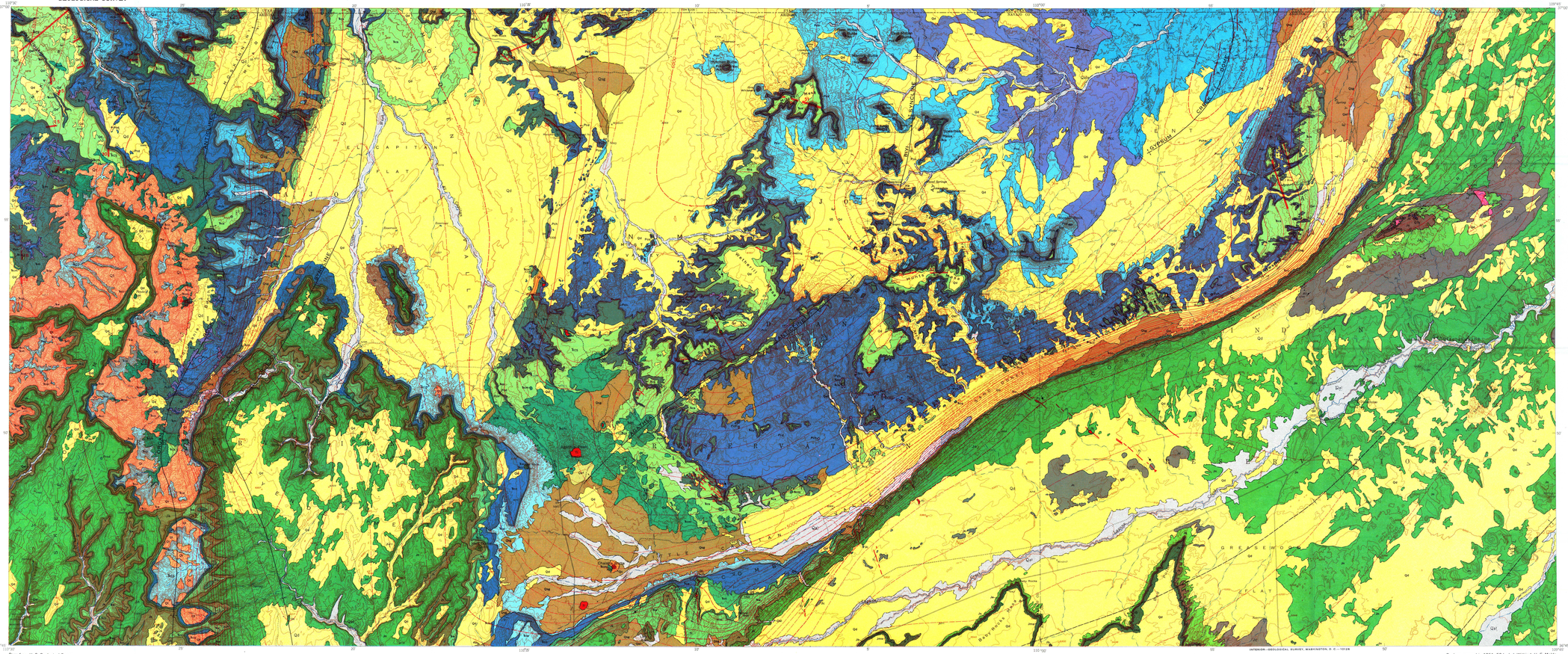

Base from U. S. Geological Survey
topographic quadrangles, 1952

GEOLOGIC MAP OF THE MONUMENT VALLEY AREA, ARIZONA

SCALE 1:62 500

CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT HALF-INTERVAL CONTOURS
DATUM IS MEAN SEA LEVEL

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1972

Geology mapped in 1951–52 by I. J. Wilkind, H. E. Malde, R. E. Thaden, E. J. McKay, D. H. Johnson, T. L. Finnell, J. D. Sears, R. J. Claus, and C. F. Lough; assisted by D. L. Johnson and F. D. Tinsley

EXPLANATION

QUATERNARY

Qal — Alluvium
Light-tan to reddish-brown interbedded clay, silt, sand, and gravel; unconsolidated

Qd — Dune sand
Light-tan unconsolidated fine to medium angular to subrounded sand, veneering most of the area as dunes

Qc — Colluvium
Light-brown to reddish-brown heterogeneous mixture of siltstone and sandstone fragments, and gravel at base of steep cliffs

Qsg — Sand and gravel
Unconsolidated partly stratified gravel in a matrix of reddish-brown fine to medium sand

