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CANADIAN GEOSCIENCE MAP 4

GEOLOGY

PANGNIRTUNG FIORD

Baffin Island, Nunavut

Map Information Document

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Cover Illustration

View to south of the twin pillars of Mount Asgard, exposing 1.88–1.89 billion year old granodiorite of the Qikiqtarjuaq plutonic suite, western Cumberland Peninsula, Nunavut. Photograph by M. Sanborn-Barrie. 2014-022

ABSTRACT

Cumberland Peninsula, eastern Baffin Island, is an under-explored, frontier region with significant diamond, base- and precious-metal potential. Archean (2.97–2.77 Ga) foliated to gneissic tonalitic plutonic rocks with enclaves of >2.77 Ga semipelite, ca. 2.88 Ga gabbro and rare ca. 2.92 Ga metavolcanic rocks form a structural basement, exposed in the south and north. Metasedimentary cover rocks of the Paleoproterozoic Hoare Bay group, exposed from the central to the northeast part of the peninsula, are in tectonic contact with the basement gneisses. The cover sequence includes widespread semipelite-psammite with minor quartzite, marble, silicate- and oxide-facies iron-formation, chert and graphitic-pyritiferous shale, and two geochemically-distinct strands of ultramafic-mafic metavolcanic rocks of pyroclastic origin. Basement and cover rocks are cut by 1.9–1.88 Ga charnockite, biotite-garnet granodiorite and lesser quartz diorite of the Qikiqtarjuaq plutonic suite. Major structures and medium to high-grade metamorphic assemblages are attributed to polyphase tectonometamorphism between ca. 1.90–1.84 Ga.

RÉSUME

La péninsule Cumberland, dans l'est de l'île de Baffin, est une région pionnière sous-explorée qui revêt un important potentiel en diamants, métaux usuels et métaux précieux. Des roches plutoniques foliées à gneissiques de composition tonalitique de l'Archéen (2,97–2,77 Ga), renfermant des enclaves de semipélite de >2,77 Ga, de gabbro d'environ 2,88 Ga et de rares métavolcanites d'environ 2,92 Ga, forment un socle structural exposé au sud et au nord. Les roches métasédimentaires de couverture du Groupe de Hoare Bay du Paléoprotérozoïque, qui affleurent de la partie centrale à la partie nord-est de la péninsule, sont en contact tectonique avec les gneiss du socle. La séquence de couverture se compose d'une abondance de semipélite-psammite et de quantités accessoires de quartzite, de marbre, de formation de fer à faciès silicaté et à faciès oxydé, de chert, de shale graphitique-pyriteux ainsi que de deux lignées géochimiquement distinctes de roches métavolcaniques ultramafiques-mafiques d'origine pyroclastique. Les roches du socle et de la séquence de couverture sont recoupées par des unités de 1,9 à 1,88 Ga de la suite plutonique de Qikiqtarjuaq formées de charnockite, de granodiorite à biotite-grenat et, en moindres quantités, de diorite quartzique. Les structures principales ainsi que les paragenèses métamorphiques de degré intermédiaire à élevé sont attribuées au tectonométamorphisme polyphasé qui s'est déroulé approximativement entre 1,90 et 1,84 Ga.

ABOUT THE MAP

General Information

Authors: G.D. Jackson and M. Sanborn-Barrie

Reconnaissance geology by J. Crawford, L. Davison, I. Ermanovics and G.D. Jackson, 1970; M. Sanborn-Barrie, M. Young, and C. Nagy 2009, 2011

Geological interpretation and notes by G.D. Jackson and M. Sanborn-Barrie, 2012–2013

Cartography by P. O'Regan, M. Méthot, B. Hillary and O. Brown

Initiative of the Geological Survey of Canada, conducted under the auspices of Multiple Metals - Cumberland Peninsula (Nunavut) as part of Natural Resources Canada's Geo-mapping for Energy and Minerals (GEM) program.

Logistical support provided by the Polar Continental Shelf Program as part of its mandate to promote scientific research in the Canadian North. PCSP 002-09 and 014-10.

Map projection Universal Transverse Mercator, zone 20. North American Datum 1983

Base map at the scale of 1:250 000 from Natural Resources Canada, with modifications.

Elevations in metres above mean sea level.

The offset of contour lines at 66°W is due to a change in the contour interval between topographic sheets.

Mean magnetic declination 2014, 32°44'W, decreasing 29.2' annually. Readings vary from 32°25'W in the SE corner to 33°02'W in the NW corner of the map.

