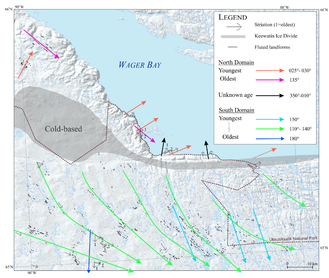

Figure 1. Generalized glacial flow directions and chronology on either side of Keewatin Ice Divide. Interpretation derived from glacial striations and streamlined landforms. Three terrain types are differentiated by surficial materials and associated landforms: 1) the Keewatin Ice Divide zone (shown in grey) and uplands north of the divide; 2) the terrain south of the ice divide; and 3) the coastal zone along Wager Bay below the marine limit.

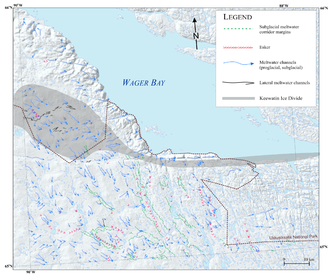

Figure 2. Ice-retreat features including subglacial meltwater corridors, eskers, proglacial/subglacial meltwater channels, and lateral meltwater channels. Location of Keewatin Ice Divide is approximate.

Acknowledgments

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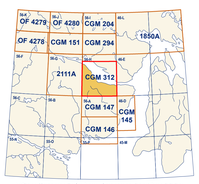
Abstract

The Douglas Harbour south map area is characterized by three terrain types differentiated by surficial materials and associated landforms (Fig. 1). The largest terrain type, situated south of the Keewatin Ice Divide, is covered by till deposits interspersed with southeast- to south-southeast trending subglacial meltwater corridors filled with eskers, hummocks, and reworked till. Streamlined till and striations indicate ice flow to the east-southeast and southeast in this area. Ice retreat to the northwest is indicated by end moraines, eskers, and various meltwater features (Fig. 2). Under and north of the divide, the terrain consists of discontinuous bouldery till commonly scoured by proglacial and lateral meltwater channels flowing towards Wager Bay (Fig. 2). Such attributes, plus the absence of other glacial features, are thought to represent the position of the divide under a cold-based regime. Along the shores of Wager Bay, wave-washed bedrock surfaces and marine littoral deposits occur below the limit of the post-glacial sea at 113–130 m a.s.l.

Résumé

La région cartographique de Douglas Harbour Sud se caractérise par trois types de terrains, qui se distinguent par la nature des matériaux de surface et des formes de relief associées (Fig. 1). Le terrain le plus étendu, situé au sud de la ligne de partage glaciaire du Keewatin, est couvert de dépôts de till, entrecoupés par des couloirs d'eau de fonte sous-glaciaires dirigés vers le sud-est et le sud-sud-est et remplis d'eskers, de petits monticules de damicton et de dépôts de till remanié. Le till profile et les stries indiquent un écoulement glaciaire dirigé vers l'est-sud-est et le sud-est dans ce secteur. Le retrait vers le nord-ouest est indiqué par des moraines frontales associées aux eaux de fonte témoignant d'un retrait glaciaire vers le nord-ouest (Fig. 2). Au nord et sous la ligne de partage glaciaire, le matériau de surface prédominant se compose de till blocailleux communément incisé par des chenaux d'eau de fonte proglaciaires et latéraux, dont les eaux s'écoulaient vers la baie Wager (Fig. 2). Ces attributs, ainsi que l'absence d'autres caractéristiques glaciaires, témoigneraient de la position de la ligne de partage glaciaire sous un régime de glacier à base froide. Le long des rives de la baie Wager, des surfaces du substratum rocheux lessivées par les vagues et des dépôts marins littoraux sont présents sous la limite de la mer postglaciaire située à 113–130 m au-dessus du niveau de la mer.



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

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CANADIAN GEOSCIENCE MAP 312
SURFICIAL GEOLOGY
DOUGLAS HARBOUR (SOUTH)
Nunavut
NTS 56-H south
1:100 000

Geological Survey of Canada
Canadian Geoscience Maps

Canada

Authors: I. Randour and I. McMartin

Geology based on aerial photography interpretation, LANDSAT TM 7 and SPOT imagery by I. Randour and I. McMartin and on field work in 2015 and 2016 by I. Randour, I. McMartin and M. Roy

Geology conforms to Surficial Data Model v. 2.3

Geomatics by L. Robertson.

