

GENERALIZED DESCRIPTION OF MAP UNITS IN THE NORTH HALF OF THE ARCTIC QUADRANGLE, ALASKA

Map symbol	Name	Description	Distribution and thickness	Topography and vegetation	Permafrost	Susceptibility to frost action	Drainage		Susceptibility to erosion	Suitability for construction uses	Problems
							Surface	Subsurface (if thawed)			
U N C O N S O L I D A T E D D E P O S I T S											
Qfg	Flood plain gravel	Gravel and sand with minor amounts of silt and clay. Gravel clasts well rounded to subrounded of diverse rock types derived from Brooks Range. Imbricate structure of cobbles and pebbles common.	Present along the Marsh Fork of the Canning, the East Fork of the Chandalar River and Cane Creek; thickness unknown.	Flood plain, flat with braided drainage channels; relief generally less than 10 feet. Vegetation generally absent.	Generally free of permafrost near surface. Probably present at some (unknown) depth.	Low	Good	Good	High because of proximity to river channels.	Excellent, primarily as coarse aggregate; presence of some chert objectionable.	Subject to erosion and flooding during times of high runoff (spring breakup). Depth of river scour must be determined before pipe or cable is buried in gravel. Local aufeis conditions occur. Shallow ground-water table will be a problem during excavation.
Qaf	Alluvial fan	Generally poorly sorted silty, sandy gravel. Clasts angular to subrounded. Boulders common near apex of fans. Cut-and-fill structure common. Rock types are representative of local bedrock. Deposited during times of rapid runoff when conditions approaching "sheetflood" occurred.	Common along the sides of the Marsh Fork of the Canning River and Cane Creek at the mouths of tributary side canyons. Thickness variable; perhaps as much as 100 feet locally.	Commonly fan shaped with steep slopes near the apex or valley sides becoming less steep near the toe of the fan. The toe of the large fans are generally quite flat where they have spread out on the valley floor. Sparse vegetation.	Present within a few feet of the surface.	Low	Good	Good	High, especially near the toe of the fans and near stream courses.	Good as coarse aggregate.	Subject to torrential flooding and associated erosion.
Qcf	Colluvial fan	Very poorly sorted, angular to subangular sandy gravel. Boulders common. These fan gravels were probably derived principally by colluviation and may represent an intermediate unit between alluvial fans and talus.	Present at two localities along the sides of the Marsh Fork of the Canning River valley, also present along the southwest side of the Old Woman Creek; thickness unknown.	Fan shaped with steep slopes near the apex becoming less steep near the toe; little, if any, vegetation.	-----do-----	Low	Good	Good	High	Fair; poor sorting could be a problem.	Subject to river erosion near the toe at localities in the Marsh Fork River valley.
Qta	Talus	Angular to subangular rock fragments up to 2 feet in diameter, locally derived.	Particularly common in the narrow canyons leading up to the divide of the Brooks Range and along the upper parts of Cane Creek; thickness variable.	-----do-----	May be present within a few feet of the surface.	Low	Good	Good	Low, except where deposit borders on present river flood plain.	Possible source for riprap.	Slopes unstable and rocks subject to movement if disturbed.
Qrs	Recent slide	Unsorted, unconsolidated soil and rock rubble.	Occurs at one locality near the drainage divide in the Brooks Range along a major tributary of the Canning River; thickness unknown.	Hummocky, irregular topography on steeply sloping side of river valley; no vegetation.	Present within 2 feet of surface.	High	Poor	Poor	High; subject to movement when thawed.	Unsuitable	Subject to surface movement during spring and summer thaw.
Qc	Colluvium, undifferentiated	Poorly sorted, sand, silt and clay derived from local upslope sources. May contain minor amounts of coarse material. Generally consists of a mixture of soil and other fine-grained materials that are subject to slow downslope creep when thawed.	Present near the base of slopes; common in the drainage divide area of the Brooks Range; is probably less than 20 feet thick.	Generally smooth slopes along the base of steeper slopes; low shrubs and grasses common.	-----do-----	High	Poor	Poor	High	Unsuitable	Occasionally subject to surface movement. Generally this material is present at or near the base of steeper slopes and represents the accumulation of debris derived by slow flowage from upslope.
