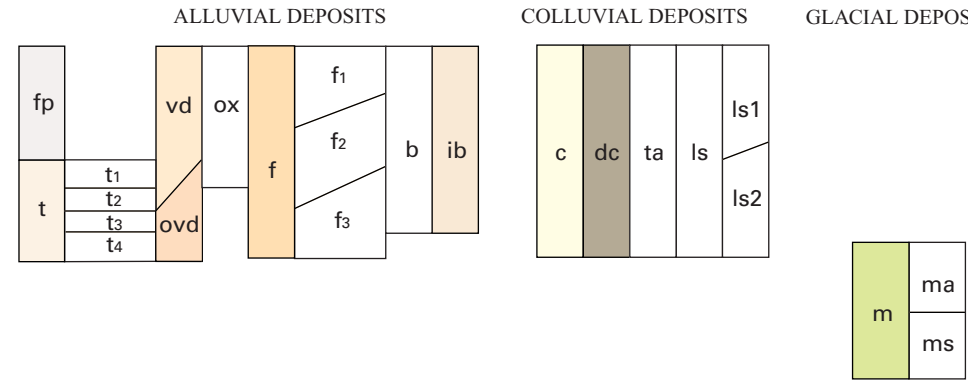


HUMAN-RELATED DEPOSITS
AND STRUCTURES

[Unit descriptions do not differ between plates 1 through 10 with the exception of bedrock, which does differ based on lithologies and geologic formations represented in a mapped area. Prefix "r" indicates alluvial, colluvial, or glacial deposits disturbed by human activities. For example, rfp refers to reworked flood plain deposits from gravel mining operations. Uncolored boxes denote units not mapped on this plate]

H

Human works (upper Holocene) – Includes human-caused deposits and structures larger than 10 m in length, such as fluvial benches, ramps, buildings, open pits, and mine waste piles. Human-made objects include concrete pipes, steel reinforcement planks, metal rods, steel mesh, steel reinforcement concrete piers with iron, steel or aluminum shells, beams, rebar, wire, fine-grained sand discarded machinery. Fluvial mine tailings are well sorted and consist of fine variety of sand and clay-size sediment. Mine waste piles consist of poorly sorted, sand-to-boulder-size fragments with a silt matrix; minerals such as pyrite, galena, sphalerite, hematite, jarosite, and malachite may occur in some waste piles. The materials have been transported by floodwater color to these dumps. Human works were constructed between 1870 and the present. Natural processes such as snow avalanches, local flooding, and slope failure aided in the modification and destruction of historic human works. Some human works such as Adis and muds dumps are composed of acidic waste waters, which discharge elements such as Al, Fe, Cu, Zn, As, and Pb to streams.

fp

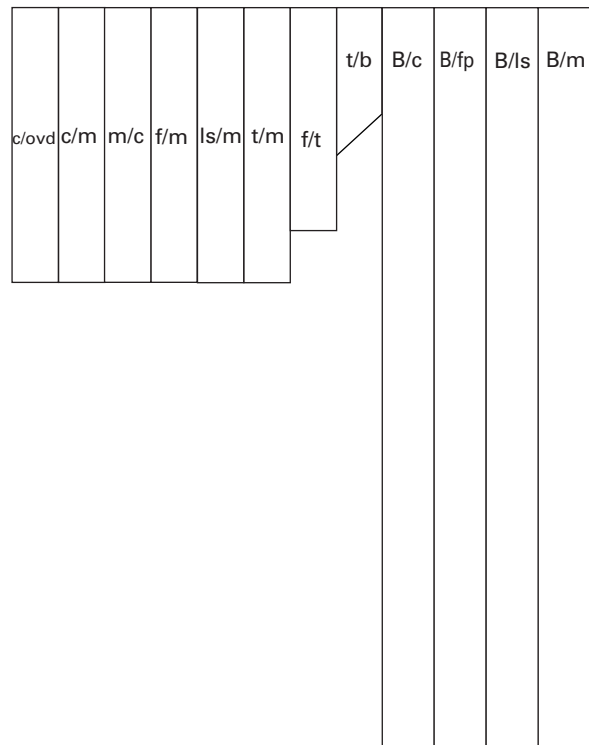
Floodplain deposits (upper Holocene)—Unconsolidated sand and gravel, commonly with silt matrix; poorly sorted, subround to round gravels, commonly imbricated; boulders as much as 0.5 m in diameter common in upper Animas River watershed. Deposited in active stream channels and as overbank sediment on adjacent terraces less than 1 m above channel. Mostly deposited during spring floods and storm discharge events. Natural, fluvial processes throughout the watershed and, in places, human activities, such as between Eureka and Hardsville, have reworked many floodplain deposits since 1860. Red (iron oxide), white (aluminum hydroxide), and black (manganese oxide) staining of floodplain sediments in some reaches indicates high concentrations of dissolved metals. Thickness 1–10 m

