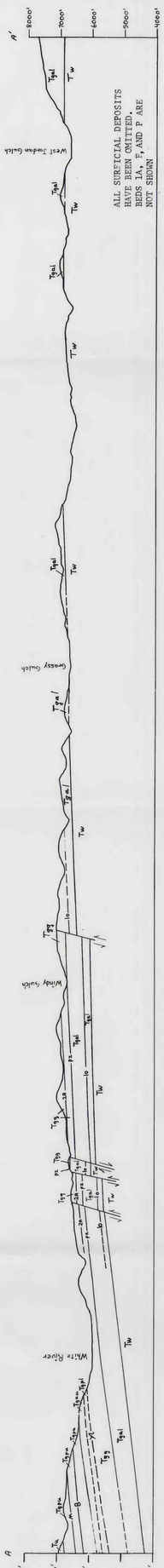
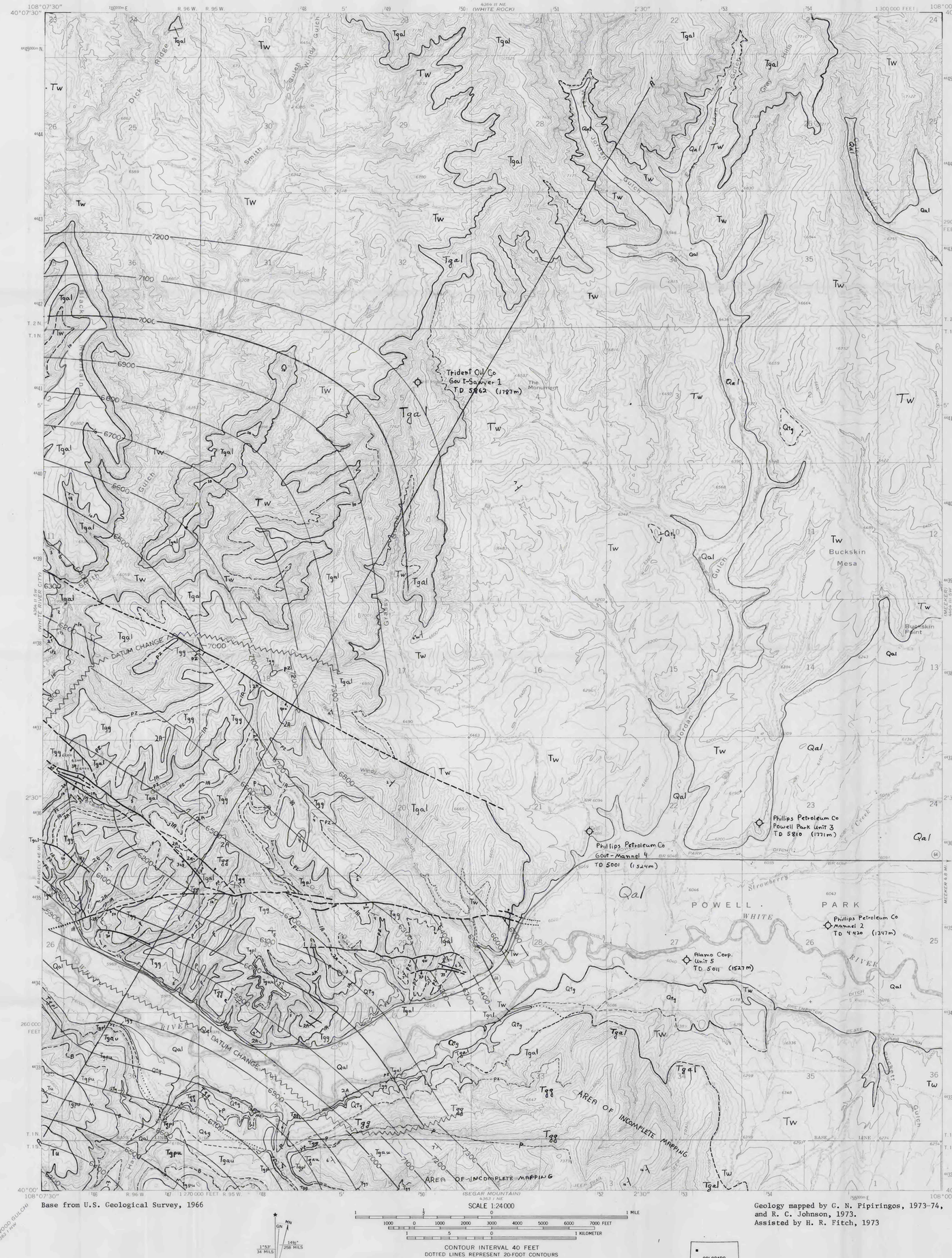
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-651





