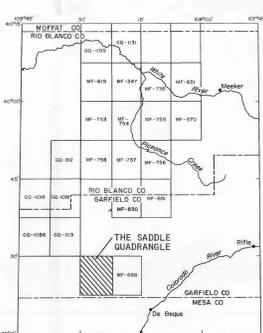


Index showing location of correlation diagram in the Saddle quadrangle, Colorado

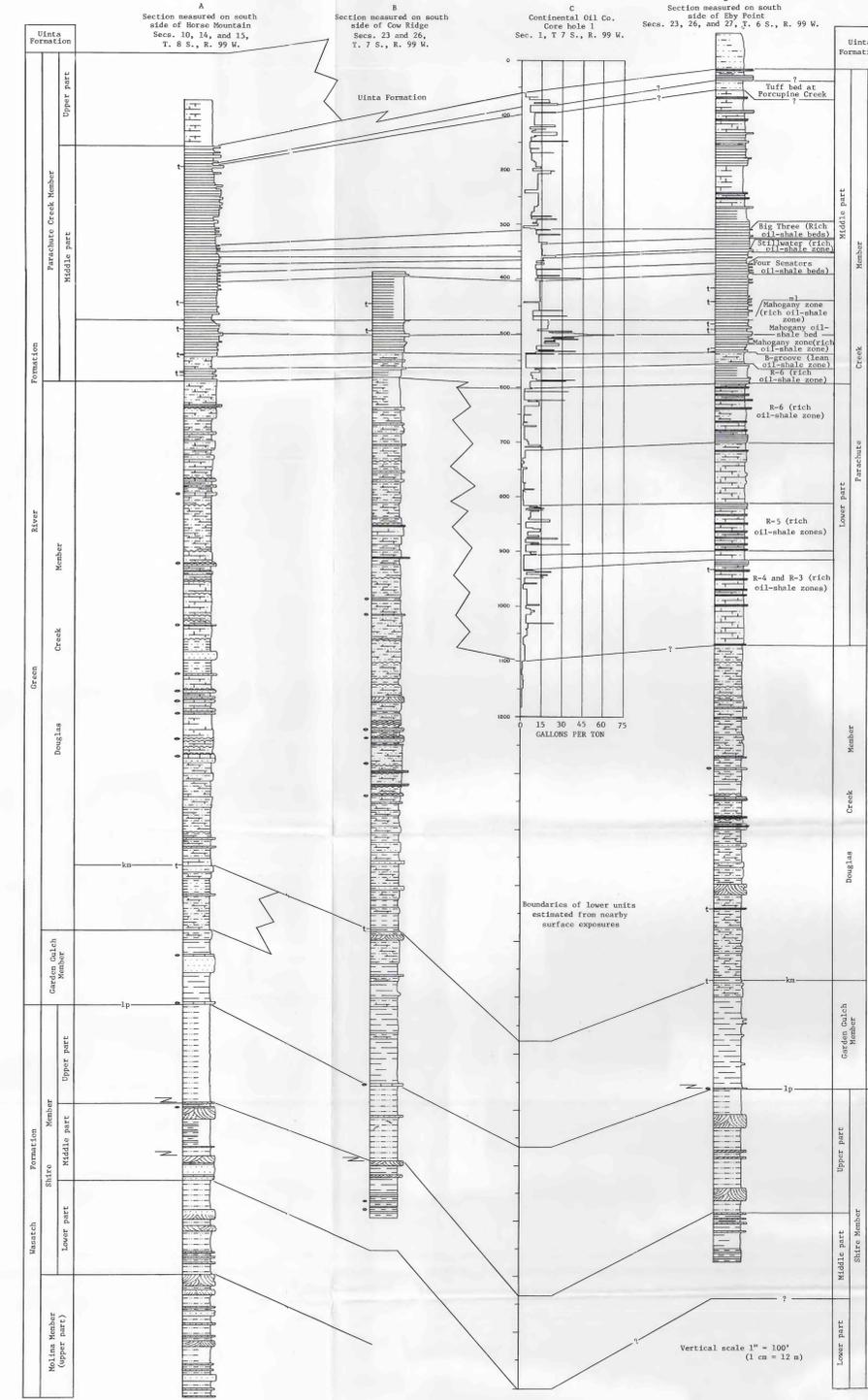
HOLES DRILLED IN THE QUADRANGLE

No.	Name	Total depth feet	Meters
1.	Continental Oil Co., Whitley corehole 3	601	183
2.	El Paso Natural Gas Co., standard shale 1	6,673	2,035
3.	Continental Oil Co., corehole 7	581	177
4.	Continental Oil Co., corehole 2	1,271	388
5.	Continental Oil Co., corehole 4	1,015	309
6.	Continental Oil Co., corehole 1	1,183	361
7.	El Paso Natural Gas, Whitley 2	1,271	388
8.	El Paso Natural Gas, Schrems 1	4,885	1,489
9.	El Paso Natural Gas, Whitley 2	1,012	309
10.	Carter and Carter, Davidson 1	4,391	1,339
11.	Carter and Carter 1-36	1,817	554



Index of recently published U.S. Geological Survey geologic maps in the Piceance Creek basin area.

