Canada

Yukon Geology Program

Yukon Government

DESCRIPTIVE NOTES

PHYSIOGRAPHY

The map area is dominated by three southwest trending valleys; Eagle Creek, East McQuesten River and Lynx Creek. Eagle Creek empties Steamboat Lake and drains westward parallel to the southern fringe of the Ogilvie Mountains. The highest summit in the map area is Steamboat Mountain at 6000 feet. Eagle Ridge separates Eagle Creek from the East McQuesten River. The East McQuesten River originates northeast of the map area, and unlike Eagle Creek, maintains its broad valley character until its confluence with the North McQuesten River to the west. South of the East McQuesten River is a series of plateaus that surround the upper Haggart Creek drainage; these are Haggart Dome, Lynx Dome and Potato Hills. Lynx Creek valley lies south of Potato Hills. Haggart, Christie and Lime creeks are the only major north-south trending valleys in the map area.

GLACIAL HISTORY

In central Yukon, the Quaternary period is characterized by multiple glaciations and interglaciations. The build-up of Cordilleran ice in Yukon consisted of glaciers originating from accumulation zones in the Ogilvie, Wernecke, Selwyn, Pelly, Cassiar and St. Elias mountains. Ice from these centers combined and flowed toward the central Yukon plateau region. The Dublin Gulch map area was glaciated by ice originating in 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 represents multiple undifferentiated glaciations that occurred approximately between 2.5 million and 400,000 years ago. Landforms from these glaciations have been subsequently eroded and are difficult to identify. In the map area evidence of pre-Reid Cordilleran ice is limited to scattered erratics above the Reid glacial limit and to rare deposits exposed in section below Reid glacial sediments. Because the data is fragmentary, the pre-Reid limit was not mapped. Pre-Reid diorite erratics were found at 4500 feet elevation on Steamboat Mountain and 4900 feet on Haggart Dome. A possible pre-Reid glacial till was noted on Potato Hills above Bawn Bay Gulch between 4500 and 4600 feet elevation. Pre-Reid erratics were also noted up to 4800 feet on Potato Hills. All of the major valleys were glaciated by pre-Reid ice in the map area.

The Reid glaciation occurred at least 200,000 years ago (Berger, 1994) and presumably followed similar flow-lines to the pre-Reid glaciations, but was less extensive. Reid glacial landforms are moderately preserved, enabling the glacial limit to be approximately delineated by air photo interpretation. Reid Cordilleran ice advanced into the map area from the northeast corner and attained a maximum elevation of approximately 4400 feet a.s.l. The ice split into two valley lobes, one of which advanced into Eagle Creek valley and the other flowed down the East McQuesten River valley. South flowing ice from the McQuesten Lake/South McQuesten River area crossed a divide into the East McQuesten River at Lime Creek to join the East McQuesten lobe. Ice from the South McQuesten valley also glaciated the valleys of Lynx Creek and Skate Creek and followed the Haggart Creek drainage. Ice reached elevations of at least 3600 feet on the south side of Potato Hills, 3500 feet at Stuttle Gulch and 3300 feet at the divide between Ironrust Creek and Christie Creek, as shown by the highest position of erratics. Although most of upper Haggart Creek drainage was occupied by the Reid ice, the effect of the ice on the valley was likely more of deposition than erosion, particularly in places that have been placer mined. The transverse orientation of Haggart Creek to regional ice-flow probably limited glacial scour and resulted in concentration of gold placers that were subsequently buried beneath a drape of till and outwash. This preservation was enhanced by Haggart Dome, Lynx Dome and Potato Hills which provided a topographic shield against the ice that converged at the headwaters of Haggart Creek and Dublin Gulch.

Cordilleran ice from the McConnell glaciation is estimated to have advanced into the map area between 17,000 and 20,000 years ago (Bond, 1997). McConnell landforms and the glacial limit are easily recognized in the map area. The McConnell Cordilleran ice, which affected the map area originated to the northeast in the Ogilvie Mountains. Ice advanced down the East McQuesten River, split into the Eagle Creek valley, and terminated near the mouth of Lime Creek. East McQuesten River ice that entered Eagle Creek valley terminated at Steamboat Lake. Flights of former ice marginal channels near the terminus of each lobe suggest that the glaciers stagnated in place. This is supported by hummocky moraine in the valley bottoms and the lack of recessional (retreatal) moraines. The hummocky moraine in Eagle Creek valley also impounded local drainages, which led to the creation of Steamboat and Eagle lakes. The South McQuesten ice lobe entered the map area at the head of Lynx and Lime creeks. Ice flowed north into Lime Creek, terminating above the limit of ice in the East McQuesten River valley. South McQuesten ice continued southwest into Lynx Creek and terminated approximately 2 km upstream from the confluence of Lynx and Skate creeks.

