Descriptive Notes

This map encompasses three physiographic regions: the glacially bedrock uplands of the Kaniapiskau Supergroup to the west, the De Pas batholith to the east, and the lowland fen underlain by Neoarchean gneisses in the central portion of the map.

The earliest phase of glacial flow was to the northeast and is preserved on the lee of later ice movements. A dominant southeast flow is observed in large streamlined landforms and striae, with a later shift to eastward flow. Abundant meltwater channels are observed on the northern part of the map sheet. Northeast-southwest oriented moraines are located in the southwest sector of the map area, in the region of Ashuanipi River and Giasson Lake. Long southeast trending eskers and glaciofluvial outwash deposits are located approximately 10 km spaced intervals throughout the map sheet.

A large, shallow glacial lake once inundated the central low lands and current Smallwood Reservoir. Features defining this glacial lake were first noted by Paulen et al. (2017). They named this glacial Lake Low after A.P. Low of the Geological Survey of Canada, who first recognized that the final disintegration of the continental ice sheet occurred in this region (Low, 1896). Washing limits in this portion of the map are about 480–500 m above sea level (8–10 m above the current reservoir levels), and affected much of the lowland of the map sheet. Littoral beach deposits, winnowed tills, strandlines and wave-cut benches in glacial landforms are observed as markers of past glacial lake levels. Glacial lake sediments have been locally re-worked into modern nearshore lake deposits, and alluvial deposition of sediments occurs along current day waterways.

Acknowledgments

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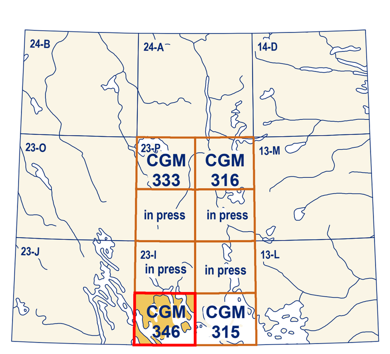
Abstract

The Ashuanipi map area lies south of the ancestral Labrador ice divide of the Laurentide Ice Sheet. The combined record of striations and large-scale streamlined landforms reveal three phases of ice flow (oldest to youngest): northeast, south-southeast, and east-southeast. Erosional and depositional features throughout the map area distinguish the distinct glacial domains. Till veneer with channels and bedrock eroded by glacial meltwater was observed in higher elevation terrain north of Ashuanipi River, and also in the uplands formed by the Paleoproterozoic De Pas batholith to the east. Ribbed moraines, eskers, and streamlined landforms characterize the area southeast of Wade Lake. Extensive lowland fens, glaciolacustrine strandlines, and wave-cut benches that surround isolated streamlined till units in the central portion of the map area mark the former inundation of a large, shallow glacial lake (glacial Lake Low), the basin of which is occupied by the present-day Smallwood Reservoir.

Résumé

La région cartographique d'Ashuanipi se situe au sud de la protoligne de partage glaciaire du Labrador de l'Inlandsis laurentidien. L'analyse combinée des stries et des grandes formes de relief profilées révèle trois phases d'écoulement glaciaire (de la plus ancienne à la plus récente : nord-est, sud–sud-est et est–sud-est). Les entités d'érosion et de dépôt dans l'ensemble de la région cartographique permettent de reconnaître des domaines glaciaires distincts. Des placages de till avec des chenaux et des roches érodées par l'action de l'eau de fonte glaciaire ont été observés dans un terrain de plus haute altitude au nord de la rivière Ashuanipi, ainsi que dans les hautes terres formées par le batholite de De Pas du Paléoprotérozoïque à l'est. Des moraines côtelées, des eskers et des formes de relief profilées caractérisent la région au sud-est du lac Wade. Dans la partie centrale de la région cartographique, de vastes tourbières minérotrophes, des lignes de rivage glaciolacustres et des escarpements créés par l'action des vagues qui circonscrivent des unités isolées de till profilé marquent un terrain anciennement inondé par un grand lac glaciaire peu profond (Lac glaciaire Low), dont le bassin est occupé de nos jours par le réservoir Smallwood.



