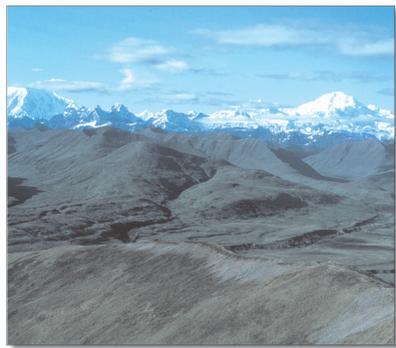


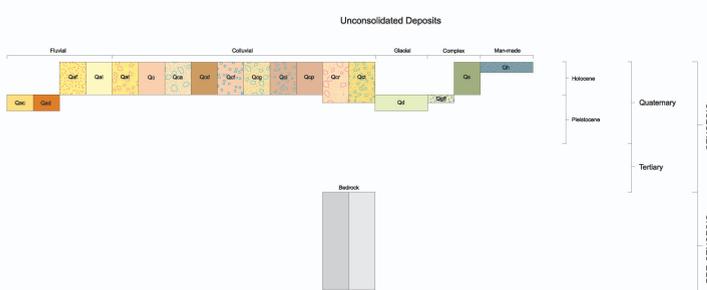


1 View southeast of periglacial rumparts forming arcuate ridges along the base of a slope in the Peters Hills. These periglacial landforms are deposited as accumulations of rock debris around the lower margins of periglacial snowbanks. Note person for scale. (Photo by R.D. Reger)

