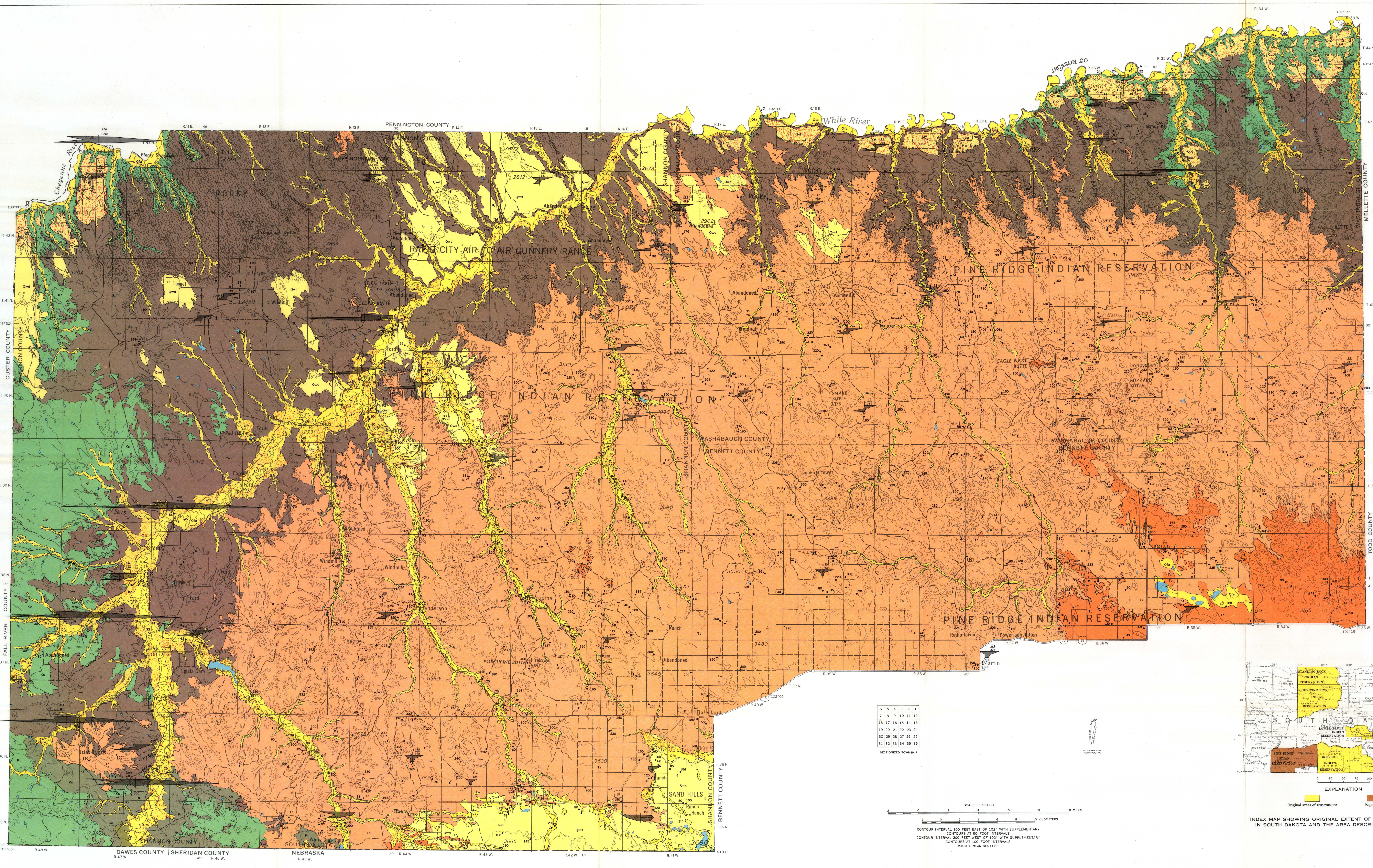
PREPARED AS PART OF THE PROGRAM OF THE
DEPARTMENT OF THE INTERIOR
FOR DEVELOPMENT OF THE MISSOURI RIVER BASIN



EXPLANATION

QUATERNARY

Holocene

Qfa — Flood-plain alluvium
Includes areas mapped as colluvium by the South Dakota Geological Survey

Qta — Terrace alluvium
Not differentiated from flood-plain alluvium in southern Washabaugh and northern Bennett Counties