Cartography by M.J. Baldock

Initiative of the Geological Survey of Canada, conducted under the auspices of the Tehery-Wager project (GEM2) 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 05315 and 05916.

Shaded relief image derived from the digital elevation model supplied by Natural Resources Canada. Illumination: azimuth 315°, altitude 45°, vertical factor 1x

Map projection Universal Transverse Mercator, zone 16. North American Datum 1983

CANADIAN GEOSCIENCE MAP 312
SURFICIAL GEOLOGY
DOUGLAS HARBOUR (SOUTH)
Nunavut
NTS 56-H south
1:100 000

2 0 2 4 6 8 km

Base map at the scale of 1:50 000 from Natural Resources Canada, with modifications.

Elevations in metres above mean sea level

Ukkusiksalik National Park boundary from Parks Canada

Mean magnetic declination 2017, 13°54'W, decreasing 13.4' annually. Readings vary from 12°03'W in the SW corner to 15°45'W in the NE corner of the map.

This map is not to be used for navigational purposes.

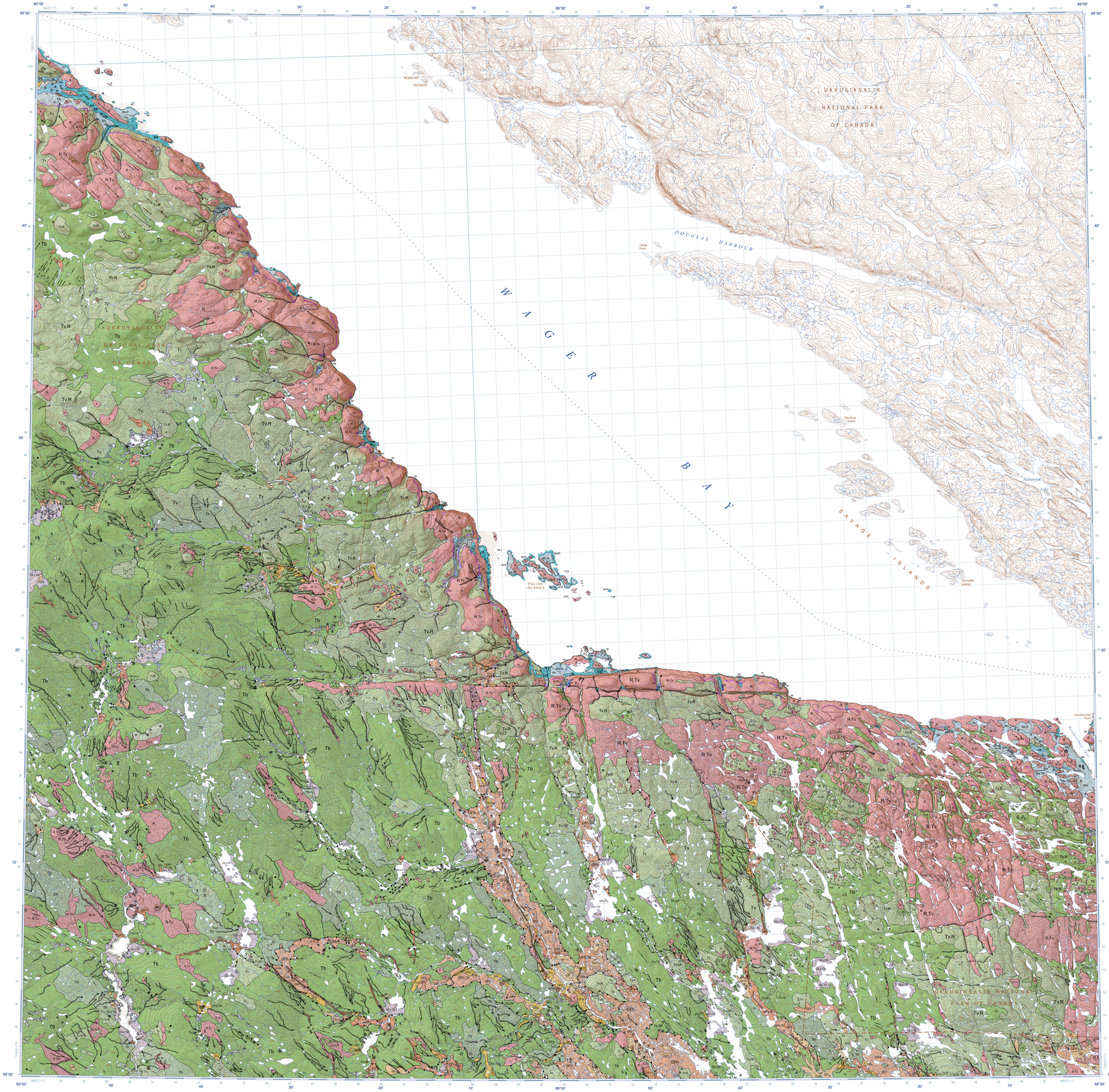
Title photograph: Meltwater channel which emptied into proto-Wager Bay during deglaciation, Wager Bay coast, Nunavut. Photograph by I. Randour. 2017-046

