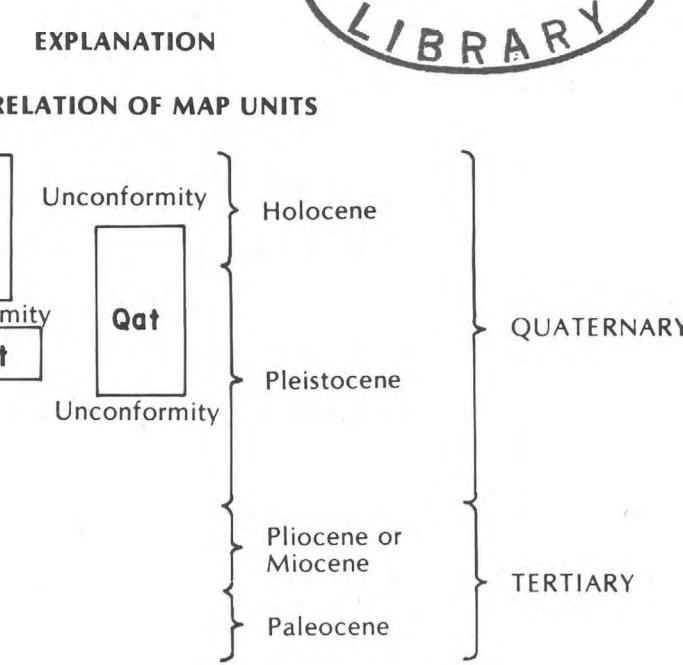
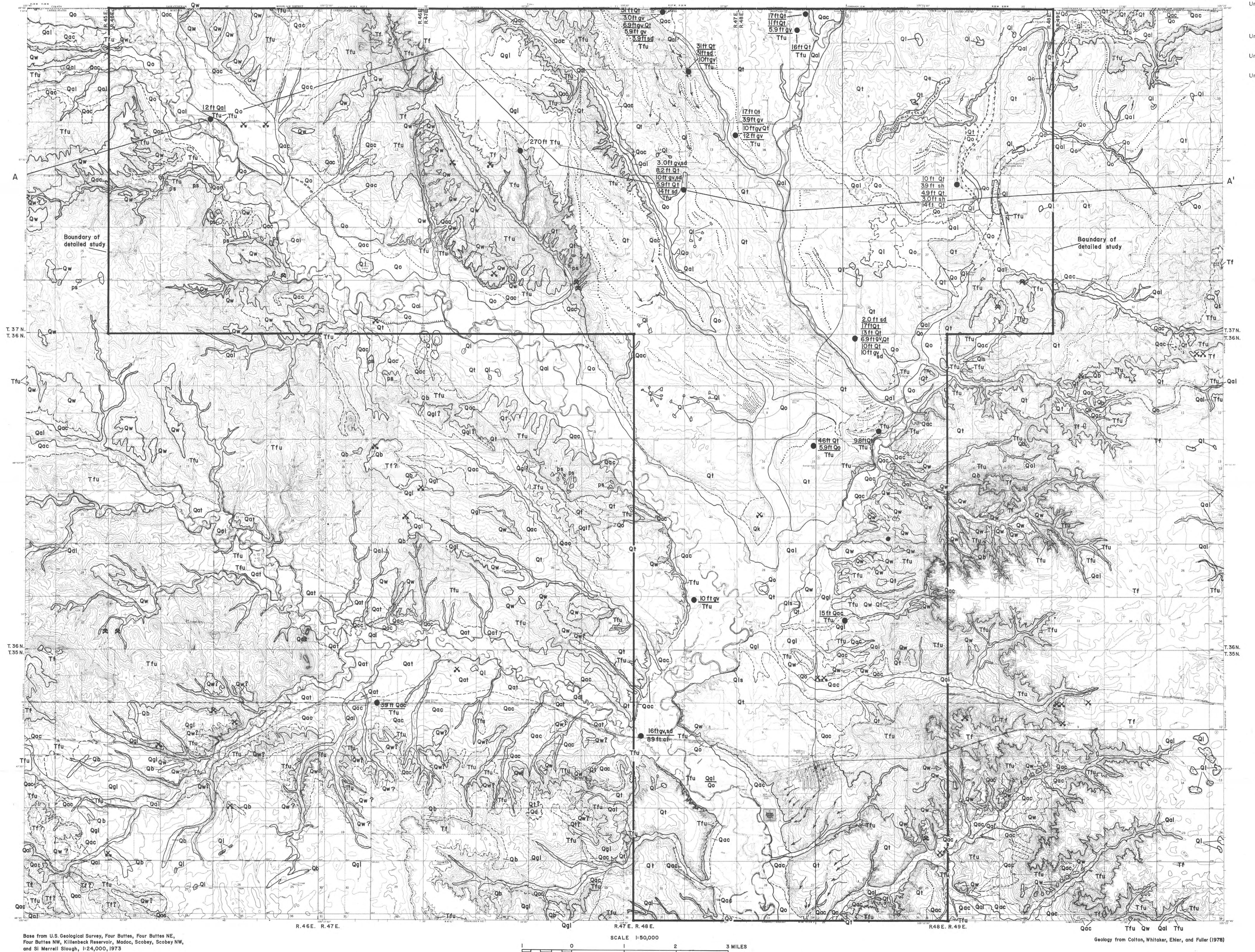


