Natural Resources Canada / Ressources naturelles Canada

GEOLOGICAL SURVEY OF CANADA / COMMISSION GÉOLOGIQUE DU CANADA

DESCRIPTIVE NOTES

PHYSIOGRAPHY

The map area (NTS 56 J/9–16) lies north of the Arctic Circle within the northern portion of the Wager plateau, approximately 200 km west of Repulse Bay, central mainland, Nunavut. Rolling hills and uplands bisected by broad valleys characterize the region. The map area occupies the headwaters of three drainage basins with a mean elevation of 380 m, punctuated by highs and lows of 560 m and 220 m, respectively. Hayes River drains Walker Lake and flows into Chantrey Inlet (Gulf of Boothia West Watershed). The eastern margin of the map area drains into Committee Bay (Gulf of Boothia East Watershed). In the southeast, drainage flows into Wager Bay, and Hudson Bay (Northwest Hudson Bay Watershed).

CLIMATE AND VEGETATION

The map area lies in the Northern Arctic Ecozone, a region of continuous permafrost (Burgess et al., 2001). The map area is at the transition of the 'high' and 'low' Arctic, in terms of the climate and vegetation. There are areas of bare ground resulting from frost action, a characteristic of the high Arctic. There are, however, some species also found in the low Arctic, such as low shrubs *Salix sp.* (willow) and *Betula glandulosa* (dwarf birch). These species and climate are indicative of Tundra Forest Region (Bliss and Matveyeva, 1992).

The effects of permafrost processes are ubiquitous throughout the map area, affecting all surficial materials, and influencing how research was performed. Freezing and thawing of the active layer results in frost heaving (freezing from the top), lateral sorting (from sides, or from below), and mechanical sorting (aided by gravitational forces). Frost creep results from material being heaved normal to the slope; subsequent melting lowers the material nearly vertically, resulting in overall down-slope movement. Gelifluction refers to the downward flow of material because of reduced cohesion due to poor drainage and resultant high pore water pressures. Combined, the processes of frost creep and gelifluction result in the mass movement process solifluction. The active layer can also slide on the frozen layer below, resulting in plug-like flow (French, 1996). Frost sorting is possible because finer materials move by freezing and thawing processes in a wider range of freezing rates than large particles. This variability of the movement of sediment results in larger scale sorted and unsorted patterned ground of circles, polygons, nets, stripes and steps (French, 1996). These processes also lead to the development of frost boils (a.k.a. mudboils), where unweathered material from the C-horizon rises to the surface by frost action.

BEDROCK GEOLOGY

The map area lies within the Rae domain of the Churchill Province (Skulski et al., 2002). Three main lithologic domains dominate the bedrock geology in the map area; (1) a central domain of a NE-SW trending belt of Archean supracrustal rocks; (2) a northern domain containing metasedimentary rocks and plutons; (3) and a southern domain of granitoids (Skulski et al., 2002).

ICE MOVEMENT INDICATORS

One hundred and two ice-movement indicators were measured at 51 field sites, in addition to 81 landform measurements from aerial photographs. Three ice-movement phases could be determined from these ice-movement indicators (Fig. 1), two of which are main phases found throughout the Committee Bay Project (CBP) map area (that includes Walker Lake and Laughland Lake (NTS 56 K to the west), Arrowsmith River (NTS 56-O to the north), and Ellice Hills (NTS 56 P to the northeast)). For consistency, the interpretations presented here are placed into the framework developed within the CBP (i.e. Phase 1, 2a, 2b, and 3) (McMartin et al., 2003). In addition to these phases the chronology is further refined to include a late phase of ice-movement, Phase 4. Phase 2 (a and b) is the oldest event identified in the Walker Lake map area. Phase 4 is the most recent; a local, topographically controlled ice-movement event.

Phase 1

Phase 1 ice-movement was northward over the entire CBP area.

Phase 2

Phase 2 incorporates two distinct, but likely contemporaneous, ice-movement directions: Phase 2a and 2b. In the northeastern portion of the CBP study area (NTS 56-O/2–8, P/5–7, P/9–16 and J/13) the ice-movement (Phase 2a) is to the northeast, towards Committee Bay. In the northwest region of the study area ice-movement (Phase 2b) is to the northwest, towards Chantrey Inlet.