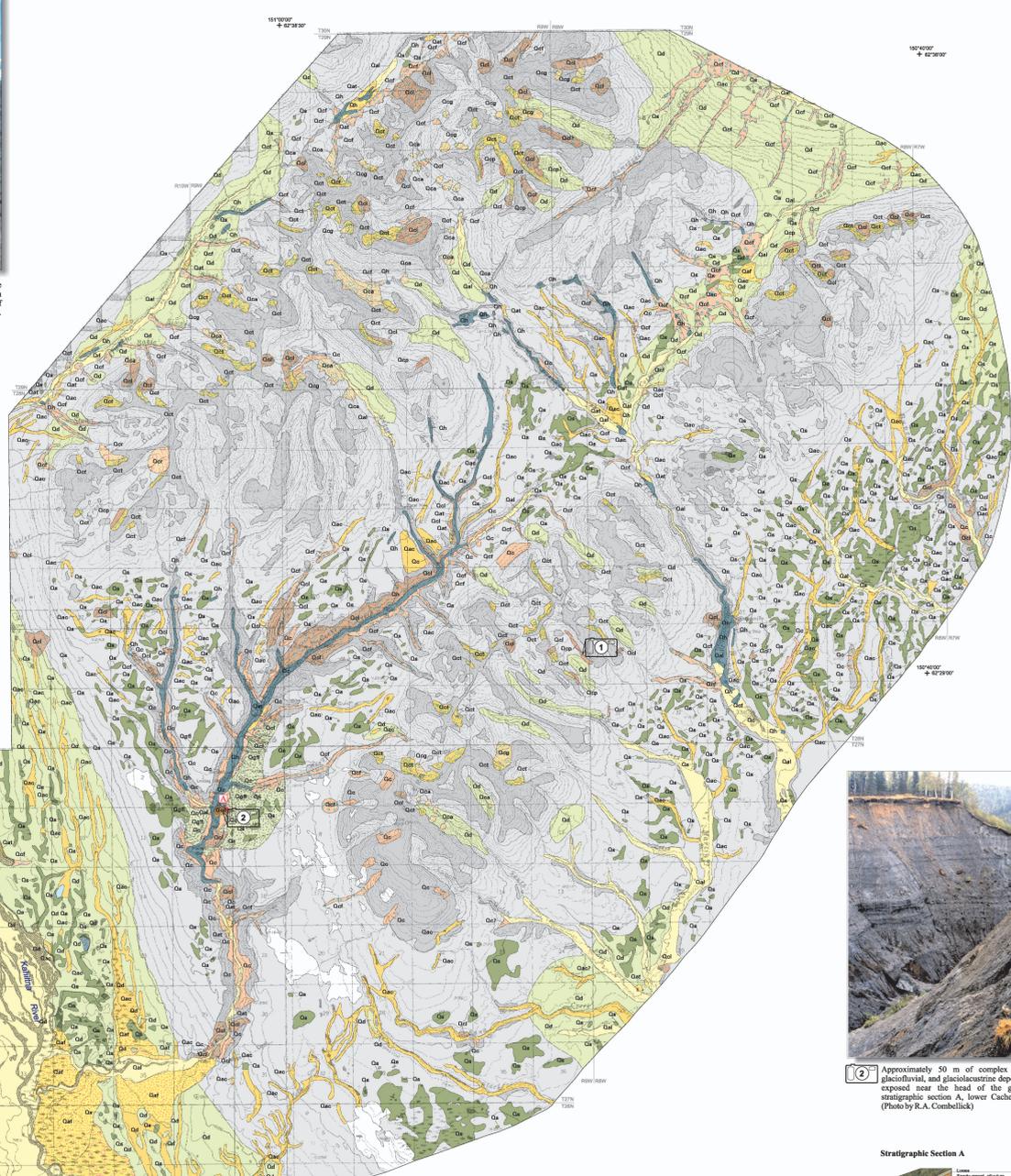


View northwest from Peters Hills to Dutch Hills showing U-shaped valleys and upper Cache Creek. The Kahlina Glacier dammed the drainage of this broad valley during Pleistocene time, creating a lake. Modern streams have since deeply incised the glaciolacustrine deposits and Tertiary sediments that form the floor of this drained lake basin. The Alaska Range and Mt. McKinley are visible in the background. (Photo by D.J. Scamaglia)

