

**CORRELATION OF MAP UNITS**

Qa1	Holocene	QUATERNARY
Tu1 - Tu100		
Tgdc	Eocene	TERTIARY
Tgsp		
Tgpc		
Tgbc		
Tgac		

**DESCRIPTION OF MAP UNITS**

**Qa1 ALLUVIUM (HOLOCENE)**—Inconsolidated material consisting of a fine-grained matrix with various sizes of brown and gray sandstone and tuffaceous siltstone fragments derived from the Uinta Formation and gray barren marlstone and brown to black oil-shale fragments from the upper part of the Parachute Creek Member of the Green River Formation. Confined to valleys of the larger streams and in alluvial fans formed at the intersection of tributaries with the larger streams; also includes siltstone at the base of steep slopes. In the valleys of the larger streams may be thicker than 100 ft.

**TU1-TU100 UINIA FORMATION (EOCENE)**—Mostly brown and gray sandstone and tuffaceous siltstone, locally includes oil-shale beds. Sandstone beds vary from very fine grained to very coarse grained with occasional 0.5- to 1.0-inch quartz and chert pebbles. In many places, the coarse-grained sandstone beds also contain rip-up clasts of the underlying marlstone and tuffaceous siltstone. The sandstone beds are generally finer grained in the southern part of the quadrangle. Structural relief on the base of the sandstone beds is great at places in the northern part of the quadrangle due to foundering of the massive clastic bodies into the unconformated underlying carbonate sediments of the Green River Formation. In the southern part of the quadrangle, the Black Sulphur Tongue of the Green River Formation (not mapped) is present in the unit but poorly developed. Unbedded remnants of the unit attain a maximum thickness of 700 ft.

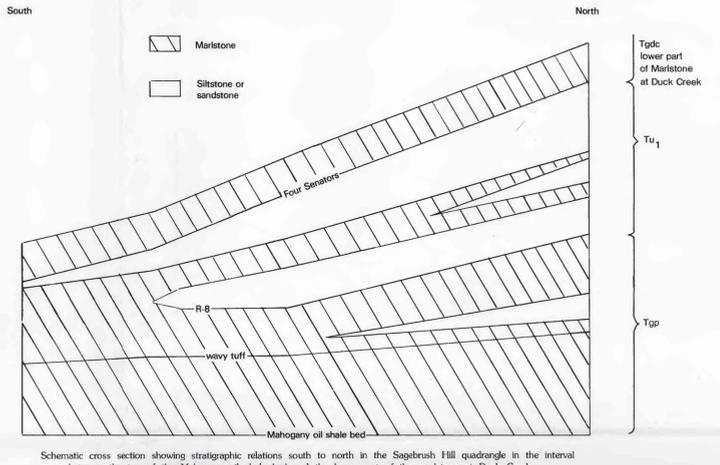
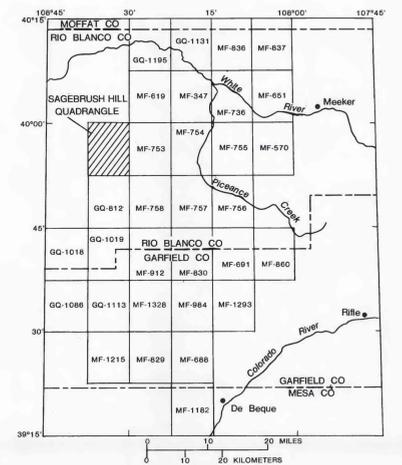
**Tu1-U100 UINIA FORMATION, channel sandstone**—Massive, contorted, fine-grained to coarse-grained sandstone; contains clasts of the underlying marlstone of the Green River Formation and scattered small, one-half inch to one-inch, pebbles of chert and quartz. The unit is restricted to the northeast part of the quadrangle in secs. 4, 8, and 9, T. 1 S., R. 99 W. Probably the lateral equivalent of Tu1 unit in the Wolf Ridge quadrangle (Duncan, 1976). Maximum exposed thickness 200 ft.

**Tu1-U100 UINIA FORMATION, siltstone and fine-grained sandstone**—In the southern and central part of the quadrangle, and medium-grained to coarse-grained sandstone in the northern part of the quadrangle. In the southern edge of the quadrangle, it is a single thin clastic unit whereas, in the northern part of the quadrangle, the unit consists of three clastic units thickening to the north separated by two oil-shale units thickening to the south. Probable equivalent of the Tu1 unit in the Wolf Ridge quadrangle (Duncan, 1976). Maximum exposed thickness 250 ft.