The Geological Survey of Canada welcomes corrections or additional information from users.

Data may include additional features not portrayed on this map. *See* documentation accompanying the data.

Additional references are included in the map information document.

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Preliminary publications in this series have not been scientifically edited.

Map Viewing Files

The published map is distributed as a Portable Document File (PDF), and may contain a subset of the overall geological data for legibility reasons at the publication scale.

ABOUT THE GEOLOGY

Descriptive Notes

Pangnirtung Fiord map sheet, northwestern Cumberland Peninsula, contains some of the most rugged and scenic topography on Baffin Island. Mount Asgard (2015 m) rising some 1600 m above the adjacent valley floor (cover photo), is perhaps the most famous peak, while Mount Odin (2147 m) is the highest. Initially mapped at a reconnaisance scale in 1970 (Jackson, 1971), much of this map sheet was designated part of Auyuittuq National Park of Canada in 1976. Recent mapping of Cumberland Peninsula, as part of the Geo-mapping for Energy and Minerals (GEM) program, was focused outside of Auyuittuq park (Sanborn-Barrie et al., 2011a,b,c; Sanborn-Barrie and Young, 2013a,b,c; Sanborn-Barrie et al., 2013a,b) in order to update geoscience knowledge for an extensive region between the communities of Pangnirtung and Qikiqtarjuaq. This map integrates new GEM data with archival knowledge in order to provide insight into the bedrock geology near Pangnirtung, thereby allowing local residents and visitors to the region insight into the composition and age of rocks that make up its majestic peaks and pinnacles, the beauty of which is recognized as a national treasure. Density of mapping

stations within this map sheet is limited due to topography and snow/ice cover, such that most landings by helicopter were made at 10 km intervals.

The Pangnirtung Fiord map sheet is dominated by granitoid rocks known to be about 1900 million years old, formed during the middle Paleoproterozoic era. It exposes lesser ca. 1950 million year old metasedimentary rocks, mainly occuring as rusty-weathering inclusions within the Paleoproterozoic granitoid rocks, and may also contain potentially ancient (Archean eon) metasedimentary and plutonic rocks. These three components of the map sheet are described below from oldest to youngest.

Ancient tonalite gneiss (unit Atg) is suspected to outcrop on the west side of the Weasel River where banded grey gneiss was reported (Jackson, 1971) in a synformal structure. Similarly, a region extending north of Avataktoo Bay characterized by a distinctly low magnetic intensity (Fig. 2), which elsewhere on Cumberland Peninsula corresponds to tonalitic rocks dated between 2950–2770 million years of age, may correspond to non-magnetic tonalite-granodiorite of Archean age. This undated unit (unit PAgd) is described at several localities as comprising coarse-grained, greyish-green- to buff-weathering rocks containing quartz and feldspar with <15% hypersthene-hornblende-biotite, and trace amounts of clinopyroxene locally.

Metamorphosed remnants of clastic sedimentary rocks (units PAsp, PAps) and mafic rocks (unit PAgb) are suspected to be Archean or/and Paleoproterozoic. These occur sparsely throughout the map area, as infolded pendants and inclusions hosted by the younger Paleoproterozoic intrusions (described below). Metasedimentary rocks are mainly psammitic (sandy) to semipelitic (more muddy). One remnant east of Summit Lake, in the far northeast corner of the map sheet, exposes quartzite (unit Pqz_H) consisting of ~85% glassy quartz grains. This unit, which is diagnostic of the Hoare Bay group elsewhere on Cumberland Peninsula, is associated at this locality with grey, fine-grained, equigranular, foliated psammite (unit Pps_H) and rust-weathering gossan containing minor pyrite, pyrrhotite, and chalcopyrite. A small outcrop of sheared, grey quartzite is interpreted on the west shore of Avataktoo Bay.