UNITED STATES DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE  
ENVIRONMENTAL PROTECTION AGENCY AND  
MONTANA BUREAU OF MINES AND GEOLOGY

(Qoo)  
W.R.  
WATER-RESOURCES INVESTIGATIONS 79-51  
PLATE I



DESCRIPTION OF MAP UNITS

- Qal** ALLUVIUM—Mostly silt and sand with lenses of clay and gravel. Deposited in valley bottoms by Poplar River or its tributaries; generally limited to the extent of the meander or braided pattern belt. Thickness as much as 45 feet, but generally much thinner along tributaries
- Qac** ALLUVIUM AND COLLUVIUM—Buff to dark-brown slope-wash deposits on hillsides and valley walls. Consists mostly of locally derived silt, sand, and gravel; may contain some windblown silt and sand. Includes alluvial fan and small intermittent stream deposits. Thickness is as much as 40 feet, but averages about 10 feet
- Qis** LANDSLIDE DEPOSIT—Slumped portions of Fort Union Formation (Tfu) and overlying deposits; consists of fine sand, silt, and clay
- Ql** LAKE AND POND DEPOSIT—Dark-gray or black organic clay, silt, sand, and pebbles derived from surrounding surficial deposits. Deposited in shallow closed depressions formed by melting buried ice or by deflation. Thickness estimated to be as much as 20 feet, but averages 7 feet
- Qd** SAND DUNE DEPOSIT—Found in the Four Buttes quadrangle south and east of the town of Four Buttes; consists of well-sorted gray sand forming small dunes that are now stabilized by vegetation. Relief between crests of dunes as much as 10 feet
- Qat** ALLUVIAL TERRACE DEPOSIT—Poorly to well-sorted sand and gravel deposited by streams; situated higher than present flood plain. Maximum thickness inferred to be 15 feet, but generally 10 feet
- Qgl** GLACIAL LAKE DEPOSIT—Gray to brown silt, sand, and gravel deposited in temporary glacial lakes formed when drainages were blocked by ice. Some deposits are well stratified and well sorted. Thickness is as much as 20 feet, but averages less than 10 feet
- Qb** BEACH DEPOSIT—Contains brown to gray interbedded sand and gravel that form thin, long, curved, or hook-shaped ridges. Deposits were formed along shorelines or as offshore bars during stillstands of glacial lake level. Thickness is as much as 20 feet. Lithology is nearly 100 percent quartzite; contains a few erratic stones
- Qo** OUTWASH DEPOSIT, UNDIFFERENTIATED—Dark-brown to gray silt, sand, and gravel; poorly to well sorted and stratified. Contains erratic stones from Canada; deposited by glacial melt waters in channels or valleys. Thickness is as much as 35 feet
- Qe** ESKER DEPOSIT—Long, narrow, sinuous, poorly stratified deposit of sand and gravel in the Scobey quadrangle north of the town of Scobey. Formed by glacial melt water flowing under, in, or on glacial ice; contains numerous erratic stones. Thickness is as much as 20 feet
- Qk** KAME DEPOSIT, UNDIFFERENTIATED—Coarse, poorly stratified and poorly sorted gravel and sand formed in or against ice. Thickness is as much as 55 feet
