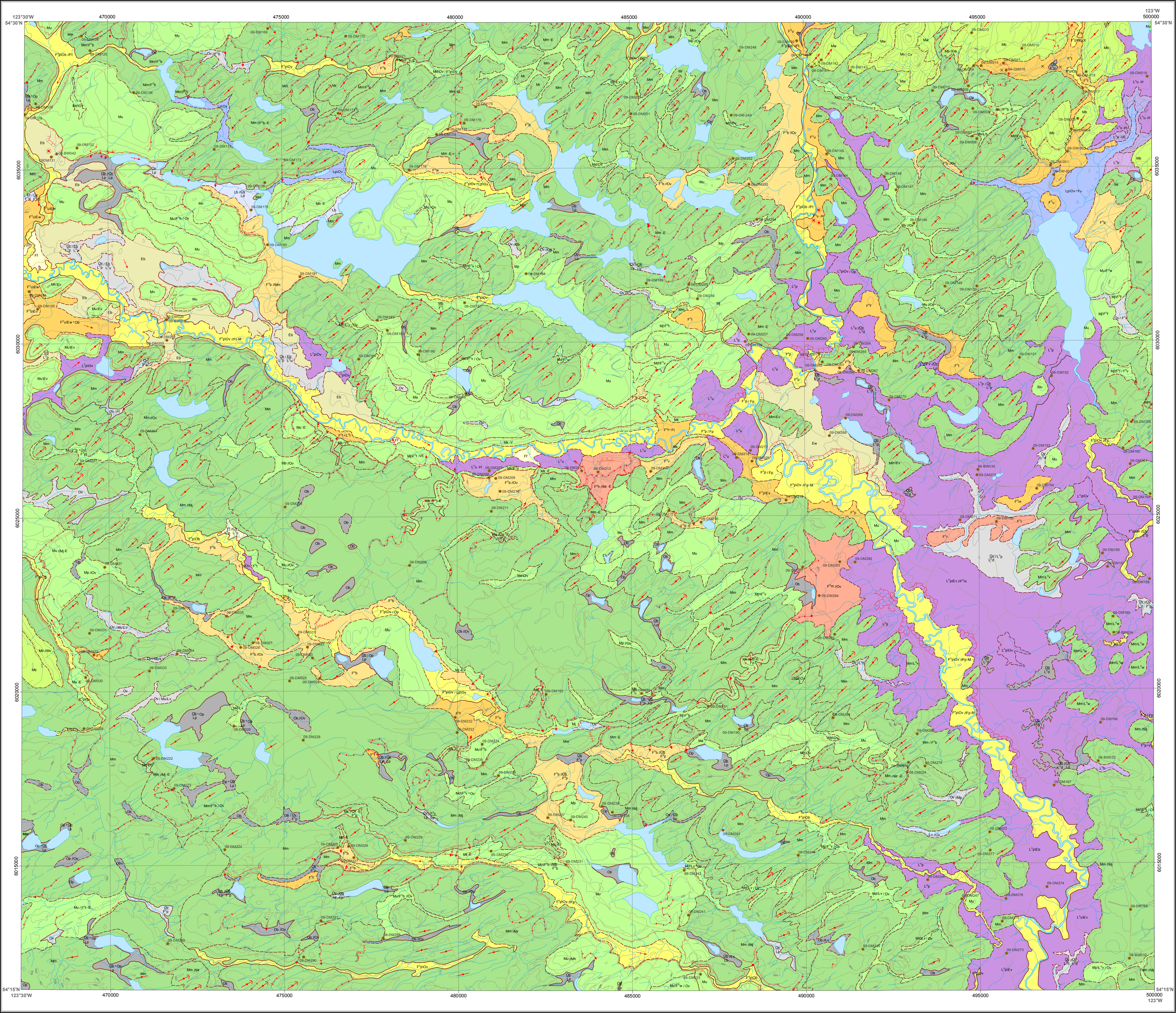
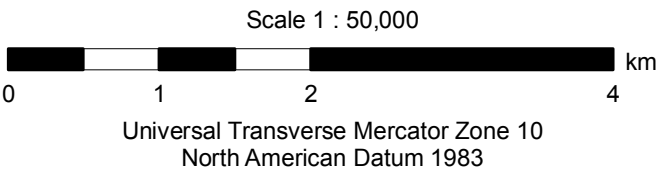