REFERENCE
Cashion, W. B., and Dennell, J. R., 1972, Chart showing correlation of selected key units in the organic-rich sequence of the Green River Formation, Piceance Creek basin, Colorado and Utah. U.S. Geol. Survey Oil and Gas Inv. Chart OC-65.

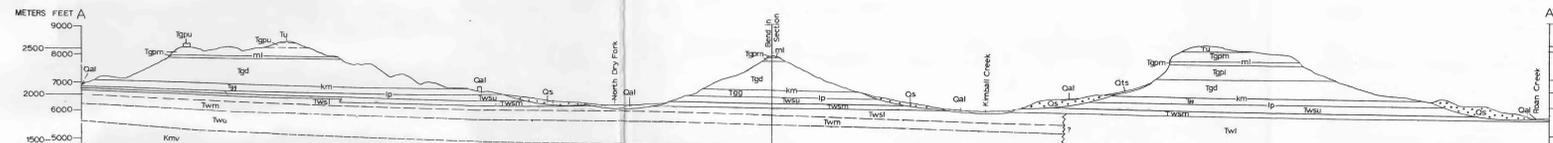


CORRELATION DIAGRAM OF WELLS AND OUTCROP

EXPLANATION

[Symbol]	Flat-bedded or massive sandstone	[Symbol]	Kerogen-rich clay shale	[Symbol]	Irregular veins of gypsum
[Symbol]	Crossbedded sandstone	[Symbol]	Oil shale (kerogen-rich silty dolomitic limestone)	[Symbol]	Algal stromatolites
[Symbol]	Siltstone	[Symbol]	Dolomitic and calcareous claystone	[Symbol]	Partially covered
[Symbol]	Claystone	[Symbol]	Dolomitic and calcareous silty claystone	[Symbol]	Oolites and ostracodes
[Symbol]	Silty claystone	[Symbol]	Dolomitic and calcareous siltstone	[Symbol]	Tuff beds
[Symbol]	Carbonaceous shale and thin coal beds	[Symbol]	Silty dolomitic limestone	[Symbol]	Tentative correlation
[Symbol]	Variegated mudstone	[Symbol]	Limestone	[Symbol]	Mahogany ledge
[Symbol]		[Symbol]		[Symbol]	Tuff bed at Kimball Mountain
[Symbol]		[Symbol]		[Symbol]	Sandstone bed at Long Point

--- CONTACT—Shaded where approximately located
--- ANTICLINE—Showing crestline and direction of plunge. Approximately located
--- SYNCLINE—Showing troughline and direction of plunge. Approximately located
--- 8000-STRUCTURE CONTOURS—Drawn on top of the Mahogany ledge. Dashed where datum is eroded. Contour interval 100 feet (30.5 m)
○ CORE HOLES—Drilled for oil shale evaluation. Quoted where approximately located
● DRILL HOLES—Drilled for oil and gas. Quoted where approximately located