PLACER POTENTIAL

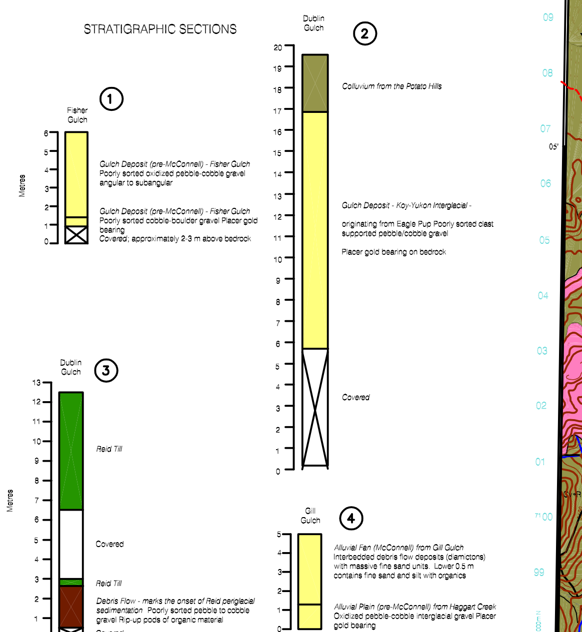
The physiography and proximity to Cretaceous intrusives appears to be the first order influence on the placer potential of Dublin Gulch map area. The second order is the orientation of drainages with respect to ice movement. Valleys aligned parallel to regional ice-flow are broad and contain thick glacial deposits, whereas the traditional Dublin Gulch placer area is ideally located in a valley transverse to the Cordilleran ice-flow and proximal to the Potato Hills granite stock. Placer potential also exists in the Lynx Creek drainage, which is also proximal to Potato Hills. The limiting factor for Lynx Creek would appear to be its orientation parallel to glacial flow. The valley is wide and depth to bedrock is likely very deep. Our sample yielded 20 ppb gold from surface alluvium hinting at a gold source amenable to large-scale bulk mining. Higher gold concentrations may be found at the base of the valley fill where pre-Reid interglacial and glacial sedimentation may have concentrated gold and other heavy minerals on bedrock.