**Tgdc GREEN RIVER FORMATION (EOCENE)**—Marlstone at Duck Creek—Unit consists mainly of thin bedded marlstone and oil shales. The base of the unit is at the lower contact of the Four Senators rich oil-shale sequence; the upper contact is approximately at the top of the Big Three oil-shale sequence. In the southern part of the quadrangle, the entire unit consists of oil shale ranging in quality from low grade to rich. In the northern part of the quadrangle, the upper third of the unit is almost entirely bone-white marlstone, barren of organic matter; the middle third consists of approximately equal parts of white to tan marlstone and tan tuffaceous siltstone; and the lower third contains barren marlstone, low-grade oil shale, and a few thin beds of moderately rich oil shale near the base of the unit. The entire unit is the probable equivalent of the combined Tg1, Tg2, and Tg3 units in the Wolf Ridge quadrangle (Duncan, 1976). Regionally the base of the unit is probably correlatable with the base of the Wolf Creek Tongue of the Green River Formation; and the top of the unit is probably correlatable with the top of the Thirtymile Creek Tongue of the Green River Formation. The unit ranges in thickness from 200 to 250 ft.

**List of drill hole data**

MAP NO.	OPERATOR AND NAME OF WELL	SECTION
	T. 1 S., R. 99 W.	
1	Cameron Engineers, CE-706	SE 1/4 7
2	Cameron Engineers, CE-704c	SW 1/4 16
3	Teton Energy, Federal 16-3	SW 1/4 16
4	Mintech Corp., Portland hole no. 1	SW 1/4 19
5	Rio Blanco Oil-Shale Company, hole M-4	SW 1/4 21
6	Rio Blanco Oil-Shale Company, hole M-1	SW 1/4 29
7	David M. Munson, 30-1-99 Federal	SW 1/4 30
8	The Oil Shale Corp., hole C-A-2	SW 1/4 32
9	David M. Munson, 31-1-99 Federal	SW 1/4 32
10	Cameron Engineers, CE-701	SW 1/4 32
11	C-A Oil-Shale Project, CH-1	SW 1/4 32
12	Cameron Engineers, CE-707	SW 1/4 32
13	C-A Oil-Shale Project, CH 2/3	SW 1/4 33
14	Cameron Engineers, CE-709	SW 1/4 33
	T. 1 S., R. 100 W.	
15	Tell Ertl, Phil	SE 1/4 25
16	David M. Munson, Cathedral Bluffs	SW 1/4 25
	Oil-Shale Claims Group, Federal 25-1-100	
17	Shell Oil Company, Ertl 44x-27	SW 1/4 27
18	David M. Munson Inc., 36-1-100	SW 1/4 36
19	David M. Munson, 36-8-1-100	SW 1/4 36
	Sagebrush Hills 2	
	T. 2 S., R. 99 W.	
20	Cameron Engineers, CE-705-A	SE 1/4 4
21	The Oil-Shale Corp., hole C-A-1	SE 1/4 4
22	C-A Oil-Shale Project, CH-9	SW 1/4 5
23	Cameron Engineers, CE-708	SW 1/4 5
24	C-A Oil-Shale Project, CH-7	SW 1/4 5
25	Cameron Engineers, CE-703	SW 1/4 5
26	David M. Munson, Federal 5-2-99	SW 1/4 5
27	Shell Oil Company, Ertl 32-7	SW 1/4 7
28	David M. Munson, 2-8	SW 1/4 8
	Sagebrush Hills Unit II	
29	Anoco Production Company, no. 3	SW 1/4 8
30	David M. Munson, no. 3-8	SW 1/4 8
31	C-A Oil-Shale Project, CH-13	SW 1/4 9
32	C-A Oil-Shale Project, CH-12	SW 1/4 9
33	C-A Oil-Shale Project, CH-11	SW 1/4 9
34	Anoco Production Co., hole 2-A	SW 1/4 9
	T. 2 S., R. 100 W.	
35	Tell Ertl, Dor-thy	SE 1/4 1
36	Shell Oil Company, Ertl 11x-1	SW 1/4 1
37	Tell Ertl, Corral	SW 1/4 2
38	Shell Oil Company, Ertl 42x-10	SW 1/4 10



INDEX OF RECENTLY PUBLISHED U.S. GEOLOGICAL SURVEY 7 1/2-MINUTE GEOLOGIC MAPS IN THE PICEANCE CREEK BASIN AREA, NORTHWESTERN COLORADO

Schematic cross section showing stratigraphic relations south to north in the Sagebrush Hill quadrangle in the interval between the top of the Mahogany oil shale bed and the lower part of the marlstone at Duck Creek

**PRELIMINARY GEOLOGIC MAP OF THE SAGEBRUSH HILL QUADRANGLE, RIO BLANCO COUNTY, COLORADO**

By  
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1982