Canada

DESCRIPTIVE NOTES

PHYSIOGRAPHY

The map area is dominated by the valley of the south-flowing North McQuesten River. Highlands in the north part of the map area represent the southern fringe of the Ogilvie Mountains. Mountains reach 6200 feet elevation in the northwest, and glacial cirques are found on many slopes. South of the highlands and on the east side of North McQuesten River are plateaus averaging 5000 feet elevation that are part of the Yukon Plateau. The major confluence of the North McQuesten River, Sluice Creek, Eagle Creek, and the East McQuesten River valleys forms a broad and poorly drained lowland in the east-central part of the map area.

GLACIAL HISTORY

In central Yukon the Quaternary period was characterized by multiple glacial and interglacial periods. The build-up of ice in Yukon consisted of glaciers originating from the Ogilvie, Wernecke, Selwyn, Pelly, Cassair and St. Elias mountains. Ice from these centers flowed toward the central Yukon Plateau region. This map area was glaciated by ice from the Ogilvie and Wernecke mountains. From oldest to youngest the main glacial episodes are the pre-Reid, Reid and McConnell glaciations.

The pre-Reid episode includes undifferentiated glaciations that occurred approximately between 2.5 Ma and 400,000 years ago (400 Ka). Landforms resulting from these glaciations have been eroded or modified by subsequent glaciations and are difficult to identify. The only pre-Reid glacial evidence are erratics noted at 4100 feet south of upper Ballard Creek and the u-shaped valley pass separating Larsen Creek from the North McQuesten River valley. Pre-Reid cirques were identified on south-facing slopes at 4500 feet in the Ogilvie Mountains north of Larsen Creek.

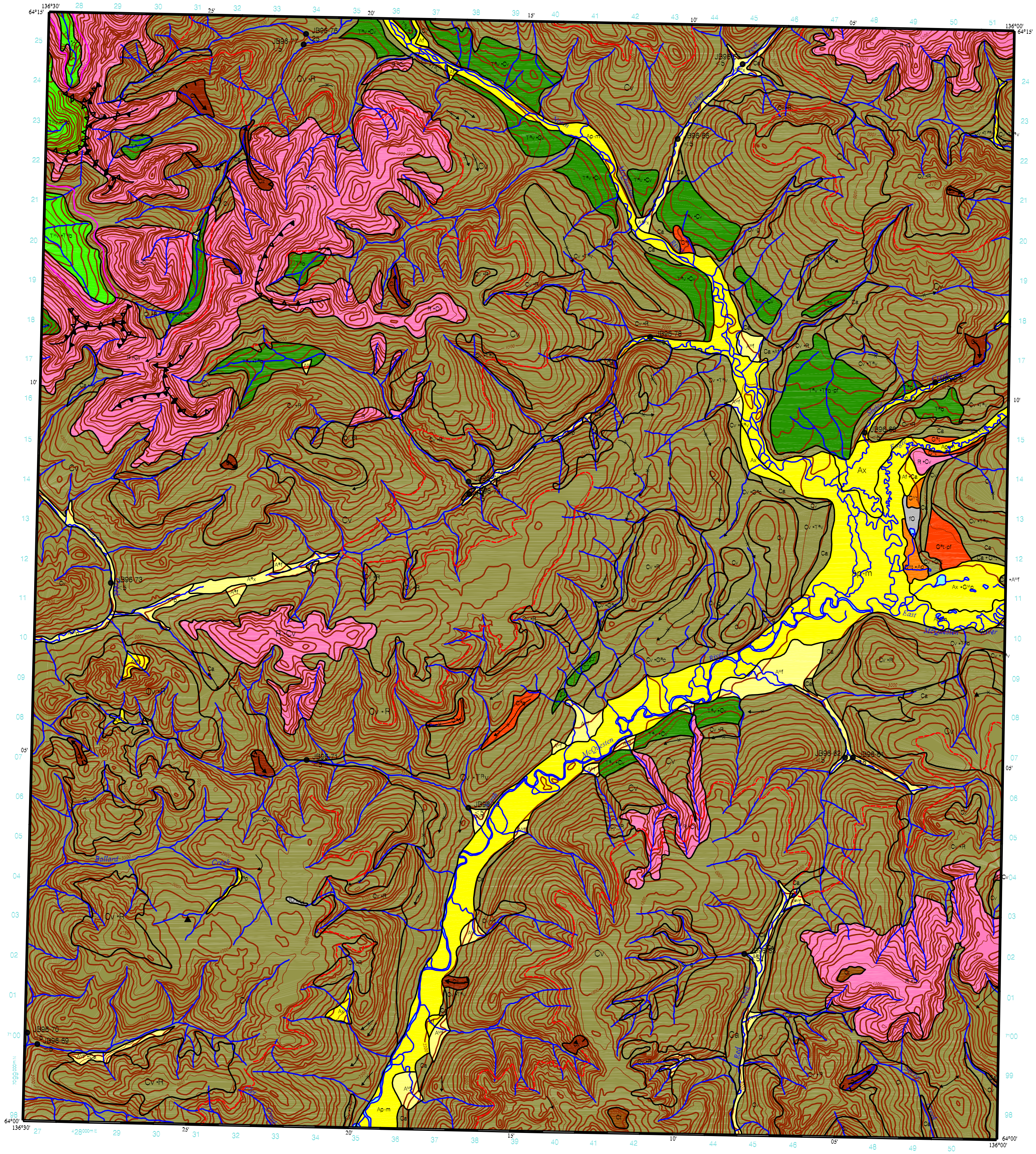
The Reid glaciation occurred at least 200,000 years ago (Berger, 1994) and presumably followed similar flow-lines to pre-Reid glaciations, but was at least 1000 feet thinner. Reid glacial landforms are better preserved than pre-Reid glacial landforms, which allows the Reid limit to be approximated throughout the major river valleys. Reid ice advanced into the map area from the east via Eagle Creek and the East McQuesten River. Ice in the North McQuesten River flowed south. At the northern border of the map area glaciers reached a maximum elevation of 4300 feet. The elevation of the ice at the south border was around 3800 feet. Ice also impinged into the headwaters of Red Creek from the confluence area of the North McQuesten and East McQuesten rivers.

