| UNIT | NAME | MATERIAL | THICKNESS m | TOPOGRAPHY | DRAINAGE PATTERN | GROUND ICE | COMMENTS |
|---|---|---|---|---|---|---|---|
| fO | Organic fenland | Peat, typically woody sedge peat | 2-3 | Flat to very gently sloping, in part with reticulate network of low ridges (50 cm high). Slope 0-2° | No integrated drainage system; water at surface throughout summer months | Commonly unfrozen to 2+m. Little data available on segregated ice content at greater depths | Poor drainage, plus high compressibility and low strength of the material makes it unsuitable for any type of construction |
| pO<br>pO-k | Organic peatland | Peat, typically sedge and woody sedge overlain by sphagnum peat; commonly treeless or with scattered black spruce; lichens commonly constitute 50% or more of surface vegetation, resulting in high albedo. | 2-4 | Flat to very gently sloping, typically with numerous shallow steep-sided (2-3 m) depressions occupied by lakes, ponds, and bogs (pO-k) | Depressions interconnected by seepage channels; poorly drained | Commonly up to 20%, locally up to 60% segregated ice within peat; typically 30-100 cm, locally up to 3 m total thickness segregated ice in mineral soil immediately below peat. Peat in wet depressions commonly thawed to 1+ m | Subsidence of up to 1 m common and subsidence up to 3 m possible when vegetation is removed; alternation of permanently frozen peat plateaus and thawed depressions and water bodies presents serious problems in construction of roads, pipelines, etc.; material highly compressible when thawed |
| Ap | Alluvial plain | Medium to coarse sand or gravel of point bar deposits, overlain by silt and fine grained sand of overbank deposits | 3-5 | Floodplain and low bordering terraces, commonly with meander scars.<br>Slope 0-3°<br>Relief to 1 m | No integrated drainage system; impeded by meander scroll ridges where present | Permafrost lacking in unvegetated part of floodplain; elsewhere 10-25% segregated ice by volume as thin (1 mm-2 cm) seams. Cement ice only in coarse sand and gravel; ice wedges in polygonal pattern (diameter of polygons 6-25 m) common | Subject to periodic flooding; along secondary streams, silt and sand of overbank deposits may be underlain by gravel, but extraction of the gravel may produce serious deleterious changes in the stream course or downstream changes in stream regimen |
| Ap-k | Thermokarst alluvial plain | Fine grained sand and silt | 3-5 | Floodplain, in part with meander scars and numerous channels and thermokarst ponds.<br>Slope 0-3°<br>Relief to 5 m | Seepage to ponds and lakes then by connecting channels to trunk stream. Poorly to moderately well drained | 20 to 50% or more segregated ice by volume; ice wedges in polygonal pattern (diameter of polygons 6-25 m) common | Thermokarst processes active around pond margins; widespread occurrence of ice wedges which, upon removal of vegetation, will melt and produce a polygonal network of depressions. Occurs mainly adjacent to Mackenzie River |
| Af | Alluvial fans and fan aprons | Highly variable, mainly silt, sand, minor gravel; discontinuous layers of woody peat | 2-15 | Gently to moderately sloping fans and fan aprons.<br>Slope 1-6° | One or more shifting streams usually present; downslope seepage in poorly defined runnels | No data; ice content probably medium to high | Fans subject to sudden and damaging shifts of streams; generally unsuitable for construction |
| Ax | Alluvial complex; includes Ap, Af | As for Ap and Af | | As for Ap and Af | As for Ap and Af | As for Af and Ap | As for Ap and Af |
| Cb | Colluvial blanket | Rock detritus and surficial deposits transported by gravity | >3 | Blanket conforms to bedrock topography; occurs mainly at the base of valley walls and scarps.<br>Slope to 20° | Generally freely drained. No integrated drainage; generally moderately well drained | No data but because this unit generally overlies relatively impermeable rock; high ice contents likely, particularly in foot slope positions | Active transportation of material by rock falls, creeping, and slumping; active layer detachment slides common, especially following forest fire |
| Cv | Colluvial veneer | Rock detritus and surficial deposits transported by gravity | 0-2 | Veneer conforms to bedrock topography; occurs mainly along valley walls and scarps.<br>Slope to 30° | Generally freely drained. No integrated drainage; generally moderately well drained | No data but because this unit generally overlies relatively impermeable rock; high ice contents likely, particularly in foot slope positions | Active transportation of material by rock falls, creeping, and slumping; active layer detachment slides common, especially following forest fire |
| Ca | Sheetwash deposits | Mostly organic silt and sand | 1-2 | Occurs as veneer or blanket on gently sloping (5-10°) scarps and valley sides developed on glaciolacustrine sediments or soft bedrock | No integrated drainage; poorly to moderately well drained | No data; material suggests that moderate to high ice content likely | High organic content and possibility of high ice contents make this unit a poor candidate for construction |