Terrain Map Bugle Lake (093J/06)

Map 2013-10-6

Maynard, D. E., Ward, B. C., Sacco, D. A., Geertsema, M.



This is a standardized legend for Geoscience BC Map 2013-10 series. Not all surficial geology units or terrain symbols appear on each map. For an explanation of the terrain unit labels, please refer to the Terrain Unit Symbol section below the map.

SURFICIAL GEOLOGY

HOLOCENE

O - ORGANIC DEPOSITS: Sediments composed largely of saturated organic materials, consisting mainly of the accumulated remains of mosses, sedges, or other hydrophytic vegetation. Polygon may include minor lacustrine sediments. Deposits are assumed to overlie till unless otherwise indicated.

O p, b	Thick organics: deposits in bogs, fens, and swamps that usually occur where shallow lakes have been infilled and in depressions along floodplains and abandoned meltwater channels. Surface expressions used are p, b.
O v, w	Organic mantle: deposits of variable thickness that commonly occur in shallow till depressions as well as at the edges of most waterways and within glaciolacustrine and bedrock hollows. Surface expressions used are v, w.

F and F⁺ - FLUVIAL DEPOSITS: Gravel and/or sand with minor silt transported and deposited by modern streams or rivers; typically stratified, moderately to well sorted, with rounded to well-rounded clasts. Deposits are assumed to overlie till unless otherwise indicated.

F⁺ p	Fluvial floodplain (F⁺): gravel, overlain in some places by sand and silt deposited during overbank flows; occurs near present day stream level and prone to flooding; may include minor areas of organic deposits, small tributary fans, and narrow terraces. Surface expression used is p.
F⁺ f	Fluvial fan (F⁺): stratified sand and gravel that may contain diamict beds and have formed at the outlets of confined drainage systems; assumed to be active, with surfaces prone to flooding and avulsion, but may contain some raised inactive areas. Surface expression used is f.
F p, t, u, w	Inactive fluvial deposits (F): stratified gravel, sand, and minor silt deposited during the Holocene occurring above present-day streams; mostly comprise thick fluvial sediment, post-depositional channeling may have modified some surfaces. Surface expressions used are p, t, u, w.

C - COLLUVIAL DEPOSITS: Materials deposited by direct, gravity-induced movement, ranging from slow (creep) to rapid (landslides); usually unsorted to poorly sorted, massive to crudely stratified, and clast-supported, but the composition depends on the type of source material and the depositional process.

C b, v, w	Colluvial mantle: variable thickness of material that conforms to the underlying topography; occurs commonly on topographic highs and steeper slopes. Monoclinic, angular clasts dominate where derived from bedrock, whereas a diamict derived from unconsolidated sediment reflects the composition of the source material(s). Surface expressions used are b, v, w.
C h, u	Landslide deposits: thick deposits of debris originating from larger-magnitude landslide events that result in a chaotic, toe-slope topography. The debris is considered inactive and may consist of transported bedrock fragments, unconsolidated sediment, or a combination of both. Surface expressions used are h, u.

L - LACUSTRINE DEPOSITS: Sediments deposited by direct, surface setting, underflow currents or littoral action in Holocene lakes; suspension settled deposits are typically rhythmites of fine sand, silt, and clay; lake margin deposits may be slightly coarser due to wave action. Polygon may include minor organics. Deposits are assumed to overlie till unless otherwise indicated.