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/).

Preliminary publications in this series have not been scientifically edited.



QUATERNARY

HOLOCENE

ORGANIC DEPOSITS: undifferentiated peat and muck; commonly less than 30 cm thick; generally occur as flat, grassy terrain over poorly drained fine-grained alluvial and marine deposits, or in low depressions between glacial landforms. Associated with thermokarst lakes and ice-wedge polygons.

ALLUVIAL DEPOSITS: undifferentiated sand, silt, clay with minor gravel and organic detritus; less than 2 m thick; form active floodplains close to modern rivers and stream levels or inactive fluvial terraces.

HOLOCENE–LATE PLEISTOCENE

MARINE SEDIMENTS: sediments deposited in postglacial Tyrrell Sea and proto-Wager Bay; 1 to 10 m thick; occur along the shores of Wager Bay below the marine limit that lies at 113–130 m a.s.l.

Marine littoral sediments: sand and gravel; 2 to 5 m thick; form shoreline features such as beach ridges and marine terraces; include a few deltas at 90–130 m where meltwater channels emptied into a high postglacial sea near marine limit, and modern deltas near present-day sea level.

Marine veneer: fine sand, silt and clay; less than 2 m thick; mimics surface of underlying reworked till deposits. Patterned ground is often visible; thin vegetation cover.

Marine blanket: sand and silt; 2 to 10 m thick; occurs as flat to gently sloping surfaces resting against steep bedrock slopes; forms a continuous cover that masks underlying sediments and bedrock; occurs in the very north part of the map area.

GLACIOLACUSTRINE SEDIMENTS: sand, gravel and silt deposited into short-lived glacial lakes ponded against the retreating ice margins.

Glaciolacustrine veneer: sand, gravel and silt; moderately to well sorted; less than 2 m thick; deposited in glacial lake basins dammed behind sediment accumulations within or adjacent to meltwater corridors; occur in association with till deposits.

GLACIOFLUVIAL SEDIMENTS: sand, gravel and minor silt; moderately to well sorted; massive to stratified; deposited by glacial meltwater streams from or in contact with glacial ice in a subglacial, or proglacial sub-aerial environment. Mainly associated with reworked glacial sediments.

Outwash plain sediments: sand and gravel; 1 to 10 m thick; moderately to well-sorted; commonly with channel scars on the surface; form large flat surfaces that represented distal facies of ice-contact stratified drift deposited in a proglacial, subaerial environment. Surfaces may present patterned ground and/or have a thin vegetation cover.

Fan sediments: gravel, sand and boulders; 2 to 10 m thick; generally poorly sorted; deposited by meltwater streams in a subaerial environment as fan shaped deposits or in proglacial ice-proximal settings as kame deltas later dissected by meltwater streams.

Hummocky sediments: gravel, sand and sandy diamicton; 2 to 10 m thick, poor to moderate sorting, massive to stratified; form irregular mounds and small ridges, fish-scale mounds, and fluted hummocks; found within subglacial meltwater corridors.

Ice-contact sediments: gravel, sand and cobbles; 2 to 20 m thick; moderately sorted; massive to stratified; deposited in a subglacial or englacial environment; form eskers and kames, commonly kettled; predominantly found within subglacial meltwater corridors. Esker segments are long (mean: 485 m), with both sharp and flat crests, and mostly oriented towards southeast and south-southeast.

Glaciofluvial sediments, undifferentiated: comprised of glaciofluvial sediments that cannot be differentiated by deposit type or separated at the scale of mapping; occur within subglacial meltwater corridors mainly.