Qsm	Solifluction mantle	-----do-----	Occurs at one locality in the southeast corner of the map area on the south side of Old Woman Creek; probably less than 20 feet thick.	Generally smooth, but occasionally lobate slopes; low shrubs and grasses common.	-----do-----	High	Poor	Poor	High; subject to creep when thawed.	Unsuitable	This unit is similar to the Qc, colluvium, except that it commonly mantles a slope rather than occurring predominantly at the base of slopes.
Qvg	Vegetated gravel	Gravel and sand with minor amounts of silt and clay. Gravel clasts well rounded to subrounded. Commonly mantled with 1 to 3 feet of carbonaceous silt.	Local deposits along the major rivers and creeks. Probably less than 50 feet thick.	Low, flat terraces bordering younger flood-plain gravels (Qfg). Almost everywhere covered by tundra or low brush vegetation.	-----do-----	Low, except in silt-rich cover.	Good	Good	High because of proximity to major rivers.	Good when stripped of thin silt overburden. However, materials generally must be thawed before being excavated. Presence of some chert objectionable.	Flooding and erosion common during high runoff. Shallow ground-water table limits depth of excavation.
Qtg	Terrace gravel	Gravel and sand with minor amounts of silt and clay. Gravel clasts well rounded to subrounded. Generally mantled with 1 to 5 feet of carbonaceous silt.	Occurs as low terraces along Cane Creek and the East Fork of the Chandalar River; probably 10 to 20 feet thick.	Generally flat terrace bounded by scarps 4 to 10 feet high; tundra and brush vegetation.	Present within 2 feet of surface; ice wedge(?) polygons observable on the terraces at the mouth of Cane Creek.	High in silty overburden; low in underlying gravel and sand.	Fair to poor	Good	High in areas next to river flood plains	Fair; silty overburden and permafrost are problems.	Flooding and erosion in areas near active flood plains. Shallow ground-water table limits depth of excavation.
Qog ₄	Outwash gravel	Gravel and sand with minor amounts of silt and clay. Gravel clasts well rounded to subrounded. Mantled with 1 to 3 feet of carbonaceous silt.	Occurs as three small terraces along the Marsh Fork; 20 to 40 feet thick.	Flat terrace bounded by scarps 6 to 15 feet high; tundra vegetation.	Present within 2 feet of surface.	Low, except in silt-rich cover.	Good	Good	High proximal to Marsh Fork.	Good, but of very limited amount.	Permafrost must be thawed before gravel can be excavated.
Qt ₄	Till	Sandy, bouldery gravel. Gravel clasts subrounded to subangular. Often mantled by 1 to 3 feet of carbonaceous silt.	Occurs as ground moraine and lateral and terminal(?) moraine remnants in valley of the Marsh Fork of the Canning River; 10 to 100 feet thick.	Hummocky, morainic topography dissected by streams. Several moraine remnants extend 200 feet above the floor of the Marsh Fork valley; tundra vegetation.	-----do-----	Low, high in silty overburden	Good	Good	Moderate	Fair; silty overburden and permafrost are problems.	-----do-----
Qt ₃	Till	Sandy, bouldery gravel. Gravel clasts subrounded to subangular.	Occurs as terminal moraine and ground moraine within a tributary of Old Woman Creek; thickness is extremely variable but may be as much as 100 feet in places.	Hummocky, morainic topography dissected by small streams; tundra vegetation.	-----do-----	Low	Good	Good	Moderate	Fair	-----do-----
Qt ₂	Till	Sandy, bouldery gravel. Gravel clasts subrounded to subangular. Commonly covered with 1 to 5 feet of carbonaceous silt.	Occurs mainly as a ground moraine within the valleys of Cane Creek, East Fork of the Chandalar River and Old Woman Creek; probably 5 to 100 feet thick; thin on floor of Cane Creek.	Very hummocky to subdued hummocky topography; smooth slopes with some lakes; tundra vegetation.	Present within 2 feet of surface; ice wedge(?) polygons observable on the flat valley floors.	High in silty overburden	Fair to poor	Good	High	Fair, silty overburden and permafrost are problems.	Thermal erosion prevalent where overlying vegetation mat is removed or disturbed.
B E D R O C K											
Jrc	Chert	Black, orange, and green radiolarian chert; black, red, and green slate and argillite.	Present only in the extreme southern part of the map area on the south side of Old Woman Creek; thickness unknown.	Gentle to steep slopes, tundra vegetation.	Variable, depending on thickness of soil. Where soils are more than 2 feet thick, permafrost is probably present. Ice in voids and fractures in consolidated rock.	Low	Good	Good	Low	Riprap and coarse fill	
Rs	Shublik Formation	Black, partly calcareous, fissile shale interbedded with silty shale, siltstone and thin beds of dark gray limestone; calcareous concretions and ironstone nodules.	Exposed only in four separate locations within the high parts of the Brooks Range; more than 300 feet thick.	-----do-----	-----do-----	Low	Good	Good	Low	Sandstone fair for riprap; of limited extent.	
