

| NATURE OF MATERIAL AND ESTIMATED THICKNESS | GENETIC DESCRIPTION | MORPHOLOGIC EXPRESSION | COMMENTS | |
|--|---|---|--|---|
| O | peat and muck; 1 to 2 m thick | organic deposits | boggy areas within alluvial and colluvial flats | Occurrence of mappable units is restricted; unmapped local bogs or organic deposits associated with thermokarst depressions and valley or gully bottoms commonly harbour permafrost as does the mapped organic terrain |
| Eb | sand; 1 to 4 m thick | eolian sand | irregular surfaces of mostly stabilized sand dunes | Dunes, ridges, and blowouts are developed on outwash (Gt, Gp) within Yukon and Pelly river valleys |
| Ev | sand; less than 1 m thick | eolian sand | irregular surfaces of blowouts and low ridges | |
| Cz | reworked material mostly from bedrock or glaciolacustrine sediments; variable thicknesses | mass wasting processes, mainly landslides | irregular or hummocky surfaces along steep slopes; major landslides marked by series of arcuate ridges | Presently stabilized landslides occur in bedrock along the west side of Yukon River valley below Carmacks; re-activation may occur if lower slopes are disturbed |
| Cv | various materials up to 1 m thick | colluvium | surface reflects morphology of underlying material; commonly occurs on bedrock slopes in mountainous terrain | Colluvial cover becomes more extensive and thicker on surfaces in mountainous terrain progressively farther from the limit of McConnell Glaciation |
| Cl | various materials from 1 to 30 m thick | colluvium | | |
| Ap | gravel, sand, and silt; 5 to 20 m thick | alluvial valley bottom deposits | gently irregular to nearly flat surfaces that include mostly floodplains of modern streams; small features such as stream terraces and alluvial fans may be present; abandoned channels and point bars are the most prominent features on these surfaces | Most of the deposits are mapped as compound units in valleys where modern streams are incised in older alluvium (At) or glaciolacustrine deposits (Gt); rare occurrences of thermokarst (Ap-k) are mapped; aggregate source |
| At | gravel, sand, and silt; 5 to 20 m thick | alluvial terraces | gently irregular or nearly flat, low level terraces bordering alluvial plains | Most terraces were formed by modern stream activity; they are separated from older terraces of glaciolacustrine or glaciolacustrine origin (Gt) on the basis of their close association with modern streams and by the absence of pitted ice-contact features; aggregate source |
| Af | gravel, sand, and silt; 5 to 20 m thick | alluvial fans | gently irregular, channelled surface with marked slope towards valley bottom | Fans are common along the sides of steep-walled, glaciated valleys; most are small features and were not mapped; aggregate source |
| Ax | gravel, sand, and silt; 5 to 20 m thick | alluvial complex | composite (Ap, At, Af) applies | Discrete units of Ap, At, and Af may be identified but are not mappable at this scale |
| Lp | clay, silt, and sand; 1 to 3 m thick | glaciolacustrine deposits | nearly flat surfaces commonly broken by shallow thermokarst ponds and depressions | Glaciolacustrine deposits have limited distribution; permafrost occurs in flats between thermokarst ponds or depressions |
| Gp | gravel, sand, and silt; 5 to 20 m thick | outwash plains | gently irregular or nearly flat terrain marked by shallow channel patterns or locally pitted surfaces | Valley trains of the McConnell Glaciation are preserved as flats slightly above the floodplains of Yukon and Pelly rivers and their tributaries (Gp) or as terraces (Gt); scattered high terraces are interpreted as remnants of Reid-age outwash (G ^R) |
| Gt | silt, sand, and gravel; 5 to 50 m thick | terraces underlain by glaciolacustrine and/or glaciolacustrine deposits | nearly flat or irregular surfaces marked by channels and shallow depressions | |
| Gd | silt, sand, and gravel; 5 to 20 m thick | glaciolacustrine delta | gently irregular or nearly flat surfaces | A delta at about 900 m elevation along the south side of the broad valley of Rowlinson Creek suggests that a large proglacial lake formed when this valley was blocked by McConnell ice blockage of Crossing Creek formed a delta at about 760 m elevation |
| Gh | silt, sand, and gravel; 5 to 50 m thick | ice-contact glaciolacustrine and glaciolacustrine deposits | strongly irregular, pitted, ridged, or hummocky terrain with local relief to 30 m | Ice-contact deposits (Gh) and associated glaciolacustrine complexes (Gx) occur mainly within Yukon and Pelly valleys and major tributaries; most deposits occur as extensive complexes within Yukon River valley |
| Gx | gravel, sand, silt, and till; 1 to 20 m thick | meltwater channel and glaciolacustrine complexes | gently irregular or hummocky glaciolacustrine deposits along with minor patches of till and bedrock; surfaces are in part marked by braided channels | |
| Mb | till; silty to sandy matrix; 1 to 10 m thick | lodgment and ablation till | subdued mountainous terrain blanketed by mostly till | Morainic blankets of Reid and McConnell age till form much of the glaciated terrain outside the major valleys |
| Mv | till; silty to sandy matrix; bouldery; generally less than 1 m thick | ablation and lodgment till | subdued mountainous terrain with a discontinuous veneer of mostly till | Morainic veneer forms a discontinuous cover in mountainous terrain where it typically is associated with patches of bedrock rubble |
| Mx | till; silty to sandy matrix; 0 to 10 m thick | lodgment and ablation till | subdued mountainous terrain blanketed or veneered by mostly till | Morainic complexes were mapped where till thicknesses appear markedly variable |
| R | bedrock and bedrock rubble | bedrock outcrop and shattered bedrock | subdued mountainous terrain with little colluvial or drift cover | Rock rubble veneer is common on the slopes of the higher parts of mountainous terrain |