The McConnell glaciation began around 29.6 Ka according to a 14C date (AMS)from detrital organics below McConnell till near Mayo (Matthews et. al., 1990). The glacial maximum is estimated to have been between 17 and 20 Ka in central Yukon (Bond, 1997). McConnell ice in the map area was limited to small alpine glaciers that developed in the Ogilvie Mountains, northwest of the North McQuesten River. Landforms of this age are easily recognized throughout central Yukon and in the map area.

PLACER POTENTIAL

There are currently no placer producing creeks in the North McQuesten map area and no old workings were observed. Bulldozer trails, presumeably for placer testing, extend up Red Creek and Fisher Creek.

The placer potential of North McQuesten map area is limited to Red Creek valley in the southeast corner. The upper part of Red Creek flows southward, and turns sharply west for about 10km before entering the North McQuesten River in the Seattle Creek map area. The lower east-to-west portion of the drainage parallels regional glacial flow patterns and was actively glaciated during the Reid glaciation. Thick outwash deposits were observed along this portion of the stream. The upper part of Red Creek, however, may have placer potential. Gold-bearing bedrock is present (Minfile # 115P026) and the orientation of the drainage is transverse to the main glacial flow, which would limit ice scouring. Ferricretes (iron-cemented gravel) were observed adjacent to the floodplain, which suggests a lengthy reworking period and no recent dilution of the stream by glacial melt-waters. Red Creek can be reached via the South McQuesten road as far as upper Goodman Creek where the road deteriorates to an ATV track before the divide into Red Creek drainage. Much of Red Creek lies within Nacho N'yak Dun settlement lands.



QUATERNARY

HOLOCENE

ORGANIC DEPOSITS: peat and woody material; occurring as a flat to gently sloping plain or as a blanket; overlie lacustrine, moraine, or poorly drained glaciofluvial deposits but rarely form a dominant geologic unit. Most common at the junction of the East McQuesten and North McQuesten rivers. Permafrost is commonly present within 1 m of surface.

fO	fenland- consisting of woody sedge peat, variable thickness.

ALLUVIAL DEPOSITS: sand and gravel with minor silt and cobbles deposited in modern drainages. Common in the East McQuesten River, North McQuesten River, Eagle Creek and Fisher Creek.

