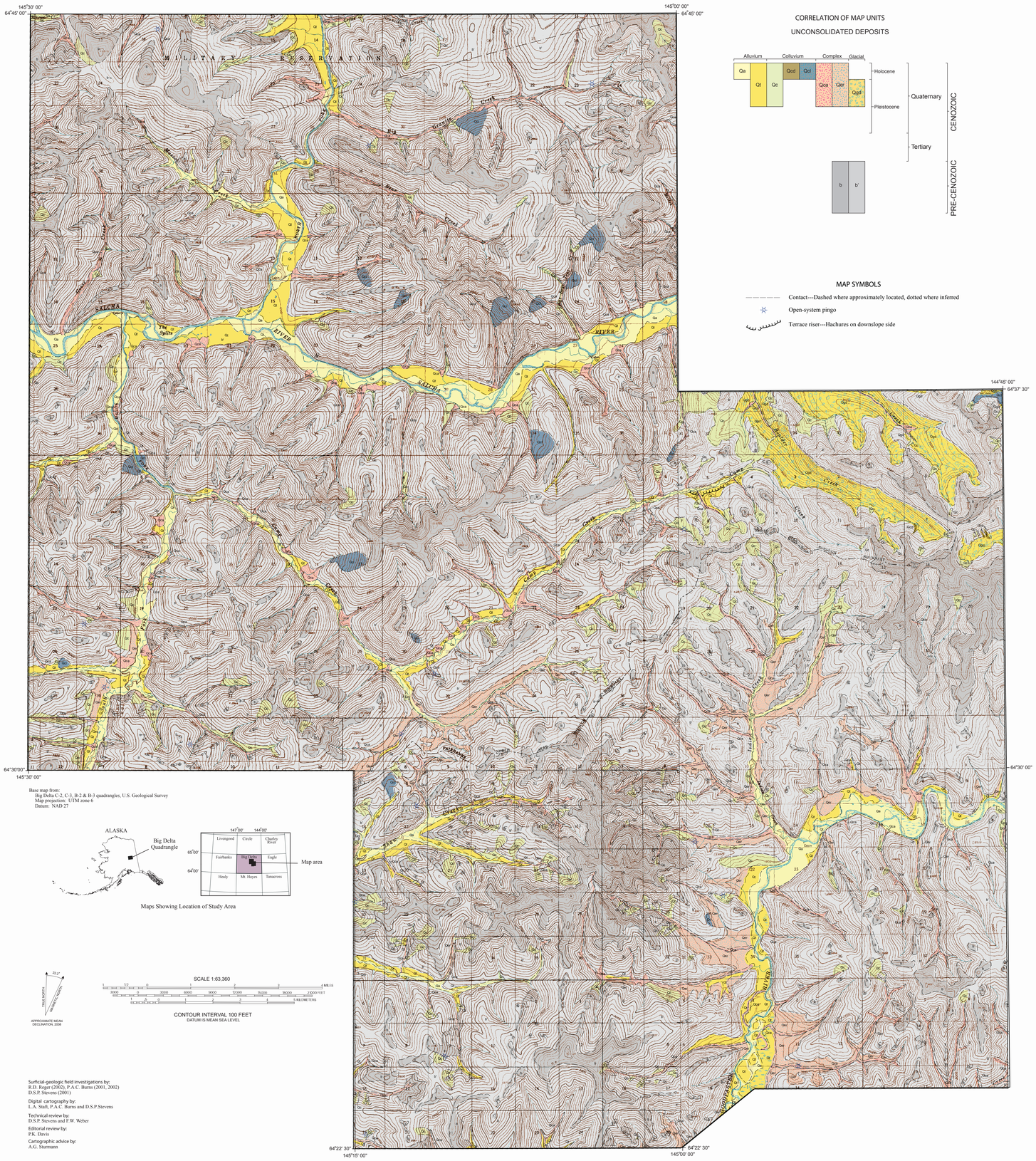
ALASKA DIVISION OF GEOLOGICAL &
GEOPHYSICAL SURVEYS

REPORT OF INVESTIGATIONS 2004-1C
Reger and others, 2008



Base map from:
Big Delta C-2, C-3, B-2 & B-3 quadrangles, U.S. Geological Survey
Map projection: UTM zone 6
Datum: NAD 27

Maps Showing Location of Study Area

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CORRELATION OF MAP UNITS

UNCONSOLIDATED DEPOSITS

MAP SYMBOLS

Contact—Dashed where approximately located, dotted where inferred

Open-system pingo

Terrace riser—Hachures on downslope side

DESCRIPTION OF MAP UNITS

EXPLANATION

This map illustrates the distribution of unconsolidated deposits and undifferentiated bedrock units in the Salcha River–Pogo area. It was prepared by the interpretation of 1:63,360-scale false-color infrared aerial photographs taken July 1978, July 1979, and August 1981, and is locally verified by ground observations during field visits.

