DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY


CORRELATION OF MAP UNITS

| | | |
|---|---|---|
| Qal, Qts, Qs | Holocene | QUATERNARY |
| | Pleistocene | |
| Unconformity | | |
| Tu, Tgpu, Tgpn, ml, yd, km, Tgg, lp, Twsm, Twa | Eocene | TERTIARY |
| | Eocene and Paleocene ? Paleocene | |
| Unconformity | | |
| Khc | Upper Cretaceous | CRETACEOUS |

DESCRIPTION OF MAP UNITS

Qal ALLUVIAL DEPOSITS (HOLOCENE)--Mostly alluvial fan deposits

Qts TALUS AND SLOPEWASH DEPOSITS (HOLOCENE)--On steep slopes; grades laterally into alluvial fan deposits

Qs SLUMP, LANDSIDE, AND TERRACE DEPOSITS (HOLOCENE AND PLEISTOCENE)--Terrace deposits are badly dissected and difficult to distinguish from slump and landslide deposits and, therefore, are not mapped separately

Tu UINTA FORMATION (EOCENE)--Mostly brown and gray, poorly bedded to massive noncalcareous to moderately calcareous sandstone, siltstone, and mudstone; as much as 50 percent of unit may be composed of rocks that are typical of the Parachute Creek Member lithologies, such as laminated silty and muddy carbonates and minor oil shale. Commonly displays a high degree of soft-sediment deformation. The lower part of the Uinta Formation grades southward into the upper part of the Parachute Creek Member. In general, any sequence composed of greater than 50 percent Parachute Creek lithologies is mapped as Parachute Creek. Occurs as remnants as much as 77 m thick on high ridges

GREEN RIVER FORMATION (EOCENE)
Parachute Creek Member

Tgpu Upper part of Parachute Creek Member--Mostly laminated, silty and muddy carbonates with minor oil shale; as much as 50 percent of the unit may be composed of rocks that are typical of the Uinta Formation. Commonly displays a high degree of soft-sediment deformation. Occurs in the southern two-thirds of the quadrangle and grades northward into Uinta Formation. From about 25 to 45 m thick

Tgpn Middle part--Most important oil-shale unit, a nearly continuous oil-shale sequence with some laminated silty and muddy carbonates. Contains numerous thin analcitized tuff beds. An unmapped tongue of Uinta Formation from 0-8 m thick informally known as the Porcupine tuff occurs as a persistent unit 6-10 m below the top of the member in the northern half of the quadrangle but is discontinuous in the southern half. From 110-140 m thick; thickens to the northeast

ml Mahogany ledge (Mahogany zone in subsurface)--Richest oil-shale unit in the Parachute Creek Member. Only the top is shown. About 18 m thick

Tgd Douglas Creek Member--Carbonate-rich rocks such as laminated silty and muddy carbonates, ostracodal, oolitic, and algal limestones interlayered with olive-green mudstone, medium- to dark-gray shale, gray siltstone, and gray sandstone. Sandstone units are fairly persistent, 5 m thick or less and constitute less than 20 percent of the member. Sandstones are fine to medium grained, and moderate to well sorted, with parallel horizontal, ripple, and small-scale cross laminations. Ostracodal, oolitic, and algal limestones constitute about 5 to 8 percent of the member and increase in abundance to the southwest. Most of the thick algal limestones are concentrated in a sequence about 75 m thick that occurs about 115 m below the top of the Mahogany zone. From about 230 to 305 m thick

km Tuff bed at Kimball Mountain--Even-bedded 5-cm thick tuff; consists of analcime which is partially replaced by large sparry calcite crystals; crystals are conspicuous on fresh surface. Purple and gray on fresh surface and rust brown where weathered. Mapped in most localities as the base of the Douglas Creek Member, although in some places Douglas Creek lithology occurs as much as 20 m below the tuff. In the southwest corner of the quadrangle, the lithologic base of the Douglas Creek is about 31 m below the tuff bed at Kimball Mountain, and the base is mapped separately. Bed is discontinuous in the southwestern part of the quadrangle

Tgg Garden Gulch Member--Mostly papery, fissile, laminated dark-gray to black, kerogen-rich clay shale with some silty and muddy carbonates, siltstone, and ostracodal, oolitic, and algal limestone. Two samples from the measured section shown in this report were analyzed for oil yield by Fischer assay. One sample collected 22 m above the base of the Garden Gulch yielded 2.4 gallons of oil per ton and is thought to be representive of much of the unit. The other sample collected 31 m above the base from a 25-cm thick oil-shale bed yielded 19.5 gallons of oil per ton. The member is from about 30 to 60 m thick in the southern part of the quadrangle. Thickness in the northern part of the quadrangle is not known because the base is not exposed

lp Marker bed at Long Point--Composed of varying amounts of fine- to medium-grained quartz sand, ostracods, and oolites; Goniobasis and Viviparus gastropods are locally abundant. This is a widespread transpressive unit found throughout the southwest Piceance Creek basin. Thickness about 1-7 m