Rps	Sadlerochit Formation	Gray to black shale, silty shale and siltstone weathers brown. Some chert, fine-grained sandstone, conglomerate and limestone in lower part. Pyritic.	Exposed in numerous places throughout the map area; thickness unknown.	-----do-----	-----do-----	Low	Good	Good	Low	Sandstone and conglomerate good for riprap and coarse fill.	Shales underlying steep slopes may be susceptible to landsliding if thawed.
PMl	Lisburne Group	Light- to dark-gray, fine- to coarse-grained limestone and dolomite with light- and dark-gray nodular to bedded chert. Locally, almost completely replaced by chert.	Forms broad outcrop band throughout the map area except in extreme southern part; thickness unknown.	Very steep to moderately steep slopes of high, rugged mountainous terrain; generally bare of vegetation.	-----do-----	Low	Good	Good	Low	Limestone excellent for riprap, coarse fill, base course and surface course.	Numerous tight folds, overturned folds and some thrust faults are present.
Mky	Kayak Shale	Black shale; interbedded limestone in upper part; sandstone in lower part. Includes some black and green chert.	Exposed in numerous places throughout map area; 400 to 1,000 feet thick.	Steep to moderately steep slopes in rugged mountainous terrain; generally bare of vegetation.	-----do-----	Low	Good	Good	Low	Unsuitable	
Mkt	Kekiktuk Conglomerate	Quartzite and quartz- and chert-pebble conglomerate; local anthracite coal.	Occurs as narrow outcrop bands in high parts of Brooks Range in the northern part of map area; thickness unknown.	-----do-----	-----do-----	Low	Good	Good	Low	Conglomerate good for riprap and coarse fill.	
Mkk	Kanayut Conglomerate	Chert- and quartz-pebble conglomerate, quartzitic sandstone and shale. Rare thin beds of calcareous sandstone and limestone. Northeast of Old Woman Creek basal conglomerate beds contain green shale chips and are interbedded with red and green shale.	Present only in the southern part of map area in vicinity of Old Woman Creek. Estimated thickness about 2,000 feet.	Steep to moderately steep slopes in fairly rugged mountainous terrain; generally bare of vegetation, locally some tundra present.	-----do-----	Low	Good	Good	Low	Conglomerate and sandstone good for riprap and coarse fill.	
Drs	Red shale	Ferruginous sandstone, quartzite, red and green shale.	Present as a few narrow outcrop bands southeast of the East Fork of the Chandalar River and north of Old Woman Creek; thickness unknown.	-----do-----	-----do-----	Low	Good	Good	Low	Sandstone can be used for riprap and coarse fill.	
Ds	Shale and sandstone	Shale and siltstone, which weathers olive or brown, and black shale; interbedded limonitic partly calcareous fine- to medium-grained sandstone; fine-grained micaceous graywacke and chert-slate pebble conglomerate.	Occurs southeast of the East Fork of the Chandalar River and north of Old Woman Creek; thickness unknown.	-----do-----	-----do-----	Low	Good	Good	High	-----do-----	Locally contains limestone unit (Dsl).
Dsl	Limestone	Argillaceous limestone, weathers orange or gray.	Occurs as thin beds within the shale and sandstone unit (Ds) in the southern part of the map area; about 100 feet thick.	-----do-----	-----do-----	Low	Good	Good	High		Of too limited extent to be of much use.
O6cp	Chert and phyllite	Dark-gray to black and red phyllite; thin-bedded glassy gray to black chert; minor red and green chert.	Present in the high parts of the Brooks Range at the north edge of the map area; thickness unknown.	Forms steep to moderately steep slopes in rugged mountainous terrain; generally bare of vegetation.	-----do-----	Low	Good	Good	Low	Locally suitable for riprap and coarse fill.	
Ev	Flows, tuffs, and volcaniclastic rocks	Flows or sills, tuffs, volcaniclastic rocks, agglomerate.	Occurs only as one small outcrop at northern boundary of map; thickness unknown.	-----do-----	-----do-----	Low	Good	Good	Low		Of too limited extent to be of much use.