Ap At Af Ax	Ap, At- alluvial plain and terraces; coarse sand and gravel with minor silt and fine sand occurring as bars, overbank floodplain and low terrace sediments, 0-10m thick; floodplain deposits subject to periodic floods. Small valley alluvial plains may not be mapped at this scale. Af- alluvial fan; coarse sand, gravel, cobbles, and mudflow deposits, up to or >10m thick. Appear as vegetated, often peat covered, landforms developed during post-glacial sedimentation. Ax- complexes of Ap, At, and Af undivided.

PLEISTOCENE AND HOLOCENE (UNDIVIDED)

COLLUVIAL DEPOSITS: diamicton, gravel, shattered bedrock, and lenses of sand and silt derived from bedrock and surficial materials by a variety of physical and chemical weathering processes. Transport of dislodged debris occurs as surface creep, sheetwash, or by mass wasting processes. Common on all slopes in the map area.

Cv Ca	Cv- colluvium veneer that conforms to bedrock topography, <1 m thick. Ca- colluvium apron that conforms to bedrock topography, >1 m thick; located at the break in slope between the valley side and valley floor.

LATE PLEISTOCENE (WISCONSINAN) - McCONNELL GLACIATION

ALLUVIAL DEPOSITS: angular gravel with sand, organic silts, and minor cobbles deposited from streams that are outside the McConnell glacial limit. Slope and stream sedimentation is enhanced by the increase in precipitation, frost weathering , and lack of vegetation in the unglaciated terrain during glacial periods.

$A^{M}f$	$A^{M}f$ - alluvial fan; coarse sand lenses, gravel, cobbles, and mudflow deposits of resedimented Reid or local colluvial deposits, 1-40 m thick. Common beyond the McConnell limit where a narrow valley enters a larger valley.

GLACIOFLUVIAL DEPOSITS: stratified to massive; poorly to well sorted; gravel and sand with minor silt and cobbles; deposited by meltwater originating from glacial ice; locally with a veneer of aeolian silt (loess). Identified at the confluence of Eagle Creek and the East McQuesten River. Throughout most of the map area McConnell outwash has been reworked by modern streams.

$G^{M}t$	$G^{M}t$ - glaciofluvial terrace, >5-10 m thick.

GLACIAL DEPOSITS (till)- unsorted clay, silt, sand, and gravel with minor boulders; deposited by or from glacier ice and occurs as subdued veneer and blanket deposits. Common on north-facing slopes in the Ogilvie Mountains where alpine glaciers developed.

$T^{M}v$ $T^{M}b$	$T^{M}v$ - till veneer that conforms to underlying topography, 0-1 m thick; $T^{M}b$ - till blanket, gently to moderately-sloping plain controlled by bedrock, or underlying surficial deposits, >1 m thick.

MIDDLE PLEISTOCENE - PRE-McCONNELL GLACIATION (UNDIVIDED)

ALLUVIAL DEPOSITS: angular-rounded gravel and cobbles deposited by streams outside the McConnell glacial limit. May include several cycles of alluvial sedimentation that pre-dates the McConnell glaciation and minor sediment input from McConnell periglacial alluvium. Commonly contain placer gold in favourable bedrock settings.

$A^{pM}p$ $A^{pM}f$ $A^{pM}x$	$A^{pM}p$ - alluvial plain; stratified coarse sand and gravel with minor silt and fine sand occurring as bars and overbank floodplain, 0-10 m thick; typically occur as buried deposits under recent McConnell alluvium. $A^{pM}f$ - alluvial fan, coarse sand lenses, angular gravel, cobbles, and mudflow deposits of resedimented Reid or local colluvial deposits, 1-40 m thick. $A^{pM}x$ - alluvial complex of $A^{pM}p$ and $A^{pM}t$ buried under $A^{pM}f$ deposits from possibly many climatic cycles, 1-30 m thick. Common in Fisher snd Red Creeks.

MIDDLE PLEISTOCENE - REID GLACIATION

ALLUVIAL DEPOSITS: angular-rounded gravel with minor silt and cobbles, with minor cobbles deposited by streams that are outside the Reid glacial limit. Slope and stream sedimentation is enhanced by the increase in precipitation, frost weathering, and lack of vegetation in unglaciated terrain during the glacial periods. May be overlain with minor deposits from climatic cycles post-dating the Reid glaciation.