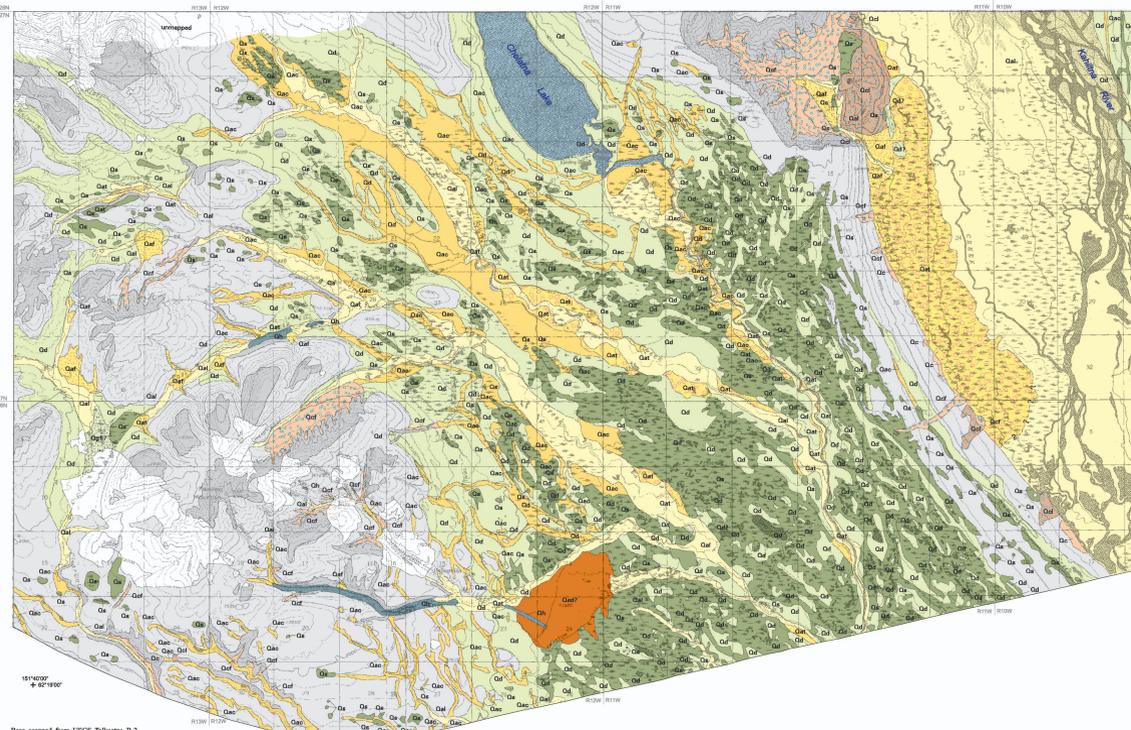
CORRELATION OF MAP UNITS



Digital Cartography by Alfred G. Sturmann, DGGS



- EXPLANATION**
- This map illustrates the distribution of a variety of unconsolidated deposits and undifferentiated bedrock in the Petersville mining district. It was prepared by the interpretation of 1:63,360-scale, false-color, infrared aerial photographs taken from August 1980 through August 1983 and is only locally verified by ground observations during brief field visits. The results should be considered reconnaissance in nature.
- DESCRIPTION OF MAP UNITS**
- UNCONSOLIDATED DEPOSITS**
- Alluvial Deposits**
- ABANDONED-CHANNEL DEPOSIT OF NAPTOWNE GLACIATION** Elongate variable deposit in channels of former meltwater streams not related to modern stream regimes or subsequent underflow streams; composition ranges from highly washed drift with thin, local surface lags of cobbles and boulders to well-sorted, clean pebble-cobble gravel and gravely medium to coarse sand with rare to numerous boulders; thin to thick bedded, locally cross-bedded; surface smooth except for local low scarps.
 - DELTAIC DEPOSIT** Fan-shaped deposit of sand with trace to some silt and trace to some pebble gravel laid down near margin of former meltwater lake by stream entering lake; well sorted and medium to massive bedded; locally cross-bedded; surface smooth.
 - ALLUVIAL-FAN DEPOSIT** Fan-shaped, heterogeneous mixture of pebble-cobble gravel with some sand and silt and scattered to numerous subangular to rounded boulders, especially in proximal areas, which may include terrestrial fluvial deposits and debris-flow deposits; thick to thin bedded; surface smooth except for numerous shallow, interconnected channels.
 - FLOODPLAIN ALLUVIUM** Elongate deposit of pebble-cobble gravel and sand with rare to numerous boulders beneath modern floodplains and associated low terraces; well sorted and medium to thick bedded; locally cross-bedded; surface smooth except for local low scarps.
 - TERRACE ALLUVIUM** Elongate deposit of pebble-cobble gravel and sand with trace to some silt and rare to numerous boulders comprising stream terraces bordering modern floodplains and clearly related to modern drainage; surface smooth except for local low scarps, includes trash terraces.
- Colluvial Deposits**
- UNDIFFERENTIATED COLLUVIUM** Irregular, heterogeneous blankets, aprons, and fans of angular to subangular rock fragments, gravel, sand, and silt up to estimated 3 m thick that are left on slopes, slope bases, or high-level surfaces by residual weathering and complex mass-movement processes including rolling, sliding, flowing, gelifraction, and frost action; locally washed by meltwater and slope runoff; medium to thick bedded; surface smooth, lobed, or terraced and generally reflects configuration of underlying bedrock surface; includes greatly modified drift of ancient glaciations.
 - SNOW-AVALANCHE DEPOSIT** Tongue-, fan-, and cone-shaped heterogeneous mixture of angular rock fragments, gravel, sand, and silt deposited in the mouth of bedrock coolers and gullies and on lower slopes by snow avalanches; surface typically covered by numerous boulders and plant debris when fresh.
 - DEBRIS-FLOW DEPOSIT** Fan-shaped heterogeneous mixture of sand and silt with some gravel and rare to numerous angular rock fragments and organic debris deposited at the mouths of gullies by debris flows; surface smooth to locally irregular.
 - UNDIFFERENTIATED COLLUVIUM AND ALLUVIUM** Fan- and tongue-shaped and elongate heterogeneous mixture of subangular rock fragments and pebble-cobble gravel with some sand and silt deposited in gullies and upper stream courses primarily by debris flows and brief, intense (torrential) summer stream flows; surface smooth except for local low scarps.
 - ROCK-GLACIER DEPOSIT** Tongue- and fan-shaped heterogeneous mixture of angular to subangular blocks of local bedrock and ice with trace to some gravel, sand, and silt deposited that accumulates on floors and lower walls of cirques and glaciated valleys by flow of rock glaciers derived from shrinking of former glaciers (ice cores) or from deposition and cementation of precipitation-derived ground ice (ice cemented); normally frozen where active; surface furrowed, ridged concentric, and pitted; covered with angular to subangular blocks.