Phase 3

Phase 3 records ice-movement primarily towards the north and north-northwest. Ice-movement indicators associated with this phase are found only south of the Chantrey Moraines, which includes all of the Walker Lake and Laughland Lake, and southern portions of Arrowsmith River and Ellice Hills (NTS 56-O/1–4 and P/1–4, 8).

Phases 4a, b, and c

At the "Howling Wolf" lake site (Fig. 2) indicators were measured on a komatiite ridge. Northward ice-movement indicators (4a) are crosscut by the others signifying ice-movement to the north-northwest (4b and c). This locality is at the south end of a regional topographic high (340 m for the site vs. 400 m for the hill). North-northeast (bearing 025°) of this site there is a lower area with a maximum elevation of 365 m.

DISCUSSION

Thinning of the Laurentide Ice Sheet (LIS) at the deep Gulf of Boothia resulted in the separation of the LIS into two separate sectors — the Keewatin and the Baffin (Dredge, 1995). This structural change caused the shifting of the margin of the Keewatin sector ice, resulting in ice-movement Phase 2a towards paleo-Committee Bay. Dyke and Prest (1987) report that this ice-movement direction occurred from ca. 18 to 8.4 ka, and was also influenced by the position of the Ancestral Keewatin Divide (AKD). Away from the influence of paleo-Committee Bay (the western portion of the map area) ice-movement was towards the northwest (Phase 2b). This may have resulted from a similar "pull" of ice towards Chantrey Inlet (McMartin et al., 2003). The northwest movement of Phase 2b probably occurred in the later stages of the AKD, when the divide was oriented southwest-northeast, and when the ice-margin had retreated to near the coast.

Phase 3 ice-movement can be associated with the Keewatin Ice Divide, when the ice margin had retreated beyond the influence of large water bodies, such as Committee Bay and Chantrey Inlet (Fig. 1). The control on this ice-movement direction may be topography, which would have exerted a greater influence as the ice sheet thinned. The fact that the indicators for this phase are found only south of the Chantrey Moraines suggests this as the location of the ice margin for this phase, and that (based on the age of the moraines (Dyke et al., 2003)) this phase occurred at ca. 8 ka.

Phase 4 records a period when ice-movement became increasingly influenced by topography. This resulted in a gradual directional shift in local ice-movement towards the low area to the northeast. The site's substrate, easily striated fine-grained ultramafic rock (komatiite), explains why this record of topographically controlled ice movement was preserved at this site.

The southern portion of the map area, in particular the southeast (56 J/9) yielded few small-scale ice-movement indicators. Likely this is because the plutonic bedrock in this area does not readily preserve ice-movement indicators.

DESCRIPTION AND DISTRIBUTION OF MATERIALS

R—Bedrock

Bedrock exposures of a significant areal extent to be mapped as an individual map polygon were reported as "Bedrock". The bedrock was not subdivided and no surface expression was used. Polygons consisting mainly of bedrock are found predominantly on the up-ice side of topographic rises. Sub-mapping scale bedrock exposures are common within veneers of other units, typically rare within blankets and also occur within composite units.

T—Till

Till (i.e. morainal deposits) is an unsorted, matrix supported sediment with grain sizes ranging from clay to boulders deposited by glacial ice (Dreimanis, 1988). The matrix of the till measured from till geochemistry samples is sandy-silt to silty-sand, with less than 10% clay, and usually less than 5%. The active layer (approx. upper 0.5 m) is extensively modified by cryoturbation that destroyed primary depositional features.

Till is the most extensive surficial unit in the study area. It covers most of the upland areas, but is generally absent in low areas, where it has been either eroded by glaciofluvial action or buried by colluvium or other glaciogenic deposits. Typical surface expressions are blankets and veneers with estimated thickness ranging from < 1 m to > 5 m. Some thicker deposits have landforms, such as flutings, crag-and-tails and Rogen moraine. The deposits are likely of one age, from the last (Wisconsinan) glaciation, although no stratigraphic exposures were found to test this inference.