$A^{R}p$ $A^{R}f$	$A^{R}p$ - alluvial plain; stratified coarse sand and gravel with minor silt and fine sand occurring as bars and overbank floodplain sediments, 0-10 m thick; typically occur as buried deposits under post-Reid alluvium. $A^{R}f$ - alluvial fan; angular gravel and cobbles with coarse sand lenses and mudflow deposits of resedimented pre-Reid or local colluvial deposits, 1-40 m thick. Common west of the Reid limit.

GLACIOFLUVIAL DEPOSITS: stratified to massive; poorly to well sorted; gravel and sand with minor silt and cobbles; deposited by meltwater originating from glacial ice; locally with a veneer of aeolian silt (loess). Sporadic at the confluence of the East McQuesten and North McQuesten rivers.

$G^{R}t$ $G^{R}x$ $G^{R}c$	$G^{R}t$ - glaciofluvial terrace up to 60 m above modern drainages and <20m thick; $G^{R}x$- glaciofluvial complex, includes glaciofluvial deposition and minor deposition associated with ice contact environments such as buried ice, resedimented till, and glaciolacustrine (clay) sediments. $G^{R}c$ -glaciofluvial channel deposit; includes glaciofluvial deposition associated with lateral meltwater channels.

GLACIAL DEPOSITS (till): unsorted clay, silt, sand, gravel, and cobbles, with minor boulders; deposited by or from glacier ice and occurs as subdued veneer and blanket deposits. Common along the lower slopes marginal to the North McQuesten River and from glaciers that developed in the northwest part of the map.

$T^{R}v$ $T^{R}b$	$T^{R}v$ - till veneer that conforms to underlying topography, <1m thick; $T^{R}b$ - till blanket, gently to moderately sloping plain controlled by bedrock or underlying surficial deposits >1 m thick.

EARLY PLEISTOCENE-PRE-REID GLACIATIONS AND INTERGLACIATIONS

ALLUVIAL DEPOSITS: angular-rounded gravel with minor cobbles, moderate-well sorted, deposited by streams beyond the limit of Reid till or meltwater. May include several cycles of alluvial sedimentation that pre-dates the Reid glacation and minor sediment input from post-pre-Reid alluvium. Commonly contain placer gold in favourable bedrock settings.

$A^{pR}p$ $A^{pR}x$	$A^{pR}p$ -alluvial plain; stratified coarse sand and gravel with minor silt and fine sand occurring as bars and overbank floodplain sediments, 0-10 m thick; typically occurs as a buried deposit under more recent alluvium. Identified in the uplands south of Ballard Creek. $A^{pR}x$ - alluvial complex of fan sediments intermixing with an alluvial plain. Identified in small drainages south of Larsen Creek.

GLACIAL DEPOSITS (till): unsorted clay, silt, sand, gravel, cobbles, and minor boulders (oxidized); deposited by or from glacier ice and occurs as subdued veneer and blanket deposits.

$T^{PR}v$	$T^{PR}v$ -Till veneer that conforms to underlying topography, <1 m thick.

PLEISTOCENE UNDIVIDED

COLLUVIAL DEPOSITS: landslides and cryoplanation terraces. Diamicton and rubble derived from bedrock and surficial materials by a variety of colluvial and sheetwash processes.

Cz	Cz- mass wasting includes slumping, debris slides, and rockfalls. Sporadic rockfalls and slumping throughout the map area. Rockfalls are common in the northwest section of the map.
Ct	Ct- rubble and/or diamicton occurring as stepped or fan shaped deposits. Formed through nivation processes on bedrock at/near mountain summits. Found near Red Creek.

PRE-PLIO-PLEISTOCENE

BEDROCK: the map area is dominated by Proterozoic - lower Cambrian Hyland Group rocks (Murphy and Heon, 1995). In Seattle Creek map area (115 P/16), to the south, Hyland Group is divided into two formations: the Yusezyu and the Narchilla (Murphy and Héon, 1994). The older Yusezyu formation comprises predominantly phyllite, metasiltstone, medium to course grained metasandstone, metaconglomerate, and sandy marble, whereas the Narchilla formation includes quartzofeldspathic sandstone, maroon and green argillite, and grey, weathered, marble (Green, 1971; Murphy and Héon, 1995). The northern limit of Hyland Group, the Robert Service Thrust, is parallel to the north edge of the map area.

