UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

OPEN-FILE REPORT
77-539
PECK LAKE QUAD., MONT.

Base from U.S. Geological Survey, 1965

Geology mapped in 1976

SCALE 1:24 000

CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT 10-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

UTM GRID AND 1965 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

QUADRANGLE LOCATION

U.S. Geological Survey
OPEN FILE REPORT
This map is preliminary and has not been edited or reviewed for conformity with Geological Survey standards.

PRELIMINARY MAP SHOWING SURFICIAL DEPOSITS IN THE EAST HALF OF THE PECK LAKE QUADRANGLE, MISSOULA AND LAKE COUNTIES, MONTANA

By
Irving J. Witkind
1977

CORRELATION OF MAP UNITS

Qal	Holocene	QUATERNARY
UNCONFORMITY		
Qo; Qtjc, Qtcc, Qtsf; Qtv; Qtf	Pleistocene	QUATERNARY
UNCONFORMITY		
pЄb	PRECAMBRIAN	

Introduction

U.S. Geological Survey personnel, in conjunction with Mark Weber, Geologic Consultant to Missoula and Powell Counties, are studying the water and earth resources of an area that extends from the Big Fork quadrangle on the north to the Avon quadrangle on the south (see index map). This map is a product of that study, and is intended for use by environmental and land-use planners. Maps of quadrangles, or parts of quadrangles, south of Highway 200 have been prepared by Weber.

The distribution of the alluvium was plotted in the office from aerial photographs. All other geologic units were mapped in the field.

Surficial deposits

Surficial deposits in the northern part of the Big Fork-Avon area were formed primarily during the latter part of the latest ice age--the Pinedale glaciation of the Pleistocene. Glacial deposits mantle the lower flanks of the mountains and form the valley floors; they have been dissected somewhat by streams, but most still appear much as when they were formed. In some localities deposits of more than one ice advance may have been included in one or the other category.

Deposits of former tributary glaciers locally extend into the Swan Valley. These deposits are mapped separately and are identified by appropriate symbols; thus, "Qtcc" is "till deposited by Cold Creek ice."

DESCRIPTION OF MAP UNITS

Qal ALLUVIUM (HOLOCENE)--Stream-deposited unconsolidated silt, sand, and gravel. Forms the floor of Swan River, and the lower reaches of Condon Creek. Locally includes small deposits of colluvium and other mass-wasting debris. Commonly overlies outwash sand and gravel deposited by meltwater of wasting ice

Qo MELTWATERS OF PINEDALE GLACIATION (PLEISTOCENE)

Outwash--Patches of light-brown to brown, unconsolidated, moderately well sorted silt, sand, and gravel, some 3 m (10 ft) above the alluvial floor of the Swan River. Locally veneered by very fine grained sand 5-60 cm (2-24 in.) thick. Clasts range in shape from subangular to subrounded; most are subrounded. In general, about 82 percent of unit is composed of clasts that range from about 5 mm to about 76 mm (1/4-3 in.) in diameter; about 17 percent is a fine to coarse sand with included small pebbles as much as 5 mm; and the remaining 1 percent is silt. Green, gray, and purple argillite clasts strongly dominate deposit; tan quartzite and sandstone clasts are minor constituents. Well-rounded cobbles, 15-20 cm (6-8 in.) in diameter, are common. A few subangular to subrounded boulders, 30-36 cm (12-14 in.), are scattered throughout the deposit. Patches are relicts of a once-continuous outwash deposit formed by north-flowing meltwater of wasting ice which occupied ancestral Swan Valley

Qtv Till (Swan Valley facies)--Characterized by a striking knob-and-kettle topography. Brown to reddish brown, very coarse; consists of a heterogeneous mixture of unconsolidated gravel, cobbles, and boulders in a matrix of medium to coarse sand. Clasts range from angular to well rounded; most are rounded. In general, about 60 percent of unit is composed of clasts that range from about 5 mm to about 76 mm (1/4-3 in.) in diameter; about 25 percent is a fine to coarse sand with included small pebbles as much as 5 mm; and the remaining 15 percent is silt. Contains many well-rounded cobbles, 8-20 cm (3-8 in.) in diameter, and many subrounded to rounded boulders 0.3-1 m (1-3 ft) across. Green, gray, and purple argillite clasts dominate; tan quartzite and sandstone clasts are minor components. Many angular to subangular boulders 2.4-3 m (8-10 ft) across are scattered throughout the till and over the surface. This till was deposited chiefly by ice that flowed northeastward from Lindbergh Lake valley (south of this quadrangle) into Swan Valley