- Qt** TILL, UNDIFFERENTIATED—Unstratified, compact, heterogeneous mixture of brown to brownish-gray clay, silt, sand, gravel, and boulders. Composition varies from 20-50 percent clay and silt, 20-60 percent sand and gravel, and 2-10 percent pebbles, cobbles, and boulders. Erratics consist of limestone and dolomite, igneous rocks, and metamorphic rocks. Thickness is as much as 25 feet, but averages 10 feet
- Qw** WIOOTA GRAVEL—Brown to reddish-brown sandy gravel deposited after the Flaxville stage (T1), but before the area was elevated. Gravel composed of 80-90 percent brown, red, and yellow quartzites; 10-15 percent brown to black argillites; 1-10 percent jasper, chaledony, and petrified wood. Deposits cap pediments and ridges which slope downward from neighboring higher plateaus. Thickness is as much as 15 feet
- Tf** FLAXVILLE FORMATION, UNDIFFERENTIATED—Buff to brown sandstone conglomerate, moderately sorted and well-stratified sand, sandy gravel, and cobble. The gravel consists of 80-90 percent brown, red, and yellow, rounded quartzites; 10-15 percent chaledony, petrified wood, and jasper; 1-3 percent fragments of Fort Union Formation; 1-3 percent porphyry and tongue porphyry; vertebrate fossils constitute a minor percentage. The formation caps highland plateaus, mesas, and high ridges that generally slope southeastward. Deposits are as much as 65 feet thick
- Tfu** FORT UNION FORMATION—Well-sorted and well-stratified gray clay, bentonitic gray clay, brown carbonaceous clay, lignite, buff, silt, silty gray limestone concretions, olive-gray sand, and buff calcareous sandstone. Marked lateral variation in lithology. Estimated to be more than 1,000 feet thick in the area. For lignite distribution see Collier (1925)
- ps** Pseudoscoria subunit—red to black combustion-metamorphosed strata of the Fort Union Formation (Tfu); locally, overlying surficial deposits have also been baked

CONTACT—Dashed where approximately located; dotted where concealed  
A A' LINE OF SECTION—Section shown on figure 3  
||||| BURIED VALLEY OR CHANNEL  
□□□ MELT WATER CHANNEL—Does not contain identifiable channel deposits  
←→ MELT WATER CHANNEL—Deposit too small for deposit to be mapped. Arrow indicates inferred direction of flow  
~~~~~ CREST OF ESKER—Chevrons point in the inferred direction of flow of water that deposited the esker  
— STREAMLINED HILL—Indicates possible drumlin in Scobey quadrangle  
- - - CREST OF MORaine  
- - - SCARP—Crest of scarp indicated by tic marks  
X ABANDONED COAL MINE  
x GRAVEL PIT  
● DRILL HOLE SITE

ABBREVIATED LOG—Shows that 46 feet of till overlies 5.9 feet of outwash which overlies Fort Union Formation  
Tfu  
7.5 ft cl  
15 ft cl  
13 ft sd  
3.2 ft sh  
16 ft ss

ABBREVIATED LITHOLOGIC LOG OF DRILL HOLE—Abbreviations indicate the following: gv, gravel; cl, clay; sd, sand; sh, shale; ss, sandstone

GEOLOGIC MAP OF THE UPPER POPLAR RIVER BASIN IN THE VICINITY OF SCOBY, MONTANA