The majority of the map sheet exposes medium- to coarse-grained quartzo-feldspathic plutonic rocks that are part of a plutonic belt that extends more than 300 km from Pangnirtung to Qikiqtarjuaq (Fig. 1). Designation of this belt as the Qikiqtarjuaq plutonic suite is based on extensive exposures of compositionally similar rock types (Whalen et al., 2012), which yield similar ages between 1900 and 1880 million years old from seven localities mainly northeast of this map sheet. These ages reveal that the spectacular peaks and pinnacles exposed throughout Auyuittuq National Park were created from magmas that crystallized within a 20 million year interval, were subsequently uplifted, and dramatically eroded by ice, water and wind into the steep-faced mountains that exist today (see cover illustration). Two main phases of the Qikiqtarjuaq plutonic suite are exposed in this map sheet. Brown weathering, hypersthene-bearing monzogranite-granodiorite (charnockite) with minor quartz monzonite and hypersthene quartz syenite (unit Pmz) containing up to 15% hypersthene in various stages of retrogression (breakdown) to biotite dominate the central map sheet. This phase typically contains <5% biotite and ilmenite-magnetite. These rocks are resinous, greasy greenish brown on fresh surfaces, reflecting high-temperature modification of feldspar crystal structure during post-crystallization high-grade metamorphism which took place about 1860–1840 million years ago (Berman et

al., 2013). Within the map sheet, this phase is dated at 1894 ± 5 Ma (Rayner et al., 2012) at scenic Aulatsivik Point, located northeast, and within sight of Pangnirtung.

Pale grey-pink-weathering granodiorite to monzogranite (unit Ꝑgd) is prominent in the eastern part of the map sheet. This phase contains 10–15% biotite, isolated aggregates of dark red garnet, and may contain ~5% quartz phenocrysts, up to 1 cm in length, and/or K-feldspar phenocrysts up to 10 cm in length. This lighter-weathering phase is often seen to cut the brown-weathering charnockite phase as horizontal sills and inclined dykes up to 3 m wide, and to contain the charnockitic phase as inclusions. Unit Ꝑgd yielded an age of 1889 ± 3 Ma (Rayner et al., 2012) from a pinnacle south of Akioktuq Lake (Sanborn-Barrie and Young, 2013a), consistent with the relative age relationships apparent in the field. In general, this slightly younger, lower grade phase yields a weaker magnetic response (Fig. 2) relative to the older charnockitic phase.

Minor components of the Qikiqtarjuaq plutonic suite include more mafic, brown-weathering hypersthene-bearing quartz diorite±tonalite (unit Ꝑdr) with lesser quartz monzonite which is exposed across Pangnirtung Fiord. A similar unit exposed at the head of Kingnait Fiord was dated at 1894 ± 6 Ma (N. Rayner, unpubl. data 2011). Pink-red-weathering syenogranite-monzogranite-granodiorite (unit Ꝑgr) occurs in the northern half of the map sheet. These medium- to coarse-grained rocks typically contain biotite and/or hornblende±ilmenite-magnetite, with hypersthene only rarely present particularly in contact with unit Ꝑmz. Pink dykes, up to 3 m wide, cut units Ꝑmz and Ꝑgr establishing the pink granitic phase to be one of the youngest phases in the map sheet. All phases of the Qikiqtarjuaq plutonic suite display only minor retrogression which is indicated by the presence of trace amounts of chlorite, sericite, uralite, blue-green hornblende, leucoxene green biotite, and epidote.

Rocks within the map sheet are variably strained. Those in the eastern half generally display a moderately to strongly developed foliation and a strong extensional (linear) fabric, while those in the western half of the map sheet appear more massive to weakly foliated. Two generations of folds were noted at one locality west of Pangnirtung Fiord (Naujaat Bluffs region), consistent with elsewhere on Cumberland Peninsula, where two generations of fabrics provide evidence of two Paleoproterozoic deformation events (Berman et al., 2013). In the northwest corner of the map sheet, a northeast-trending corridor of strong cleavage development may reflect a brittle-ductile fault along the northern margin of a discrete granitic pluton. This fault zone may extend southwest to Shark Fiord, given its parallel trend.

References

Berman, R.G., Sanborn-Barrie, M., Hamilton, B.M., Rayner, N., and Young, M., 2013. Preliminary in situ SHRIMP geochronological constraints on the tectonometamorphic evolution of Cumberland Peninsula, Baffin Island, Nunavut; Geological Survey of Canada, Current Research 2013-7, 19 p. doi:10.4095/292215

Clarke, D.B. and Upton, B.G., 1971. Tertiary basalts of Baffin Island: Field relations and tectonic setting; Canadian Journal of Earth Sciences 8, 248–258 p.