Terms used to describe the estimated percentages 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 two cobbles or boulders in an interval of 3 to 4.5 m; and 'rare' implies that drilling would encounter two cobbles or boulders in an interval of more than 4.5 m.

DISCUSSION

The Yukon–Tanana Upland is defined as the region bounded by the Yukon and Tanana Rivers in east-central Alaska; it covers about 116,550 km , and rises to a maximum elevation of 1,194 m. More than 20 percent of the uplands were glaciated during the Pleistocene. During the period of maximum advance, ice caps formed on the higher mountains, and glaciers radiated down the surrounding valleys (Weber, 1986). In contrast to the rapidly rising region south of the Denali fault, the Yukon–Tanana Upland has been relatively stable since the Late Cretaceous (Bacon and Lanphere, 1996). As the Alaska Range rose, it effectively blocked north-directed moisture as it moved toward the Yukon–Tanana Upland. As a result, the youngest glaciers remained in north-facing valleys of the relatively stable Yukon–Tanana Upland (Péwé and others, 1967). Weber (1983, 1986) defined glacial events compatible with elevation ranges. Based on the generally subdued nature of glacial deposits in the field area, we speculate that undifferentiated glacial deposits mapped are composed of material deposited by the Charley River (early? Pleistocene), Mt. Harper (middle? Pleistocene), and Eagle (early? Wisconsin) glaciations (Weber, 1986). It is highly unlikely that the area was glaciated during Salcha (late Wisconsin) or Ramshorn (Holocene) glaciations.

The northeast–southwest-trending Shaw Creek fault crosses the study area. Although the fault was observed on 1:63,360-scale, false-color, infrared aerial photographs, we were unable to document offset on surficial geologic units. Please refer to the associated engineering-geologic and bedrock geologic maps of the Salcha River – Pogo area, east-central Alaska, for more information related to lineations and faulting in the study area (Reger and Burns, 2008; Werdon and others, 2004).

UNCONSOLIDATED DEPOSITS

Qa FLOODPLAIN ALLUVIUM (Holocene) — Chiefly well-sorted and well-stratified layers and lenses of silt, sand, and polymictic gravel (pebbles and cobbles) overlain by up to about 3 m of overbank silty sand, sandy silt, and peat comprising deposits of modern stream systems; includes deposits beneath active, inactive, and abandoned floodplains; may include several surface levels (low terraces); peat widespread on abandoned surfaces; locally subject to seasonal stream icings; generally unfrozen beneath active and young inactive surfaces with low to moderate ice content where frozen; continuously frozen with moderate to high ice content beneath abandoned floodplains; peat generally frozen with moderate to high ice content.

Qt STREAM-TERRACE ALLUVIUM (Holocene to Pleistocene) — Chiefly up to about 3 m of overbank organic sandy silt and silty sand overlying moderately- to well-sorted polymictic gravel and sand beneath stream terrace treads no longer subject to inundation by the stream that deposited the alluvium; may include several levels and incorporate outwash alluvium in higher, older terraces; locally subject to seasonal stream icings; continuously to discontinuously frozen with low to moderate ice content.

Qc UNDIFFERENTIATED COLLUVIUM (Holocene to Pleistocene) — Blankets, aprons, and fans of heterogeneously mixed angular rock fragments, gravel, sand, and silt formed by complex mass movements involving sliding, flowing, gelifluction, and frost creep of weathered bedrock and modified glacial drift; cobbles and boulders are scattered to numerous; on lower headwalls of cirques and upper walls of glaciated valleys includes talus aprons and related features as well as steep fans built by snow avalanches and debris flows; surfaces of colluvial sheets generally reflect morphology of underlying materials; generally discontinuously to continuously frozen; locally subject to seasonal slope icings.