L p, u, j	Thick lacustrine: flat to gently undulating or sloping fine-textured sediment deposited in shallow Holocene or pluvial lakes that have either drained or infilled; thick enough to mask the underlying topography. Surface expressions used are p, u, j.
L v, b, w	Lacustrine mantle: variable thickness mantle of fine-textured sediment where the underlying topography influences surface expression; material may be thicker in the hollows and thinner to non-existent on the raised surfaces; deposited in very short-lived and shallow Holocene or pluvial lakes. Surface expressions used are v, b, w.

E - AEOLIAN DEPOSITS: Well-sorted, silt to fine sand that is transported and deposited by wind; generally occurs as dunes or a thin mantle; active during the post-glacial period. Deposits are assumed to overlie glacioluvial material unless otherwise indicated.

E m, u, r	Sand dunes: parabolic or poorly formed dune structures; inactive unless recently disturbed by logging or fire. Surface expressions used are m, u, r.
E b, v, w	Aeolian mantle: occurs as a discontinuous, variable thickness mantle of well-sorted, sand and silt commonly overlying glacioluvial or glaciolacustrine material; in places these thinner deposits may appear to be sand dunes where they are underlain by ice contact or channelled glacioluvial landforms. Surface expressions used are b, v, w.

PLEISTOCENE

FRASER GLACIATION (LATE WISCONSINAN)

L⁺ - GLACIOLACUSTRINE DEPOSITS: Well sorted, stratified sand, silt and clay deposited dominantly by suspension setting, underflow currents or released from floating ice in glacial lakes; ice proximal deposits may be coarser and may include lenses of diamict or gravel; distal deposits contain drop stones; lake margin deposits are slightly coarser due to wave action. Polygons may include organics or glacioluvial deposits. Deposits are assumed to overlie till unless otherwise indicated.

L⁺ p, u	Thick glaciolacustrine: flat to gently undulating or sloping fine-textured sediment deposited in relatively long-lived proglacial lakes; may be affected by post depositional channeling or setting; locally incised areas may be susceptible to mass wasting or erosion. Surface expressions used are p, u.
L⁺ s, k, b	Glaciolacustrine scarp: erosive scarps occur where thick deposits are incised by meltwater or Holocene streams; susceptible to gullying and mass wasting. Surface expressions used are s, k, a.
L⁺ w, v, b	Glaciolacustrine mantle: variable thickness mantle of fine-textured material deposited in short-lived lakes and at the margins of large glacial lakes; surface expression is controlled by the underlying topography. Surface expressions used are w, v, b.

F⁺ - GLACIOFLUVIAL DEPOSITS: Well to poorly sorted gravel and sand transported and deposited directly by glacial meltwater; sediment size and sorting vary depending on depositional process and environment. Differentiated from fluvial deposits by the surface expression, elevation and fit to present day drainage systems. Deposits are assumed to overlie till unless otherwise indicated.

F⁺ p, t, u, f, s, k	Outwash: plains and terraces deposited in front of or adjacent to the glacier and are typically composed of fine to upward gravel; fans consist of stratified gravel, sand and minor diamict beds and occur at the mouth of confined drainage systems; may be affected by post depositional channeling or setting. Polygon may include minor amounts of organic and aeolian material. Surface expressions used are p, t, u, f, s, k.
F⁺ r, m, h, u	Ice contact: dominantly stratified gravel and sand with minor diamict deposited supra-, en-, or subglacially as esker systems, ice stagnation topography and kames; commonly associated with kettle holes and may display brittle or ductile deformation, from the melting of buried ice blocks. Ice stagnation topography deposits are generally poorly sorted. Surface expressions used are r, m, h, u.
F⁺ b, v, w	Glacioluvial mantle: stratified material deposited during short-lived events on upper surfaces around meltwater channels. Surface expressions used are b, v, w.

