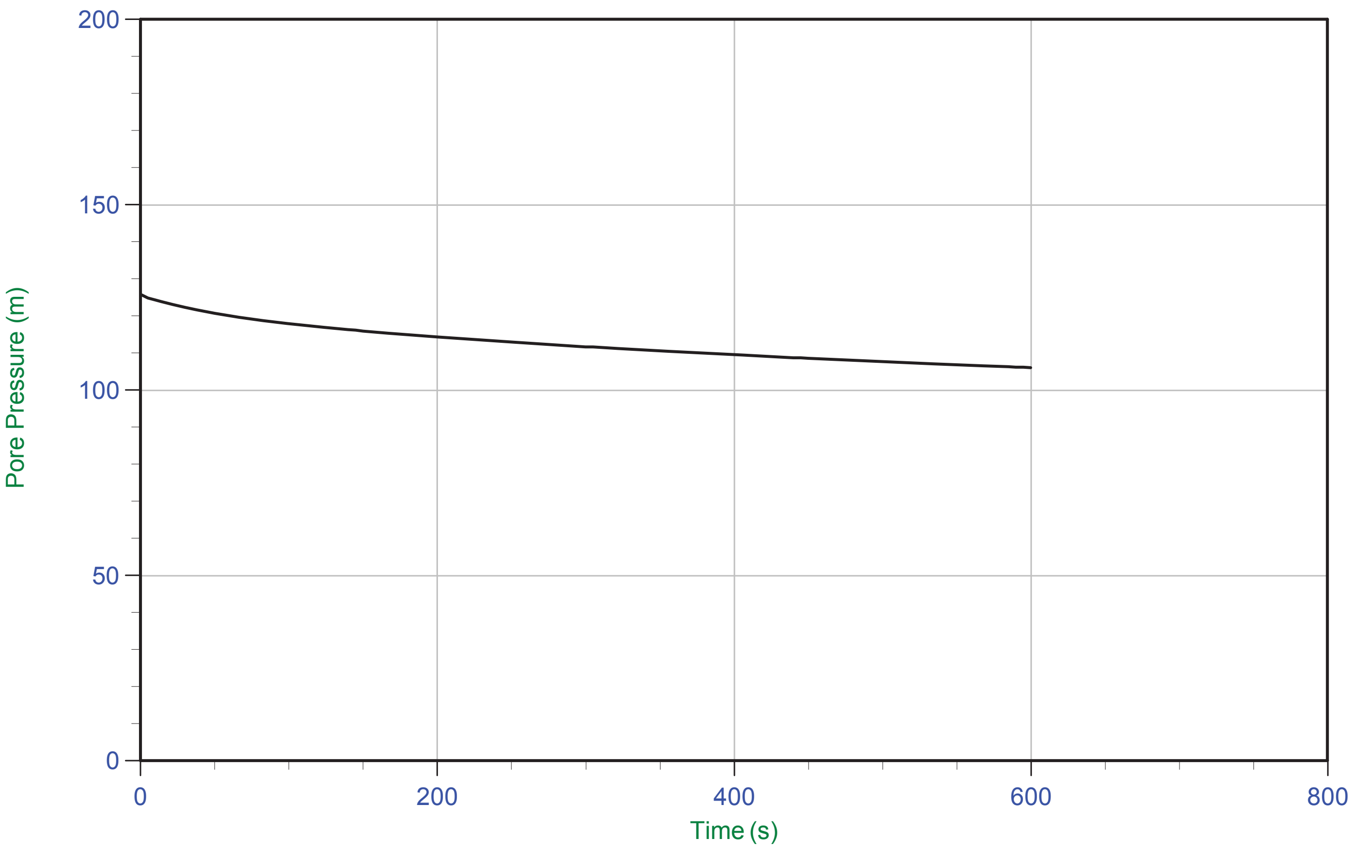
Trace Summary:

Filename: 17-05010_SPD004.PPF	U Min: 36.4 m	WT: -27.285 m / -89.517 ft
Depth: 9.200 m / 30.183 ft	U Max: 36.9 m	Ueq: 36.5 m
Duration: 300.0 s		

Baffinland

Job No: 17-05010
Date: 04/04/2017 16:44
Site: Milne Port Expansion

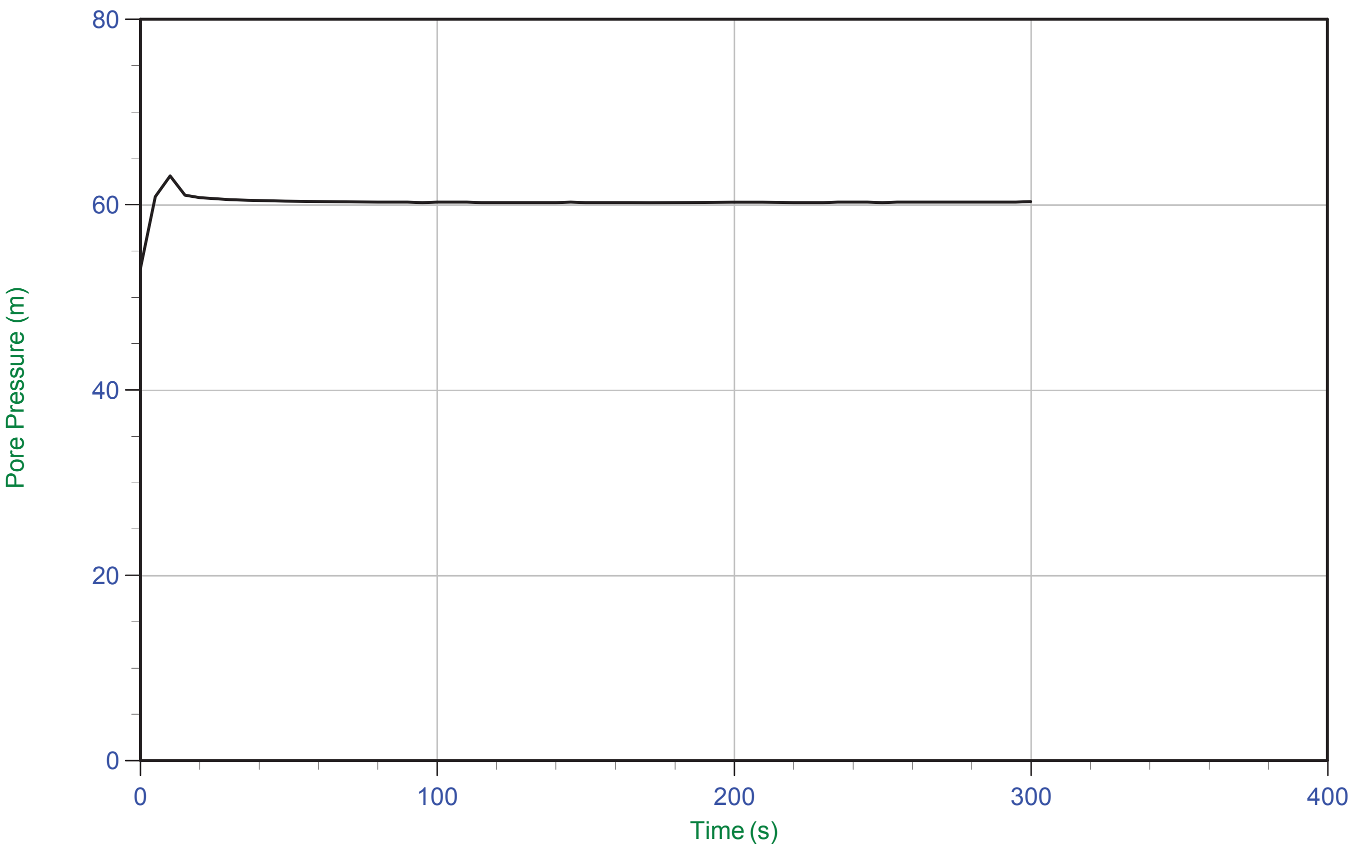
Sounding: SCPT17-D004
Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_SPD004.PPF
Depth: 30.475 m / 99.982 ft
Duration: 600.0 s

U Min: 106.1 m
U Max: 125.8 m



Trace Summary:

Filename: 17-05010_SPD004.PPF
Depth: 32.050 m / 105.150 ft
Duration: 300.0 s

U Min: 53.2 m
U Max: 63.1 m

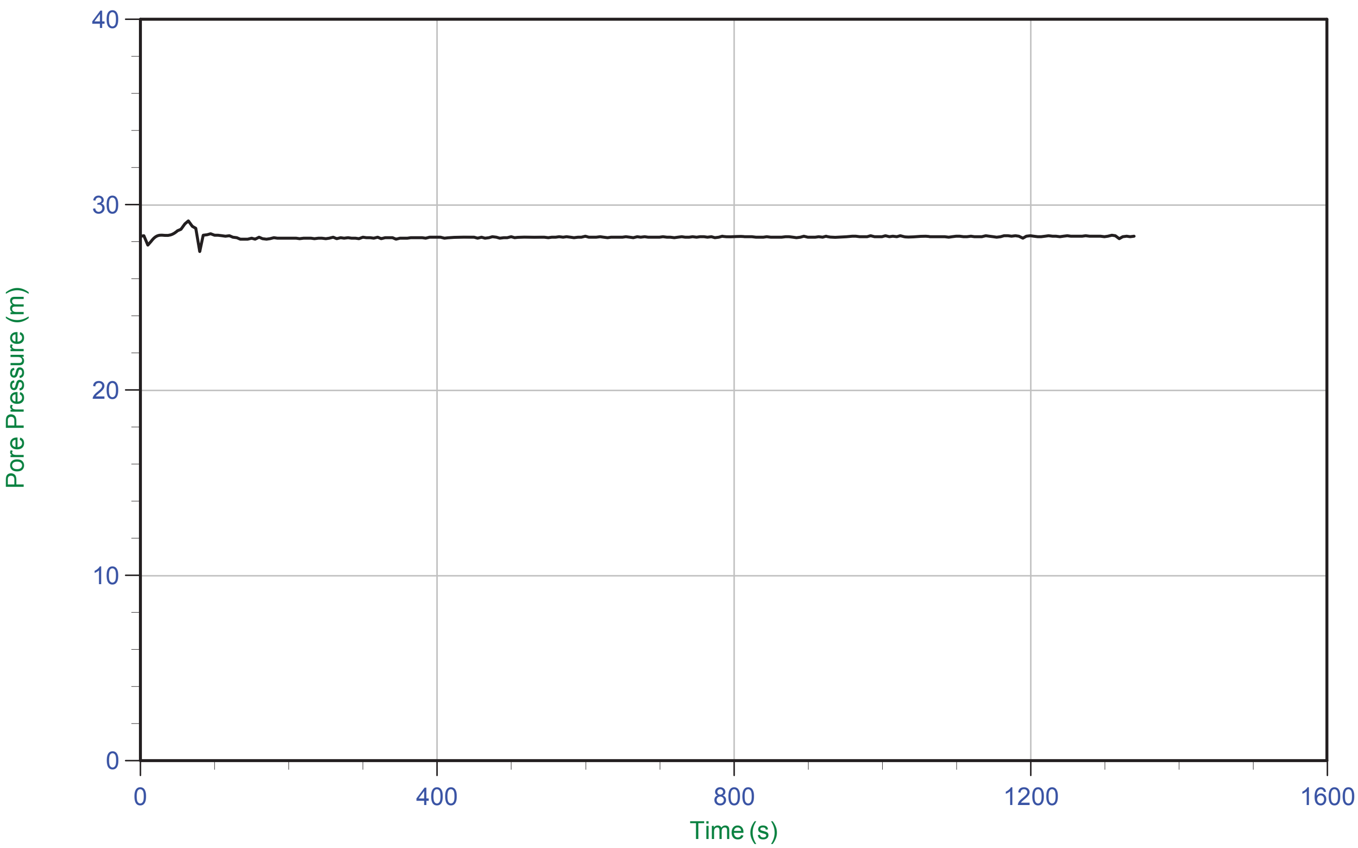
WT: -28.233 m / -92.627 ft
Ueq: 60.3 m

ConeTec

Baffinland

Job No: 17-05010
Date: 04/03/2017 02:19
Site: Milne Port Expansion

Sounding: CPT17-D005
Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_CPD005.PPF
Depth: 2.275 m / 7.464 ft
Duration: 1340.0 s

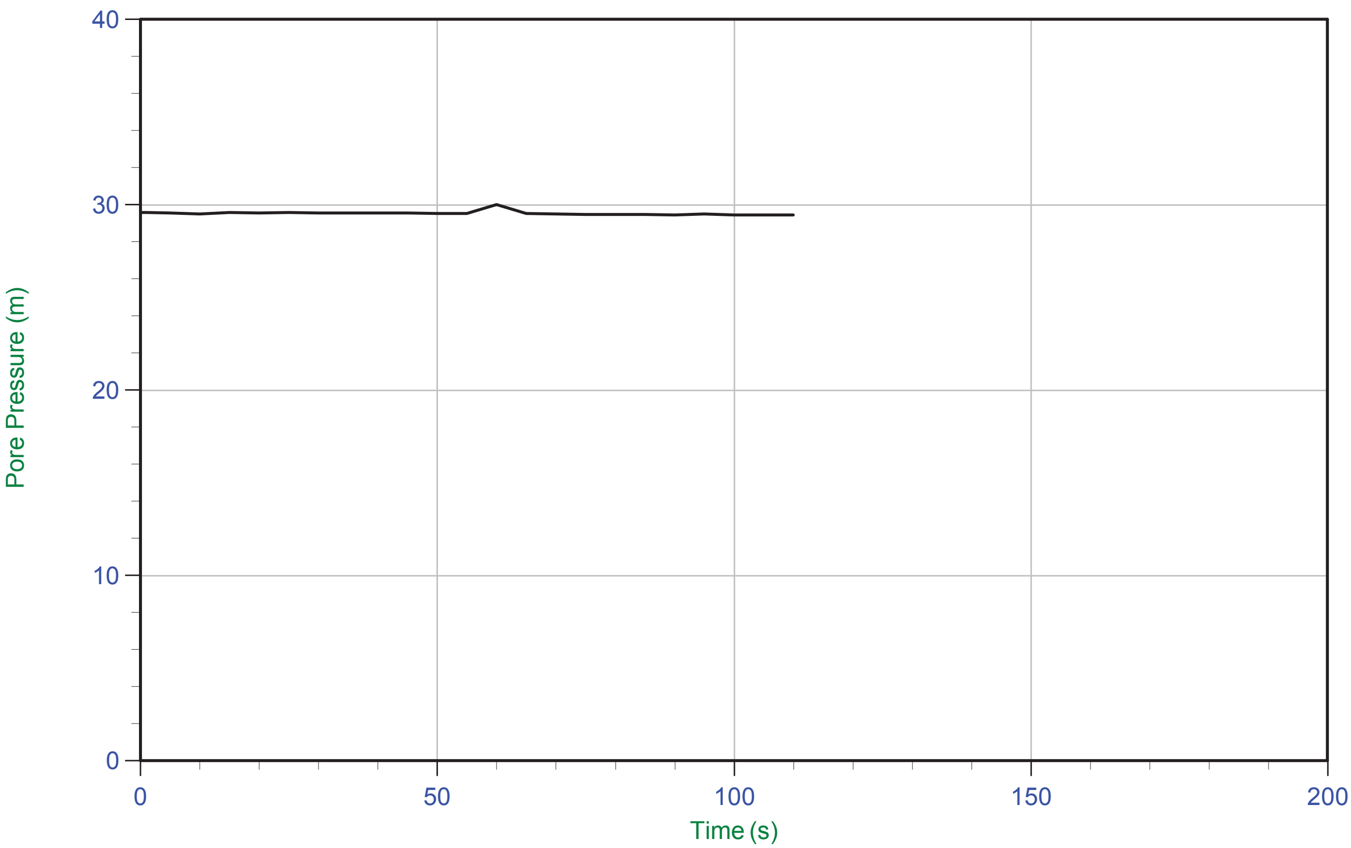
U Min: 27.5 m
U Max: 29.1 m

WT: -26.008 m / -85.327 ft
Ueq: 28.3 m

Baffinland

Job No: 17-05010
Date: 04/03/2017 02:19
Site: Milne Port Expansion

Sounding: CPT17-D005
Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_CPD005.PPF
Depth: 3.325 m / 10.909 ft
Duration: 110.0 s