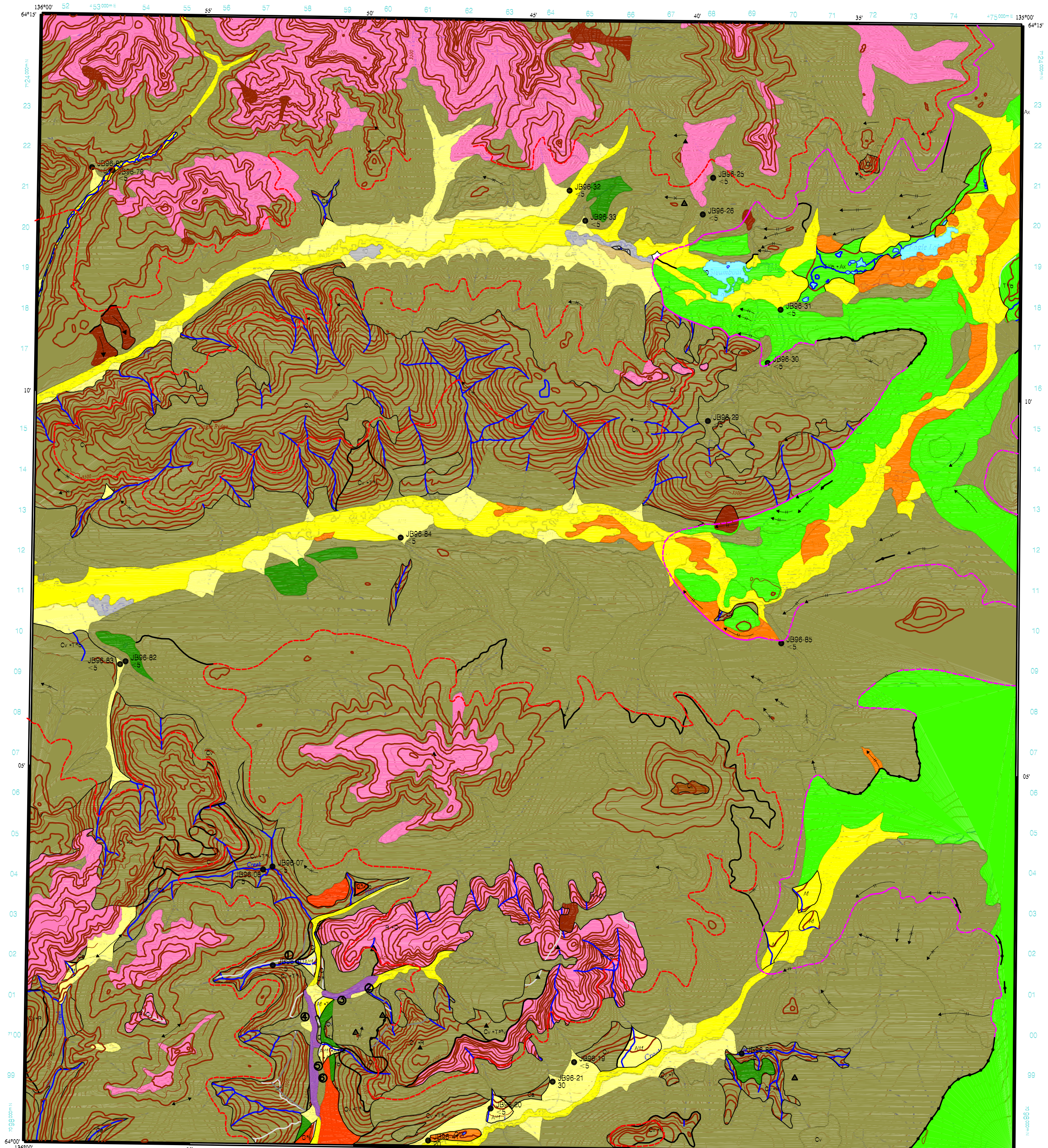
The main placer creeks are Haggart Creek, Dublin Gulch, Fisher Gulch and Gill Gulch. In Haggart Creek, gold has been placer mined from the modern alluvial plain, and from alluvial plains and terraces buried under alluvial fans. On Dublin Gulch gold was placer mined from the modern alluvial plain and gulch gravel. Fisher Gulch contains gulch placer gold. The placer deposit presently being mined at Gill Gulch is a Haggart Creek alluvial terrace buried beneath the Gill Gulch alluvial fan.

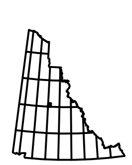
Accessible placers may exist in some of the tributaries of Lynx Creek. Several small streams drain south from Potato Hills into Lynx Creek; each of these (the largest being Ray Gulch), has a large alluvial fan which developed after the Reid glaciation and periglacially during the McConnell glaciation. The combination of vein mineralization in Potato Hills (Yukon Minfile 106D-27) and moderate stream geochemical results (30 ppb gold from a dry creek immediately west of Ray Gulch), support the possibility of a gold source and potential for placer gold. The gulches are small, however they are larger than tributaries to Dublin Gulch on the opposite side of Potato Hills, which have been successfully mined in the past.

Skate Creek is a tributary to Lynx Creek on the south side of the valley, 3 km upstream from Ray Gulch. Gold mineralization is reported from the Len Claims immediately south of the creek and this area is probably the bedrock source for placer gold in Skate Creek. The lower end of the creek is confined to a canyon containing considerable colluvium, which will hamper exploration. A north-flowing tributary approximately 1 km upstream from the mouth of Skate Creek may be the most prospective part of the drainage.

STRATIGRAPHIC SECTIONS







Topographic base produced by SURVEYS AND MAPPING BRANCH, DEPARTMENT OF ENERGY, MINES AND RESOURCES.