M - MORAINAL DEPOSITS: Diamict deposited in the proximal glacial environment (e.g. lodgement, deformation, melt-out or flow), thus encompassing all types of its composition and texture is dependent on its genesis. Basal till is the most common, occurring as a dense, clayey silt matrix supported diamict; avulsion till occurs as less dense discontinuous veneers with a higher sand fraction in the matrix. Deposits are assumed to overlie bedrock unless otherwise indicated.

M r, m	Streamlined till: represents flutings, drumlins and the sediment portion of crag and tails; hollows commonly contain minor amounts of glacioluvial or fluvial material and organics. Surface expressions used are r, m.
M p, j, a, k, s, t, h, u, d	Thick till: occurs with a variety of surface expressions; some surface expressions, such as hummock terraces and scarps, are the result of post depositional erosion; hummocky or undulating till also occurs in association with ice stagnation; these units may contain minor glacioluvial deposits. Till depressions may contain minor glacioluvial, glaciolacustrine, lacustrine and organic deposits. Surface expressions used are p, j, a, k, s, t, h, u, d.
M b, v, w	Till mantle: occurs dominantly in upland regions with isolated bedrock exposures where deposits are thinner. Surface expressions used are b, v, w.

PRE-PLEISTOCENE

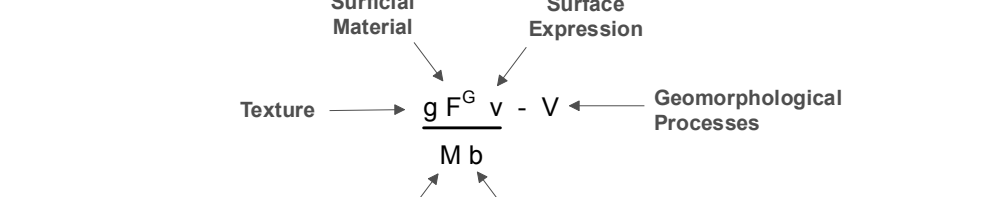
R - BEDROCK: Lithology varies greatly across the map area; sedimentary, metamorphic, volcanic and intrusive rocks of Precambrian to Cenozoic age; little outcrop is observed except in the higher relief areas.

R
k, s, h, u, m, f **Bedrock:** high angle slopes occur in upland areas or as a result of deep meltwater incision and may be susceptible to rock fall; hummocky or undulating expressions are the result of glacial erosion, meltwater or preferential erosion due to structure; streambed diamict is the result of glacial erosion or preferential erosion due to structure. Polygons may include minor colluvial or till veneers and organics in hollows. Surface expressions used are k, s, h, u, m, f. |

TERRAIN UNIT SYMBOL

Many polygon labels contain more information than indicated by the surficial geology unit. This extra information listed in the polygon label is based on the British Columbia Terrain Classification System (Howes and Kenk, 1997). These terrain unit labels have been simplified for cartographic display but each polygon is linked to a database that, where applicable, provides more detail of the terrain attributes, including texture, more complex surface expression and more complex composite units.

Simplified Terrain Unit Label



Explanatory note:

The terrain symbol above indicates a veneer of gravely glacioluvial material overlying a till blanket with the polygon being actively gullied. Texture is not shown on the accompanying map but is shown in the digital database where applicable. Surficial materials that constitute less than approximately 10% of the polygon are not included in the terrain symbols. Stratigraphic symbols are used when the nature of the subsurface material is important and not obvious from the context of the units. Letters may be omitted if information is lacking.

COMPOSITE UNITS
Two groups of letters may be used to indicate that two types of terrain are present within a map unit.
- components on either side of the symbol are of approximately equal proportion
e.g. CvRs indicates colluvial veneer and steep rock are of roughly equal extent
/ the component in front of the symbol is more extensive than the one that follows
e.g. CvRs indicates that colluvial veneer is more extensive than steep rock
// the component in front of the symbol is considerably more extensive than the component that follows
e.g. CvRr indicates that colluvial veneer is much more extensive than steep rock
- indicates the stratigraphic relationship of two or more surface material types
e.g. See example above
\ is used in front of one material to indicate a discontinuous cover on the previous material.
e.g. FQvEv indicates that an aeolian veneer partially covers a glacioluvial plain. This symbol was defined for this project to simplify the map labels and is not in the Howes and Kenk (1997) guidelines.