Pleistocene

Qwd — Windblown sand deposits
Mapped only where areally extensive or water bearing

Qot — Old terrace deposits
Mapped only where areally extensive or water bearing

TERTIARY

Pliocene

To — Ogallala Formation
Shown only where mapped by the South Dakota Geological Survey or described in other published reports. Probably present over large areas in eastern Shannon, northwestern Bennett, and southwestern Washabaugh Counties

Miocene

Ta — Arikaree Formation
See table 1 for division into units A, B, C, D, and E

Oligocene

Twr — White River Group
Includes Brule and Chadron Formation

CRETACEOUS

Upper Cretaceous

Kp — Pierre Shale

Kn — Niobrara Formation

Kc — Carlile Shale

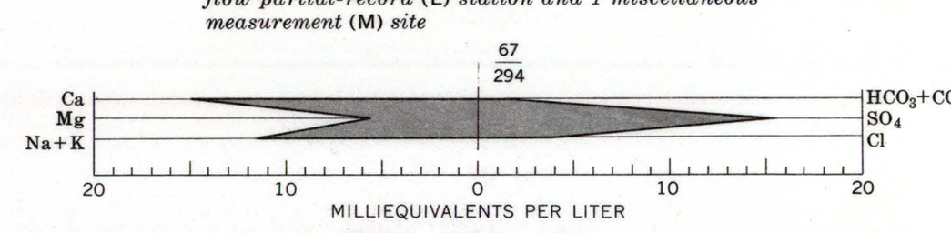
Contact

○60
Test hole
Number indicates depth of test hole in feet. Subsurface information obtained from 71 test holes drilled by the U.S. Geological Survey and from logs of 11 test holes drilled by the U.S. Bureau of Reclamation. Most test holes were drilled in alluvial deposits in the valleys to obtain geologic and hydrologic data.

●42
Water well
Number indicates depth of well in feet. Most wells completed in alluvial deposits, wind blown sand deposits, or old terrace deposits are less than 50 feet deep. Most wells deeper than 50 feet are completed in bedrock formations. Wells are generally completed in the same geologic unit they are shown as starting in on the map. The only exceptions are wells more than 50 feet deep which start in alluvial deposits; these wells are usually completed in bedrock formations

Spring
Springs are an important source of water for ranch use, especially in the northern and western parts of the Reservation. In many areas they are the only source of potable water. All the springs are contact springs—the water issues from permeable material where it is in contact with underlying, less permeable material that impedes downward percolation. More than 200 springs or spring areas were observed in the Reservation; many more occur, however, especially in stream valleys. The rate of flow from nearly all springs is variable but is more constant than streamflow

▲D
Gaging station
Records of stage and discharge of streams are available for 7 active (A) and 2 discontinued (D) stream-gaging stations. Stream-flow data are available for 1 low-flow partial-record (L) station and 1 miscellaneous measurement (M) site



Water analysis pattern
Numbers indicate hardness (above) and total dissolved solids (below) in milligrams per liter. Concentrations, in equivalents per million (epm), are plotted for calcium (Ca), magnesium (Mg), sodium plus potassium (Na+K), bicarbonate plus carbonate ($HCO_3 + CO_3$), sulphate (SO_4), and chloride (Cl). The anions are plotted to the right of the centerline, and the cations are plotted to the left. The area of the water analysis-pattern is an indication of the dissolved solids content—the larger the area of the pattern, the greater the dissolved-solids content

