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TRACE ELEMENTS MEMORANDUM REPORT 1068

PRELIMINARY GEOLOGIC MAP OF THE ELK RIDGE 1SW QUADRANGLE, SAN JUAN COUNTY, UTAH

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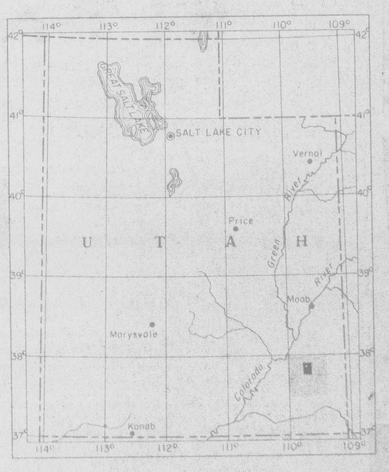
Geology by R.Q. Lewis, Sr., R.H. Campbell, and R.E. Thaden, 1954-56



INDEX MAP OF UTAH SHOWING AREA OF THIS REPORT

EXPLANATION

QUATERNARY

Qal

Alluvium

Chiefly stream deposited silt, sand, and gravel, but including some wind-deposited sand and silt.

Qls

Landslide and slump

Developed locally at base of Moss Back member of Chinle formation.

UNCONFORMITY

JURASSIC AND JURASSIC(?)

Jn

Navajo sandstone

Predominantly gray to white, locally weathering tan or buff, massive with sweeping large-scale cross-laminations, fine-grained quartz sandstone; forms steep rounded cliffs where cut by deep canyons, but irregularly rounded domes and spires on mesa tops. The Navajo appears to intertongue with the underlying Kayenta formation. Where thick sections are exposed the upper part of the map unit may include rocks equivalent to the Carmel formation. Locally, over 450 feet of thickness of this unit is exposed.

JURASSIC(?)

Jk

Kayenta formation

Gray to white, purple, red, and buff thick-and thin-bedded lenticular interbedded sandstone and siltstone with some limestone; generally forms a succession of benches between the underlying Wingate sandstone and the overlying Navajo sandstone. The Kayenta intertongues with, and locally may be gradational into the underlying Wingate; the contact is commonly well expressed topographically. The Kayenta ranges in thickness from about 250 feet to 300 feet.

Glen Canyon group

Rw

Wingate sandstone

Red and buff massive to thick-bedded cross-laminated medium- to fine-grained quartz sandstone; generally weathers to steep cliff, but where parallel bedding planes are more abundant and/or where higher strata have been removed it weathers to a series of ledges. Locally the Wingate intertongues with the underlying Chinle formation. The Wingate is generally about 270 feet thick.

TRIASSIC

Upper Triassic

Rcu
Rcm
Rcl
Rcls

Chinle formation

Upper Chinle, Rcu, red, gray, and brown generally thin-bedded, evenly bedded locally shaly fine- to very fine grained sandstone, siltstone, and claystone; generally forms a steep slope below the Wingate, except for a prominent zone of maroon thick-bedded sandstone at the top which crop out as blocky ledges. The upper Chinle appears to be conformably above and may intertongue with the Moss Back member. The upper Chinle ranges from about 500 feet to about 600 feet in thickness generally thinning (with some local variation) from south to north. Moss Back member, Rcm, gray to brown thick- and thin-bedded, crossbedded, lenticular fine- to coarse-grained sandstone and conglomeratic sandstone; forms the continuous blocky ledge capping a prominent hogback ridge west of Cottonwood Wash. Its contact with the underlying lower Chinle appears, at least in part, gradational and/or intertonguing but is locally marked by shallow scour depressions; although generally not well exposed it is commonly well expressed by a topographic slope break. The Moss Back is generally from 80 to 100 feet thick with some local variation. Lower Chinle, Rcl, chiefly blue, gray, and red massive lenticular mudstone with variable amounts of disseminated medium and fine sand grains, interbedded with and grading into some thin lenses of brown thin-bedded flaggy sandstone and lenses of sandstone and conglomeratic sandstone lithologically very similar to those of the Moss Back member; generally expressed as a slope or bench below the overlying Moss Back. The contact with the underlying Moenkopi formation is a slightly irregular erosion surface; the contact with the locally underlying sandstone lenses of the lower Chinle is gradational and intertonguing. The lower Chinle is generally from 100 to 120 feet thick and may be thicker locally. Sandstone lenses of the lower Chinle, Rcls, lying directly on the Moenkopi (may be correlative, in part, with sandstone mapped as the Shinarump member in the Deer Flat and White Canyon areas to the west of Elk Ridge) only known outcrops are shown. Lenses consist of light-gray to brown crossbedded discontinuous lenticular medium-, coarse-, and fine-grained sandstone and conglomeratic sandstone (chiefly pebbles but locally cobbles) with interbedded lenses of mudstone and muddy sandstone similar to those of the lower Chinle (Rcl). The basal parts commonly fill scour depressions in the top of the underlying Moenkopi. These sandstone lenses rarely exceed 20 feet in thickness. Sandstone at this horizon contains important uranium deposits in the Cottonwood Creek area of this quadrangle, and on Elk Ridge to the west.