Qt — Talus
Reddish-brown heterogeneous mixture of angular blocks and boulders

Qs — Landslide block
Large segment of consolidated strata that has slid to a lower topographic level

Qaf — Alluvial fan
Fan-shaped deposits of stratified silt, sand, and gravel near mouths of gulches and canyons

TERTIARY OR QUATERNARY

Qrb — Rubble
Light-green serpentine and well-rounded fragments of sedimentary and igneous rocks in pipes and extruded masses

TERTIARY

Ti — Intrusive breccia
Dark-gray to black intrusive breccia consisting of angular fragments of minette, vogesite, shale, sandstone, and various plutonic and metamorphic rocks in a matrix of foliated minette and vogesite

UNCONFORMITY

JURASSIC

Jsw — Salt Wash sandstone member of Morrison formation
Gray to chocolate-brown cliegstone alternating with white to gray medium- to coarse-grained sandstone lenses

Jb — Bluff sandstone
Light-brown massive even-bedded fine-grained friable sandstone

Js — Summerville formation
Brown to reddish-brown even-bedded siltstone; forms cliffs

UNCONFORMITY

Je — Entrada sandstone
Upper part chocolate-brown even-bedded shaly siltstone that weathers to boudouiliie structures. Lower part orange-brown massive fine-grained sandstone that weathers to smooth rounded slopes

Jc — Carmel formation
Red fissile siltstone with local lenses of red platy sandstone

UNCONFORMITY

JURASSIC OR JURASSIC(?)

Jn — Navajo sandstone
Pink and buff massive eolian crossbedded sandstone with interbedded thin lenses of sandy limestone; forms cliffs

JURASSIC(?)

Jk — Kayenta formation
Light-violet to reddish-brown irregularly bedded calcareous sandstone with local lenses of conglomeratic; forms benches

Jw — Wingate sandstone
Reddish-brown massive eolian crossbedded siltstone and sandstone; forms cliffs

TRIASSIC

Upper Triassic

Ttc — Chinle formation
Divided into five members. The Church Rock member, Ttcr, at top consists of reddish-brown blocky, in part fluvial, in part eolian, parallel-bedded and cross-bedded siltstone and sandstone weathering to rubble-covered slopes. The Owl Rock member, Ttcor, is a light-bluish-gray claystone alternating with ledge-forming cherty limestone. Petrified Forest member, Ttcp, consists of variegated mudstone and siltstone with local lenses of sandstone and siltstone with local zones of mud-pebble conglomerate. Monitor Butte member, Ttcm, consists of dark-gray fluvial cross-bedded lenticular sandstone and conglomerate, locally broken and folded into intraformational structures. Shinarump member, Ttcs, at base consists of light-gray fluvial crossbedded conglomeratic sandstone with intercalated conglomeratic lenses

UNCONFORMITY

Lower and Middle(?) Triassic

Ttm — Moenkopi formation
Reddish-brown even-bedded ripple-marked shaly siltstone weathering to gentle slopes

PERMIAN

Pch — Cutler formation
Divided into five members. The Rhoblannini tongue, Pch, at top is a reddish-brown even-bedded siltstone that weathers to smooth rounded slopes. The Chelly sandstone member, Pcl, is a buff massive eolian crossbedded sandstone weathering to steep rounded slopes and vertical cliffs. The Organ Rock tongue, Pco, consists of reddish-brown even-bedded siltstone that weathers to form blocky and ledgy slopes. Halgaito tongue, Pcha, at base consists of Cedar Mesa sandstone member, Pcc, is a dark-gray-brown crossbedded fine- to medium-grained sandstone with thin lenticular beds of bluish-gray limy siltstone. Halgaito tongue, Pcha, at base consists of reddish-brown shaly siltstone and silty sandstone with thin discontinuous beds of nodular-weathering bluish-gray limestone

Upper Permian

Middle and Upper Permian

Cow Canyon group

Sou Rafael group

Contact
Dashed where approximately located

High-angle fault
Dashed where inferred. U, upthrown side; D, downthrown side

Anticline
Showing trace of axial plane; dashed where approximately located

Syncline
Showing trace of axial plane; dashed where approximately located

Strike and dip of beds

Horizontal beds

Strike and dip of joints

Strike of vertical joints

4000 — Structure contours
Drawn on top of Ite Chelly sandstone member of the Cutler formation; dashed where approximately located. Contour interval 100 feet; datum is mean sea level

50 — Channel
Number referred to in table 1