Qca MIXED COLLUVIUM AND ALLUVIUM (Holocene) — Primarily elongate and fan-shaped deposits of poorly stratified colluvium overlying and mixed with angular to subangular polymictic pebble gravel with scattered to rare cobbles and boulders in upland tributary valleys; subject to widespread seasonal stream and slope icings; discontinuously to continuously frozen with low to moderate ice content.

Qcd DEBRIS-FLOW DEPOSIT (Holocene) — Chiefly elongate mixtures of angular rock fragments and gravel deposited on steep colluvial slopes and fans and in upper stream valleys by flowing slurries of mud, rock debris, and gravel; initial fine fractions are later winnowed, leaving numerous cobbles and boulders as natural levees bounding medial channels; generally unfrozen and discontinuously frozen with low ice content.

Qcl LANDSLIDE DEPOSIT (Holocene to Pleistocene) — Oval to triangular, heterogeneous mixtures of large, fractured bedrock blocks and pebble gravel with scattered to numerous cobbles and boulders and trace to some sand and silt deposited by near-surface to deep creeping, flowing, and sliding of failed bedrock and unconsolidated surficial deposits; surface features include irregularities, hummocks, low longitudinal ridges, and terminal bulges; unfrozen to continuously frozen with low to moderate ice content.

Qer RETRANSPORTED LOESS (Holocene to Pleistocene) — Chiefly organic silt with variable amounts of sand and lenses of locally derived angular pebble gravel and scattered cobbles that were deposited on lower walls and old terraces of stream valleys by slope runoff and small ephemeral streams draining bedrock slopes covered with thin loess; subject to seasonal icings; continuously frozen with moderate to high ice content.

Qgd UNDIFFERENTIATED GLACIAL DRIFT (Pleistocene) — Discontinuous to continuous sheets of heterogeneous pebble gravel, sand, and silt with rare to numerous cobbles, boulders and blocks up to 2.5 m diameter deposited directly from melting glacial ice; includes drift of Charley River, Mount Harper and Eagle glaciations (Weber, 1983, 1986); silty sand matrix weathered light brown to brown; surface morphology extensively modified by mass-movement processes; discontinuously to continuously frozen with low to moderate ice content.

BEDROCK

b UNDIFFERENTIATED BEDROCK—Outcrops with relief and planar bedrock structures indicated by linear and curvilinear shallow troughs and linear changes of surface vegetation

b' THINLY COVERED BEDROCK—Subcrops covered by a thin (generally less that 2 m) veneer of surficial debris

REFERENCES CITED

Bacon, C.R., and Lanphere, M.A., 1996, Late Cretaceous age of the Middle Fork Caldera, Eagle Quadrangle, east-central Alaska, *in* Moore, T.E., and Dumoulin, J.A., eds., Geologic Studies in Alaska by the U.S. Geological Survey, 1994: U.S. Geological Survey Bulletin 2152, p. 143–147.

Péwé, T.L., Burbank, Lawrence, and Mayo, L.R., 1967, Multiple glaciations in the Yukon–Tanana Upland, Alaska: U.S. Geological Survey Miscellaneous Investigations Map 507, 1 sheet, scale 1:500,000.

Reger, R.D., and Burns, P.A.C., 2008, Engineering-geologic map of the Salcha River – Pogo area, eastcentral Alaska: Alaska Division of Geological & Geophysical Surveys Report of Investigations 2004-1D, 1 sheet, scale 1:63,360.

Weber, F.R., 1983, Glacial geology of the Yukon–Tanana Upland—a progress report, *in* Thorson, R.M., and Hamilton, T.D., eds., Glaciation in Alaska: Extended abstracts from a workshop: University of Alaska Museum Occasional Paper No. 2, p. 96–100.

———1986, Glacial geology of the Yukon–Tanana Upland, *in* Hamilton, T.D., Reed, K.M., and Thorson, R.M., eds., Glaciation in Alaska: The geologic record: Anchorage, Alaska Geological Society, p. 79–98.

Werdon, M.B., Newberry, R.J., Athey, J.E., and Szumigala, D.J., 2004, Bedrock geologic map of the Salcha River-Pogo area, Big Delta Quadrangle, Alaska: Alaska Division of Geological & Geophysical Surveys Report of Investigations 2004-1B, 1 sheet, scale 1:63,360.

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SURFICIAL-GEOLOGIC MAP OF THE SALCHA RIVER - POGO AREA, BIG DELTA QUADRANGLE, ALASKA

by
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2008

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