U Min: 29.4 m
U Max: 30.0 m

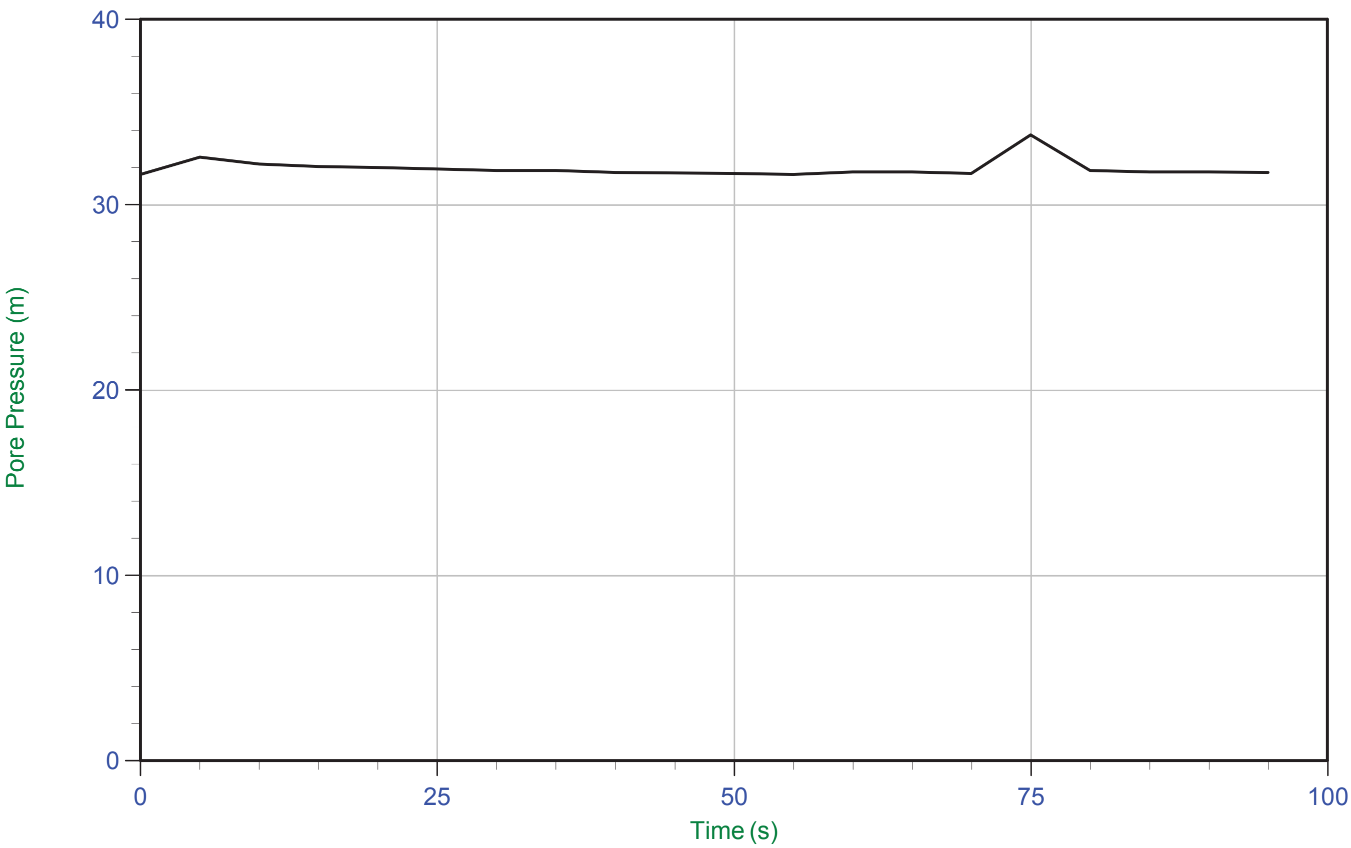
WT: -26.170 m / -85.859 ft
Ueq: 29.5 m

CONETEC

Baffinland

Job No: 17-05010
Date: 04/03/2017 02:19
Site: Milne Port Expansion

Sounding: CPT17-D005
Cone: 338:T1500F15U500 Area=15 cm²



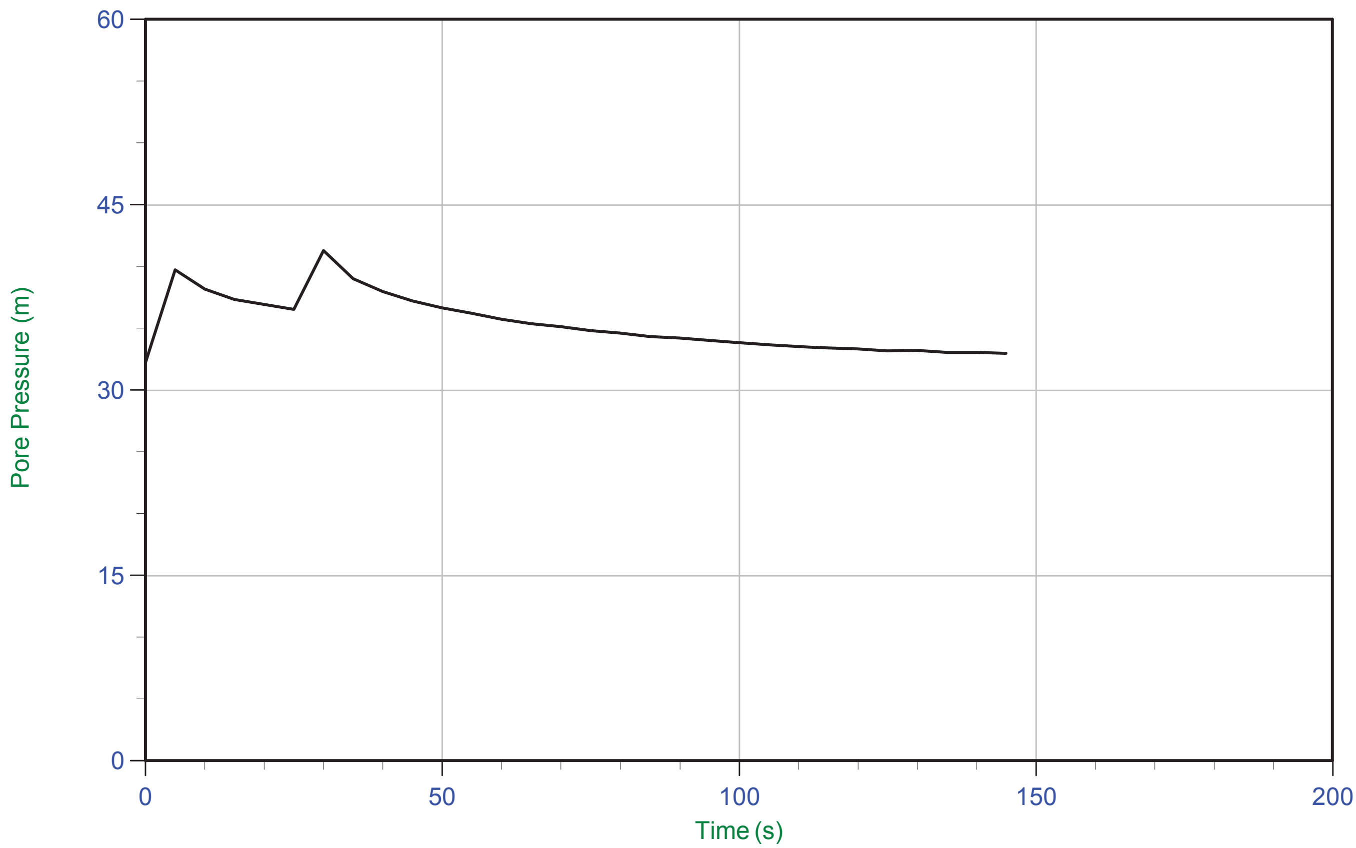
Trace Summary:

Filename: 17-05010_CPD005.PPF
Depth: 5.375 m / 17.634 ft
Duration: 95.0 s

U Min: 31.6 m
U Max: 33.8 m

WT: -26.383 m / -86.557 ft
Ueq: 31.8 m

Baffinland	Job No: 17-05010 Date: 04/03/2017 02:19 Site: Milne Port Expansion	Sounding: CPT17-D005 Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_CPD005.PPF
Depth: 6.375 m / 20.915 ft
Duration: 145.0 s