Twsm WASATCH FORMATION (EOCENE AND PALEOCENE)--The Shire Member is mostly well banded gray, purple, and maroon mudstone with a few discontinuous fine-grained massive sandstone units. The member is about 60-110 m thick. The Molina Member is mostly nonpersistent, buff weathering sandstone and well-banded, gray, purple, and maroon mudstone. The sandstone units are 10 m thick or less, fine to medium grained, well to moderately well sorted, parallel horizontal, trough cross and drift ripple laminated. The top of the Molina is the top of the highest buff weathering sandstone. The base of the Molina Member is mapped as the change from mottled gray and maroon mudstone of the Atwell Gulch Member below to well-banded, gray, purple and maroon mudstone above. The contact appears to be a persistent and distinct surface. The lowest sandstone in the Molina Member always occurs at or above this contact, but never below. The member is from 0 to 50 m thick. Because of the lenticular character of the Molina and its interfingering relationship with the Shire Member, the Molina is mapped with the Shire. Age of the Shire Member is Eocene (Johnson and May, 1979). The Molina Member has not been dated; however, dates on units above and below bracket the age of the Molina as between late Paleocene and early to middle Eocene (Johnson and May, 1979).

Twa Atwell Gulch Member (Paleocene)--Mostly mottled maroon and gray claystone and mudstone with some black claystone and a few thin sandstone units. Sandstones are fine grained and ripple laminated or massive. Black claystone is found mainly in the lower 50 m. The Atwell Gulch is late Paleocene in age (Johnson and May, 1979). Exposed only in the southwest corner of the quadrangle where it is about 172 m thick.

Khc HUNTER CANYON FORMATION (UPPER CRETACEOUS)--Mostly gray to white sandstone, interlayered with massive gray mudstone and gray carbonaceous claystone. Sandstone units are as much as 40 m thick, lenticular, and make up about 60 to 70 percent of the formation. Sandstones are fine to coarse grained with a few lenses of small pebbles of gray chert and gray silicified limestone found mainly in the upper 100 m. Sandstones are parallel horizontal and trough cross laminated with some large-scale lateral accretion beddings. The upper 50-100 m of the formation is white due to a breakdown of feldspar to kaolinite and is believed to be the result of paleo-weathering that occurred during the time interval represented by the overlying unconformity (Johnson and May, 1980). This white zone, which has sparse conglomeratic lenses in some areas, has been called Ohio Creek Formation in the past but was recently redefined as a member of the Hunter Canyon Formation (Johnson and May, 1980). In the Middle Dry Fork quadrangle, the lower contact of the Ohio Creek Member is gradational on outcrop, and, consequently, the member was not mapped. The Hunter Canyon Formation is early Maastrichtian to late Campanian in age (Johnson and May, 1979). Exposed only in the southwest corner of the quadrangle. Only the upper 120 m are exposed

——— CONTACT--Dashed where approximately located

—8100— STRUCTURE CONTOURS--Drawn on top of the Mahogany zone. Dashed where datum is removed. Contour interval. 100 feet (30.5 m)

DRILL HOLE--Queried where approximately located. Locations given on table of drill-hole data

MEASURED SECTION--Numbers keyed to map

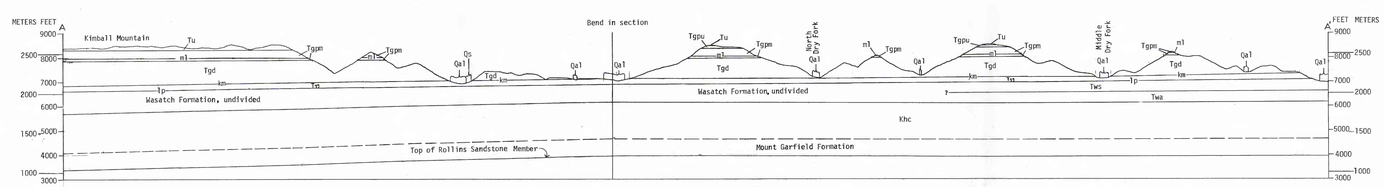
REFERENCES CITED

Johnson, R. C., and May, Fred, 1979, Preliminary stratigraphic studies of the upper part of the Mesaverde Group, the Wasatch Formation, and the lower part of the Green River Formation, DeBeque area, Colorado, including environments of deposition and investigation of palynomorph assemblages: U.S. Geological Survey Miscellaneous Field Studies Map MF-1050.