Coyle, M., 2009a. Residual total magnetic field, Cumberland Peninsula aeromagnetic survey, part of NTS 16 D North, Nunavut; Geological Survey of Canada, Open File 6086, scale 1:100 000. doi:10.4095/226684

Coyle, M., 2009b. Residual total magnetic field, Cumberland Peninsula aeromagnetic survey, part of NTS 16E South, Nunavut; Geological Survey of Canada, Open File 6087, scale 1:100 000. doi:10.4095/226685

Coyle, M., 2009c. Residual total magnetic field, Cumberland Peninsula aeromagnetic survey, part of NTS 26H North, Nunavut; Geological Survey of Canada, Open File 6088, scale 1:100 000. doi:10.4095/226686

Coyle, M., 2009d. Residual total magnetic field, Cumberland Peninsula aeromagnetic survey, part of NTS 16E North, Nunavut; Geological Survey of Canada, Open File 6089, scale 1:100 000. doi:10.4095/226687

Coyle, M., 2009e. Residual total magnetic field, Cumberland Peninsula aeromagnetic survey, part of NTS 26H North, Nunavut; Geological Survey of Canada, Open File 6090, scale 1:100 000. doi:10.4095/226688

Coyle, M., 2009f. Residual total magnetic field, Cumberland Peninsula aeromagnetic survey, part of NTS 16K South, Nunavut; Geological Survey of Canada, Open File 6091, scale 1:100 000. doi:10.4095/226689

Coyle, M., 2009g. Residual total magnetic field, Cumberland Peninsula aeromagnetic survey, part of NTS 16L South, Nunavut; Geological Survey of Canada, Open File 6092, scale 1:100 000. doi:10.4095/226690

Coyle, M., 2009h. Residual total magnetic field, Cumberland Peninsula aeromagnetic survey, part of NTS 26-I South, Nunavut; Geological Survey of Canada, Open File 6093, scale 1:100 000. doi:10.4095/226691

Coyle, M., 2009i. Residual total magnetic field, Cumberland Peninsula aeromagnetic survey, part of NTS 16K North and 16L North, Nunavut; Geological Survey of Canada, Open File 6094, scale 1:100 000. doi:10.4095/226692

Coyle, M., 2009j. Residual total magnetic field, Cumberland Peninsula aeromagnetic survey, part of NTS 16D North, Nunavut; Geological Survey of Canada, Open File 6095, scale 1:100 000. doi:10.4095/226693

Coyle, M., 2009k. Residual total magnetic field, Cumberland Peninsula aeromagnetic survey, part of NTS 16E South, Nunavut; Geological Survey of Canada, Open File 6096, scale 1:100 000. doi:10.4095/226694

Coyle, M., 2009l. Residual total magnetic field, Cumberland Peninsula aeromagnetic survey, part of NTS 26H North, Nunavut; Geological Survey of Canada, Open File 6097, scale 1:100 000. doi:10.4095/226695

Coyle, M., 2009m. Residual total magnetic field, Cumberland Peninsula aeromagnetic survey, part of NTS 16E North, Nunavut; Geological Survey of Canada, Open File 6098, scale 1:100 000. doi:10.4095/226696

Coyle, M., 2009n. Residual total magnetic field, Cumberland Peninsula aeromagnetic survey, part of NTS 26 H North, Nunavut; Geological Survey of Canada, Open File 6099, scale 1:100 000. doi:10.4095/226697

Coyle, M., 2009o. Residual total magnetic field, Cumberland Peninsula aeromagnetic survey, part of NTS 16K South, Nunavut; Geological Survey of Canada, Open File 6100, scale 1:100 000. doi:10.4095/226698

Coyle, M., 2009p. Residual total magnetic field, Cumberland Peninsula aeromagnetic survey, part of NTS 16 L South, Nunavut; Geological Survey of Canada, Open File 6101, scale 1:100 000. doi:10.4095/226699

Coyle, M., 2009q. Residual total magnetic field, Cumberland Peninsula aeromagnetic survey, part of NTS 26-I South, Nunavut; Geological Survey of Canada, Open File 6102, scale 1:100 000. doi:10.4095/226700

Coyle, M., 2009r. Residual total magnetic field, Cumberland Peninsula aeromagnetic survey, part of NTS 16K North and 16L North, Nunavut; Geological Survey of Canada, Open File 6103, scale 1:100 000. doi:10.4095/226701

Heaman, L.M., LeCheminant, A.N., and Rainbird, R.H., 1992. Nature and timing of Franklin igneous events, Canada: Implications for a Late Proterozoic mantle plume and the break-up of Laurentia; Earth and Planetary Science Letters 109, 117–131 p.

Jackson, G. D., 1971. Operation Penny Highlands South-central Baffin Island. Geological Survey of Canada Paper 71-1, Part A, 138–140 p.