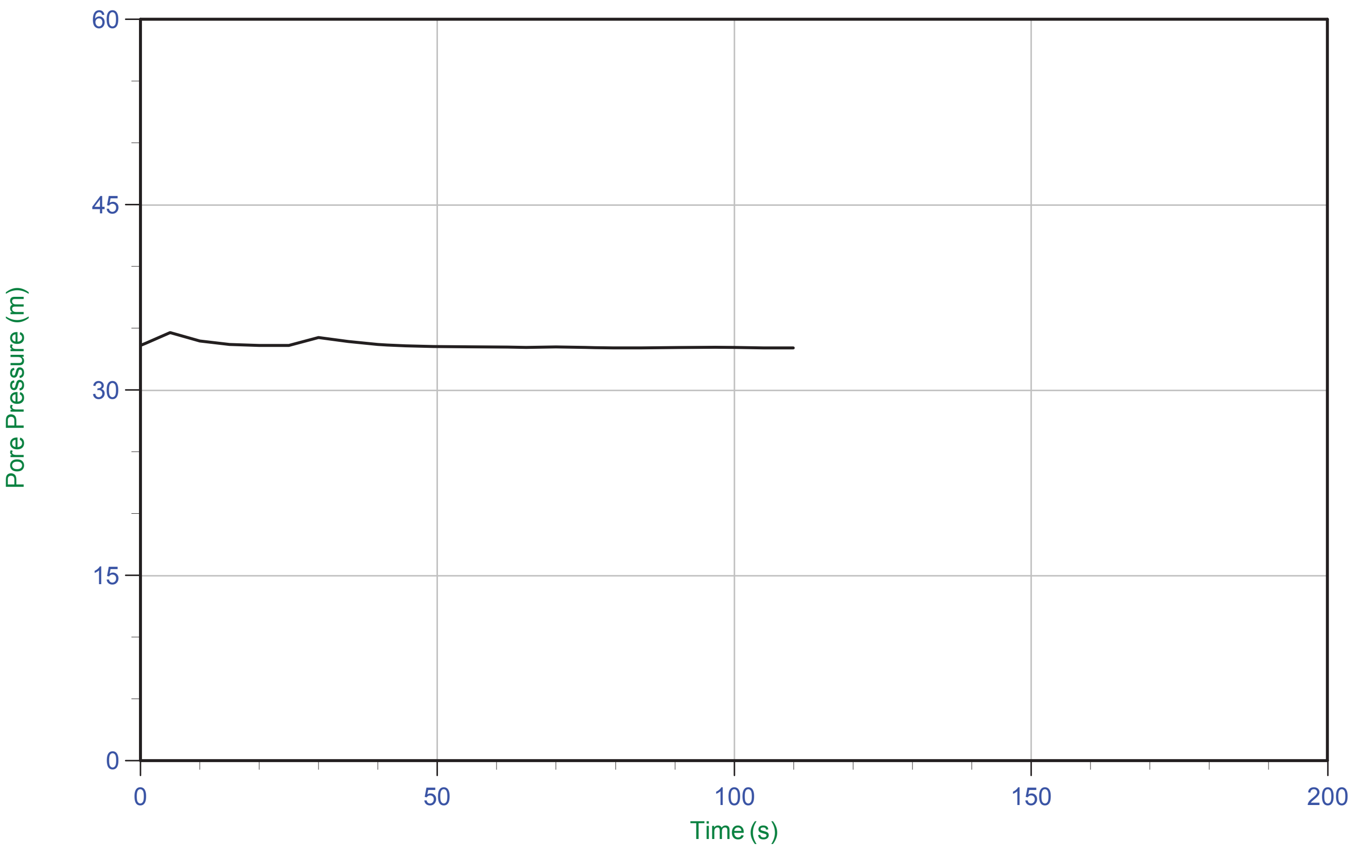
U Min: 32.2 m
U Max: 41.3 m

ConeTec

Baffinland

Job No: 17-05010
Date: 04/03/2017 02:19
Site: Milne Port Expansion

Sounding: CPT17-D005
Cone: 338:T1500F15U500 Area=15 cm²



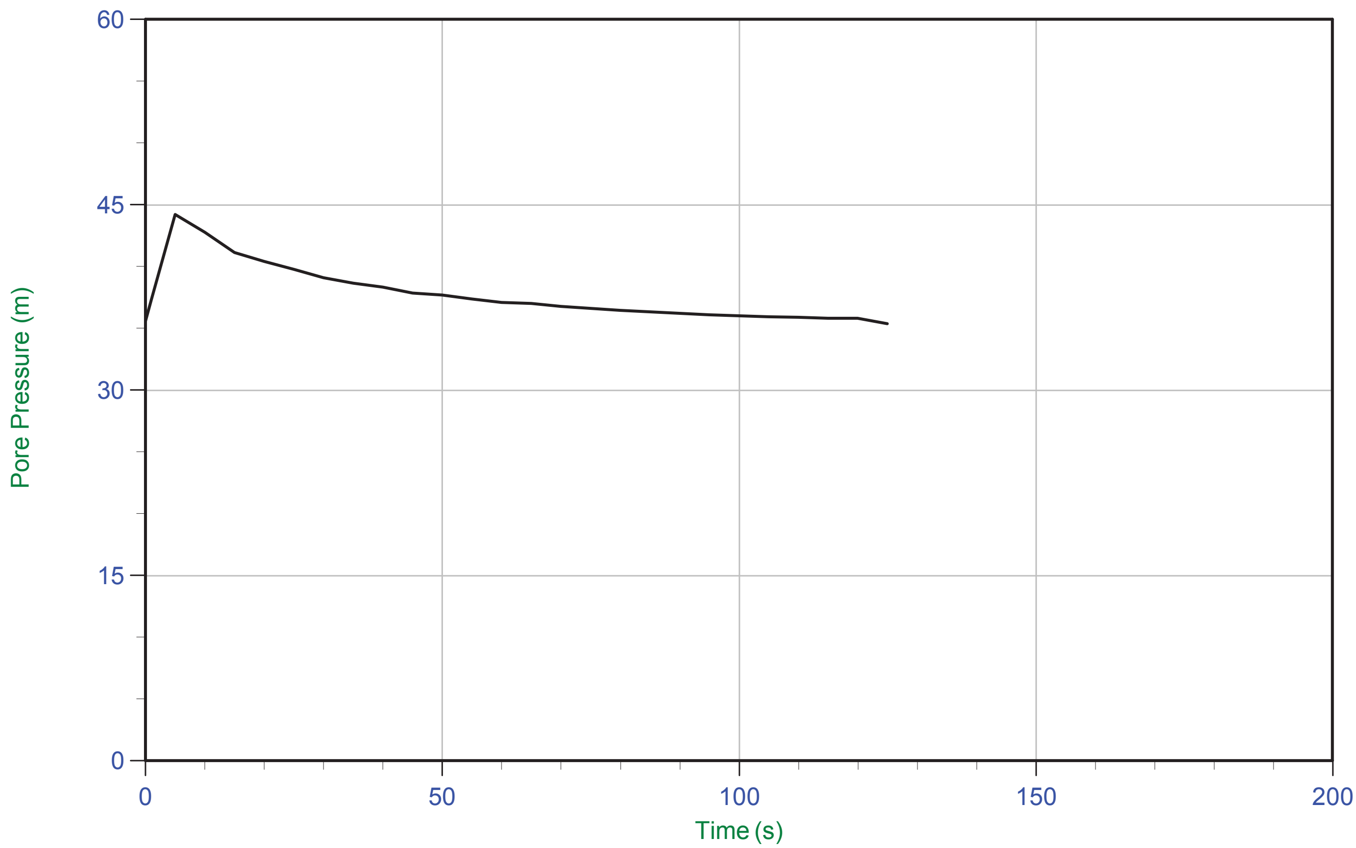
Trace Summary:

Filename: 17-05010_CPD005.PPF	U Min: 33.4 m	WT: -26.055 m / -85.481 ft
Depth: 7.400 m / 24.278 ft	U Max: 34.6 m	Ueq: 33.5 m
Duration: 110.0 s		

Baffinland

Job No: 17-05010
Date: 04/03/2017 02:19
Site: Milne Port Expansion

Sounding: CPT17-D005
Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_CPD005.PPF
Depth: 9.350 m / 30.675 ft
Duration: 125.0 s

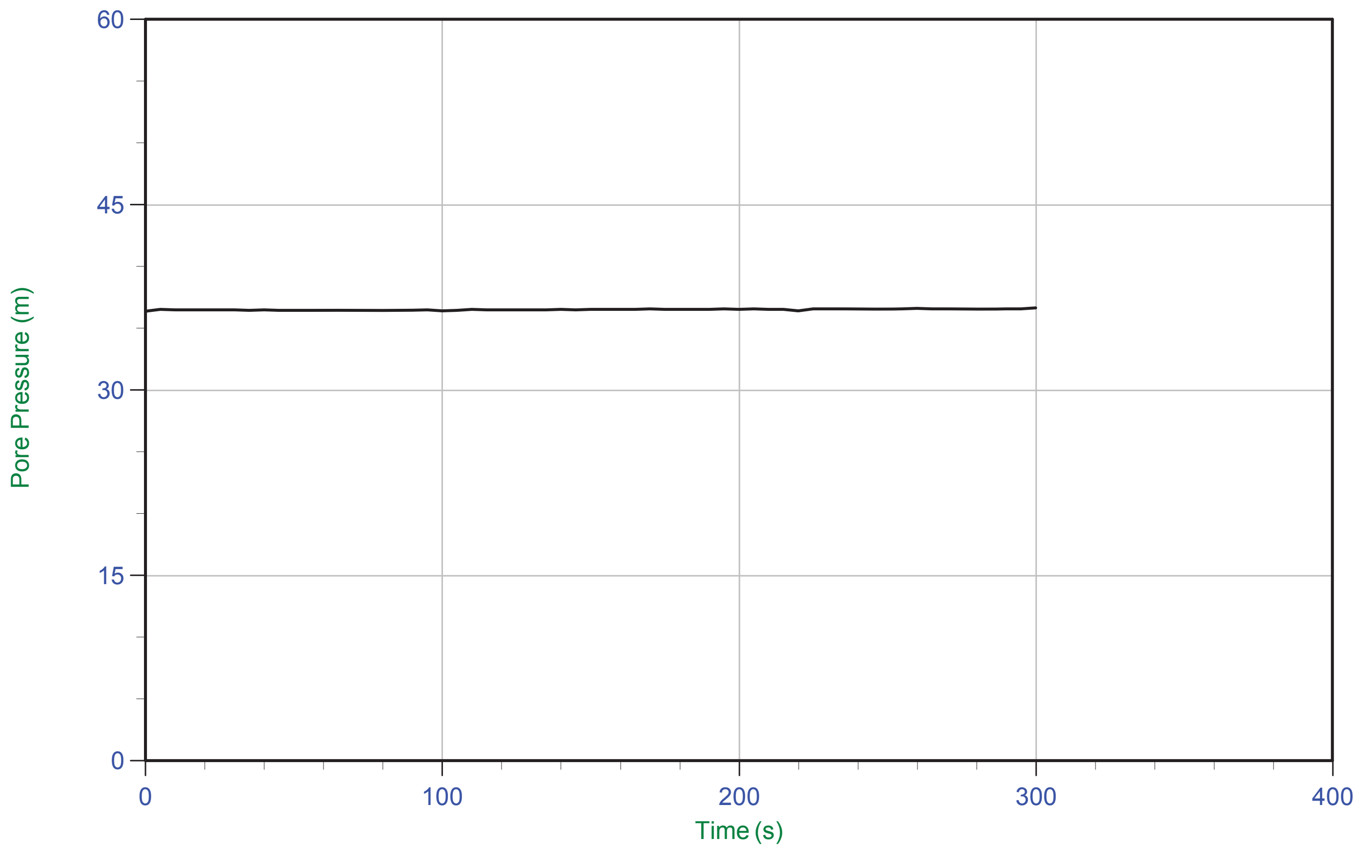
U Min: 35.4 m
U Max: 44.2 m

CONETEC

Baffinland

Job No: 17-05010
Date: 04/03/2017 02:19
Site: Milne Port Expansion

Sounding: CPT17-D005
Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_CPD005.PPF
Depth: 10.300 m / 33.792 ft
Duration: 300.0 s

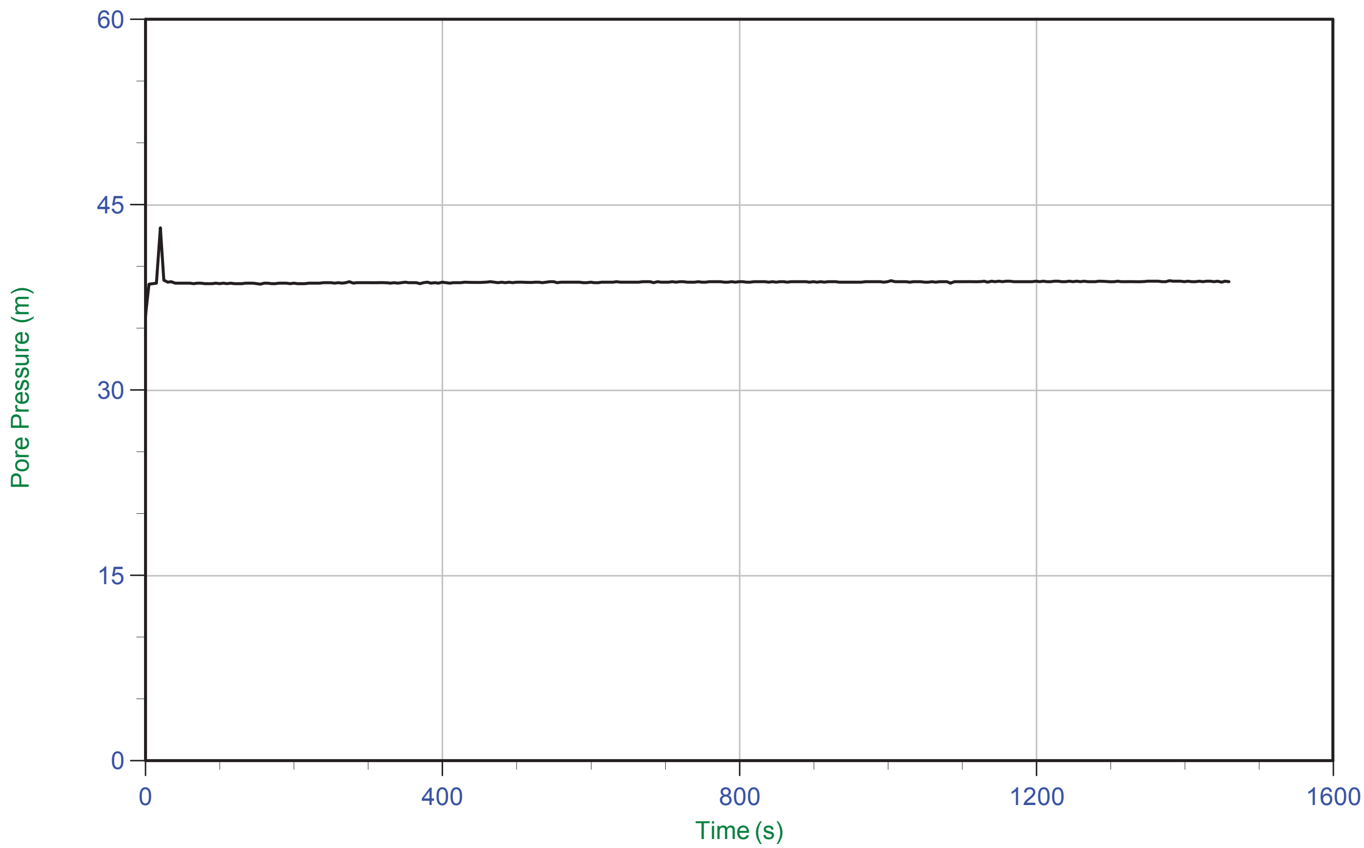
U Min: 36.4 m
U Max: 36.6 m

WT: -26.185 m / -85.908 ft
Ueq: 36.5 m

Baffinland

Job No: 17-05010
Date: 04/03/2017 02:19
Site: Milne Port Expansion

Sounding: CPT17-D005
Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

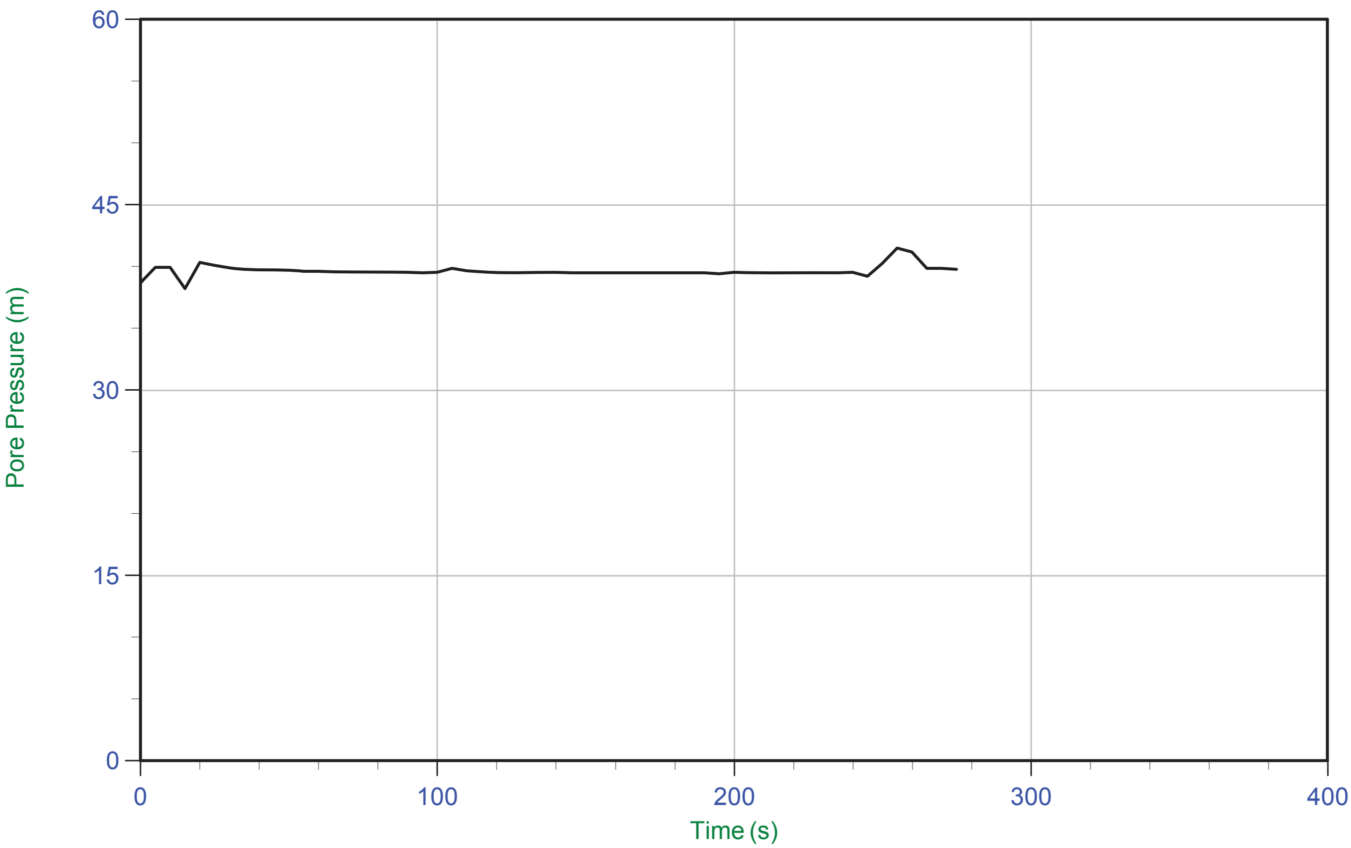
Filename: 17-05010_CPD005.PPF
Depth: 12.350 m / 40.518 ft
Duration: 1460.0 s