Base from U.S. Geological Survey, 1966

Geology mapped by G. N. Pipiringos, 1973-74, and R. C. Johnson, 1973.
Assisted by H. R. Fitch, 1973

SCALE 1:24 000
1 MILE
1 KILOMETER
CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT 20-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

UTM GRID AND 1966 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

COLORADO
QUADRANGLE LOCATION

PRELIMINARY GEOLOGIC MAP OF THE BUCKSKIN POINT QUADRANGLE, RIO BLANCO COUNTY, COLORADO

By
George N. Pipiringos and Ronald C. Johnson

1975

CORRELATION OF MAP UNITS

Qal	Holocene	QUATERNARY
Qtg	Pleistocene	QUATERNARY
Tu		TERTIARY
M, B — Tgpu		TERTIARY
Tgau		TERTIARY
Tgpl, yt, P, F, 2A, 1A, pz, 1o — Tgg	Eocene	TERTIARY
Tgal		TERTIARY
Tw		TERTIARY

DESCRIPTION OF MAP UNITS

The term "oil shale" as used in this publication refers to kerogenaceous rocks regardless of lithologic composition or amount of oil yield by Fischer assay.

Qal ALLUVIAL DEPOSITS (HOLOCENE)--Unconsolidated silt, sand, and gravel

Qtg TERRACE DEPOSITS (PLEISTOCENE)--Mostly cobbles and pebbles in a matrix, lime cemented, and generally overlain by as much as 10 feet (3 m) of sandy silt. Cobbles and pebbles are derived mostly from Paleozoic sandstone, siltstone, and limestone together with some clasts of volcanic rocks and a minor number from plutonic igneous and metamorphic rocks. At least three distinct terrace levels occur in the mapped area

Tu UINTA FORMATION (EOCENE)--Mostly brown to yellowish-gray medium- to coarse-grained massive tuffaceous sandstone; includes an unnamed tongue (not shown on map) of the Green River Formation consisting of marlstone and marly siltstone beds 90-160 feet (27-49 m) above the base. The lower 250 feet (76 m) of the formation is exposed in the extreme southwest corner of the quadrangle. Uinta Formation replaces the abandoned term, Evacuation Creek Member of the Green River Formation, in Piceance Creek basin (Cashion and Donnell, 1974)

GREEN RIVER FORMATION (EOCENE)

Tgpu Upper part of Parachute Creek Member--Thin- to medium-bedded marlstone containing several zones of papery fissile to thin-bedded oil shale. Fresh and weathered surfaces of marlstone are light gray; the oil shale is moderate brown to olive black and weathers pale yellowish brown to light bluish gray. The Parachute Creek Member contains several thin sandstone ledges and tuff beds. Four of the tuff beds are relatively thick and persistent, but only the lowermost of these, bed yt, found in lower part of Parachute Creek Member is shown on the map and described with that unit. The other three tuffs are 0.5-1 foot (15-30 cm) thick and occur: (1) 90 feet (27 m) above the top of the Mahogany ledge, (2) 30 feet (9 m) below the top of the Mahogany ledge, and (3) 3-7 feet (1-2 m) above the base of the Mahogany ledge. These four tuffs seem to be equivalent to beds 202, 175, 134, and 22 respectively of Brobst and Tucker (1973, p. 14, 15, 18). The unit is exposed only in the southwest corner of the quadrangle where it is about 900 feet (241 m) thick