Rayner, N., Sanborn-Barrie, M., Young, M., and Whalen, J.B., 2012. U-Pb ages of Archean basement and Paleoproterozoic plutonic rocks, southern Cumberland Peninsula, eastern Baffin Island; Geological Survey of Canada, Current Research 2012-8, 28 p. doi:10.4095/291401

Sanborn-Barrie, M., Young, M., Whalen J.B., and James, D., 2011a. Geology, Ujuktuk Fiord, Nunavut; Geological Survey of Canada, Canadian Geoscience Map 1 (2nd edition, preliminary), scale 1:100 000. doi:10.4095/289237

Sanborn-Barrie, M., Young, M., and Whalen J.B., 2011b. Geology, Kingnait Fiord, Nunavut; Geological Survey of Canada, Canadian Geoscience Map 2 (2nd edition, preliminary), scale 1:100 000. doi:10.4095/289238

Sanborn-Barrie, M., Young, M., Whalen J.B., James, D., and St-Onge, M.R., 2011c. Geology, Touak Fiord, Nunavut; Geological Survey of Canada, Canadian Geoscience Map 3 (2nd edition, preliminary), scale 1:100 000. doi:10.4095/289239

Sanborn-Barrie, M. and Young, M., 2013a. Geology, Circle Lake, Nunavut; Geological Survey of Canada, Canadian Geoscience Map 5 (preliminary), scale 1:100 000. doi:10.4095/288929

Sanborn-Barrie, M. and Young, M., 2013b. Geology, Padle Fiord, Nunavut; Geological Survey of Canada, Canadian Geoscience Map 37 (preliminary), scale 1:100 000. doi:10.4095/292014

Sanborn-Barrie, M. and Young, M., 2013c. Geology, Durban Harbour, Nunavut; Geological Survey of Canada, Canadian Geoscience Map 38 (preliminary), scale 1:100 000. doi:10.4095/288929

Sanborn-Barrie, M.,Young, M., Keim, R., and Hamilton, B.M., 2013a. Geology, Sunneshine Fiord, Nunavut; Geological Survey of Canada, Canadian Geoscience Map 6 (preliminary), scale 1:100 000. doi:10.4095/288931

Sanborn-Barrie, M., Young, M., and Whalen, J., 2013b. Geology, Qikiqtarjuaq, Nunavut; Geological Survey of Canada, Canadian Geoscience Map 39 (preliminary), scale 1:100 000. doi:10.4095/292016

Whalen, J., Sanborn-Barrie, M., and Young, M., 2012, Geochemical Data from Archean and Paleoproterozoic Plutonic and Volcanic Rocks of Cumberland Peninsula, eastern Baffin Island, Nunavut; Geological Survey of Canada, Open File 6933, 15 p. doi:10.4095/291453

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Coordinate System

Projection: Universal Transverse Mercator
Units: metres
Zone: 20
Horizontal Datum: NAD83
Vertical Datum: mean sea level

Bounding Coordinates

Western longitude: 67°02’00” W
Eastern longitude: 65°06’00” W
Northern latitude: 66°46’00” N
Southern latitude: 66°10’00” N

Data Model Information

Surface bedrock data are organized into feature classes and themes consistent with logical groupings of geological features. All field observation point data are related through the Station_ID property of the Station theme. These feature attribute names and definitions are identical in the shapefiles and the XML files.

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4. Droits de propriété intellectuelle signifie tout droit de propriété intellectuelle reconnu par la loi, y compris tout droit de propriété intellectuelle protégé par une législation telle que celle qui régit, sans être limitée à, les droits d'auteur et les brevets.

2.0 CESSION D'UNE LICENCE

1. 2.1 Sous réserve des modalités du présent Accord, le Canada octroie au Détenteur de licence une licence non exclusive, sans frais ni redevances exigibles, et le droit d'exercer tous les Droits de propriété intellectuelle sur les Données. Ceci comprend le droit d'utiliser, incorporer, accorder des licences d'utilisation (avec droit subséquent d'accorder des licences d'utilisation), modifier, améliorer, développer et distribuer les Données; et de fabriquer ou distribuer des Produits dérivés.

2. Les Droits de propriété intellectuelle découlant de toute modification, amélioration, développement ou traduction des Données, ou de la fabrication de Produits dérivés, effectués par ou pour le Détenteur de licence seront détenus par le Détenteur de licence ou tout substitut identifié par le Détenteur de licence.