U Min: 35.9 m
U Max: 43.1 m

WT: -26.438 m / -86.738 ft
Ueq: 38.8 m

CONETEC

Baffinland	Job No: 17-05010 Date: 04/03/2017 02:19 Site: Milne Port Expansion	Sounding: CPT17-D005 Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

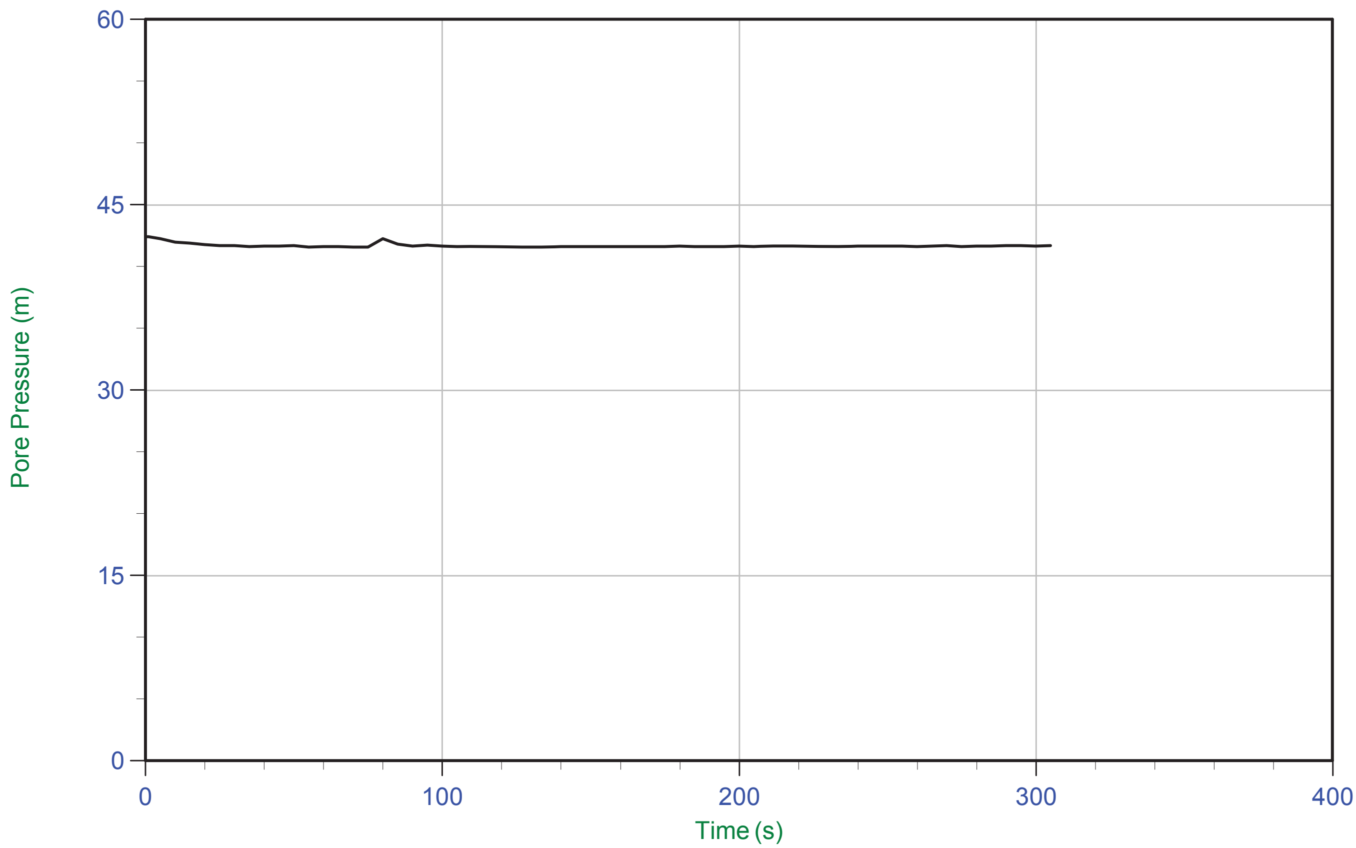
Filename: 17-05010_CPD005.PPF
Depth: 13.175 m / 43.225 ft
Duration: 275.0 s

U Min: 38.2 m
U Max: 41.5 m

Baffinland

Job No: 17-05010
Date: 04/03/2017 02:19
Site: Milne Port Expansion

Sounding: CPT17-D005
Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_CPD005.PPF
Depth: 15.050 m / 49.376 ft
Duration: 305.0 s

U Min: 41.6 m
U Max: 42.4 m

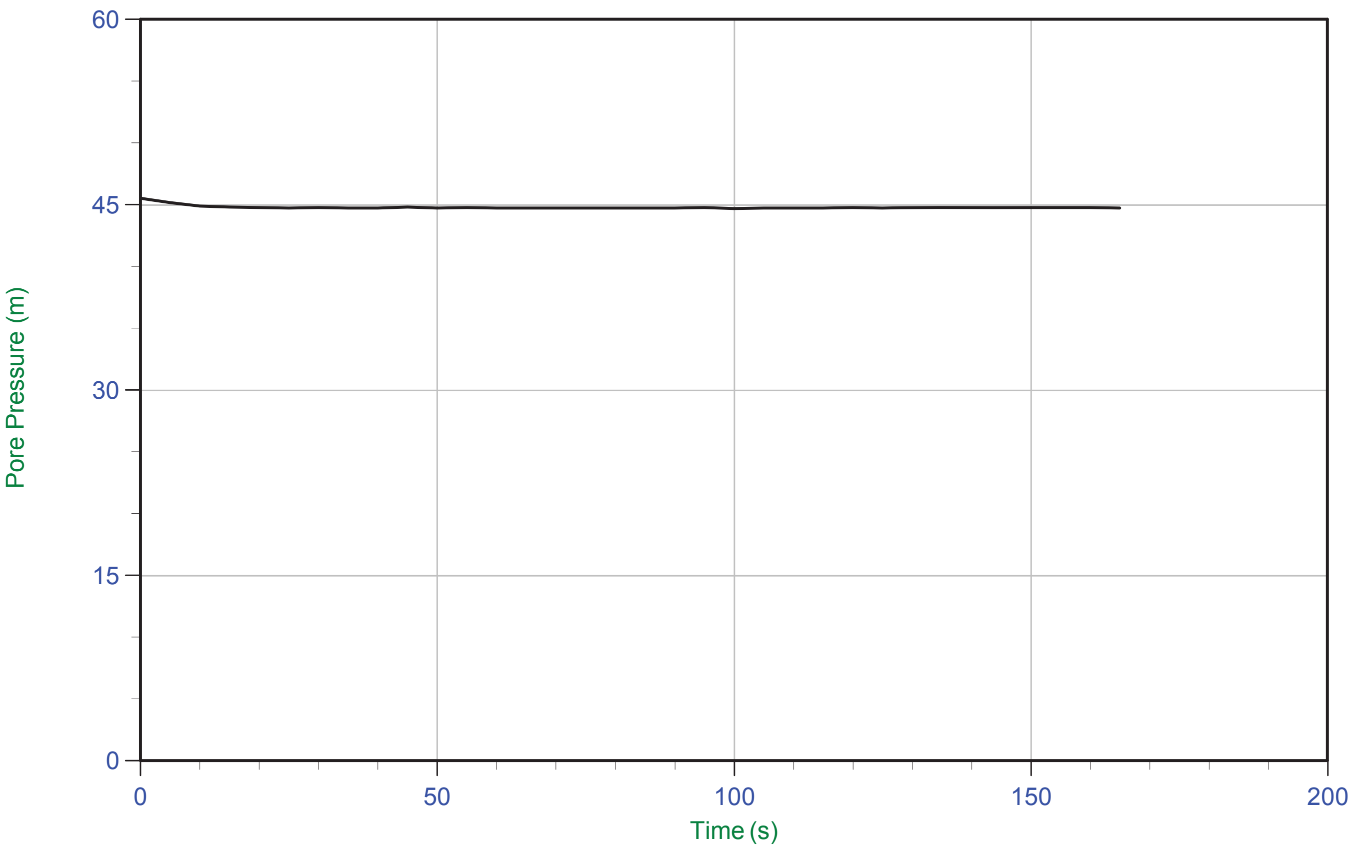
WT: -26.647 m / -87.423 ft
Ueq: 41.7 m

CONETEC

Baffinland

Job No: 17-05010
Date: 04/03/2017 02:19
Site: Milne Port Expansion

Sounding: CPT17-D005
Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_CPD005.PPF
Depth: 18.100 m / 59.382 ft
Duration: 165.0 s