—M— Mahogany ledge--Rich oil-shale zone which forms conspicuous ledge; top is about 275 feet (84 m) below top of the Parachute Creek Member; exposed only in the southwest corner of the quadrangle where it is about 165 feet (50 m) thick. Only the upper contact is shown

—B— B-groove--Lean oil shale and barren marlstone zone directly beneath the Mahogany ledge. The B-groove is about 60 feet (18 m) thick and is exposed only in the southwest corner of the mapped area. Only the lower contact of the B-groove is shown. At a locality in the SE 1/4 SW 1/4 SE 1/4 NW 1/4 sec. 36, T. 1 N., R. 96 W., a 5 foot (1.5 m) thick sandstone bed occurs 15-20 feet (4.5-6 m) below the top of the B-groove. The sandstone thins and disappears both to the west and to the south within 0.25 mile (0.4 km)

Tgau Upper part of Anvil Points Member--Mostly sandstone, siltstone, and claystone containing a few beds of marlstone and low-grade oil shale. The sandstone is gray, medium bedded to massive, forms ledges that commonly are rippled marked. Claystone is olive gray, medium bedded to massive, and forms slopes. Siltstone is gray to tan and forms slopes. The top of this unit is about 300 feet (91 m) below the base of the B-groove. The complete unit is present only in the southwestern part of the mapped area. It is about 185 feet (56 m) thick in the NE 1/4 NE 1/4 sec. 35, T. 1 N., R. 96 W.; from that place it thins and disappears within the Garden Gulch Member at a point about 4 miles (6.4 km) to the northwest

Tgpl Lower part of Parachute Creek Member--Mostly medium-grade oil shale, medium-bedded to massive; weathers to light gray, forms ledge. The unit ranges in thickness from about 17 to 100 feet (5-30 m) and thickens southwestward

—yt— Yellow tuff bed--A 0.1 foot (3 cm) thick yellow-weathering tuff which forms a persistent marker bed about 5-20 feet (1.5-6 m) above the base of the Parachute Creek Member throughout the quadrangle area

Tgg Garden Gulch Member--Mostly dark-gray shale and olive-gray claystone commonly interbedded with dolomite, dolomite concretions, and algal stromatolites. The member includes many ledges of medium-grained sandstone and ostracodal, oolitic, and pisolitic limestones. At least two kerogen-rich papery fissile oil-shale zones, 6-10 feet (2-3 m) thick, are present. Along the southwestern margin of the quadrangle the base of the Garden Gulch is placed at the top of the pisolite ledge (pz); elsewhere, to the east, the base is placed at the top of an ostracodal limestone which is stratigraphically about 15 feet (4.5 m) below the top of the pisolite ledge. The lithology of the Garden Gulch Member in this area is intermediate between typical Garden Gulch Member to the west and typical Anvil Points Member to the east. The member is 375-650 feet (114-198 m) thick

—P— P-ledge--Light-gray fine- to medium-grained ledge-forming sandstone, commonly ripple marked. The sandstone occurs about 75-155 feet (23-47 m) below the yellow tuff bed (yt). The P-ledge is 3-9 feet (1-3 m) thick and thins westward

—F— F-ledge--Calcareous light-gray massive medium-grained ledge-forming sandstone. From 3-6 feet (1-2 m) thick. It is the uppermost sandstone bed in a zone of at least four similar sandstone beds. The top of the F-ledge occurs 45-100 feet (14-30 m) above the 2A zone. The P-ledge was mapped locally north of the White River only

—2A— Second algal zone--Zone of algal stromatolites which are spheroidal elongate and 0.5-6 feet (15 cm to 2 m) long. Zone overlies olive-gray to brown clay-shale and in most places is directly overlain by a medium-grained massive sandstone ledge as much as 3 feet (1 m) thick. Locally, a sandstone ledge as much as 25 feet (7.5 m) thick occurs 0-14 feet (0-4 m) below the 2A zone

—1A— First algal zone--Zone of algal stromatolites which are spheroidal elongate and as much as 2 feet (0.5 m) long. Zone immediately overlies a medium-grained gray to red-brown ledge-forming sandstone as much as 45 feet (14 m) thick. Locally, a second zone of algal stromatolites occurs 12-25 feet (3.5-7.5 m) above the sandstone