G—Glaciofluvial

The composition of glaciofluvial deposits varies from well-sorted sands to poorly-sorted boulder gravel. Clasts are typically moderate to well-rounded. Exposures were poor in gravels but structures within sandy esker deposits included planar laminations up to fine bedding with both normal grading and ripple cross stratification.

Glaciofluvial deposits are widespread in the map area, but still less extensive than till. Although not exclusively, the majority of these deposits are found in NNW trending strips, known as "glaciofluvial corridors" (cf. St-Onge, 1984). These narrow bands of glaciofluvial material dissect areas of till and other materials throughout Keewatin (Aylsworth and Shilts, 1989). Three idealized types of corridor deposits were identified: undulating corridors, valley corridors, and kettled corridors.

Landforms such as eskers, pitted outwash, deltas, glaciofluvial corridor hummocks (GCHs) and transverse ridges are constructed of glaciofluvial material. These landforms are located in topographic lows (eg. valleys) although some cross local drainage divides. Some eskers may extend for several kilometres, but because they are narrow (< 100 m), they are typically reported using symbols.

Sandy, flat-topped, glaciofluvial landforms such as terraces and plains typically have recti-linear ice wedge polygons of up to 20 m in diameter. Glaciofluvial sediments are likely from the last glaciation — they overlie till, and do not appear to be modified by overriding ice.

L—Glaciolacustrine

Glaciolacustrine material is moderately to well sorted, and varies in composition from silt to coarse sand. Exposures of these deposits are primarily terraces above the shore line of present-day lakes. Eskers are commonly observed in kettle lakes.

Vertical exposures (> 10 m) at Walker Lake contain cross-bedded coarse sand within dominantly horizontally stratified fine sand. The lower contact was not observed, but likely all of the deposits uncomformably overlie bedrock, till and/or glaciofluvial material. The layers of cross-bedded and horizontally stratified sands suggest phases of relatively high water flows. The depositional environment of the horizontally stratified and cross-bedded sands likely results from underflows, caused by water density differences (Lambert et al., 1976).

C—Colluvium

Colluvium was a relatively extensive map unit compared to other low relief, northern mapping projects (e.g. Kerr et al., 1997; Ward et al., 1997; McMartin, 2002). This is mainly due to a broader application of the terminology, rather than an abundance of the material. Colluvium, *sensu stricto*, is material that has been transported solely by gravity (Howes and Kenk, 1997). However, for this project colluvium includes solifluction deposits (typified by horsetail drainage) and felsenmeer (a result of frost heaving and freeze-thaw processes), as both of these are difficult to distinguish from colluvium proper during aerial photograph analysis. These processes only affect the upper surface (i.e. active layer) and leave the underlying sediments unaltered. These types of deposits were reported as map units of the underlying material with hachure patterns denoting the overlaying material (i.e. colluvium).

A—Alluvium

Alluvial deposits result from non-glacial related fluvial processes. Differentiating between distal glaciofluvial deposits (outwash), and alluvium presented a difficulty in this study. Because peak flow regimes in the present-day fluvial systems (even at maximum spring runoff) are low, the majority of fluvial deposits were reported as glaciofluvial material.

ACKNOWLEDGMENTS

I would like to thank my Masters supervisor, Brent Ward, for his guidance in field mapping techniques, and Edward Little for managing the Quaternary aspect of the Committee Bay Project. Overall project leadership was expertly provided by Hamish Sandeman and Tom Skulski. I would like to thank: Isabelle McMartin for providing logistical support through TGI funding, and her enthusiastic field support; Kaz Shimamura for his assistance in digitizing the maps; Celine Gilbert and Jo-Anne Dohar for their cartographic assistance; and Travis Ferbey and Carl Ozyer for their assistance in the field and collaboration on map boundaries.

REFERENCES

Aylsworth, J.M. and Shilts, W.W.
1989: Glacial features around the Keewatin Ice Divide: Districts of Mackenzie and Keewatin; Geological Survey of Canada, Paper 88-24, 21 p.