Explanation of Letter Notation

Map units are designated by combinations and arrangements of letters that indicate composition, genesis, morphology, age, and other modifiers. The basic component is a two letter combination of a compositional-genetic category identified by an upper case letter and a morphologic category identified by a lower case letter, e.g. Mb. Compound map units are used for areas of more than one component that could not be separated at the scale of mapping. Where one component is more dominant, they are separated by a diagonal line, e.g. Mb/Mv; two or more components of approximately the same distribution are separated by a comma, e.g. M,Cv. The age of deposits is indicated by an upper case superscript, e.g. M^R, M^R (older given first); where no superscript is given, the deposit dates from McConnell Glaciation. Other modifiers are shown by the addition of a dash and lower case letter to a component, e.g. Mb-g.

* The latest evidence from dates on volcanic ash suggests that deposits of Reid Glaciation are more than 30 000 years old (Tarnocai et al., 1983). The last glacial advance (McConnell) was of Late Wisconsinan age (Hughes et al., 1969).

Compositional-genetic category

- O - organic; peat and muck
- C - colluvial; various materials
- A - alluvial; gravel, sand, and silt
- L - glaciolacustrine; clay, silt, and sand
- G - glaciolacustrine; silt, sand, and gravel
- M - morainic; till
- R - bedrock; various types

Morphologic category

- p - plain, floodplain
- h - hummocky
- t - terraced
- r - ridged
- d - delta
- b - blanket
- v - veneer
- x - complex

Other modifiers

- c - channelled
- g - gullied
- k - thermokarst

Age

- R - Reid
- PR - Pre-Reid

References

Hughes, O.L., Campbell, R.B., Muller, J.E., and Wheeler, J.C.
 1969: Glacial limits and flow patterns, Yukon Territory, south of latitude 65 degrees north latitude; Geological Survey of Canada Paper 68-34.
 Tarnocai, C., Smith, S., and Hughes, O.L.
 1983: Soil development on Quaternary deposits of various ages in the central Yukon Territory; in Current Research, Part A, Geological Survey of Canada Paper 83-1A, p. 229-238.

SYMBOLS

- Geological boundary
- Drumlin, drumlinoid ridge, glacial fluting
- Moraine ridge
- Esker
- Meltwater channel (major, minor)
- Glacial limit
- McConnell Glaciation (position defined, approximate)
- Reid Glaciation (position defined, approximate)

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

Base map at the same scale published by the Surveys and Mapping Branch in 1971

Copies of the topographical edition of this map may be obtained from the Canada Map Office, Department of Energy, Mines and Resources, Ottawa, Ontario, K1A 0E9

Mean magnetic declination 1986, 30°25' East, decreasing 13.6' annually. Readings vary from 29°48' in the SW corner to 31°03' in the NE corner of the map

Elevations in feet above mean sea level

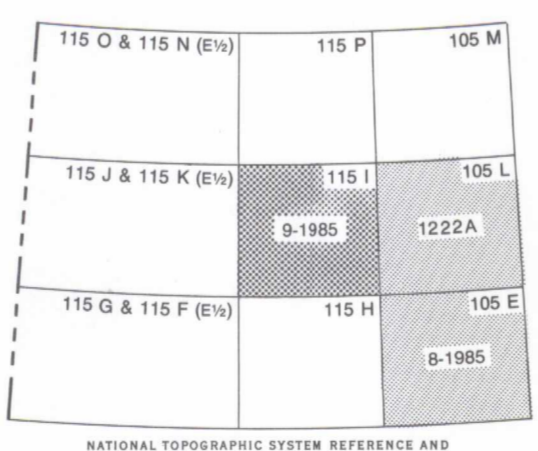
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MAP 9-1985
 SURFICIAL GEOLOGY
CARMACKS
 YUKON TERRITORY

Scale 1:250 000



Universal Transverse Mercator Projection
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Geology by R.W. Klassen and S.R. Morison, 1978-1979

Age assignment of deposits based on airphoto interpretation by A. Duk-Rodkin, 1984

Recommended citations:
 Klassen, R.W., Morison, S.R., and Duk-Rodkin, A.
 1987: Surficial geology, Carmacks, Yukon Territory; Geological Survey of Canada, Map 9-1985, scale 1:250 000.



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