Tgal Lower part of Anvil Points Member--Mostly sandstone and siltstone, and some shale. The sandstone is fine grained to medium grained, medium bedded to massive, and forms ledges and slopes. The siltstones are tan and the shales are light gray and generally form slopes. Channel sandstones are common in the lower half of the unit and become more numerous in the northern and eastern parts of the quadrangle. The contact with the underlying Wasatch Formation is placed at the indefinite change from cliff-forming sandstone above to slope-forming variegated claystone and siltstone below. The unit ranges in thickness from about 400 to 700 feet (122-213 m) and appears to thin to the southwest

—pz— Pisolite ledge--Light-gray sandstone makes a cliff as much as 40 feet (12 m) high. The top 12-15 feet (3.5-4.5 m) comprises, in descending order, stromatolitic limestone, pisolitic limestone, oolitic sandstone, ostracodal limestone, and ostracodal sandstone. The stromatolites that cap the cliff and the underlying pisolitic layer are each about 1 foot (30 cm) thick. Pisolites generally are sparse or inconspicuous in rocks of this area, but in the pisolite ledge are conspicuous and as much as 0.5 inch (12 mm) in diameter and suggest the informal name given to this key sequence. The stromatolitic limestone and the oolitic sandstone beds grade eastward into slope-forming clayey siltstone so that in the eastern and southern parts of the mapped area the ledge is capped by the ostracodal limestone; the pisolite layer, which is about 0.5 foot (15 cm) thick, makes an inconspicuous ledge in the overlying slope about 15 feet (4.5 m) above the top of the ostracodal limestone. The ostracodal limestone is 3-6 feet (0.9-2 m) thick and grades downward into an ostracodal sandstone that contains oil residue in its pore spaces

—1o— Lower ostracodal limestone--The lower ostracodal limestone is the uppermost prominent bed in a sequence of gray ostracodal oolitic limestone and sandy limestone ledges separated by slopes of gray to brown medium-grained sandstone; total thickness of the sequence is about 20 feet (6 m). The ledges becomes sandier in a general eastward direction, and concomitantly the ostracodes and oolites become scarce to absent. The top of the lower ostracodal limestone is about 210-330 feet (64-100 m) above the Wasatch-Green River contact. The lower ostracodal limestone is 1-3 feet (30-90 cm) thick

Tw WASATCH FORMATION (EOCENE)--Mainly variegated claystone and siltstone containing lenses and channels of medium- to coarse-grained crossbedded sandstone. The upper 50-100 feet (15-30.5 m) nearly everywhere is green or gray rather than the red, pale-red, lavender, and ochre colors which are typical of most of the Wasatch in this area. The base is not exposed in the quadrangle

REFERENCES

Brobst, D. A., and Tucker, J. D., 1973, X-ray mineralogy of the Parachute Creek Member, Green River Formation, in the northern Piceance Creek basin, Colorado: U.S. Geol. Survey Prof. Paper 803, 53 p.

Cashion, W. B., and Donnell, J. R., 1974, Revision of nomenclature of the upper part of the Green River Formation, Piceance Creek basin, Colorado, and eastern Uinta Basin, Utah: U.S. Geol. Survey Bull. 1394-G, 9 p.

———— CONTACT--Dashed where approximately located; dotted where concealed

———— FAULT--Dashed where approximately located; dotted where concealed. Bar and ball on downthrown side; displacement, where given, is in feet (one foot equals 0.3048 metre)

STRIKE AND DIP OF BEDS

DRY HOLE--Showing operator and lease names, and total depth (TD) in feet (metres in parentheses)

—6500— STRUCTURE CONTOURS--Drawn on top of three units of the Green River Formation: on top of the lower ostracodal limestone (1o) in the northern part, on top of the pisolite ledge (pz) in the middle part, and on top of the Mahogany ledge (M) in the southern part of the contoured area. Contours approximately located; areas where contoured horizon has been eroded are not differentiated. Contour interval 100 feet (30.5 m). Datum is mean sea level

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