Bliss, L.C. and Matveyeva, N.V.
1992: Circumpolar Arctic Vegetation; *in* Arctic ecosystems in a changing climate, an ecological perspective, (ed.) F.S. Chapin, R.L. Jefferies, J.F. Reynolds, G.R. Shaver and J. Svoboda, Academic Press, San Diego, p. 59–89.

Burgess, M.M., Riseborough, D.W., and Smith, S.L.
2001: Permafrost and glaciers/icecaps monitoring networks workshop report on the permafrost sessions: a contribution to the development of the Canadian GCOS-Global Climate Observing System-Cryosphere Plan, Geological Survey of Canada, Open File 4017, 72 p.

Dredge, L.A.
1995: Quaternary geology of northern Melville Peninsula, Northwest Territories; Geological Survey of Canada, Bulletin 484, 114 p.

Dreimanis, A.
1988: Tills: Their genetic terminology and classification; *in* Genetic Classification of Glacigenic Deposits, (ed.) R.P. Goldthwait and C.L. Matsch; Balkema, Rotterdam, p. 17–83.

Dyke, A.S. and Prest, V.K.
1987: Paleogeography of northern North America; 18 000 – 5 000 years ago, 1:12 500 000, Geological Survey of Canada, Map 1703A.

Dyke, A.S., Moore, A., and Robertson, L.
2003: Deglaciation of North America; 1:30 000 000, Geological Survey of Canada, Open File 1574.

French, H.M.
1996: The periglacial environment; Longman, London, England, 341 p. (second edition).

Howes, D.E. and Kenk, E.
1997: Terrain Classification System for British Columbia, a system for the classification of surficial materials, landforms and geological processes of British Columbia (Version 2); Ministry of Environment, Lands and Parks, Victoria, B.C., 101 p.

Kerr, D.E., Dredge, L.A., and Ward, B.C.
1997: Surficial geology, Napaktulik Lake, District of Mackenzie, Northwest Territories; 1:125 000, Geological Survey of Canada, Map 1889A.

Lambert, A.M., Kelts, K.R., and Marshall, N.F.
1976: Measurements of density underflows from Walensee, Switzerland; *in* Sedimentology, v. 23, p. 87–105.

McMartin, I.
2002: Surficial geology, Rankin Inlet, Nunavut; (NTS 55 K/16), 1:50 000, Geological Survey of Canada, Open File 4116.

McMartin, I., Little, E.C., Ferbey, T., Ozyer, C.A., and Utting, D.J.
2003: Ice flow history and drift prospecting in the Committee Bay Belt, central Nunavut: results from the Targeted Geoscience Initiative; *in* Current Research 2003-C4, Geological Survey of Canada, 11 p.

Skulski, T., Sandeman, H., Sandborn-Barrie, M., MacHattie, T., Hyde, D., Johnstone, S., Panagapko, D., and Byrne, D.
2002: Contrasting crustal domains in the Committee Bay belt, Walker Lake–Arrowsmith River area, central Nunavut; *in* Current Research 2002-C11, Geological Survey of Canada, 11 p.

St-Onge, D.A.
1984: Surficial deposits of the Redrock Lake area, District of Mackenzie; *in* Current Research, Part A; Geological Survey of Canada, Paper 84-01A, p. 271–278.

Ward, B.C., Dredge, L.A., and Kerr, D.E.
1997: Surficial geology, Lac de Gras, District of Mackenzie, Northwest Territories; 1:125 000, Geological Survey of Canada, Map 1870A.

