

68-335

ALLUVIAL FACIES

EXPLANATION

COLLUVIAL FACIES

HEDROCK

Qal

Low terrace and floodplain deposits  
Pinkish-gray to grayish-brown boulder, cobble, and pebble gravel in a fine sand matrix; well sorted, well rounded; in stream valleys draining Battlement Mesa stones are predominantly basalt with subsidiary amounts of local sedimentary rocks; along the Colorado River igneous and metamorphic cobbles are common. Reddish-brown lenses of sandy silt are common. Locally merges with terraces and fan gravels of Grand Mesa

TIME OF DEVELOPMENT OF LATE RECENT SOIL

Qes

Earthflow and solifluction deposits  
Unsorted boulder, cobble, and pebble gravel in a light-greenish-gray sandy silt matrix; contains some basalt boulders derived from older till and landslide deposits; predominantly angular fragments of sandstone, siltstone, and claystone derived from the Wasatch Formation. Surfaces are irregular, often crudely terraced with lobes and swales and undrained depressions; local pond deposits. Almost exclusively restricted to areas underlain by the claystone-rich members of the Wasatch Formation. 1-30 feet thick

Qit

Frost rubble, talus, and rock glaciers(?)  
Boulders and cobbles of basalt, commonly 1-4 feet in diameter, some 20 feet across; angular; lichen covered; boulders have accumulated at base of basalt cliffs; slopes 30°-40° common, occasionally 50°. Arcuate ridges of rubble resembling rock glaciers and several protalus ramparts are included

Tge  
Tgp  
Tgl  
Tgd  
Tg1

Green River Formation

Tge, Evacuation Creek Member: light-brown and gray very fine to medium grained sandstone and light-gray marlstone and siltstone; contains pelacyods, gastropods, ostracods, and fragments of fossil vertebrates  
Tgp, Parachute Creek Member: black, brown, and gray oil shale of varying quality that locally forms cliffs; contains minor amount of light-gray siltstone and light-gray and brown fine- to medium-grained sandstone; also contains numerous thin persistent light-gray to brown analcite and tuff beds. Outcrop of richest oil-shale bed (Manogany bed) shown by dashed-and-dotted line  
Tgg, Garden Gulch Member: light-gray barren marlstone, dark-brown to black paper shale (oil shale of varying quality), light-gray oolitic limestone and sandstone, light-gray algal limestone, and some massive brown fine- to medium-grained sandstone  
Tgd, Douglas Creek Member: brown and buff massive fine- to coarse-grained sandstone and gray shale  
Tg1, lower member: fine- to coarse-grained gray and brown sandstone containing minor amounts of light-gray siltstone and marlstone and a few tan low-grade oil-shale beds

Tm1  
Tm2  
Tm3  
Tm4

Wasatch Formation

Tm, variegated red, gray, purple, and lavender shale and clay; some lenticular fine- to coarse-grained sandstone and thin limestone beds; in the eastern part of the quadrangle the formation is undifferentiated; in the western part it is divided into three members; only the upper member (Tm1) is exposed in the quadrangle, but the middle (Tm2) and lower (Tm3) members may be recognized in the subsurface  
Tm1, upper member: variegated red, gray, purple, and lavender shale and claystone, with red claystone predominating; minor amount of lenticular fine- to coarse-grained sandstone

Contact

Dashed where approximately located

Core drill hole

In SW 1/4 sec. 34, T. 7 S., R. 9 S W

Gas well

\*Although these strata are here assigned to the Evacuation Creek Member of the Green River Formation, as they commonly have been here and elsewhere in the Piceance Creek Basin, they are lithologically more similar to and probably equivalent to the Junta Formation as used in the Uinta Basin (see H. D. Curry, 1964, Oil-content correlation of Green River oil shales, Uinta and Piceance Creek Basins: Intermountain Assoc. Petroleum Geologists Guidebook, 13th Ann. Field Conf., p. 169-171).

This report is preliminary and has not been edited or reviewed for conformity with U.S. Geological Survey standards

SOIL DESCRIPTIONS

Only those soils displaying a completely developed diagnostic profile are described. These soils may occupy as little as 10 percent of the mapped area of a unit.

LATE RECENT SOIL:

A horizon: reddish-gray to brownish-black silt, brownish-black fine sandy silt loam, and black silty clay; humic; 0.5-1.5 ft.  
Cca horizon (generally absent): contains fracture fillings and thin stringers of grayish-white calcareous carbonate; some thin carbonate films on stones; 0.5-2.0 ft.