GLACIAL SEDIMENTS: silty sand to sandy diamicton (till); thickness can exceed 20 m in buried depressions and streamlined landforms but is generally less than 5 m; unsorted to poorly sorted; generally massive; largely deposited beneath active ice. Colour is varying between grey (light yellowish/brownish-grey, greenish grey and grey) to brown (light olive/yellowish brown). Clasts are sub-angular to sub-rounded and predominantly derived locally from gneissic granitoid rocks.

Hummocky till: sandy diamicton; generally 10 to 20 m thick; characterised by rolling till plain with large subdued hummocks associated with solifluction stripes; also occurs as semi-flat top hummocks reworked and/or dissected by meltwater, forming boreenes; commonly associated with subglacial meltwater corridors. Irregular kettle lakes are common.

Till veneer: bouldery, silty sand diamicton; generally less than 2 m thick; forms a discontinuous cover over bedrock and interspersed with many outcrops; deposits mimic underlying bedrock structure. May be fluted; surfaces frequently covered with boulders; frost boils are common.

Till blanket: bouldery, silty sand diamicton; 2 m to greater than 20 m thick; forms a continuous cover that generally masks underlying bedrock topography; occur in streamlined terrain or till plain. Frost boils and solifluction stripes are common; ice-wedge polygons may be present in sandier diamicton.

Till, undifferentiated: sandy diamicton; 1 to 10 m thick; forms hummocky to flat surface with small kettle depressions or lakes, and giant ice-wedge polygons; occurs as a single large unit in the central-western part of the map.

PRE-QUATERNARY

BEDROCK: Archean to Paleoproterozoic metamorphosed intrusive igneous and minor supracrustal rocks. The east-west trending Chesterfield fault zone and Wager shear zone traverse the central map area.

Bedrock, undifferentiated: intact and frost-riven outcrops of various lithologies; predominantly undifferentiated tonalite to granodiorite orthogneiss, granulite-facies plutonic rocks and orthogneiss, and minor supracrustal rocks. Hudson suite monzogranite rocks are commonly found along the Wager Bay south shore.

Complex units: two map-unit designators are used in cases where the bedrock is so frequently exposed and the outcrops are too small to be mapped individually, yet constitute a significant areal extent of the total polygon (e.g. R.Tv designates an area of bedrock interspersed with till veneer). In such instances a dot (.) is used to separate the map-unit designator.

Stratigraphic relationship: a stratigraphic relationship is shown with two map-unit designators separated by a slash (/) (e.g. MvTb designates marine veneer overlying till blanket).

Thermokarst:
- *Large*
- *Small*
- Patterned ground

Scoured sediments: channelized till by meltwater drainage; surfaces have abundant boulder lags derived from the reworking of glacial sediments; present as small erosional till remnants; associated with subglacial meltwater corridors or pro-glacial channels. Bedrock is exposed when erosion by meltwater was strong enough to remove sediments and obliterate channel scars.

Reworked sediments: sediments reworked by meltwater; sediments may be winnowed. Darker colours on air photos are due to the presence of a black lichen, which needs a coarser-grained sediment to grow.

Boulder concentration: exposed bedrock and/or till with surface boulders primarily deposited by glacial ice, includes some felsenmeers. Mostly present along Wager Bay and generally in the northern part of the map area.

Kettle:
- *Large*
- *Small*

- Geological boundary (defined)
- Limit of mapping
- Terrace scarp
- Shoreline (faint beach crest or wave-cut notch)
- Limit of marine submergence

Meltwater channel:
- *Minor, proglacial or subglacial; sense unknown*
- *Proglacial or subglacial; sense known*
- *Lateral (barb on uphill side)*
- *Major*
- *Subglacial meltwater corridor margin*

Moraine ridge:
- *Minor*
- *Major*

Esker ridge:
- *Sense unknown*
- *Sense known or inferred*

- Drumlinoid ridge
- Drumlin ridge
- Crag-and-tail ridge
- Fluted bedrock
- Fluted drift
- Delta (direction of flow indicated)
- Kame and kame terrace

Striations:
- *Well defined; sense unknown*
- *Well defined; sense known*
- *Crossed (1 = oldest)*

- Small outcrop
- Sample location

Recommended citation
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