3.0 PROTECTION ET IDENTIFICATION DE LA SOURCE

1. L'utilisation des Données ne constitue en aucune façon une reconnaissance par le Canada d'un Produit dérivé. Le Détenteur doit identifier la source de données, de la façon suivante, lorsque toute partie des Données est redistribuée ou comprise dans un Produit dérivé :

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4.0 GARANTIE, EXCLUSION ET INDEMNISATION

1. Le Canada ne fait aucune représentation ou garantie, expresse ou tacite, découlant de la loi ou d'autres sources, en ce qui concerne entre autres l'exactitude, l'utilité, la nouveauté, la validité, l'étendue, l'intégralité ou l'actualité des Données et rejette expressément toute garantie implicite de qualité loyale et marchande ou l'à propos à une fin particulière des Données. Le Canada n'assure ni ne garantit la compatibilité du site qui contient les Données avec les versions antérieures, actuelles et futures de n'importe quel fureteur.

2. Le Canada ne peut être tenu responsable par le Détenteur de licence en ce qui a trait à toute réclamation, revendication ou action en justice, quelle qu'en soit la cause, concernant toute perte ou tout préjudice ou dommage ou frais, direct ou indirect, qui pourrait résulter de la possession ou de l'utilisation des Données par le Détenteur de licence.

3. Le Détenteur de licence tiendra le Canada et ses représentants, employés, agents et exécutants, indemnes et à couvert à l'égard de toute réclamation, revendication ou action en justice, quelle qu'en soit la cause, alléguant toute perte, tout frais, toute dépense, tout dommage ou toute blessure (y compris toute blessure mortelle) qui pourrait résulter de la possession ou de l'utilisation des Données par le Détenteur de licence.

4. Le Détenteur de licence devra accorder des licences d'utilisation à toute personne ou partie qui obtient les Données ou des Produits dérivés au moyen d'un accord de licence, et cet accord devra imposer à ces personnes ou parties les mêmes modalités que celles qui sont énoncées dans la section 4.0 de cet Accord.

5. L'obligation du Détenteur de licence d'indemniser le Canada selon cet Accord ne peut affecter ni empêcher le Canada d'exercer tout autre droit selon la loi.

5.0 DURÉE

1. Cet Accord entre en vigueur à partir de la date et de l'heure d'acceptation des modalités de l'Accord (Heure de l'Est) et restera en vigueur pour une période d'un (1) an, en vertu de la sous-section 5.2 et de la section 6.0 qui suivent.

2. À la fin du premier terme, cet Accord sera automatiquement renouvelé pour des termes successifs d'un (1) an, en vertu de la section 6.0 qui suit.

6.0 RÉSILIATION

1. 6.1 Nonobstant la section 5.0, cet Accord peut être résilié :

   i. automatiquement et sans préavis, si le Détenteur de licence manque à ses engagements ou obligations selon cet Accord;

   ii. par un préavis écrit de résiliation émis par le Détenteur de licence, en tout temps, et cette résiliation prendra effet trente (30) jours suivant la réception d'un tel préavis par le Canada; ou

   iii. par consentement mutuel des parties.

2. Lors de la résiliation de cet Accord, pour quelque raison que ce soit, les obligations qui incombent au Détenteur de licence en vertu de la section 4.0 continueront de s'appliquer et les droits du Détenteur de licence en vertu de la section 2.0 cesseront immédiatement.

3. Lors de la résiliation de cet Accord, pour quelque raison que ce soit, le Détenteur de licence devra immédiatement effacer ou détruire toutes les Données obtenues en vertu de cet Accord, ou à l'intérieur d'un délai raisonnable lorsque les Données sont nécessaires pour terminer la livraison de Produits dérivés commandés avant la résiliation de cet Accord.

7.0 GÉNÉRAL

1. **Lois d'application**
   Le présent Accord est régi et interprété en vertu des lois en vigueur dans la province de l'Ontario. Les parties acceptent de tomber sous la juridiction de la Cour supérieure de la Province de l'Ontario.

2. **Totalité de l'Accord**
   Le présent Accord constitue l'intégralité de l'entente conclue entre les parties relativement à l'objet du présent Accord. Toute modification à cet Accord ne peut être que par écrit, doit porter la signature de chaque partie et exprimer clairement l'intention de modifier cet Accord.

3. **Solution des litiges**
   Si un litige survient à propos de cet Accord, les parties tenteront de le résoudre par des négociations de bonne foi.