R	R- bedrock, primarily prominant ridges, escarpments, and mountain summits.

The surficial geology unit(s) are shown first followed by the terrain hazard indicator(s). Combined surficial geology units are used where for reasons of scale, two or more deposits cannot be delineated individually. The dominant unit (>50 percent) is shown first and the subordinate units (<50 percent) are shown second and third. A dot seperates the surficial units and a dash separates the terrain hazard unit from the surficial geology.

The age of deposits are designated by the following superscripts: McConnell Glaciation, e.g. $T^{M}v$; Reid Glaciation, e.g. $A^{R}f$, Pre-Reid Glaciation, e.g. $A^{pR}x$.

SYMBOLS

Geological contact..

Glacial limit of McConnell Glaciation
(defined, approximate)..

Glacial limit of Reid Glaciation
(defined, approximate)..

Cirque (McConnell, Reid, Pre-Reid).. ⊃ ⊃ ⊃

Glacial erratic (McConnell, Reid, Pre-Reid).. △ △ ▲

Moraine ridge...

Esker...

Glacial meltwater channel..

Aligned landform...

Stream sediment (-80 mesh) gold assay (ppb)... ● JB96-57
34

TERRAIN HAZARDS

Mass Movement

- slow to moderate failure (ie. creep or slump).
- moderate to extreme failure (ie. slides and avalanches).

Arctic, Alpine, and Periglacial Processes:

Pf - permafrost within 1 m of surface.
K - thermokarst
S - Solifluction
Ⓐ- Pingo

Fluvial Processes

B - braided; multiple unstable channels, prone to rapid changes (flooding)
A - anastomosing; multiple stable channels, gradual changes in channel/bar morphology.
M - meandering; 1-2 channels, gradual channel changes caused by meander migration (scrolled).

Erosional Processes:

P - piping; subsurface channel erosion.
G - gullying; areas of rapid surface erosion.

REFERENCES

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RECOMMENDED CITATION

BOND, J.D., 1998. Surficial geology of North McQuesten River, Central Yukon, NTS 116 A/1. Exploration and Geological Services Division, Indian and Northern Affairs, Canada, Geoscience Map 1998-5, 1:50,000-scale map.

Digital cartography and drafting by Will van Randen, Yukon Geology Program.

Any revisions or additional geological information known to the user would be welcomed by the Yukon Geology Program.

Copies of this map, the accompanying report and Yukon Minfile may be purchased from Geoscience Information and Sales, Exploration and Geological Services Division, Indian and Northern Affairs Canada, Room 102-300 Main St. Whitehorse, Yukon Y1A 2B5 Ph. 867-667-3264 Fax 867-667-3267.

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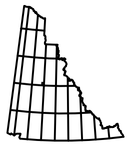
This map was released May, 1998, subsequent revision dates are:



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ONE THOUSAND METRE
Universal Transverse Mercator Grid
ZONE 8

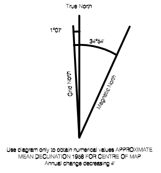
NORTH McQUESTEN RIVER

YUKON TERRITORY
SCALE 1:50 000

Miles 1 0 1 2 3 Milles

Metres 1000 0 1000 2000 3000 4000 Mètres

CONTOUR INTERVAL 100 FEET Elevations in Feet above Mean Sea Level North American Datum 1983 Transverse Mercator Projection



Use diagram only to obtain numerical values APPROXIMATE MEAN DECLINATION 1958 FOR CENTRE OF MAP
Annual change decreasing 4'

116 A/7 Davidson Pass	116 A/8 Worm Lake	106 D/5 Elliot Lake
116 A/2 Larsen Creek	116 A/1 THIS MAP	106 D/4 Bond Geoscience Map 1998-6
115 P/15 Bond Geoscience Map 1998-1	115 P/16 Bond Geoscience Map 1998-2	105 M/13 Bond Geoscience Map 1998-3

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Yukon Region

Geoscience Map 1998-5 (G)

SURFICIAL GEOLOGY OF NORTH McQUESTEN RIVER CENTRAL YUKON (116 A/1)

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