SURFICIAL MATERIALS

- C Colluvium
- D Weathered bedrock
- F Fluvial
- F⁺ Active fluvial
- F⁺ Glaciolacustrine
- L⁺ Morainal (fill)
- O Organic
- R Bedrock

SURFACE EXPRESSION

Simple (unidirectional) slopes

- p plain, 0 - 3°
- j gentle slope(s), 4 - 15°
- a moderate slope(s), 16 - 26°
- k moderately steep slope(s), 27 - 35°
- s steep slope(s), >35°

Complex slopes

- u undulating, gentle irregular rises and hollows, slopes predominantly <15°
- m rolling, gentle linear rises and hollows, slopes predominantly <15°
- h hummocky, steeper irregular rises and hollows, many slopes >15°
- r ridged, steep linear rises and hollows, many slopes >15°

Material thickness

- b blanket, greater than 1.2 metres
- v veneer, less than 1.2 metres
- w mantle of variable thickness

Discrete landforms

- c cone, slope >15°
- f fan, slope <15°
- t terrace, step-like topography
- d depressions

GEOMORPHOLOGICAL PROCESSES

- A Terrain modified by snow avalanches
- E Channel formation by glacial meltwater
- F Slow mass movement (undifferentiated)
- F⁺ Slow mass movement initiation zone
- Fc Soil creep
- I Kettled
- I Irregularly sinuous channel
- M Meandering
- R Rapid mass-movement (undifferentiated)
- Rf Rapid mass-movement initiation zone
- Rt Rock fall
- Rr Rock slide
- V Debris Slide
- V Gully erosion

More information on the British Columbia Terrain Classification System is given in:

Howes, D. E. and Kenk, E. (1997): Terrain classification system for British Columbia. Version 2.0, 1997. MCE Manual 10. British Columbia Ministry of Environment, Lands and Parks, Victoria, B.C.

Resources Inventory Committee. (1996): Guidelines and standards for terrain mapping in British Columbia. Earth Science Task Force, Surficial Geology Task Group, Government of British Columbia, Victoria, B.C.

Location Map

Index Map



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GBC Map 2013-10-4 Carrier Lake 093J/12	GBC Map 2013-10-3 Weedon Lake 093J/11
GBC Map 2013-10-5 Great Beaver Lake 093J/05	GBC Map 2013-10-6 Bugle Lake 093J/06

Field observation	•
Bedrock outcrop	×
Kettle hole	Ⓚ
Landslide headwall	Ⓛ
Landslide deposit	Ⓛ
Drumlin, crag and tail, fluting	Ⓛ
Striation (direction known): maximum phase - intermediate, retreat phase - youngest	Ⓛ
Striation (direction unknown): advance phase - oldest, maximum phase - intermediate, retreat phase - youngest	Ⓛ
Rf Rapid mass-movement initiation zone	Ⓛ
Moraine	Ⓛ
Escarpment	Ⓛ
Esker: direction known, unknown	Ⓛ
Meltwater channel, small: direction known, unknown	Ⓛ
Meltwater channel, large (arrow if direction known)	Ⓛ
Terrain unit boundary: definite, approximate, assumed	Ⓛ
Road	Ⓛ
Elevation contours (20 m intervals): major, minor	Ⓛ

Citation:
Maynard, D. E., Ward, B. C., Sacco, D. A., Geertsema, M. (2013): Terrain Map Bugle Lake (093J/06); Geoscience BC Map 2013-10-6, 1:50,000 scale.