 - LANDSLIDE DEPOSIT** Oval- to tongue-shaped heterogeneous mixture of fractured bedrock and pebble-cobble gravel with trace to some sand and silt deposited by near-surface to deep creep, flowing, and sliding due to instability of failed bedrock and unconsolidated surficial deposits; surface slightly irregular and broken by acute ground cracks and low ridges.
 - PROTALUS-RAMPART DEPOSIT** Arcuate, steep-sided ridge of angular rock fragments of local bedrock with trace to some sand and silt deposited by bouncing, rolling, and sliding of individual large clasts across surface of periglacial snowbank.
 - ROCK-FALL DEPOSIT** Fan-shaped to irregular accumulation of large angular blocks of local bedrock derived by collapse of higher outcrop.
 - TALUS** Cone- and apron-shaped heterogeneous mixture of angular rock fragments with trace to some gravel, sand, and silt deposited on steep slopes and at the mouths of steep bedrock coolers by snow avalanches, free fall, tumbling, rolling, and sliding; surface steep, slightly irregular, and covered with numerous angular rock fragments, especially in distal zones.
- Glacial Deposits**
- DRIFT OF NAPTOWNE GLACIATION** Heterogeneous blanket of pebble-cobble gravel with trace to some sand, trace to some silt, and rare to numerous boulders deposited directly from glacial ice; generally massive bedded; surface slightly irregular to irregular.
- Complex Deposits**
- UNDIFFERENTIATED GLACIAL, GLACIOFLUVIAL, AND GLACIOLACUSTRINE DEPOSITS** Complexly intermingled drift, outwash alluvium, and lake clay and silt laid down in local basins intermittently occupied by glacier-impounded lakes adjacent to Dutch and Peters Hills; thickness ranges from 1-10 to at least 50 m (fig. 1); mapped only in the vicinity of stratigraphic section A (T27, R20 and 10W) (fig. 1) in the lower drainage of Cache Creek, and on the basis of topographic evidence, is tentatively mapped in the upper drainage of Clearwater Creek (T26N, R15W), where it is inferred to be present below an elevation of about 2,000 ft, the apparent elevation of the ancestral Kahlina Glacier from which the gully is believed to be present but not recognized in the drainage of Dutch Creek (T26N, R10W), Milk Creek (T26N, R12W), Twin Creek (T26N, R13W), Ramondike Creek (T26N, R15W), Long Creek (T26N, R16W), and below about 1,600 ft elevation along the southwestern flank of Peters Hills; mapped as fluvio-lacustrine deposits and drift of the Eklutna and Naptowne glaciations by Nelson and Reed (1978) and Reed and Nelson (1980).
 - UNDIFFERENTIATED SWAMP DEPOSIT** Elongate to blanket deposit of peat, organic silt, and organic sand accumulated as surface deposits in local basins, in former stream channels, and down slope from springs and seeps; saturated and locally frozen, locally ice rich; thickness ranges from <1 m to >4 m; complexly bedded; surface hummocky, or pitted and typically vegetated by sphagnum moss; permeability good, except very poor where frozen.
- Man-made Deposits**
- PLACER-MINE TAILINGS AND ARTIFICIAL HILLS** Pebble-cobble gravel with trace to some sand and silt forming bases for roads and airports and piled in active or former gravel pits, open-pit mines, and dredged areas; well to poorly sorted; surface smooth to irregular; extent based on distribution between August 1980 and August 1983 when the aerial photographs were taken.
- BEDROCK**
- UNDIFFERENTIATED BEDROCK** Exposed undifferentiated bedrock.
 - SHALLOWLY BURIED BEDROCK** Undifferentiated bedrock that is covered by sufficiently thin drift, undifferentiated glacial, glaciofluvial, and glaciolacustrine deposits, or colluvium, or combinations of these deposits, to affect the surface expression of the cover material, so that planar bedrock structures like joints, foliation, and bedding, or glacier-scoured bedrock substeps are reflected the ground surface by linear and curvilinear shallow troughs and bands of moist ground or hydrophytic vegetation; in uplands older surface manifestations include greater relief and steeper slopes relative to areas where drift is thicker than an estimated 1 to 5 m; in uplands thin bedrock cover is vegetated by extensive alder thickets or circular alder patches with scattered spruce trees interspersed in grassy meadows, and reduced infiltration produces widespread blanket peats and other swamp deposits; above the treeline cocones vegetated by widespread shrub tundra and local swamp deposits; less reliably identified in lowlands near extensive shallow outcrops where glacial scouring has been intensive and dominant over deposition but there is little relief or other surface manifestation, except the widespread distribution of swamp deposits.