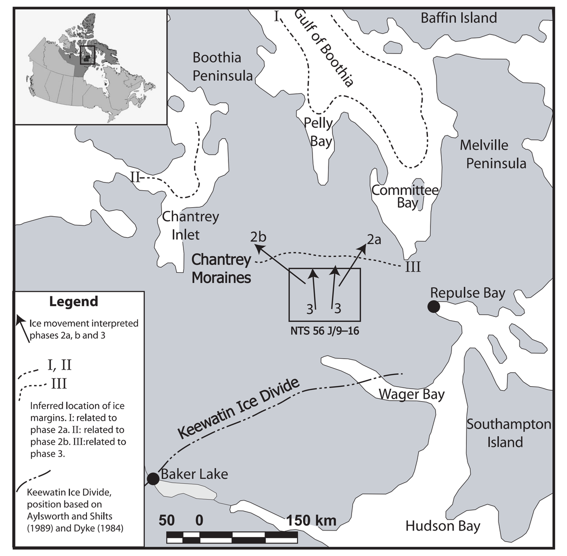


Figure 1. Schematic diagram of ice-movement phases in the study area (Walker Lake map area, NTS 56 J/9–16). I: inferred location of the ice margin for phase 2a, when ice-movement was "pulled" towards Committee Bay, at *ca*. 9 ka (Dyke *et al*. 2003). II: inferred location of the ice margin for phase 2b, when ice-movement was "pulled" towards Chantrey Inlet at *ca*. 8.5 ka (Dyke *et al*. 2003). III: position of the ice margin for phase 3, which corresponds to the position of the Chantrey Moraines. The Chantrey Moraines indicate the position of the ice margin at *ca*. 8 ka (Dyke *et al*. 2003). Phase 1 was not detected in the map area. Phase 4 (local flows) is not shown on this diagram. The location of the Keewatin Ice Divide was generalized from Aylsworth and Shilts (1989) and Dyke (1984).

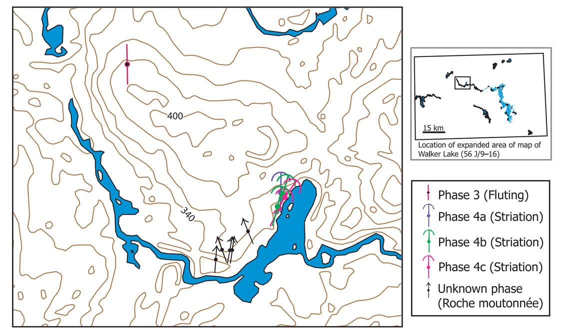


Figure 2. Ice-movement data from Howling Wolf lake site. Earlier phases (2 and 3) are parallel with the flutings. Later phases (4a, b, and c) are towards the northeast, likely the result of topographic control. No movement data from phase 1 is present in this area. Elevations are in metres.

LEGEND

Notes regarding compound units: *For those compound units that contain veneers (e.g., Tv/R), only two possibilities have been mapped. Where veneers are observed as a minor component forming patches over another map unit, the "/" is used to allow for representation of the underlying unit. Where veneers are interpreted to stratigraphically overlie a dominant surficial unit (e.g., Cv-Tb), the "-" is used to designate ubiquitous veneer cover overlying the primary unit.*

In areas where the surficial units (other than veneers) form complex cover, the area is coloured according to the dominant cover and is labelled in descending order of cover, example Tb/R. The relation of these complex covers are shown with a symbol between the unit letters as follows:

. approximately 50% cover to each unit;
/ approximately 70% to 30%;
// approximately 90% to 10%.

Example: Tb/R represents a cover with an approximate ratio of 70% Tb and 30% R.

In areas where the surficial units (including veneers) form stratigraphic relationships that have been observed in cross-section, the overlying unit is separated from the underlying unit by a hyphen (e.g., Gt-R); this applies to the uppermost two units only.

QUATERNARY

POST GLACIAL ENVIRONMENT

Ev — ***Eolian veneer:*** *Well sorted silt and sand deposited by wind; less than 1 m thick or discontinuous sheets. Stipple-fill is used when eolian veneer overlies another unit.*

ALLUVIUM: *Silt, sand, and gravel deposited by streams either within channels or as overbank deposits. Deposits are typically stratified and moderately to well sorted.*

Ap — ***Alluvial plain:*** *Predominantly sands and gravels. May be locally overlain by or include lacustrine silt, clay, and minor peat and organic silt deposited in abandoned channels and along floodplain margins. Typically forms plains within approximately 1 m of present stream level. Thickness ranges from 1 to 5 m.*

PERIGLACIAL ENVIRONMENT

COLLUVIUM: *Poorly sorted, unconsolidated debris (diamicton) deposited by gravitational (slope) processes; derived from bedrock or glacial materials. This unit also includes frost-heaved stacks of angular joint blocks from bedrock outcrops (felsenmeer); blocks are 0.5 to 2 m across and have unweathered surfaces.*