National Topographic System reference and index to adjoining published Geological Survey of Canada maps

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Natural Resources Canada / Ressources naturelles Canada

CANADIAN GEOSCIENCE MAP 346

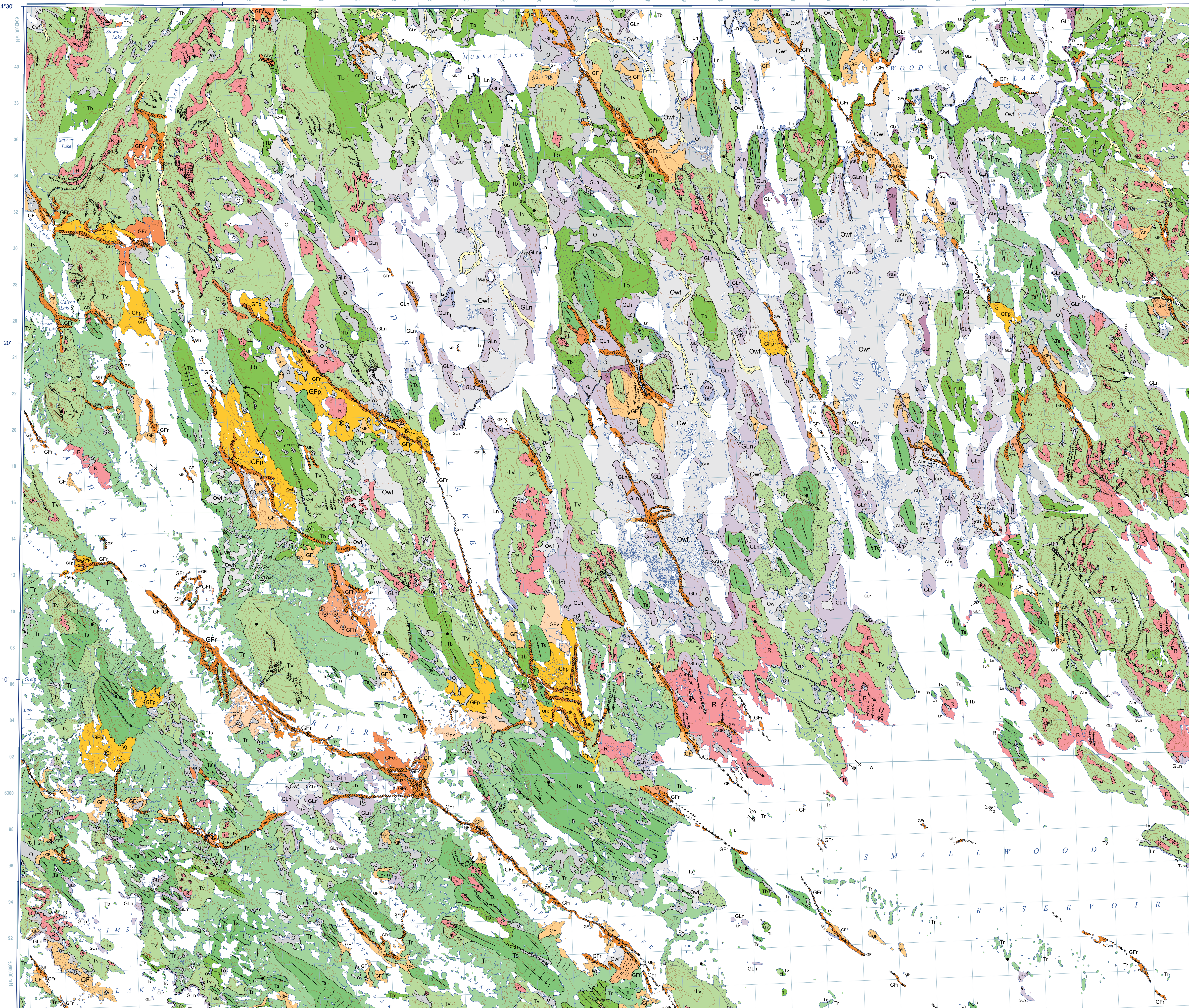
SURFICIAL GEOLOGY

ASHUANIPI RIVER

Newfoundland and Labrador

NTS 23-I southwest

1:100 000



QUATERNARY

POST LAST GLACIATION

NON-GLACIAL ENVIRONMENT

ORGANIC DEPOSITS: peat and muck, 1 to 2 m thick on average; formed by the accumulation of plant material in various stage of decomposition; occurs as low relief, wet terrain (swamps, bogs, and fens).

Owf — **Organic deposits:** fen; derived from sedges and partially decayed shrubs in a eutrophic environment; commonly forms a ribbed pattern of small shrubs transverse to drainage with ponds of open water.