U Min: 44.7 m
U Max: 45.5 m

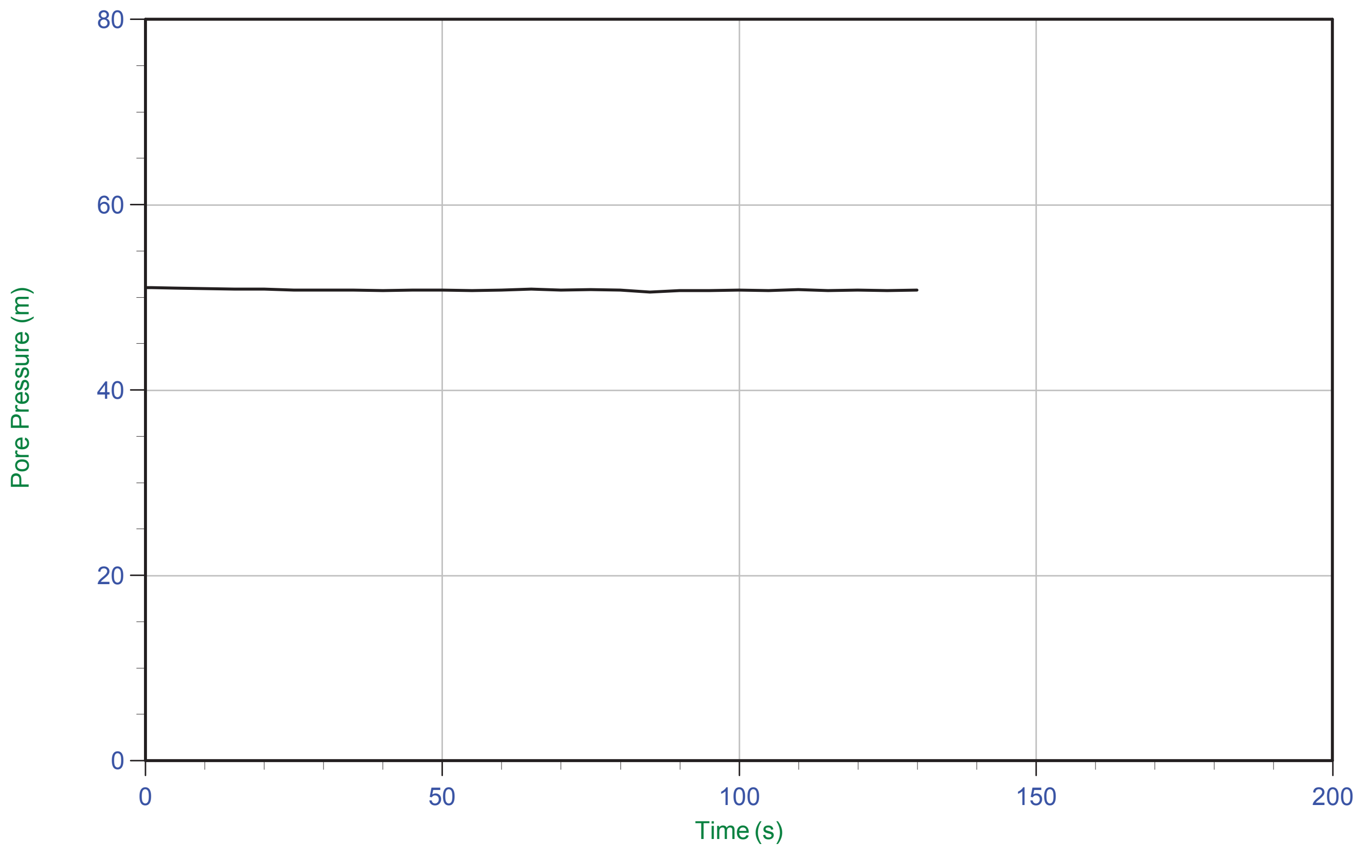
WT: -26.627 m / -87.358 ft
Ueq: 44.7 m

CONETEC

Baffinland

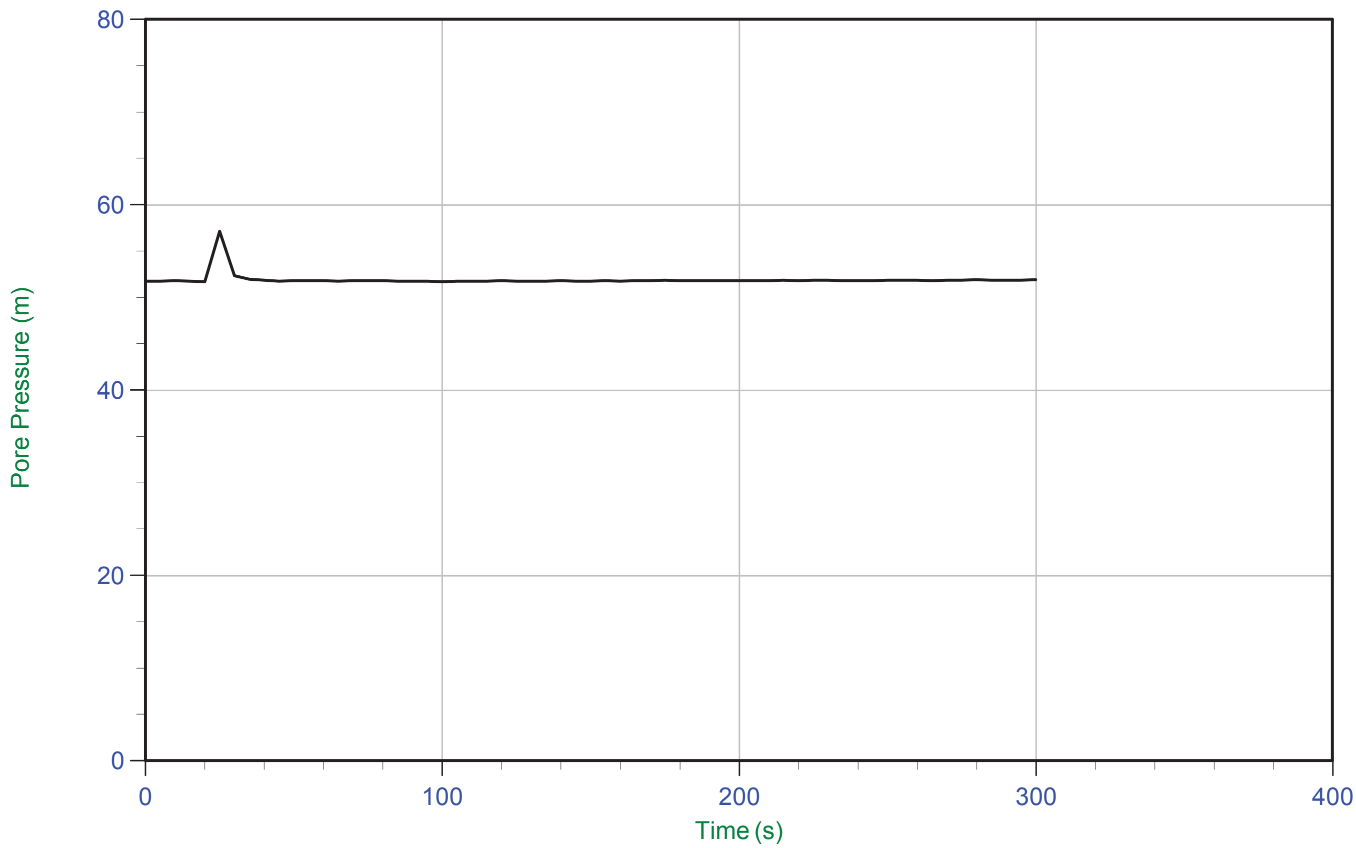
Job No: 17-05010
Date: 04/03/2017 02:19
Site: Milne Port Expansion

Sounding: CPT17-D005
Cone: 338:T1500F15U500 Area=15 cm²



Trace Summary:	Filename: 17-05010_CPD005.PPF	U Min: 50.6 m	WT: -26.822 m / -87.998 ft
	Depth: 23.925 m / 78.493 ft	U Max: 51.1 m	Ueq: 50.7 m
	Duration: 130.0 s		

CONETEC	Baffinland	Job No: 17-05010 Date: 04/03/2017 02:19 Site: Milne Port Expansion	Sounding: CPT17-D005 Cone: 338:T1500F15U500 Area=15 cm²



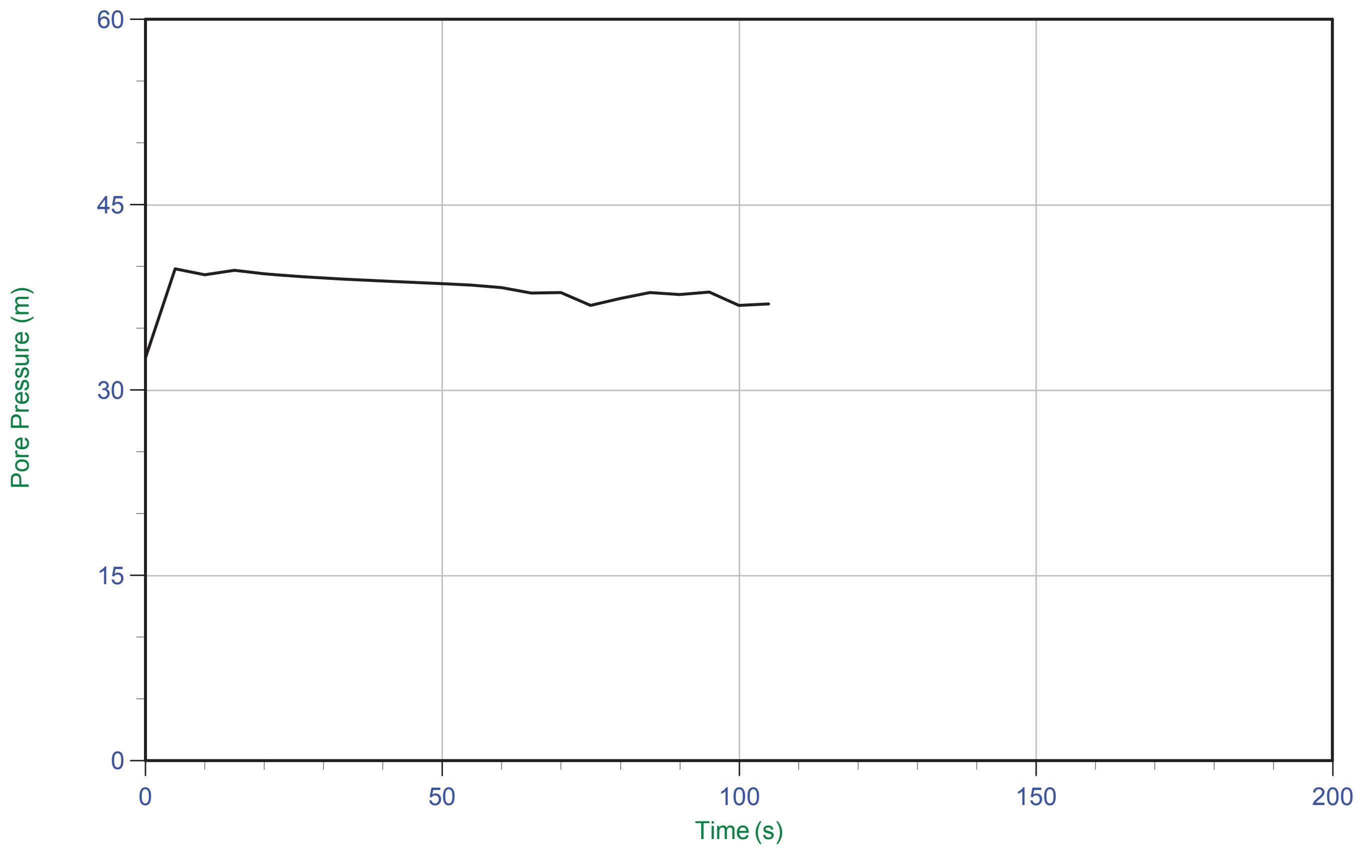
Trace Summary:	Filename: 17-05010_CPD005.PPF Depth: 25.125 m / 82.430 ft Duration: 300.0 s	U Min: 51.7 m U Max: 57.2 m	WT: -26.754 m / -87.775 ft Ueq: 51.9 m

ConeTec

Baffinland

Job No: 17-05010
Date: 04/06/2017 23:59
Site: Milne Port Expansion

Sounding: CPT17-D006
Cone: 374:T1500F15U500 Area=15 cm²

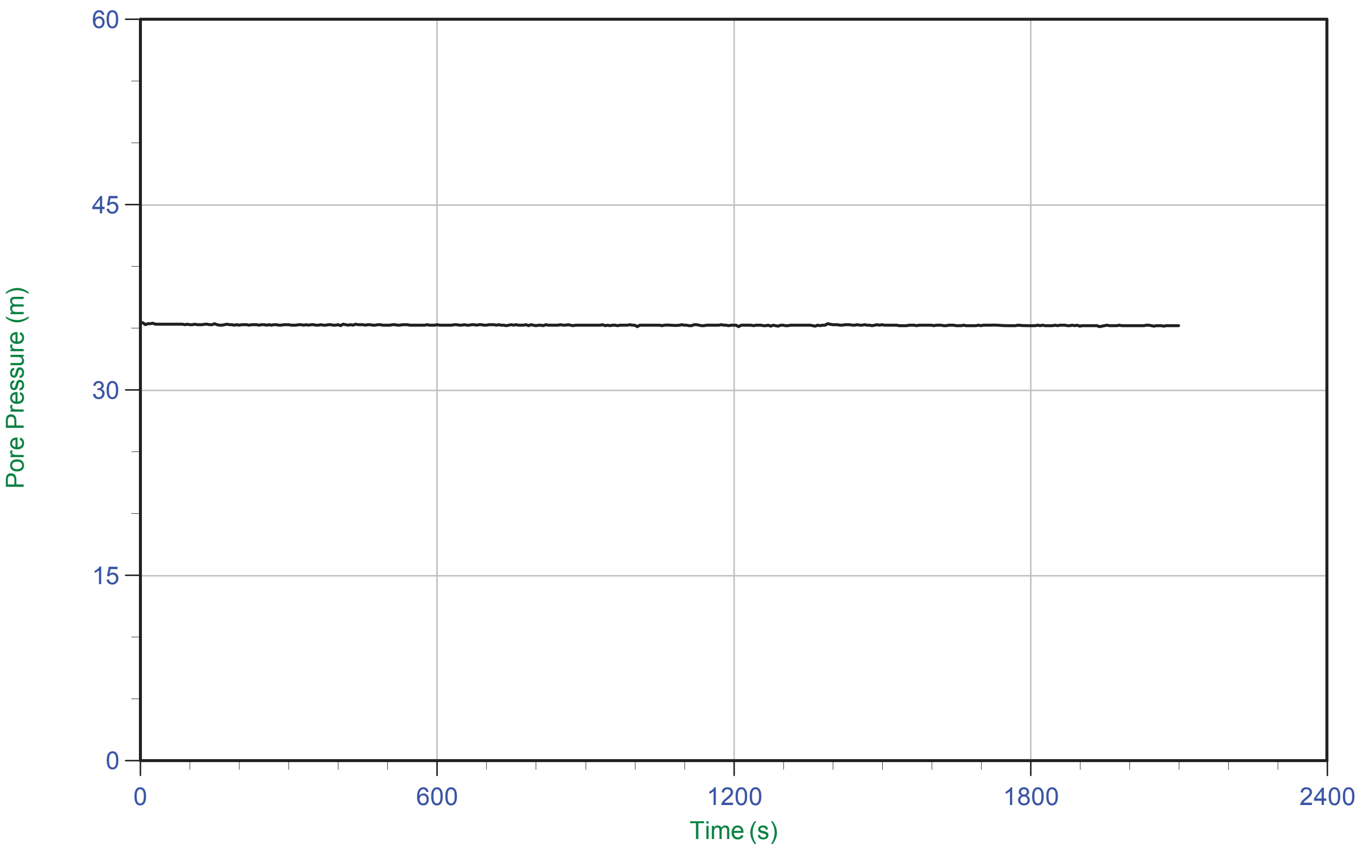


Trace Summary:

Filename: 17-05010_CPD006.PPF
Depth: 2.300 m / 7.546 ft
Duration: 105.0 s

U Min: 32.6 m
U Max: 39.8 m

Baffinland	Job No: 17-05010 Date: 04/06/2017 23:59 Site: Milne Port Expansion
	Sounding: CPT17-D006 Cone: 374:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_CPD006.PPF
Depth: 3.300 m / 10.827 ft
Duration: 2100.0 s

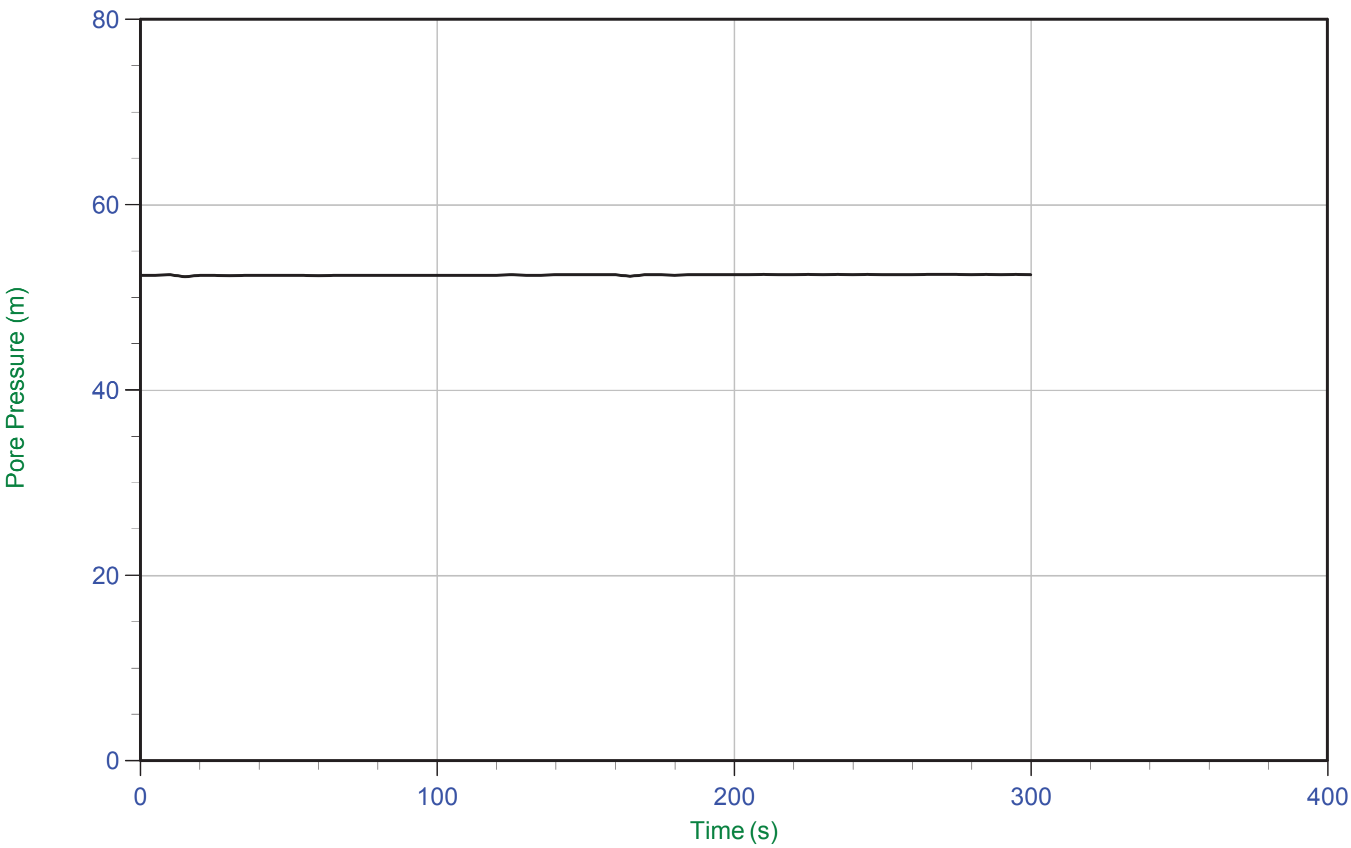
U Min: 35.1 m
U Max: 35.4 m

WT: -31.973 m / -104.897 ft
Ueq: 35.3 m

Baffinland

Job No: 17-05010
Date: 04/06/2017 23:59
Site: Milne Port Expansion

Sounding: CPT17-D006
Cone: 374:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_CPD006.PPF
Depth: 20.575 m / 67.502 ft
Duration: 300.0 s