Cv — ***Colluvial veneer:*** *Colluvial material less than 1 m thick; or discontinuous sheets of colluviated materials. Hatch-fill is used when colluvial veneer overlies another unit.*

Cb — ***Colluvium blanket:*** *A mantle of colluviated material with a thickness greater than 1 m.*

Ca — ***Colluvium apron:*** *Stratified diamicton and poorly sorted sand and gravel. Deposit forms a wedge-shaped, slope-toe complex of debris flows and solifluction deposits derived from bedrock and glacial debris. Thickness up to 10 m, thinning at head and toe of deposit.*

GLACIAL ENVIRONMENT (WISCONSINAN)

GLACIOLACUSTRINE DEPOSITS: *Stratified sand, silt, and clay deposited in lakes dammed by glacier ice or as a result of high lake levels during deglaciation. Distally deposited glaciolacustrine sediments typically underlie plains or gently rolling terrain. Proximally deposited glaciolacustrine sediments may underlie ridged, hummocky, or pitted terrain caused by subsequent meltout.*

L^Gp — ***Glaciolacustrine plain:*** *Well stratified clay, silt, and sand. Local relief is less than 1 m and masks the underlying topography. Thickness ranges from 1 to greater than 10 m.*

L^Gd — ***Glaciolacustrine delta:*** *A scarp or face with a low-relief mantle of cross-stratified sand and rounded gravels associated with glaciofluvial deposition into a glaciolacustrine environment. Thickness ranges from 1 to greater than 10 m.*

L^Gx — ***Glaciolacustrine — undifferentiated:*** *Glaciolacustrine complex — units are too small to be represented at the scale of mapping. Consists primarily of glaciolacustrine units, but may have relatively small pockets of alluvial, colluvial, till and/or glaciofluvial sediments. Thickness ranges from 1 to greater than 10 m.*

GLACIOFLUVIAL DEPOSITS: *Well stratified to massive sand, gravel with minor silt and diamicton deposited by streams flowing away from, or in contact with glacier ice. These sediments can range from well to poorly sorted. Strata are commonly deformed due to syndepositional collapse from the meltout of supporting ice.*

Gv — ***Glaciofluvial veneer:*** *Glaciofluvial material less than 1 m thick; may occur in patches or as a gravel lag over rock. Hatch-fill is used when glaciofluvial veneer overlies another unit.*

Gt — ***Glaciofluvial terrace (outwash):*** *A scarp or face with a low-relief mantle of moderately to well sorted, cross-stratified sand and rounded gravels elevated above. Thickness ranges from 1 to greater than 20 metres.*

Gp — ***Glaciofluvial plain (outwash):*** *Low-relief mantle of moderately to well sorted, cross-stratified sand and rounded gravels; 1 to greater than 20 m thick.*

Gh — ***Hummocky glaciofluvial (ice-contact):*** *Complex arrangement of slopes extending from rounded depressions, to irregular conical mounds and includes esker ridges. Composed primarily of poorly sorted sand and gravel; 5 to greater than 20 m thick.*

Gx — ***Glaciofluvial — undifferentiated:*** *Glaciofluvial complex — units are too small to be represented at the scale of mapping. Consists primarily of glaciofluvial units, but may have relatively small pockets of alluvial, colluvial, till and/or glaciolacustrine sediments.*

MORAINAL SEDIMENTS (Till): *Diamicton (granule to boulder size clasts suspended in a poorly sorted clay to sand matrix) either deposited directly by glacial ice or redeposited directly from glacial ice by sediment gravity flow and/or ductile deformation.*

Laurentide Till: *Grey to dark brown stony granitic till with sandy matrix; occurs as veneers, blankets and hummocky deposits.*

Tv — ***Till veneer:*** *Till less than 1 m thick; occurs in patches over rock and is interspersed with rock outcrop in some cases eroded to form roche moutonnée. Deposits are thin enough (<1 m) to reveal the underlying surface morphology. Hatch-fill indicates when till veneer overlies another unit.*