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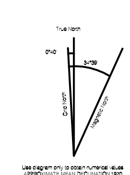
ONE THOUSAND METRE
Universal Transverse Mercator Grid
ZONE 8

DUBLIN GULCH
YUKON TERRITORY
SCALE 1:50 000

Miles 1 0 1 2 3 Miles

Metres 1000 0 1000 2000 3000 4000 Metres

CONTOUR INTERVAL 100 FEET Elevations in Feet above Mean Sea Level North American Datum 1927 Transverse Mercator Projection



Use diagram only to obtain numerical values APPROXIMATE MEAN DECLINATION 1970 FOR CENTRE OF MAP Annual change decreasing 4.4'

116 A/8 Worm Lake	106 D/5 Elliot Lake	106 D/6
116 A/1 BOND Geoscience Map 1998-5	106 D/4 Dublin Gulch	106 D/3 McQuesten Lake
115 P/16 BOND Geoscience Map 1998-2	105 M/13 BOND Geoscience Map 1998-3	105 M/14 BOND Geoscience Map 1998-4

QUATERNARY

HOLOCENE

ANTHROPOGENIC DEPOSITS: Human-made landforms or structures. Rarely forms a dominant unit. The Haggart and Dublin placer mine tailings form the only mappable unit in the area.

MT — *PLACER MINE TAILINGS;* washed alluvial and glacial gravel; grit to boulder size, settling ponds contain clay, silt and fine sands.

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 in Eagle Creek valley near Steamboat and Eagle Lakes. 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 Eagle Creek valley, East McQuesten River and Lynx Creek valleys.

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 postglacial or periglacial 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.

AEOLIAN DEPOSITS: fine to medium-grained sand transported and deposited by wind-blown processes. Typically consists of glaciofluvial sands that were remobilized by katabatic (glacial) winds.

Ev — Ev- aeolian veneer <1 m thick.

LATE PLEISTOCENE (WISCONSINAN) - McCONNELL GLACIATION

ALLUVIAL DEPOSITS: angular gravel with sand, organic silts, and minor cobbles deposited from streams outside the McConnell 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). Common near Eagle Lake and in the East McQuesten River valley at the McConnell limit.

$G^{M}p$ $G^{M}t$ $G^{M}x$ $G^{M}c$ — $G^{M}p$ - glaciofluvial plain, 3-10 m thick; $G^{M}t$ - glaciofluvial terrace, >5-10 m thick. $G^{M}x$ - glaciofluvial complex includes glaciofluvial deposition and minor deposition associated with ice contact environments. Common near Eagle Lake. $G^{M}c$ - glaciofluvial channel deposit; includes glaciofluvial deposition associated with lateral melt-water channels. Common near Eagle and Steamboat Lakes.

GLACIAL DEPOSITS (till) - unsorted clay, silt, sand, and gravel with minor cobbles; deposited by or from glacier ice and occurs in a variety of different landforms (plains, hummocks, or rolling moraine surfaces). Common near the McConnell limit in Eagle Creek valley and the East McQuesten River valley.

$T^{M}v$ $T^{M}b$ $T^{M}x$ — $T^{M}v$ - till veneer that conforms to bedrock topography, 0-1 m thick; $T^{M}b$ - till blanket, gently to moderately sloping plain controlled by bedrock, >1 m thick. $T^{M}x$ - till complexes, hummocky or ridged till associated with ice contact sediments, 3-15 m thick. Also includes some veneer and blanket units, undifferentiated.

MIDDLE PLEISTOCENE - PRE-McCONNELL GLACIATION (UNDIVIDED)

ALLUVIAL DEPOSITS: stratified sand and gravel with minor silt and cobbles deposited by streams outside the McConnell 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 hard rock settings.

$A^{pM}p$ $A^{pM}t$ $A^{pM}x$ — $A^{pM}p$ $A^{pM}t$ - alluvial plain and terraces; stratified coarse sand and gravel with minor silt and fine sand occurring as bars, overbank floodplain and low terrace sediments, 0-15 m thick; typically occur as buried deposits under recent or McConnell alluvium. $A^{pM}x$ - alluvium complex of $A^{pM}p$ and/or $A^{pM}t$ buried under Af deposits from possibly many climatic cycles, 1-30 m thick. Common in the Haggart Creek area.