UNCONFORMITY

Lower and Middle(?) Triassic

Rm

Moenkopi formation

Red, brown, and buff thin- and thick-bedded, evenly bedded discontinuous interbedded very fine to medium-grained sandstone and sandy siltstone, commonly shaly to flaggy, with thick-bedded discontinuous sandstone beds more common in the middle third of the formation than in the upper and lower thirds; generally in the form of a steep slope with intermittent discontinuous ledges between the overlying lower Chinle and the underlying Hoskinnini tongue of the Cutler formation. The contact with the underlying Hoskinnini appears conformable. The Moenkopi is generally from 180 feet to 220 feet thick but may be somewhat thinner locally.

PERMIAN

Pch
Pco
Pcc

Cutler formation

Hoskinnini tongue, Pch, red to buff, locally bleached white to gray massive and thick-bedded cross-laminated medium- to fine-grained silty sandstone containing generally sparsely disseminated coarse well-rounded frosted sand grains; commonly forms blocky or rounded ledge between overlying Moenkopi and underlying Organ Rock; commonly about 85 feet thick. The contact with the underlying Organ Rock appears generally conformable. Organ Rock tongue, Pco, predominantly red even-bedded very fine grained sandstone and/or sandy siltstone with some gray cross-laminated fine- to medium-grained sandstone lenses interbedded near the base; generally forms a uniform slope below the Hoskinnini ledge; generally about 200 feet thick, but may differ as much as 50 feet locally. The contact with the underlying Cedar Mesa sandstone is intertonguing and gradational. Cedar Mesa sandstone member, Pcc, light-gray to tan, thick-bedded to massive, cross-laminated fine- to medium-grained sandstone beds separated by thin partings of red to gray siltstone and limy siltstone; the partly eroded top controls the form of the nearly dip slope to the east of Chimney Park, whereas, in the deep canyons it forms massive and ledgy vertical cliffs; generally about 1,000 feet thick; contact with the underlying Rico formation is conformable.

PENNSYLVANIAN AND PERMIAN(?)

PPr

Rico formation

Gray thin limestone interbedded with red shaly calcareous siltstone, medium- and fine-grained calcareous sandstone, thick-bedded cross-laminated medium- to fine-grained sandstone, and some irregularly bedded thin chert and cherty limestone; generally forms a ledgy steep slope below the Cedar Mesa sandstone in the deep canyons. Marine fossils are rare and generally poorly preserved. The base of this unit is not exposed.

Contact

(Dashed where approximately located; short dashes where inferred)

High angle fault

(Dashed where approximately located; dotted where concealed; U-upthrown side; D-downthrown side)

Anticlinal bend

(Showing trace of axial plane and direction of plunge of axis. Dashed where approximately located. Arrow barbed on side of steeper dip)

Synclinal bend

(Showing trace of axial plane and direction of plunge of axis. Dashed where approximately located. Arrow barbed on side of flatter dip)

Strike and dip of beds

Structure contours

Drawn on the base of the Moss Back member of the Chinle formation and the base of the Kayenta formation. Dashed where approximately located; short dashes indicate projection above surface. Contour interval 100 feet. Datum is mean sea level.

Uranium mine or prospect