| Cz | Slide, slump | Most commonly developed on shale bedrock and glaciolacustrine sediments | | Commonly stepped rotational slumps and retrogressive thaw flow slides | No integrated drainage; poorly to moderately well drained | No data but because of poor drainage, high ice contents likely | Poor drainage and possible high ice contents make this unit a poor candidate for construction |
| Cx | Slope complex (Cv, Cb, Ca, Cz, Af, undivided) | Deposits derived from entire range of surficial material plus bedrock detritus transported by gravity, sheetwash, and intermittent or permanent streams | 0-5 | Occurs as veneer or blanket on gently to steeply sloping scarps and valley sides.<br>Slope 1-30°<br>Relief to 90 m | No integrated drainage; poorly to moderately well drained | No data; ice content probably highly variable depending on texture and thickness of material forming the unit | Potential slope instability presents major problems for any kind of construction |
| Lp | Glaciolacustrine plain | Glaciolacustrine silt and clay, minor sand; discontinuous organic cover | 3-15 + | Flat to gently sloping. (0-5°)<br>Relief to 3 m | Surface seepage through fen-filled depressions. Poorly drained, except where overlain by sand | Commonly 10 to 25% segregated ice as thin (1 mm-2 cm) seams in upper 1-3 m; segregated ice as reticulate network to 50% by volume, or thick tabular bodies of nearly pure ice at greater depth. | Active layer detachment slides followed by development of retrogressive-thaw flow slides common on slopes developed on this unit, especially following fire or other disturbance of vegetation. Highly susceptible to gullying even on gentle slopes, following removal of vegetation |
| Lp-k | Glaciolacustrine thermokarst plain | Glaciolacustrine silt and clay, minor sand; discontinuous organic cover | 3-15 + | Flat to gently sloping, numerous thermokarst lakes and ponds.<br>Slope 0-5°<br>Relief to 6 m | Seepage centripetal to ponds, and lakes, intermittent seepage along fen-filled depressions between ponds and lakes. Poorly drained | Commonly 10 to 25% segregated ice as thin (1 mm-2 cm) seams in upper 1-3 m; segregated ice as reticulate network to 50% by volume, or thick tabular bodies of nearly pure ice at greater depth. | Thermokarst processes active around pond margin; active layer detachment slides, followed by development of retrogressive flow slides (Cz) common on slopes developed on this unit, especially following fire or other disturbance of vegetation |
| Lx | Glaciolacustrine complex | Sand and silt; may overlie glaciolacustrine silt and clay | 3-20 | Gently irregular topography.<br>Slope 0-5° | Generally moderately well drained | Low to medium ice content; higher ice content (as for Lp, Lp-k) in underlying glaciolacustrine silt and clay, if present | This unit marks the transition between lacustrine and glaciofluvial deposits. Offers restricted well drained sites at margins of larger areas of poorly drained Lp, Lp-k |
| Gp<br>Gt | Glaciofluvial plain<br>Glaciofluvial terrace | Sand, gravel locally with veneer of eolian silt or sand; silt and/or peat may occur as filling in channels | 3-30 | Flat to gently sloping. Commonly retain shallow braided channels.<br>Slope 0-2° | Drainage mainly subsurface, locally with seepage along channels. Well drained except for channels | Very low ice content, but when ice present consists of cement ice only | Offers good construction sites; major source of aggregate where the material is gravel rather than sand. Where the unit grades into unit Lx, the surface deposit is typically sand rather than gravel and may be underlain by ice-rich silt |
| Gh<br>Gr | Hummocky, ridged glaciofluvial deposits (include esker complexes) | Gravel, sand | 3-20 | Hummocks and ridges.<br>Slope 5-15°<br>Relief to 25 m | Drainage mainly subsurface. Hummocks and ridges well drained; intervening depressions may be poorly drained | Very low ice content, but when ice present consists of cement ice only | Major source of aggregate where the material is gravel rather than sand |
| Gx | Glaciofluvial complex (Gh, Gr, Gp, undivided) | Gravel, sand | 2-20 | Hummocky-kettled topography connected with short flat surfaces.<br>Slope 0-15°<br>Relief to 25 m | As for Gh, Gr, Gp | As for Gp, Gh, Gr | Major source of aggregate where the material is gravel rather than sand |
| Mp | Moraine plain | Glacial till, typically clay, silt, minor sand and gravel | 3-20 | Flat to gently sloping.<br>Slope 0-5° | Downslope seepage in shallow subparallel runnels. Generally poorly to moderately well drained | Commonly 10-25% segregated ice as thin (1 mm-2 cm) irregular discontinuous seams in upper 2-3 m. Thicker (10 cm-3 + m) ice lenses may occur at depth, but uncommon | Potential subsidence upon removal of vegetation typically less than 1 m. Possible high ice content in organic deposits within the unit. Because of drainage by numerous runnels, roads, or berms normal to slope direction, requires numerous culverts to avoid impoundment of surface water |