MIDDLE PLEISTOCENE - REID GLACIATION

ALLUVIAL DEPOSITS: angular gravel with sand, organic silts, and minor cobbles deposited from 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 the unglaciated terrain during the glacial periods. May be overlain with minor deposits from climatic cycles post-dating the Reid glaciation.

$A^{R}f$ $A^{R}x$ — $A^{R}f$ -alluvial fan; coarse sand lenses, gravel, cobbles, and mudflow deposits, 1-40 m thick. Identified at the divide between Ironrust and Secret Creeks. $A^{R}x$ - a complex of coalescing alluvial fans with alluvial plain sediments; may overlie pre-Reid interglacial deposits.

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). Present in Haggart Creek valley and at the mouth of Christie Creek.

$G^{R}t$ $G^{R}x$ — $G^{R}t$ - 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. Common along the margins of Haggart Creek.

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 in the East McQuesten valley, in Haggart Creek valley, and as a veneer near Skate Creek. Exposed on the left limits of Dublin Gulch.

$T^{R}v$ $T^{R}b$ — $T^{R}v$ - 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

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. A veneer/blanket deposit is present on the Potato Hills above Bawn Boy Gulch.

$T^{pR}v$ — $T^{pR}v$ - till veneer that conforms to underlying topography, <1m 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.

Ct — Ct- rubble and/or diamicton occurring as stepped or fan shaped deposits. Formed through nivation processes on bedrock at/near mountain summits. Found at the summit of Lynx Dome.

PRE-PLIO-PLEISTOCENE

BEDROCK: dominated by Hyland group rocks of the Selwyn Basin that include psammite, phyllite, carbonate, and meta-clastic rocks. The Robert Service Thrust, a Jura-Cretaceous thrust that has emplaced the Hyland Group over Mississippian Keno Hill quartzite, lies along the north part of the map area (Murphy and Heon, 1995) and re-enters the area immediately southeast of Lynx dome and extends south across Skate Creek (Green, 1971). Cretaceous quartz monzonite and granodiorite with minor granite and quartz diorite intrusions are exposed at Dublin Gulch and in the headwaters of Lynx Creek.

R — R- bedrock, primarily prominant ridges, escarpements, 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 glacial deposits are designated by the following superscripts: McConnell Glaciation, e.g. G^{Mt} ; Reid Glaciation, e.g. $G^{R}t$, Pre-Reid Glaciation, e.g. $T^{pR}v$.

SYMBOLS

Geological boundary

McConnell glacial limit (defined, approximate)

Reid glacial limit (defined, approximate)

Cirque (McConnell, Reid, Pre-Reid)

Glacial erratic (McConnell, Reid, Pre-Reid)

Moraine ridge

Esker

Glacial meltwater channel McConnell, Reid, Pre-Reid

Aligned landform

Stream sediment (-80 mesh) gold assay (ppB) — JB97-38 37

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.

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RECOMMENDED CITATION

BOND, J.D., 1997. Surficial geology of Dublin Gulch, Central Yukon, NTS 106 D/4. Exploration and Geological Services Division, Indian and Northern Affairs, Canada. Geoscience Map 1998-6 (G), 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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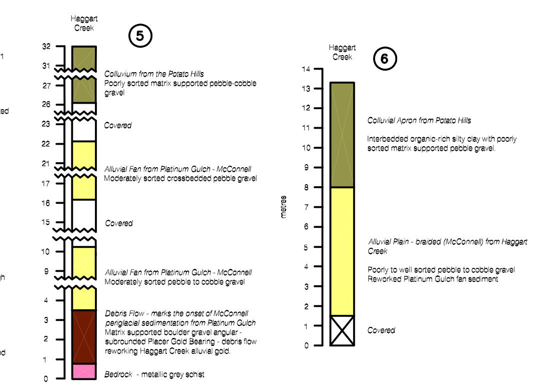
This map was released May, 1998, subsequent revision dates are:

STRATIGRAPHIC SECTIONS



Indian and Northern Affairs Canada
Exploration and Geological Services Division
Yukon Region

Geoscience Map 1998–6

SURFICIAL GEOLOGY OF DUBLIN GULCH CENTRAL YUKON (106 D/4)

by

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