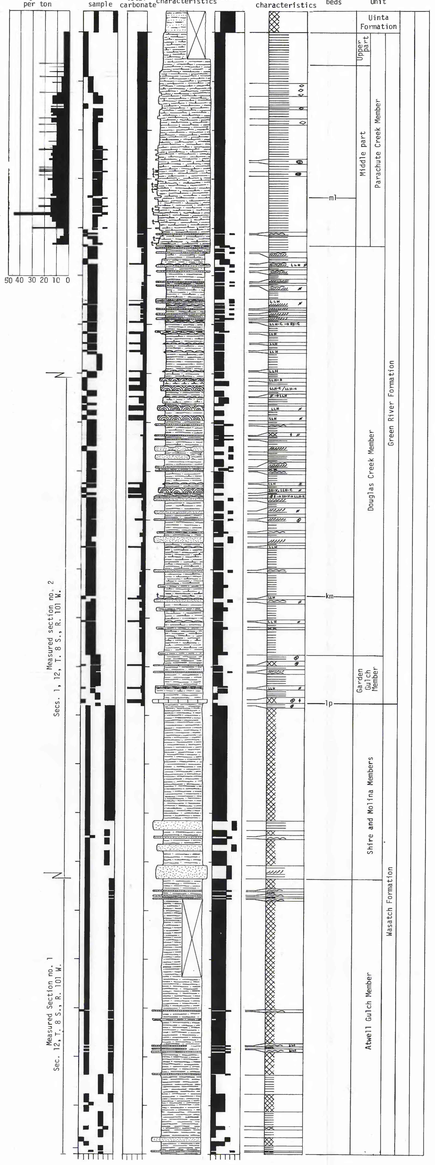
1980, A study of the Cretaceous-Tertiary unconformity in the Piceance Creek basin, Colorado--The underlying Ohio Creek Formation (Upper Cretaceous) redefined as a member of the Hunter Canyon or Mesaverde Formation: U.S. Geological Survey Bulletin 14828.

Table 1.--Drill-hole data

| Map no. | Name and operator | Location sec. | T.S. | R.W. | Total depth ft | m |
|---|---|---|---|---|---|---|
| 1 | El Paso Natural Gas Co. corehole no. 3 Whatley. | 33 | 6 | 100 | 560 | 171 |
| 2 | El Paso Natural Gas Co. corehole no. 2 Whatley. | 34 | 6 | 100 | 605 | 185 |
| 3 | El Paso Natural Gas Co. corehole no. 1 Whatley. | 2 | 7 | 100 | 650 | 198 |
| 4 | Fuel Resources Development Co. no. 18-1 Chevron-Federal. | 18 | 7 | 100 | 8,300 | 2,531 |
| 5 | Great Basins Petroleum Co. no. 1 Winn-Govt. | 10 | 8 | 100 | 3,578 | 1,090 |




MEASURED SECTIONS



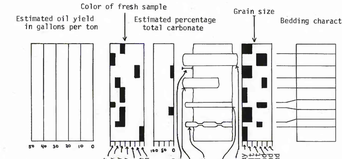

EXPLANATION FOR MEASURED SECTIONS

Lithologic characteristics

- Sandstone
- Siltstone
- Calcareous siltstone
- Claystone or clayshale
- Silty claystone or silty clayshale
- Limestone
- Algal stromatolites
- Partially covered

Bedding characteristics

- LLE Laterally linked hemispheroids
- LLH-C Close-linked hemispheroids
- SHV Vertically stacked hemispheroids
- LLH-S/LLH-C Space-linked hemispheroids with close-linked hemispheroids on a microscale
- SHV→LLH-C Vertically stacked hemispheroids grading up into close-linked hemispheroids
- bmt Bioturbation
- Massive
- Poorly developed parallel laminae
- Well-developed parallel laminae
- Ripple beds
- Cross strata, 30 cm or less
- Ostracods
- Oolites
- Oncolites
- Crystal cavities
- Insect larva
- t Tuff




MISCELLANEOUS FIELD STUDIES
MAP MF-1215
MIDDLE DRY FORK QUAD., COLORADO

# PRELIMINARY GEOLOGIC MAP OF THE MIDDLE DRY FORK QUADRANGLE, GARFIELD COUNTY, COLORADO

By
Ronald C. Johnson
1980

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1980

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