O — **Organic deposits, undifferentiated:** undifferentiated bog and fen deposits, the area may be locally mixed or underlain with alluvial sediments; often associated with minor alluvial channels established for surface drainage.

ALLUVIAL SEDIMENTS: undifferentiated deposits of sorted gravel, sand, silt, and organic detritus; commonly stratified, variable thickness; deposited by streams and rivers.

A — **Alluvial sediments, undifferentiated:** gravel to silt and organic detritus, variable thickness.

LACUSTRINE SEDIMENTS: cobble to pebble gravel, sand, silt, and minor organic detritus; >1 m thick, consisting of beach and storm deposits, ice rafted debris or formed during recent fluctuations in lake levels, deposited along the shorelines of larger lakes.

Ln — **Littoral and nearshore sediments:** fine to coarse sand beaches with minor gravel and ice-rafted debris, relief is typically <1 m, sediments formed in the nearshore environment of larger lakes.

Lr — **Lacustrine beach sediments:** fine sand to coarse cobble gravel; forming beach ridges of gravel up to 1 m high, sediments deposited adjacent to large lakes.

L — **Lacustrine sediments, undifferentiated:** gravel, sand, silt and organic detritus; variable thickness.

POSTGLACIAL OR LATE WISCONSIN

PREGLACIAL AND GLACIAL ENVIRONMENTS

GLACIOLACUSTRINE SEDIMENTS: coarse gravel, sand silt, and minor clay; commonly massive to poorly stratified; >1 m; derived from winnowing of till in relatively shallow water; formed during various stages of proglacial Lake Low.

GLr — **Ridged beach sediments:** pebbly to coarse granular sand; moderately to well sorted, with stratification and open framework of clasts; deposited during glacial Lake Low, inundation limited to elevations approximately at 480 m.

GLn — **Littoral and nearshore sediments:** sand and gravel, moderately sorted, not more than 1 m thick, commonly produced by glaciolacustrine winnowing of till.

GLACIOFLUVIAL SEDIMENTS: sand, gravel with minor silt, and diamicton; well to poorly-sorted, massive to stratified; deposited by glacial meltwater streams from, or in contact with, glacial ice in a subglacial, subaqueous, or proglacial subaerial environment.

GFp — **Outwash plain sediments:** sand and rounded gravel, minor silt, moderately to well-sorted; planar and cross-stratified; form low relief plains commonly with kettle lakes, channel scars and minor kettle lakes; ice-contract stratified drift deposited in a proglacial, subaerial environment within meltwater corridors.

GFf — **Outwash fan sediments:** fine sand to well-rounded gravel, minor silt, moderately sorted; cross-stratified, with foreset bedding; sediments fine toward distal edge of fan; deposited at the terminus of subglacial and subaerial meltwater corridors.

GFh — **Hummocky sediments:** gravel to fine-sand, with minor silt, and isolated boulders; massive to crudely stratified, moderate to poor sorting; commonly formed in ice-contact meltwater environments, local relief is 2 to 4 m.

GFc — **Ice-contact sediments:** moderately to poorly sorted gravel to medium-sand, massive to crudely stratified often occurring as small hummocks and ridges (1 to 3 m high); deposits usually are restricted in morphology due to overlying ice, often associated with subglacial meltwater corridors and esker networks.

GFr — **Esker:** sinuous ridges of moderate to well-sorted sand and gravel, cross-stratified to massive; characterized by pronounced ridges with crested peaks, or flat topped and winnowed by proglacial lakes; associated deposits often flank each side; deposited as ice-contact glaciofluvial sediments in larger subglacial meltwater corridors; can be associated with kame deposits, other ice-contact sediments and outwash fan deposits with kettle depressions and lakes.

GFv — **Glaciofluvial veneer:** glacial meltwater sediments, gravels to fine-sand with minor silts; cross-stratified to massive; <1 m thick, often draping the underlying till or bedrock morphology.

GF — **Glaciofluvial sediments, undifferentiated:** sand and gravel with minor silt; well to poorly-sorted massive to stratified; deposited by glacial meltwater streams from, or in contact with, glacial ice in a subglacial, subaqueous or proglacial subaerial environment.

GLACIAL SEDIMENTS (TILL): silty-sand to sandy diamicton; contains striated and faceted clasts of various lithologies; clast content ranges from 15 to 25%; thickness ranges from 1 to >3 m thick; till sheets and ridges have been exposed to varying degrees of washing and winnowing from meltwater channel systems and glacial Lake Low; generally thicker in the lowland regions and also as lee-side tails of streamlined glacial landforms; deposited directly by the Laurentide Ice Sheet.