U Min: 52.2 m
U Max: 52.5 m

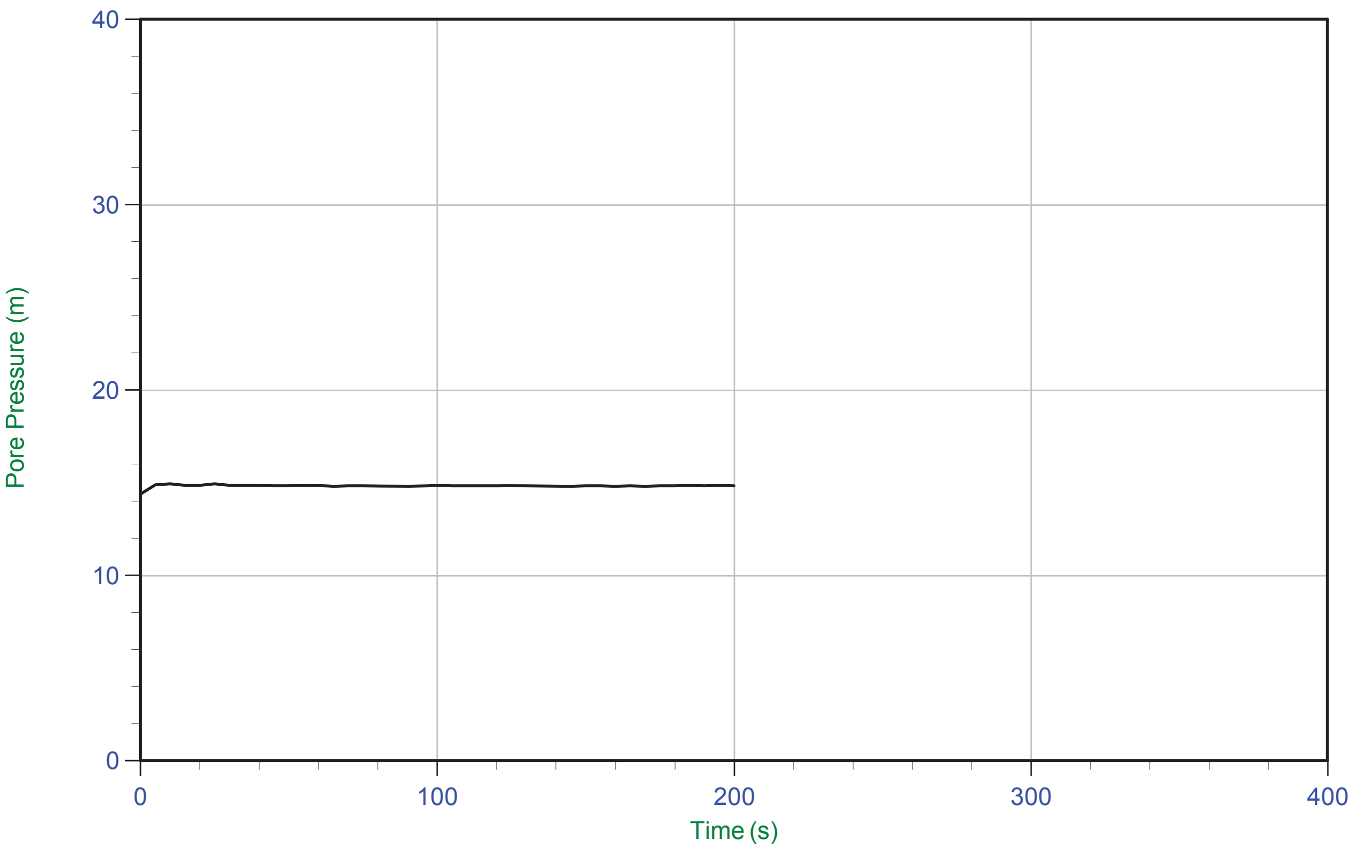
WT: -31.789 m / -104.293 ft
Ueq: 52.4 m

CONETEC

Baffinland

Job No: 17-05010
Date: 04/07/2017 11:27
Site: Milne Port Expansion

Sounding: CPT17-D007
Cone: 374:T1500F15U500 Area=15 cm²



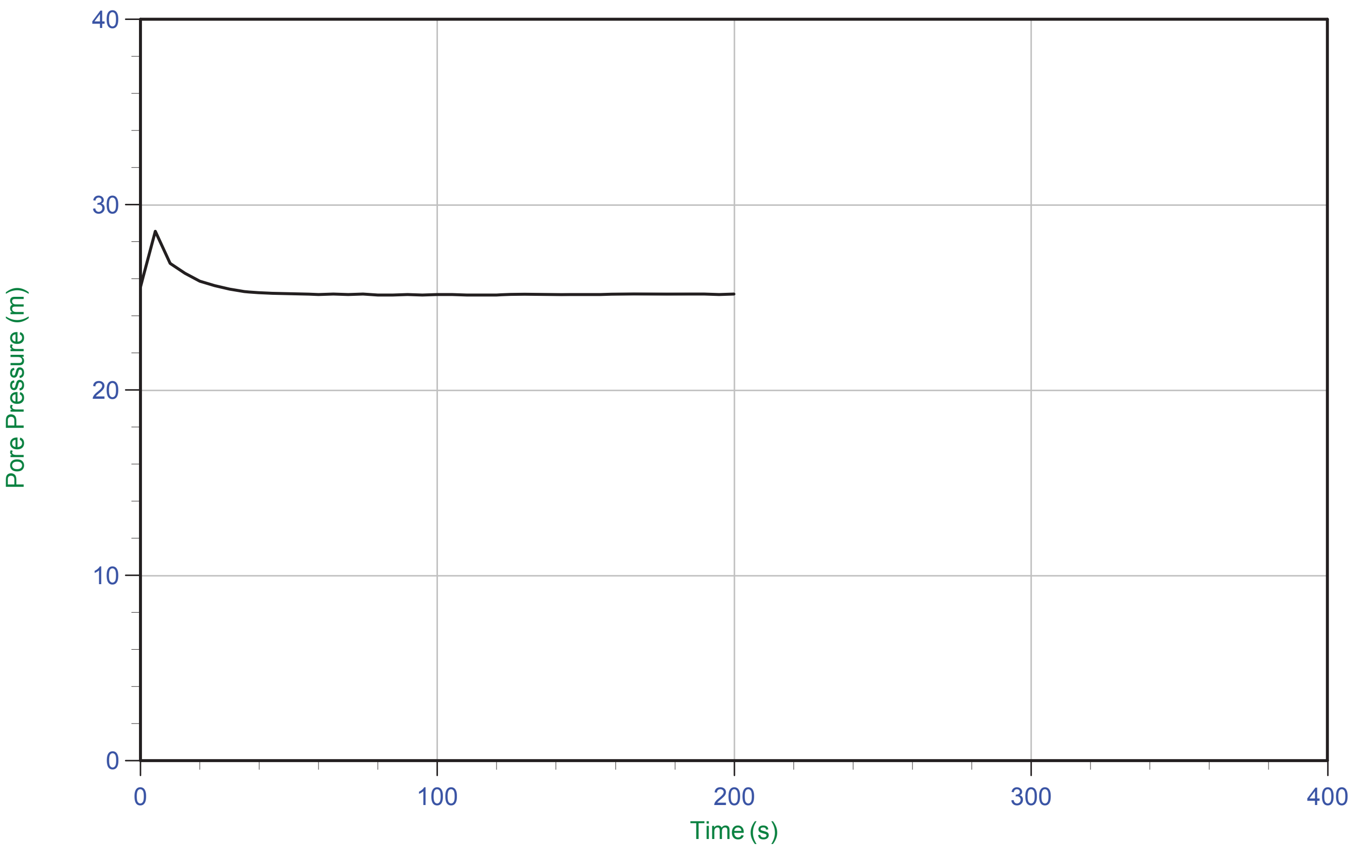
Trace Summary:

Filename: 17-05010_CPD007.PPF	U Min: 14.4 m	WT: -4.688 m / -15.380 ft
Depth: 10.100 m / 33.136 ft	U Max: 15.0 m	Ueq: 14.8 m
Duration: 200.0 s		

Baffinland

Job No: 17-05010
Date: 04/07/2017 11:27
Site: Milne Port Expansion

Sounding: CPT17-D007
Cone: 374:T1500F15U500 Area=15 cm²



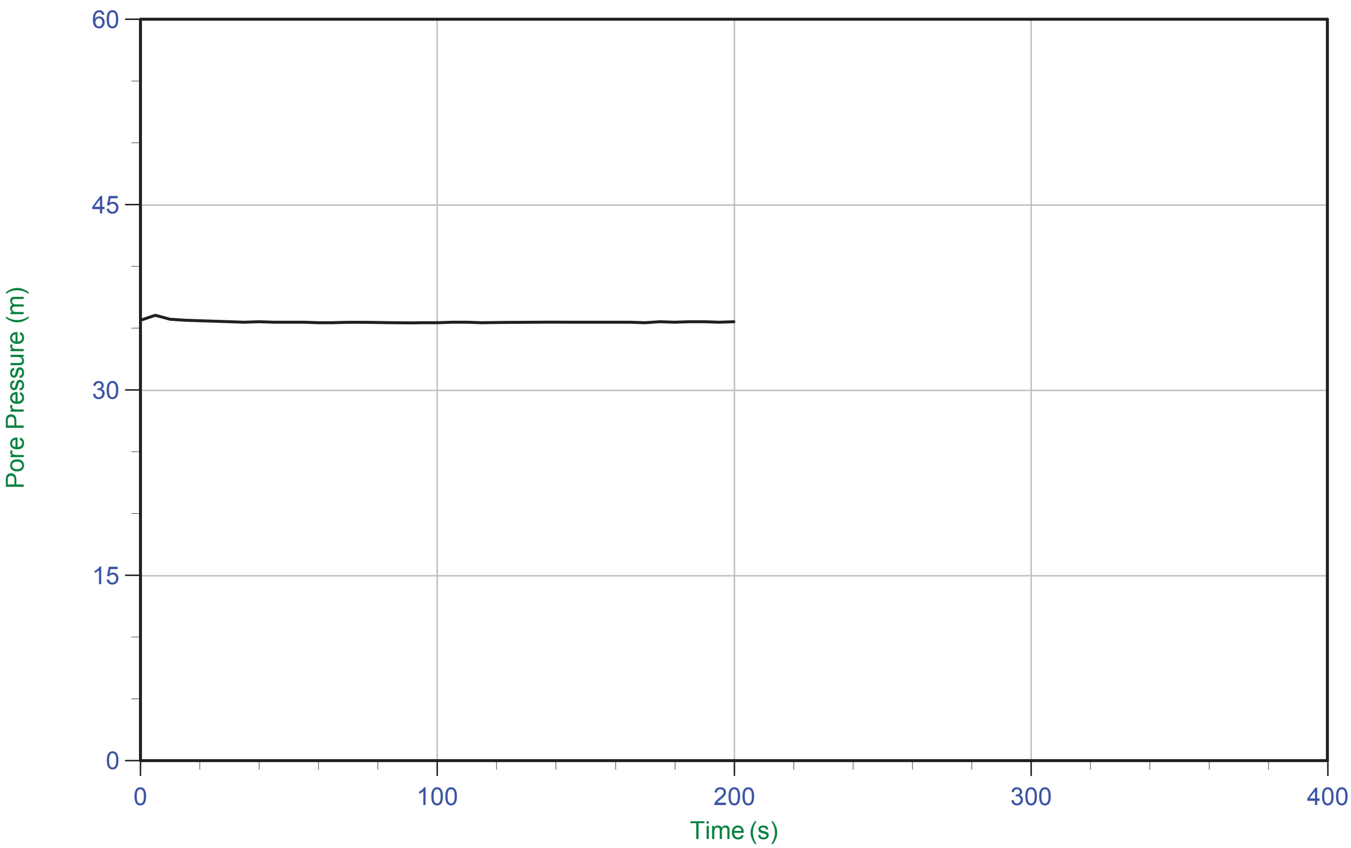
Trace Summary:

Filename: 17-05010_CPD007.PPF
Depth: 20.150 m / 66.108 ft
Duration: 200.0 s

U Min: 25.1 m
U Max: 28.6 m

WT: -4.981 m / -16.342 ft
Ueq: 25.1 m

CONETEC	Baffinland	Job No: 17-05010 Date: 04/07/2017 11:27 Site: Milne Port Expansion	Sounding: CPT17-D007 Cone: 374:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_CPD007.PPF
Depth: 30.200 m / 99.080 ft
Duration: 200.0 s