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

SECTIONIZED TOWNSHIP

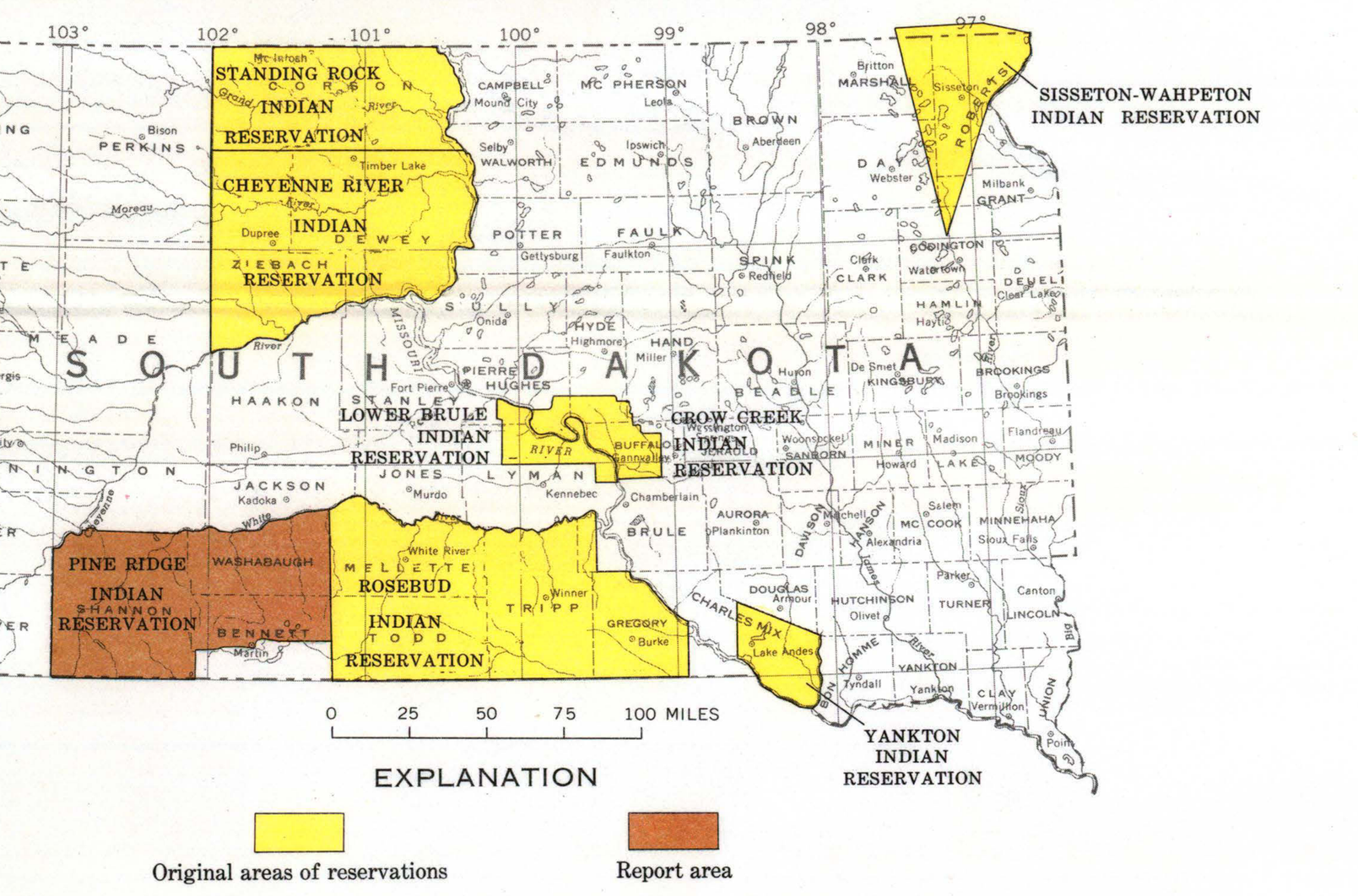
DECLINATION, 1971

SCALE 1:125 000

2 0 2 4 6 8 10 MILES

2 0 2 4 6 8 10 KILOMETERS

CONTOUR INTERVAL 100 FEET EAST OF 102° WITH SUPPLEMENTARY CONTOURS AT 50-FOOT INTERVALS
CONTOUR INTERVAL 200 FEET WEST OF 102° WITH SUPPLEMENTARY CONTOURS AT 100-FOOT INTERVALS
DATUM IS MEAN SEA LEVEL



INDEX MAP SHOWING ORIGINAL EXTENT OF INDIAN RESERVATIONS IN SOUTH DAKOTA AND THE AREA DESCRIBED IN THIS REPORT

Base from U.S. Geological Survey,
Hot Springs and Martin 1:250,000, 1955

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D.C.—1971—W69338

Geology mapped in 1962 and 1963 by M. J. Ellis, assisted by D. G. Adolphson. Geology as mapped in previous studies adapted to criteria used in this investigation

Geologic map showing water-analysis diagrams and locations of wells, springs, and test holes

HYDROGEOLOGY OF THE PINE RIDGE INDIAN RESERVATION, SOUTH DAKOTA

By
M. J. Ellis and D. G. Adolphson

1971

For sale by U.S. Geological Survey, price $1.25 per set