| Mb | Moraine blanket | Glacial till, typically clay, silt, minor sand and gravel | 3-6 | Gentle to steeper slopes.<br>Slope 5-15° | Downslope seepage in shallow subparallel runnels. Generally poorly to moderately well drained | Commonly 10-25% segregated ice as thin (1 mm-2 cm) irregular discontinuous seams in upper 2-3 m. Thicker (10 cm-3 + m) ice lenses may occur at depth, but uncommon | Potential subsidence on removal of vegetation typically less than 1 m; potential for creep of active layer. Because of drainage by numerous runnels, roads, and berms normal to slope direction, requires numerous culverts to avoid impoundment of surface water |
| Mv | Moraine veneer | Glacial till, typically clay, silt, minor sand and gravel | 0-3 | Gently to steeper sloping veneer conforms to the underlying bedrock topography.<br>Slope 8-15° | Downslope seepage in subparallel runnels; poorly to moderately well drained where subjacent bedrock is sandstone or limestone | Low ice content in till; subjacent bedrock typically free of visible ice | Where slopes are gentle this unit offers relatively good construction sites |
| Md | Drumlinoid till plain | Glacial till, typically clay, silt, minor sand and gravel | 3-30 | Moraine plain with individual drumlins, to fluted moraine plain.<br>Slope 2-15° | Parallel seepage or streams in fluted moraine, to trellis pattern or deranged in moraine plain with drumlins | Commonly 10-25% segregated ice as thin (1 mm-2 cm) irregular discontinuous seams in upper 2-3 m; thicker (10 cm-3 + m) ice lenses at depth. Subjacent bedrock typically free of visible ice | Crest of drumlins and drumlinoid ridges typically well drained, intervening depressions poorly drained; construction of roads, etc. easier parallel to rather than normal to orientation of drumlins |
| Mvd | Drumlinoid moraine veneer | Thin till over glacially eroded drumlinoid bedrock ridges | 1-3 | Moraine plain with individual drumlins, to fluted moraine plain.<br>Slope 2-15° | Drumlinoid ridges well drained; intervening depressions commonly poorly drained | Low ice content in till on drumlinoid ridges, higher in till of intervening ridges; subjacent bedrock typically free of visible ice | Crest of drumlins and drumlinoid ridges typically well drained, intervening depressions poorly drained; construction of roads, etc. easier parallel to rather than normal to orientation of drumlins |
| Mm | Rolling moraine | Glacial till, typically with 5-20% pebble size and larger in a silty clay or clayey silt matrix; locally includes small areas of gravel (tgMm) | up to 20 | Broad hummocks 10-20 m high.<br>Slope 0-10° | Drainage centripetal to local depressions. Elevated areas moderately well drained; intervening depressions generally poorly drained | Commonly 10-25% segregated ice as thin (1 mm-2 cm) irregular discontinuous seams in upper 2-3 m; irregularly shaped and irregularly distributed large masses of segregated ice common at greater depth | Summits of broad hummocks typically well drained; removal of vegetation may cause differential subsidence up to 3 m due to thawing of segregated ice masses. It is an extensive unit, covering about 50% of the map area |
| Mh | Hummocky moraine | Glacial till with 20-50% (locally 60%) pebble size in clayey silt to silty sand matrix; locally includes small areas of gravel (tgMh) | up to 20 | Individual or coalescent hummocks.<br>Slope 0-20° exceptionally 30°<br>Relief 15-50 m | Hummocks well drained; intervening depressions may be poorly drained | Few data; ice content probably low | Crests of prominent ridges are commonly well drained offering restricted good construction sites; ice content and potential for subsidence may be high in depressions |
| Mr | Ridged moraine | Glacial till with 20-50% (locally 60%) pebble size in clayey silt to silty sand matrix | | Individual and compound straight to sinuous ridges 15 to 60 m high<br>Slope 0-20°, exceptionally 30°<br>Relief to 60 m | Ridges well drained; intervening depressions may be poorly drained | Few data; ice content probably low | Crests of prominent hummocks are commonly well drained and offer restricted good construction sites |
| Mx | Moraine complex (Mh, Mr, Mm, undivided) | Glacial till as in Mh, Mr, Mm | up to 20 | As for Mh, Mr, Mm | As for Mh, Mr, Mm | As for Mh, Mr, Mm | As for Mh, Mr, Mm |
| R | Bedrock | Sandstone, siltstone, and shale | | Mainly prominent ridges, scarps, and hills developed on sandstone, siltstone, and shale | Generally freely drained but with some poorly drained depressions | No data | Bedrock within the map area comprises shale, siltstone, and minor limestone of Devonian Hare Indian Formation; limestone of Ramparts Formation; sandstone of Middle Devonian age; siliceous shale of Devonian Canol Formation; siltstone and sandstone of Devonian Imperial Formation; and sandstone and shale of Cretaceous age. Limestone of Ramparts Formation is suitable for rip-rap, and can be crushed for use as road-metal. Shale of Canol Formation can be crushed readily for use as road-metal but has proven to be injurious to rubber tires. Other bedrock of the area is mostly too soft for use as road-metal, but low ground ice content makes it valuable for common fill |