Terrace deposits (Holocene to uppermost Pleistocene)—Unconsolidated sand and gravel with silt matrix; poorly sorted, subround to round gravels, commonly imbricated; boulders as much as 0.5 m in diameter common in upper watershed reaches. In highly mineralized areas, the gravels are encased in a thin, discontinuous conglomeratic sand. Sediments deposited during spring runoff and storm over-bank flow discharge events. Surfaces are narrow and flat, and parallel the modern stream channel. Where differentiated by their relative ages, youngest terraces are labeled T₁, lie 1–2 m above the modern channel, and predate 1860 (Kirk Vincent, U.S. Geological Survey, written communication, 2001). Sequentially higher and older terraces are designated T₂, T₃, and T₄. Higher terraces display stronger color and textural B soil horizons. Terrace elevations are not necessarily correlated with terrace ages. Terrace headwater regions of the Animas River basin thickness is 1–10 m, but terrace thicknesses in the lower Animas River basin. Thickness 1–10 m

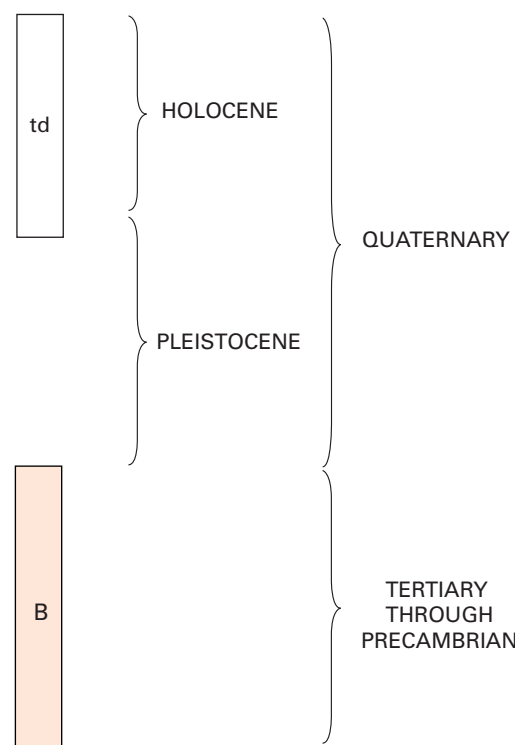
Valley deposits (upper Holocene)—Unconsolidated sand and gravel with a silty matrix and occasionally larger stones derived from valley sides. Deposits formed by fluvial and colluvial processes including periodic floods, small debris flows, and slope wash. Deposits often found on slightly concave valley floors near the heads of tributaries where no distinct fluvial terraces or alluvial fans can be found. Deposits are both historic and pre-historic in age. Thickness 1–5 m

Old valley deposits (Holocene to uppermost Pleistocene)—Unconsolidated sand and gravel with a silty matrix and occasionally larger stones derived from valley sides. Deposits formed by fluvial and colluvial processes, including periodic floods, small debris flows, and slope wash. Same as valley deposits (vd) in mode of formation except unit ovd occupies older concave surfaces now perched above the modern valley floor. Thickness 1–5 m

UNDIFFERENTIATED DEPOSITS



BEDROCK



COLLUVIAL DEPOSITS

C

Colluvial deposits (upper Holocene to uppermost Pleistocene)—Unconsolidated soil and sand- to cobble-size debris derived from valley walls. Processes include rockfall, sheetwash, and creep. Colluvium is discontinuous on the valley sides and produces irregular-shaped, hummocky surfaces. Growth has been continuous since glacial retreat. Thickness 1–5 m

dc

Debris cone deposits (Holocene to uppermost Pleistocene)—Unconsolidated, poorly sorted silt, sand, and gravel with angular cobbles and boulders derived from source gullies. Fluvial and colluvial processes predominate. Deposit volume increases through time due to freeze-thaw weathering processes. Seasonal thunderstorm events result in rock falls, debris flows, and sheet wash onto the cone. Debris cones are fan shaped in map view, have slopes greater than 20°, and are found at the mouth of steep bedrock gullies. Growth has been continuous since glacial retreat. Thickness 1–10 m

GLACIAL DEPOSITS

m	ma
	ms

Glacial till deposits (under the Pleistocene)—Unconsolidated to compacted, poorly sorted, clay to boulder-size sediment derived from ablation of glaciers at ice margins. Form hummocky end moraines and lateral moraine ridges. Best displayed at north end of Durango and near Silverton. Deposits represent the last vestiges of glaciers between 12 and 15 ka. Carrara and others (1984) and Maher (1972) indicated ice-free conditions existed as early as 15 ka, but recent data indicate ice-free conditions at around 12 ka (Gillam, 1998). Till deposits north of Durango are subdivided into two relative ages. Animas City moraines (ma) are 15–25 ka and Spring Creek moraines (ms) are 85–160 ka (Gillam, 1998; Carroll and others, 1999). Thickness 1–20 m

