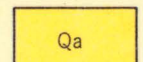




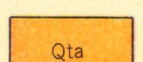
EXPLANATION

Loess of Pleistocene and Recent age, a few inches to more than 20 feet thick, represented on the map by a stipple pattern, covers much of the area northeast of the Missouri River; generally it is not shown where less than 2 feet thick



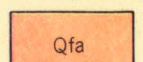
Qa
Flood-plain alluvium

Silt, sand, and pebble gravel which underlie surfaces of present flood plains. A few feet to probably 75 feet thick



Qta
Terrace alluvium

Silt, sand, and gravel which underlie surfaces of terraces 3 to 20 feet above present flood plains. Several feet to probably more than 80 feet thick



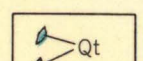
Qfa
Fan alluvium and colluvium

Shale detritus, sand, and gravel which typically occur as broad, gently sloping alluvial fans in area between shale outcrops in valley walls and flood plain or terrace alluvium. One to 30 feet thick



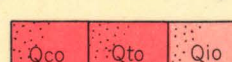
Ql
Landslide deposit

Slumped material consisting chiefly of glacial drift and Pierre shale. Generally shown only along valley walls of the Missouri and Bad Rivers. Ten to probably 125 feet thick



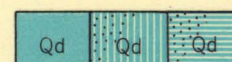
Qt
Travertine

Spring deposits of calcium carbonate that occurs chiefly as a cementing material in local outcrops of conglomerate composed of outwash sand and gravel. Three to 15 feet thick



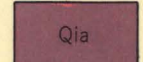
Qco, Qto, Qio
Glacial outwash terrace deposit

Sand and pebble to boulder gravel which occur as dissected terrace deposits in the trenches of the Missouri River and its tributaries. Granitic and carbonate rock types predominate; iron-oxide concretions from the Pierre shale locally are abundant. Deposits inferred to be of following ages: Qco, Mankato and Cary sub-stages; Qto, Tazewell substage; Qio, Iowa substage. A few feet to 150 feet thick



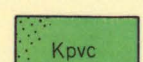
Qd
Glacial drift, undifferentiated

Predominantly clay-rich till and included deposits of sand and gravel. Areas that form broad, elongate swells with local relief of 20 to 40 feet are end moraine and are shown by vertical pattern; areas that lack a linear trend and have a local relief of 10 to 20 feet are ground moraine and are shown by horizontal pattern



Qia
Iowan alluvium

Sand and pebble gravel predominantly of western derivation forming fill terraces in valley of Bad River. Alluvium consists chiefly of carbonate rock types, chert, and chalcodony; subordinate amount of basic and granitic igneous rocks represent glacially derived material contributed by southeastward-flowing tributaries of Bad River. A few feet to about 50 feet thick



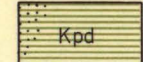
Kpvc
Virgin Creek member

Virgin Creek member consists of gray shale and claystone. Upper part weathers to gray gumbo; lower part weathers to flakes and chips and contains bentonite beds from less than an inch to 8 inches thick. Thickens westward from about 120 feet in Canning quadrangle to about 200 feet in Oahe quadrangle. Subject to slumping. Moberge and Elk Butte members are not known to crop out in the Pierre quadrangle



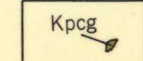
Kpv
Verendrye member

Gray and olive-gray claystone that weathers to gumbo. Subject to extreme slumping. Thickens westward from about 145 feet in Canning quadrangle to about 160 feet in Pierre quadrangle



Kpd
DeGray member

Gray, moderately siliceous shale, claystone, and bentonite beds. Thickness ranges from 100 to more than 180 feet. Upper 30 to 35 feet in Canning and Pierre quadrangles contains many thin bentonite beds and manganese-bearing concretions, and is particularly subject to extensive slumping



Kpcg
Crow Creek and Gregory members, undifferentiated

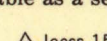
Crow Creek member (at top) is 7 to 10 feet of marl above about one foot of calcareous siltstone; siltstone is horizontally bedded and cross laminated. Gregory member is gray, noncalcareous claystone; upper 5 feet only is exposed

Contact

Dashed where approximately located

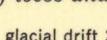
Contact, gradational

Contact, concealed beneath loess or colluvium not mappable as a separate unit



loess 15'
till

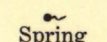
Abbreviated log of surficial deposits (auger hole) Shows thickness of loess and underlying deposit



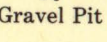
glacial drift 215'±
shale

Abbreviated drill log from Corps of Engineers

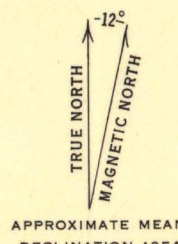
Approximate centerline of Oahe Dam



Spring



Gravel Pit

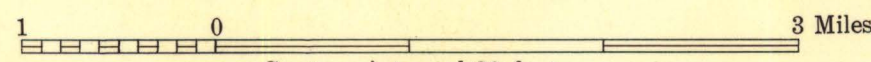


Base from U. S. Geol. Survey map of Pierre quadrangle, South Dakota

Geology mapped in 1948 and 1949 by D. R. Crandell, assisted by J. R. Hensley

GEOLOGIC MAP OF THE PIERRE QUADRANGLE, SOUTH DAKOTA

Scale 1:62,500



Contour interval 20 feet
Datum is mean sea level

QUATERNARY

CRETACEOUS

Recent

Pleistocene
Wisconsin stage

Upper Cretaceous
Pierre shale