U Min: 35.5 m
U Max: 36.0 m

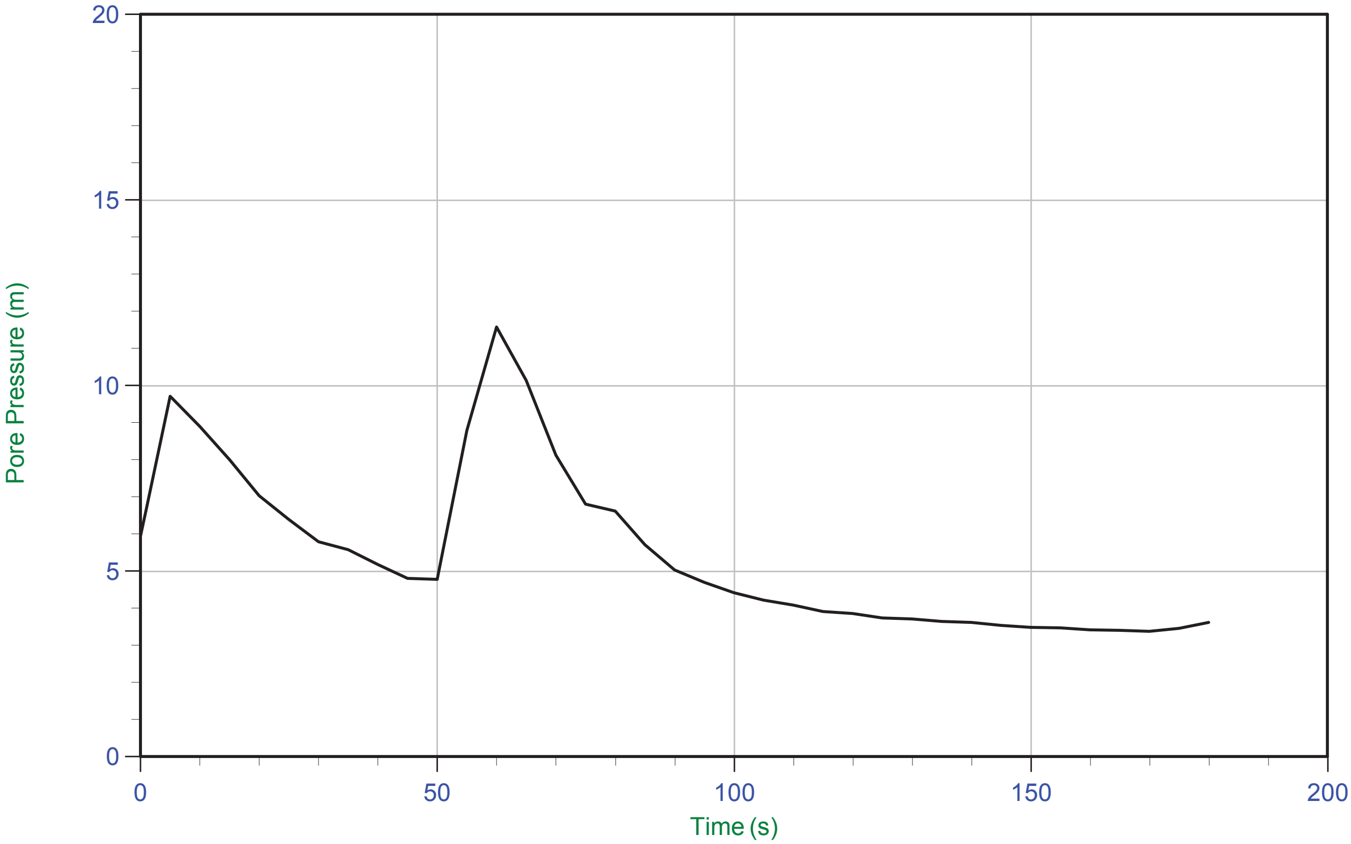
WT: -5.315 m / -17.437 ft
Ueq: 35.5 m

ConeTec

Baffinland

Job No: 17-05010
Date: 04/07/2017 16:47
Site: Milne Port Expansion

Sounding: CPT17-D008
Cone: 374:T1500F15U500 Area=15 cm²

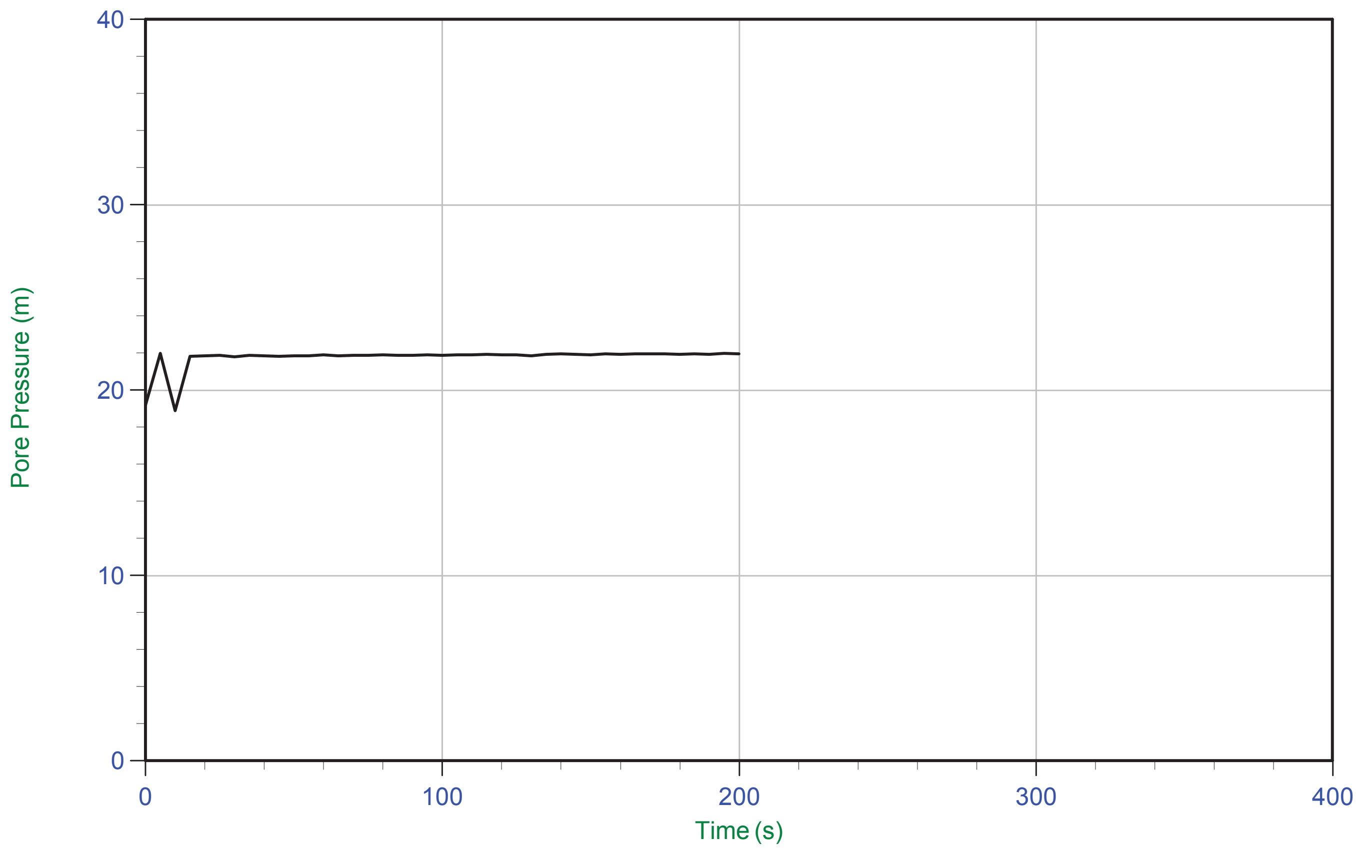


Trace Summary:

Filename: 17-05010_CPD008.PPF
Depth: 2.075 m / 6.808 ft
Duration: 180.0 s

U Min: 3.4 m
U Max: 11.6 m

Baffinland	Job No: 17-05010 Date: 04/07/2017 16:47 Site: Milne Port Expansion	Sounding: CPT17-D008 Cone: 374:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_CPD008.PPF
Depth: 20.500 m / 67.256 ft
Duration: 200.0 s

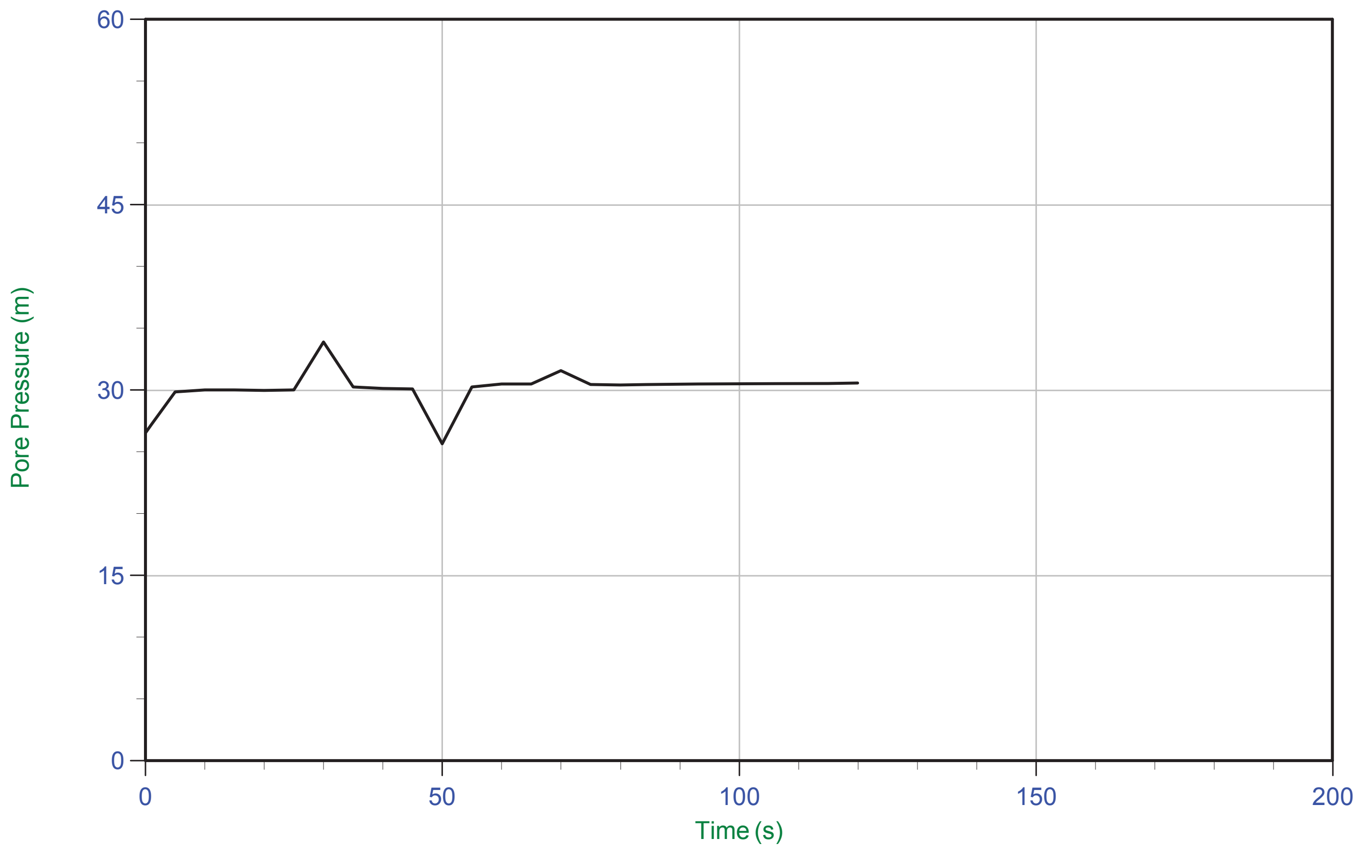
U Min: 18.9 m
U Max: 22.0 m

WT: -1.399 m / -4.590 ft
Ueq: 21.9 m

Baffinland

Job No: 17-05010
Date: 04/07/2017 16:47
Site: Milne Port Expansion

Sounding: CPT17-D008
Cone: 374:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 17-05010_CPD008.PPF
Depth: 28.975 m / 95.061 ft
Duration: 120.0 s

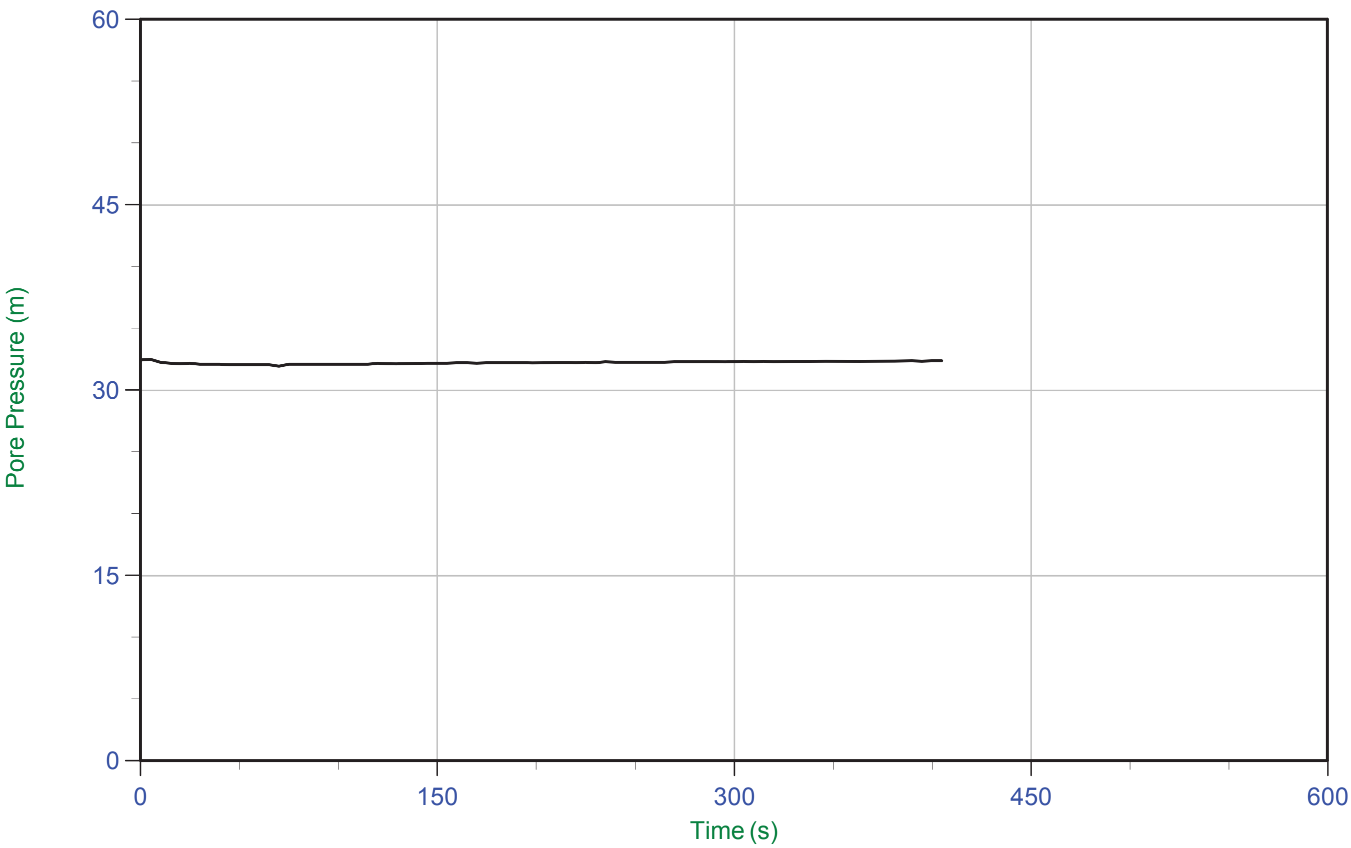
U Min: 25.6 m
U Max: 33.9 m

WT: -1.449 m / -4.754 ft
Ueq: 30.4 m

Baffinland

Job No: 17-05010
Date: 04/07/2017 16:47
Site: Milne Port Expansion

Sounding: CPT17-D008
Cone: 374:T1500F15U500 Area=15 cm²



Trace Summary:

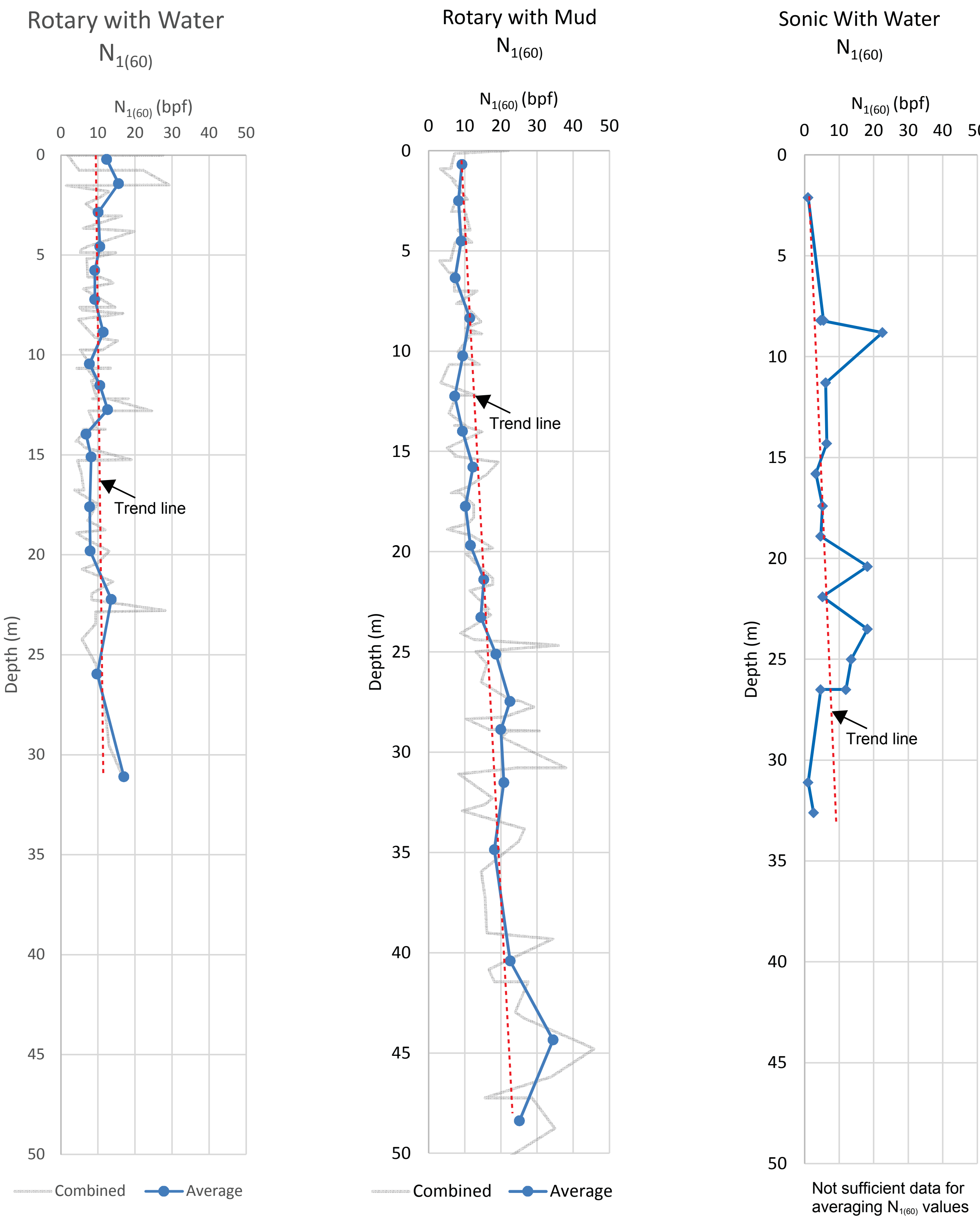
Filename: 17-05010_CPD008.PPF
Depth: 30.000 m / 98.424 ft
Duration: 405.0 s

U Min: 32.0 m
U Max: 32.5 m

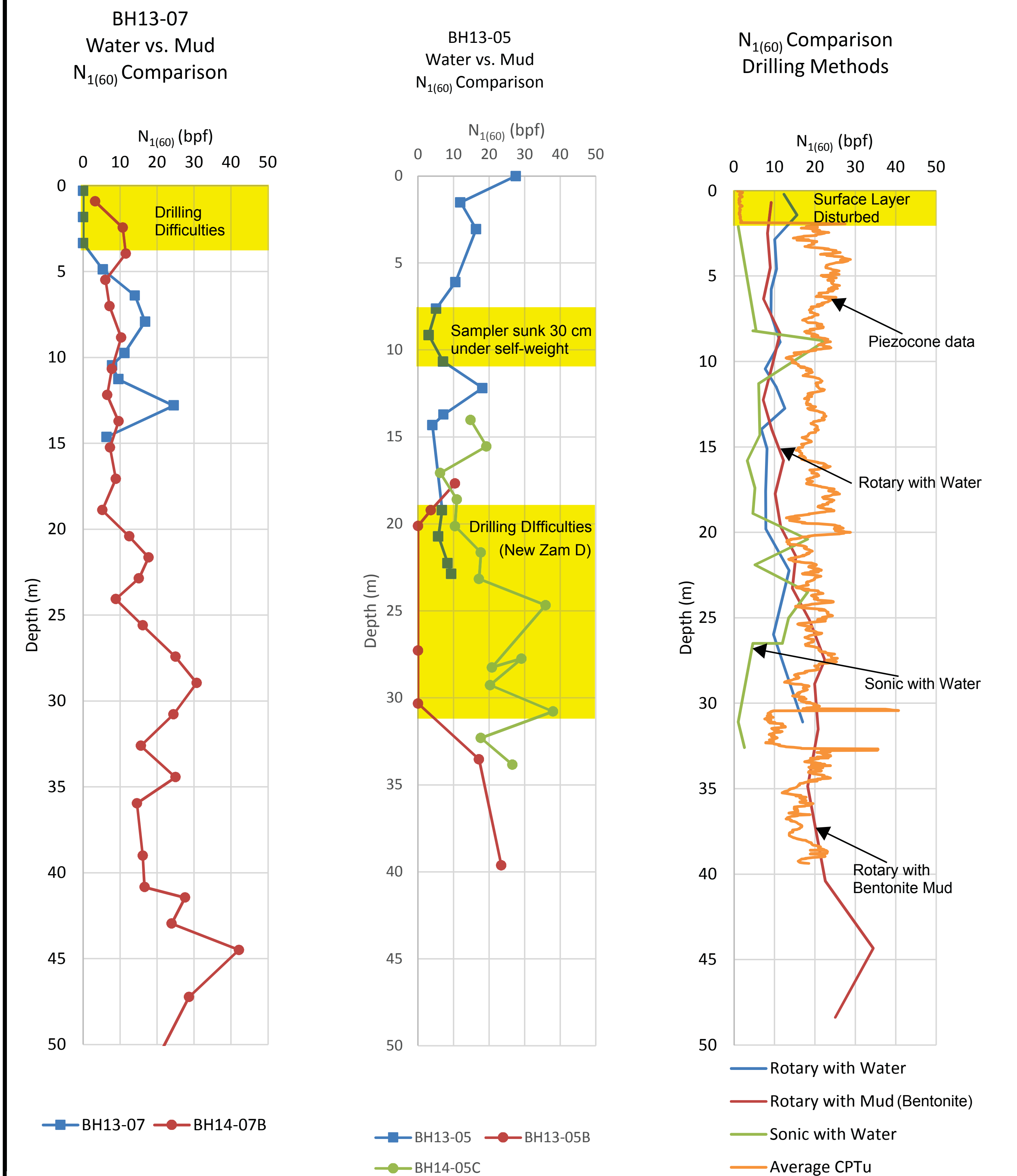
WT: -2.242 m / -7.356 ft
Ueq: 32.2 m

Appendix K

Influence of Drilling Methods on SPT



Notes:
Diamond Rotary with water includes data from BH13-03, BH13-05, BH13-07, BH13-08, BH13-09 and BH13-011
Diamond Rotary with Mud includes data from BH14-05C, BH14-06, BH14-07B, BH14-12 and BH14-13
Sonic with Water includes data from BH17-D001, BH17-D002, BH17-D003, BH17-D004, BH17-D005 and BH17-D006.

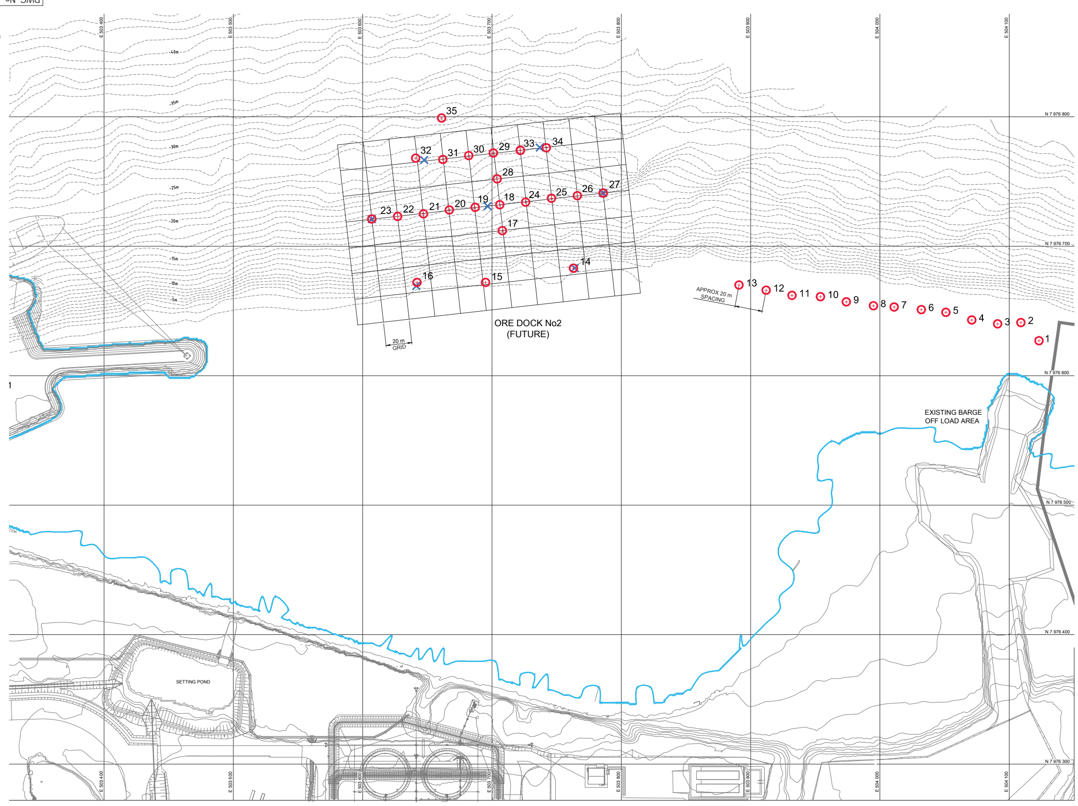


Notes:
BH13-05B was drilled with New Zam D Mud Only
BH14-05C and BH14-07B were drilled with New Zam D Mud and Bentonite
CPTu was averaged using data from CPT-D001, CPT-D002 and CPT-D003

Appendix L

Ice Thickness Tests

DWG. No. H352034-GEOSKT-229-292-0007



PLAN

0 30 60 90 120 150 METRES

SCALE 1:1500

NOTES:

1. COORDINATE GRID IS UTM, NAD 83, ZONE 17
2. INFORMATION FOR BATHAMETRY IS A COMBINATION OF LOGISTEC STEVEDORING INC. AND M&S.
3. THE CHART DATUM HAS BEEN ASSUMED TO BE 1.2 METRES BELOW CGVD 28 (0.0m CHART DATUM = -1.2m GEODETIC DATUM)
4. ELEVATIONS ARE BASED ON CHART DATUM
5. DIMENSIONS AND ELEVATIONS ARE SHOWN IN METERS

LEGEND

X GEOTECHNICAL INVESTIGATION LOCATION

⊕ AUGER HOLE LOCATION FOR OFFSHORE ICE ASSESSMENT (20 METERS SPACING, MAXIMUM)

DESIGN SHOWN IS A HATCH CONCEPT DESIGN
CONTRACTOR TO PROVIDE HIS OWN DESIGN

DRAWING No.	DRAWING TITLE
REFERENCE DRAWINGS	

NAME

SIGNATURE

ENG REG NUMBER

REVISION DATE

ORIGINAL DATE

REGISTERED PROFESSIONAL

No.	DESCRIPTION	BY	CHK'D	DATE
-	-	-	-	-

REVISIONS

HATCH

ROLE	NAME	SIGNATURE	DATE
DRAFTSPERSON	D PARKES	NR	16/03/2017
DESIGNER		NR	
CHECKER			
DESIGN COORD.	W HOYLE		
RESP. ENG.			
LEAD DISC. ENG.	S HINCHBERGER		
ENG. MANAGER			
PROJ. MANAGER	S HEINER		

DRAWING APPROVAL STATUS: CLIENT REVIEW

Baffinland

BAFFINLAND EXPANSION 12 MTPA MINE OPTION
PRE FEASIBILITY STUDY

PORT SITE - ORE DOCK No. 2
OFF SHORE ICE ASSESSMENT
AUGER HOLE LOCATIONS

SCALE 1:50,000 OR AS NOTED

DWG. No. H352034-GEOSKT-229-292-0007

REV B

$USERNAME$ $DATE$ $FILE$ $TIME$