BEDROCK

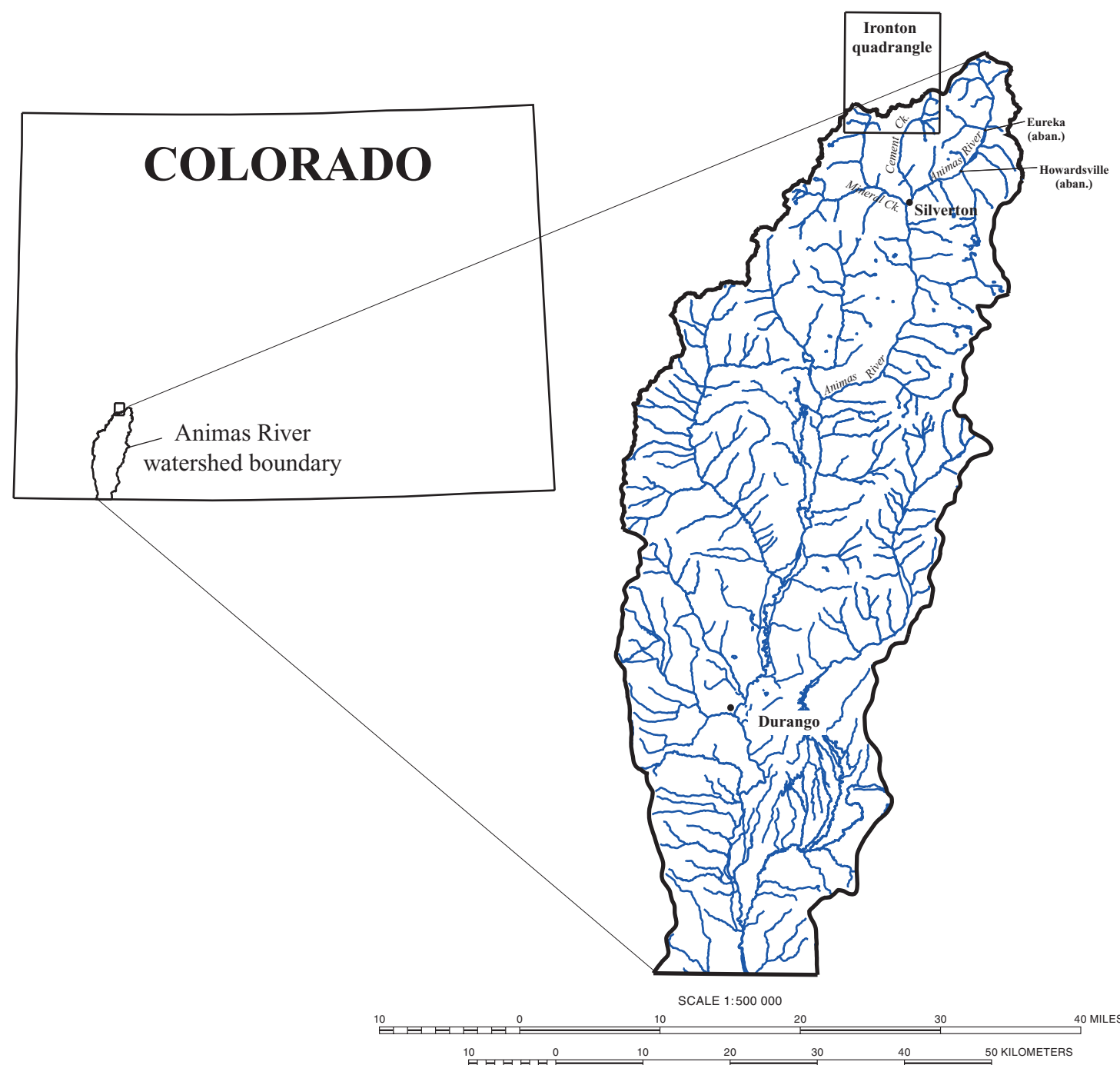
B

Bedrock (Tertiary)—Bedrock forms the exposed valley walls and occasional knobs on the valley floor with thin to no soil cover. Where soil cover is thin, vegetation cover may be present. Bedrock consists mainly of intermediate-composition, volcanoclastic sedimentary rocks, mudflow deposits, and lava flows. Ages of igneous and volcanoclastic rocks range from 35 to 27 Ma. Dacite to rhyolitic intrusions (about 22 Ma) are preserved in tributary basins centered near Red Mountain Nos. 1 and 3 (Steven and others, 1974; Yager and Bove, 2002).

Contact

35

Site of photograph—Camera symbol is located where photograph was taken and camera symbol lens is approximately oriented in direction of photograph. Click on each photograph icon to view a linked .pdf-file photograph and site description



SURFICIAL GEOLOGY ALONG MINERAL AND CEMENT CREEKS IN THE IRONTON QUADRANGLE, ANIMAS RIVER WATERSHED, SAN JUAN COUNTY, COLORADO

By
Robert W. Blair, Jr., and Douglas B. Yager