POST-GRAND MESA SOIL:

A horizon: brown and dark-brown to dark reddish-gray gravelly silt loam to brownish-black silt; friable; 0.5-1.8 ft.  
B horizon: moderate-yellowish-brown (10YR 4/4) gravelly silt loam to reddish-brown (5Y 3/3) sandy silt loam to dark reddish-gray gravelly silt loam; loose, weak granular structure; very weakly oxidized; pH 8.0; 0.8-1.7 ft.  
Cca horizon: white to gray-white gravelly silt; calcium-carbonate impregnation ranges from very strong with well-developed platy structure to thin coatings on stones; 1.0-1.5 ft.

LANDS END-GRAND MESA INTERGLACIAL SOIL:

A horizon: brown to brownish-black silt and fine silty sand; loose friable; 0.5-1.0 ft.  
B horizon: dark reddish-brown (5YR 3/3) clay to dark reddish-brown (5YR 4/4) sandy silt to reddish-brown (2.5YR 4/4) silty clay loam and silt; clay skins, medium platy to blocky structure; moderately sticky; pH 5.5-8.5; secondary carbonate; 1.5-4.5 ft. thickness varies with elevation.  
Cca horizon: pink (7.5YR 7/4) silt loam to white gravelly silt; strongly impregnated with calcium carbonate at low elevations; locally indurated; platy structure; 1.0-5.0 ft.

PRE-LANDS END INTERGLACIAL SOIL:

A horizon: dark-brown to brown sandy silt; friable, calcium-carbonate aggregates scattered throughout; probably of modern origin; no structure; pH 8.0; 0.5-1.5 ft.  
B horizon (commonly partially or completely stripped): reddish-brown (5YR 4/3-5YR 4/3) fine sandy silt; a few partially weathered basalt pebbles; weak blocky structure, very slightly sticky; 2.0-3.0 ft.  
Cca horizon: white gravelly silty sand; very strongly impregnated with calcium carbonate, stones often thickly coated; prominent platy structure, moderately well cemented, firm; 3.0-5.0 ft.

Qgo  
Qgy

Terrace and fan gravels of Grand Mesa  
Pebble, cobble, and boulder gravel in a sandy matrix; glacial and nonglacial; moderately to well sorted; subrounded to well rounded; fabricate structure; stones are mostly basalt but also include variable amounts of sedimentary rocks; near Colorado River are abundant cobbles of igneous and metamorphic rocks derived from east of the mapped area. Gradients are 50-100 feet per mile. 5-200 feet thick  
Qgy, younger gravels; merges with Recent floodplain deposits (Qal)

Qgp

Pediment gravel of Grand Mesa  
Pebble, cobble, and boulder gravel in a light-greenish-gray silty sand matrix; poorly sorted; commonly unstratified; stones angular to subangular, slabs predominantly locally derived sandstone, siltstone, claystone, and marlstone; basalt boulders scarce. Deposits especially common at the base of steep slopes in the arid regions. Probably includes some colluvial material. Gradients 150-200 feet per mile; 100-200 feet above streams. Commonly mantled with thin reddish-brown eolian silt. 5-40 feet thick

Qgmf

Mudflows and fan gravel of Grand Mesa  
Pebble, cobble, and boulder gravel in a gray matrix of coarse sand; poorly sorted with stones seldom in contact; stones angular to subangular; primarily unweathered basalt. Derived largely from landslide deposits (Qsl). Forms both smooth and irregular slopes, some natural levees. Several generations of flows cut out and override terrace and fan gravels of Lands End (Qla) and older mudflow deposits (shown by contacts within unit Qgmf)

Qsl

Slump blocks, talus, and solifluction deposits  
Slump blocks forming ridges of basalt and basalt rubble mantling much of the high surface on Battlement Mesa. Unbroken blocks are as much as 1 mile long and locally have relief of 500 feet; as much as 50° rotation observed. Block rubble deposits composed of large angular blocks of basalt are included

Qla

Terrace and fan gravels of Lands End  
Grayish-brown sandy gravel; moderately to poorly sorted; poorly stratified, rock fragments angular to well rounded; basalt and locally derived slabby siltstone, marlstone, and sandstone. North of Battlement Mesa the fan gravels are deposited on pre-Wisconsinan pediments and alluvial fans; correlation with the till of Lands End is inferred. Gradients of fans 400 feet per mile; 20-200 feet thick