Tr — **Ridged till:** bouldery, silty-sand diamicton of varying thickness, characterized generally by subparallel low-relief ridges, interpreted as ribbed moraine, oriented transverse to regional ice flow.

Ts — **Streamlined till:** silty-sand diamicton, deposited by active flowing ice, associated with larger oriented landforms; geomorphology includes drumlinoid features, and larger crag-and-tails.

Tv — **Till veneer:** bouldery, sandy diamicton; less than 1 m but up to 2 m thick locally; forms a discontinuous cover over bedrock and interspersed with many small outcrops of bedrock; surface morphology follows the underlying bedrock structures; localized frost heaved bedrock and boulders are frequent at higher elevations.

Tb — **Till blanket:** silty-sand diamicton; >2 m thick; forms continuous cover that masks underlying bedrock topography and structure; frost boils and solifluction stripes are common.

PRE-QUATERNARY

R — **Bedrock:** Core Zone bedrock, a composite Precambrian lithotectonic terrane of undifferentiated Archean rocks, and Paleoproterozoic supracrustal rocks. The middle Paleoproterozoic De Pas Batholith outcrops in the eastern half of the map sheet, Neoarchean meta-tonalites, tonalitic and granitic gneisses of the Core Zone are located in the central portion of the map. Middle Paleoproterozoic metasedimentary and volcanic (alkalai basalts) rocks of the Kaniapiskau Supergroup outcrop in the western portion of the map; metavolcanic rocks of the Doublet Zone (associated with the New Quebec Orogen) occur in the western and north halves of the map sheet. Wakuach Gabbros intrude the northern and central portions of the map.

Winnowed sediments and localized thin (<1 m) sorted sediments of sand, gravel and cobble lag deposits; surface may exhibit meltwater channels or minor littoral feature.

Kettle

Geological boundary, defined

Beach crest

Meltwater channel:

Minor, sense unknown

Minor, sense known

Major scarp

Moraine ridge

Esker ridge, direction known or inferred

Drumlinoid ridge or fluting

Crag-and-tail ridge, sense known

Striations:

Direction known

Crossed, relative ages given (1 = oldest)

Small outcrop

Station location

Till sample location

Recommended citation

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Canadian Geoscience Maps

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Geology based on fieldwork 2014–2016, and air photo interpretation in 2016 by H.E. Campbell, R.C. Paulen, and J.M. Rice.

Geological compilation by H.E. Campbell and R.C. Paulen, 2017

Geology conforms to Surficial Data Model v. 2.3

Geomatics by L. Robertson

Cartography by E. Everett

Initiative of the Geological Survey of Canada, conducted under the auspices of the GEM-2 Hudson-Ungava Core Zone Project 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 05915 (2015) and 06016 (2016)

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

Base map at the scale of 1:50 000 from Natural Resources Canada, with modifications.
Elevations in metres above mean sea level

SURFICIAL GEOLOGY

ASHUANIPI RIVER

Newfoundland and Labrador

NTS 23-I southwest

1:100 000

2 0 2 4 6 8 km

Mean magnetic declination 2018, 21°55'W, decreasing 14.2' annually. Readings vary from 20°41'W in the SW corner to 21°08'W in the NE corner of the map.

This map is not to be used for navigational purposes.

Title photograph: Oblique aerial view southward toward the Smallwood Reservoir at the confluence of three eskers that form part of a large trunk esker system commencing northwest of Giasson Lake and terminating just north of Churchill Falls (more than 100 km long). In the foreground, strandlines of glacial Lake Low can be seen on the glaciofluvial sediments, up to 8 metres above the present maximum level of the Smallwood Reservoir. NTS 23-I/04 (54°07'52"N/65°39'37"W). Photograph by H.E. Campbell. 2017-100

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

Data may include additional observations not portrayed on this map. *See* map info document accompanying the downloaded data for more information about this publication.

This publication is available for free download through GEOSCAN (http://geoscan.nrcan.gc.ca/).

This publication has been scientifically reviewed, but it has not undergone a formal edit.

CANADIAN GEOSCIENCE MAP 346
SURFICIAL GEOLOGY
ASHUANIPI RIVER
Newfoundland and Labrador
NTS 23-I southwest