Base scanned from USGS Talkeetna B-2, B-3, B-4, C-2, and C-3 quadrangles, Alaska.

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This DGGS Report of Investigations is a final report of scientific research. It has received technical review and may be cited as an agency publication.

SCALE 1:63360

0 1 2 3 4 MILES

0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL: 100 FEET

Approximate Mean Magnetic Declination 23 1/2° to 24° (1999)

LOCATION INDEX

STUDY AREA



2 Approximately 50 m of complex glacial, glaciofluvial, and glaciolacustrine deposits are exposed near the head of the gully at stratigraphic section A, lower Cache Creek. (Photo by R.A. Combellick)

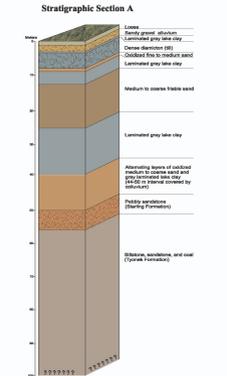


Figure 1. Stratigraphic section through complex glacial, glaciofluvial, and glaciolacustrine deposits, lower Cache Creek (T27N, R20W), Talkeetna B-3 Quadrangle, Alaska, measured 6-8-98 by R.A. Combellick.

- REFERENCES CITED**
- Nelson, S. W., and Reed, B. L., 1978, Surficial deposits map of the Talkeetna Quadrangle, Alaska; U. S. Geological Survey Miscellaneous Field Studies Map, MF-870-J, 1 sheet, scale 1:63,360.
- Reed, B. L., and Nelson, S. W., 1980, Geologic map of the Talkeetna Quadrangle, Alaska; U. S. Geological Survey Miscellaneous Investigations Series Map, I-1174, 15 p., 1 sheet, scale 1:63,360.
- ACKNOWLEDGEMENTS**
- Thomas Hamilton (USGS) and Gail Davidson (DGGS) reviewed this map and offered many constructive comments that improved it. We gratefully appreciate their input.

¹ Terms used to describe the estimated percentage of cobbles and boulders are "numerous," "scattered," and "rare." "Numerous" implies that drilling through the layer would encounter two cobbles or boulders in an interval of 0.6 m; "scattered" implies that drilling would encounter one cobble or boulder in an interval of 1.4 to 1.6 m; and "rare" implies that drilling would encounter two cobbles or boulders in an interval of more than 4.5 m.

² Estimated content of gravel, sand, and silt, based on field observations, is indicated by the terms "coarse" and "fine." "Coarse" implies a general composition of 12 to 30 percent. "Trace" implies a general composition of 4 to 12 percent. Estimated compositions of less than 4 percent were not recorded in the field.

Reconnaissance surficial-geologic map of the Petersville (Yentna) mining district, Alaska

By
R.D.Reger, R.A. Combellick, and D.S. Pinney

1999

2 Laminated, gray lacustrine silt and clay exposed at a depth of 25-40 m in stratigraphic section A, lower Cache Creek (fig. 1). (Photo by R.A. Combellick)