TIME OF DEVELOPMENT OF LANDS END-GRAND MESA INTERGLACIAL SOIL

Qp

Pediment gravel  
Subangular to subrounded pebble, cobble, and boulder gravel; basalt boulders as much as 8 feet in diameter; cobbles, pebbles, and matrix are approximately 50 percent locally derived grayish-green sandstone, siltstone, and claystone; poorly sorted except near Colorado River. Gravel surface is commonly mantled with a thin veneer of reddish-brown wind-blown sand and silt. Gradients commonly 300-400 feet per mile; 400-600 feet above Colorado River. Generally less than 50 feet thick

GLACIAL FACIES

ALLUVIAL FACIES

COLLUVIAL FACIES

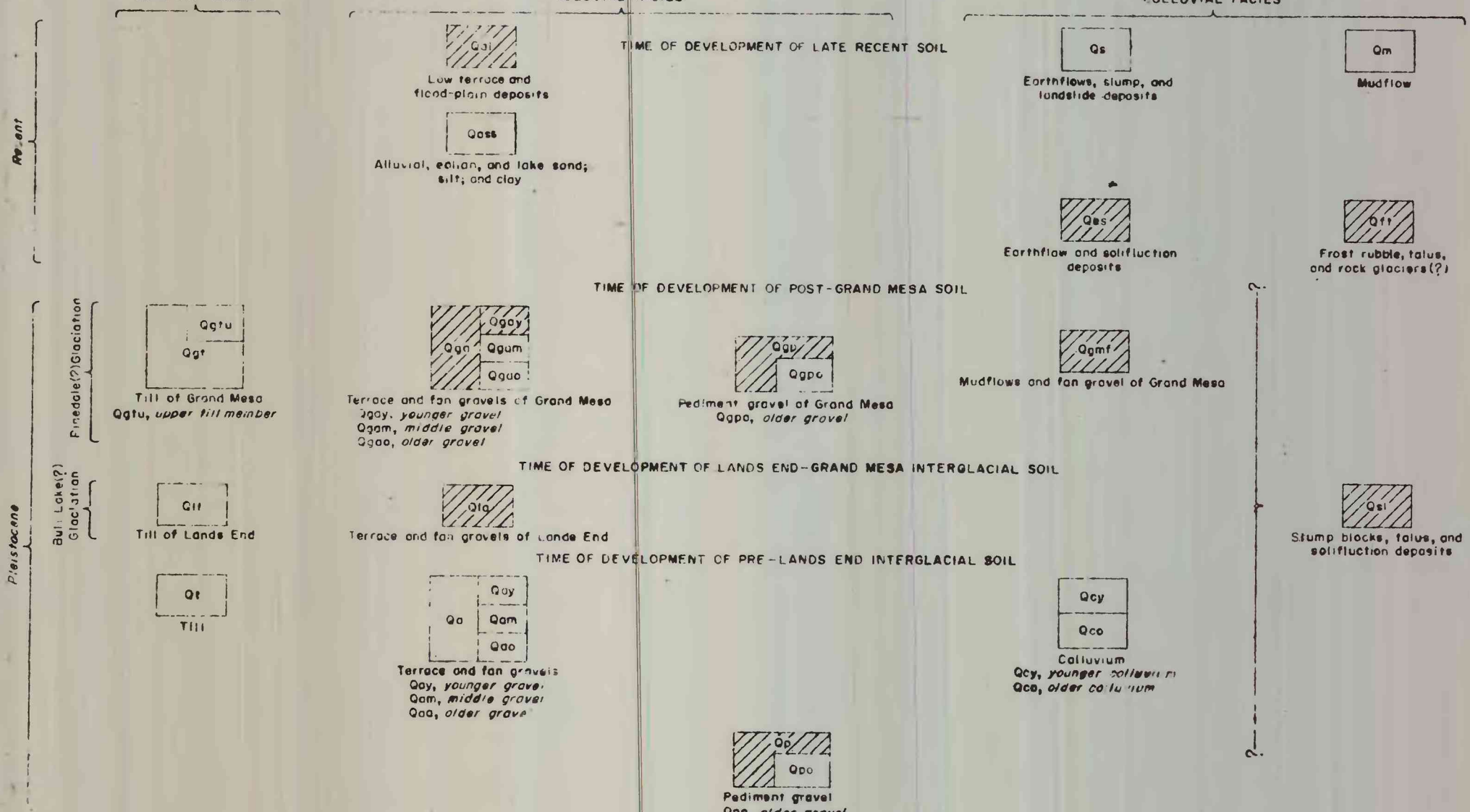


DIAGRAM SHOWING RELATIVE AGES OF SURFICIAL UNITS IN THE GRAND MESA-BATTELEMENT MESA AREA  
Patterned boxes indicate units present in this quadrangle