Tb — ***Till blanket:*** *Surface morphology conforms to underlying bedrock topography. May exhibit crag-and-tails, and/or flutings. Some areas have large frost polygons and stone nets. Thicknesses generally range from 1 to 5 m.*

Tp — ***Till plain:*** *Surface morphology forms a plain with < 2 m of relief. Generally masks underlying topography. Some areas have large frost polygons and stone nets. Thickness is greater than 5 m.*

Tm — ***Rolling till plain:*** *Surface morphology forms gently rolling plains with 1 to 3 m of relief; may exhibit flutings. Generally masks underlying topography. Some areas have large frost polygons and stone nets. Thickness is greater than 5 m.*

Tr — ***Ridged till complex:*** *Surface morphology parallel ridges with amplitudes less than 15 m and wavelengths less than 30 m. Orientation is commonly transverse to paleo-ice-movement. Comprised of till and glaciofluvial sediments. Thickness is variable, but is usually less than 15 m.*

Tx — ***Till — undifferentiated:*** *Till complex — units are too small to be represented at the scale of mapping. May contain relatively small pockets of alluvial, colluvial, glaciofluvial and/or glaciolacustrine sediments.*

PRE-QUATERNARY

R — ***Bedrock — undifferentiated:*** *Cross-reference with Committee Bay Project, bedrock component.*

Geological boundary (defined, approximate, inferred)
Crag-and-tail
Fluting
Esker (flow direction known, unknown)
Abandoned channel, minor (flow direction known, unknown)
Roche moutonnée

LOCATION MAP

OPEN FILE 4280

SURFICIAL GEOLOGY

WALKER LAKE

NUNAVUT

Scale 1:100 000/Échelle 1/100 000

kilometres 2 0 2 4 6 8 kilomètres

Universal Transverse Mercator Projection
North American Datum 1983

Projection transverse universelle de Mercator
Système de référence géodésique nord-américain, 1983

© Her Majesty the Queen in Right of Canada 2004
© Sa Majesté la Reine du chef du Canada 2004

Author: D.J. Utting

Geology by D.J. Utting, 2001–2002

Geological compilation by D.J. Utting and E.C. Little, 2001–2003

Co-ordinated through the auspices of the Committee Bay TGI Project

Digital data preparation by D.J. Utting and K. Shimamura

Digital cartography by J.L. Dohar, Earth Sciences Sector Information Division (ESS Info)

This map was produced from processes that conform to the ESS Info Publishing Services Subdivision Quality Management System, registered to the ISO 9001: 2000 standards

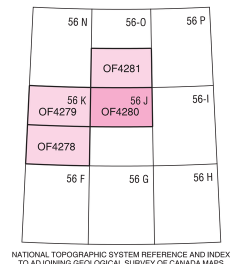
Any revisions or additional geological information known to the user would be welcomed by the Geological Survey of Canada

Digital base at the scale of 1:250 000 from data compiled by Geomatics Canada, modified by ESS Info

Due to the differences between the geological mapping scale and the available digital topographic scale, some inconsistencies between geological units and topographic features may be observed. The geological units should be considered accurately georeferenced.

Proximity to the North Magnetic Pole causes the magnetic compass to be erratic in this area. Mean magnetic declination 2004, 14°50'W, decreasing 11.6' annually. Readings vary from 12°19'W in the SW corner to 17°21'W in the NE corner of the map

Elevations in metres above mean sea level



NATIONAL TOPOGRAPHIC SYSTEM REFERENCE AND INDEX TO ADJOINING GEOLOGICAL SURVEY OF CANADA MAPS

OPEN FILE / DOSSIER PUBLIC
4280
GEOLOGICAL SURVEY OF CANADA / COMMISSION GÉOLOGIQUE DU CANADA
2004

Open files are products that have not gone through the GSC formal publication process.

Les dossiers publics sont des produits qui n'ont pas été soumis au processus officiel de publication de la CGC.

Recommended citation:
Utting, D.J.
2004: Surficial geology, Walker Lake, Nunavut; Geological Survey of Canada, Open File 4280, scale 1:100 000.

Canada