Till deposited by tributary glaciers in valleys--These deposits consist of an unsorted, unconsolidated to partly consolidated mixture of gravel, cobbles, and boulders in a sandy to clayey matrix. Clasts range from angular to subangular; most are angular. Sizes range from small pebbles to boulders as much as 4.6 m (15 ft) across. In general, all three tills are similar; they consist chiefly of green, gray, and purple argillite clasts, and tan dolomite and tan sandstone clasts. These tills were deposited by small glaciers that were tributary to the ice which occupied Swan Valley

Qtjc Till deposited in valley of Jim Creek

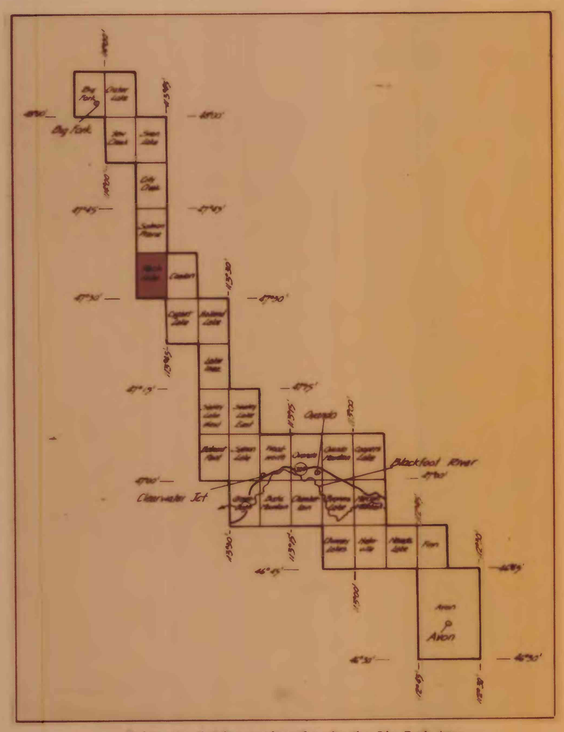
Qtcc Till deposited in valley of Cold Creek

Qtsf Till deposited in valley of South Fork Creek

Qtf Till (Foothill facies)--Forms a thin to thick veneer over bedrock; extensively mantled by unmapped colluvium. Light brown to brown; consists of an unsorted mixture of gravel, cobbles, and boulders in a silty to clayey matrix. Clasts range from angular to subrounded; most are subangular. Most clasts range from 0.1 to 6 cm (1/2-2 1/2 in.) across. Green, gray, and purple argillite, tan dolomite, and tan quartzite and sandstone clasts, are approximately equally abundant. Boulders 0.5-4.5 m (2-15 ft) across are common. Source of this till is unknown. It may represent material deposited during a previous ice advance, or it may have been formed during the waste of the ice that lay in Swan Valley and that deposited the till which now forms the valley floor

pЄb BEDROCK OF BELT SUPERGROUP, UNDIVIDED (PRECAMBRIAN)--Consists of several units of the Belt Supergroup, chiefly the Spokane (argillite and siltite), Empire (argillite and siltite), and Helena (dolomite) Formations. These are "bright" units in varying shades of red, purple, green, tan, and gray

——— CONTACT--Approximately located or inferred. In many places wholly or partly concealed by debris or dense foliage



Index map showing quadrangles in the Big Fork-Avon area. The Peck Lake quadrangle is shaded. Preliminary surficial geologic maps of the following quadrangles, by I. J. Witkind, are available as U.S. Geological Survey Open-File Reports from the following offices:

Denver Public Inquiries Office
U.S. Geological Survey
1012, Federal Building
1961 Stout Street
Denver, CO 80202

Salt Lake City Public Inquires Office
U.S. Geological Survey
8105, Federal Office Building
125 South State Street
Salt Lake City, UT 84111

Spokane Public Inquiries Office
U.S. Geological Survey
678, U.S. Courthouse Building,
West 920 Riverside Avenue
Spokane, WA 99201

1.	Condon (W. half)	77-540
2.	Coopers Lake	77-466
3.	Cygnet Lake	77-198
4.	Holland Lake (W. half)	77-199
5.	Lake Inez	77-200
6.	Ovando (N. half)	77-196
7.	Ovando Mountain	77-465
8.	Peck Lake (E. half)	77-539
9.	Salmon Lake	77-197
10.	Seeley Lake East	77-202
11.	Seeley Lake West	77-201
12.	Woodworth	77-203