CORRELATION OF MAP UNITS

Map Unit	Geologic Age	Description
Qal	Quaternary	ALLUVIAL DEPOSITS (HOLOCENE)—Mostly alluvial fan deposits.
Qts	Quaternary	TALUS AND SLIPFASH DEPOSITS (HOLOCENE)—On steep slopes; grades laterally into alluvial deposits.
Qp	Quaternary	SLOW, LANDSLIDE, CREEP AND TERRACE DEPOSITS (HOLOCENE AND PLEISTOCENE)—Single slump blocks as large as 0.3 km ² . Most slump blocks show slight to extreme back rotation. Terrace deposits scattered in eastern one-third of quadrangle, where they form at least one badly dissected surface. Difficult to distinguish from mass wasting deposits, therefore two units mapped together.
Tu	Tertiary	UINTA FORMATION (Eocene)—Mostly brown and gray poorly bedded or massive sandstone, siltstone, and mudstone with some thin units of laminated dolomitic and calcareous mudstone. Locally contains abundant carbonaceous trash. Occurs as remnants as much as 250 ft (77 m) thick on high ridges.
Tgmu	Tertiary	Upper part of Parachute Creek Member—Mostly carbonaceous shale and thin coal beds with some thin beds of oil shale and thin zones of massive sandstone, siltstone and mudstone similar to Uinta Formation. Poorly exposed, found only on Horse Mountain and on Cow Ridge in the southern part of the quadrangle; grades northward into Uinta Formation. Thickness about 140-180 ft (43-55 m).
Tgpm	Tertiary	Middle part of Parachute Creek Member—Main oil-shale unit. Nearly continuous oil shale with some carbonaceous-rich laminated siltstone and laminated silty claystone. Contains numerous thin sandstone and siltstone lenses. In the upper part of the quadrangle this is 20-35 ft (6-11 m) above the porcupine tuff bed (see informal term). An unmapped tongue of Uinta Formation is 10-15 ft (3-5 m) below the top of the middle part on the east end of Kimball Mountain, in the northeast corner of the quadrangle. The unmapped tongue of the Uinta begins in about sec. 3, T. 7 S., R. 99 W., and thickens to the northeast, reaching a thickness of 50 ft (16 m) in sec. 2, T. 7 S., R. 99 W. where the upper contact is dropped to the next highest oil-shale bed; the lower contact is 20-40 ft (6-12 m) below the base of the groove (an informal term) thickness 400-550 ft (120-170 m) to the northeast. Lower part of Parachute Creek Member—Mostly light buff silty laminated carbonaceous rocks with numerous thin oil-shale beds. Found only on the eastern end of Kimball Mountain, on the east end of Kimball Mountain in the basal contact is approximately the base of the 3-3 oil-shale zone (see notes cited by Janet Pitman, oral comm.). For description of oil-shale zones see Cashion and Dennell (1972). Thickness 375-550 ft (115-168 m); thickens to the northeast.
Tgml	Tertiary	Mahogany ledge or Mahogany zone in subsurface—richest part of the Parachute Creek Member. Only top is shown on map and section. Thickness about 60-65 ft (18-20 m).
Tgms	Tertiary	Douglas Creek Member—Mostly siltstone, with olive-green silty claystone, and olive-green claystone with algal stromatolite structures, oolitic and ostracoidal limestone, and some sandstone. Much of the siltstone, silty claystone and claystone contains a significant amount of carbonate and locally abundant gastropods, goniatites sp., and vyastranus sp. Nodules for exposures 3-10 ft (1-3 m) thick on Long Point in Long Point quadrangle. Only the base is shown on map.
Tgmn	Tertiary	MASTACH FORMATION (Eocene AND PALEOCENE AND DESE SHIRE MEMBER, UPPER PART (Eocene)—Mostly gray and maroon variegated mudstone; some lenticular outcrops of massive and crossbedded sandstone. Sandstone is fine grained, and usually calcemented. Massive sandstone is bioturbated. Thickness 70-100 ft (21-30 m).
Tgmo	Tertiary	Shire Member, middle part (Eocene)—Mostly gray clay shale with sandstone and siltstone in the upper half; mostly carbonaceous shale with coal, siltstone, and ostracoidal limestone in the lower half. Sandstone is fine grained, even bedded to crossbedded and occurs mainly as thin persistent units. Clay shale is similar to the Garden Gulch Member of Green River Formation. Coal beds are usually less than 4 in. (10 cm) thick. Most of the middle part contains a significant amount of carbonaceous shale and weathers light gray in contrast to the gray and maroon variegated alphas above and below. Grades laterally into sandstone and variegated mudstone to the southwest. In the extreme southwestern corner of the quadrangle the upper half is predominantly sandstone. The lower half of the middle part has graded into mudstone and is mapped with the lower part of the Shire Member. A persistent 10-10 ft (3-3 m) thick sandstone ledge is found 70-110 ft (21-34 m) above the base throughout most of the southern half of the quadrangle. Thickness is about 190-200 ft (58-61 m) and increases to the southeast.
Tgmp	Tertiary	Sandstone bed at Long Point—Lowermost persistent lacustrine bed; consists of varying amounts of quartz sand, ostracodes, and oolites with locally abundant gastropods, goniatites sp., and vyastranus sp. Nodules for exposures 3-10 ft (1-3 m) thick on Long Point in Long Point quadrangle. Only the base is shown on map.
Tgms	Tertiary	MASTACH FORMATION (Eocene AND PALEOCENE AND DESE SHIRE MEMBER, UPPER PART (Eocene)—Mostly gray and maroon variegated mudstone; some lenticular outcrops of massive and crossbedded sandstone. Sandstone is fine grained, and usually calcemented. Massive sandstone is bioturbated. Thickness 70-100 ft (21-30 m).

PRELIMINARY GEOLOGIC MAP AND CROSS SECTION OF THE SADDLE QUADRANGLE, GARFIELD COUNTY, COLORADO

By
Ronald C. Johnson
1977