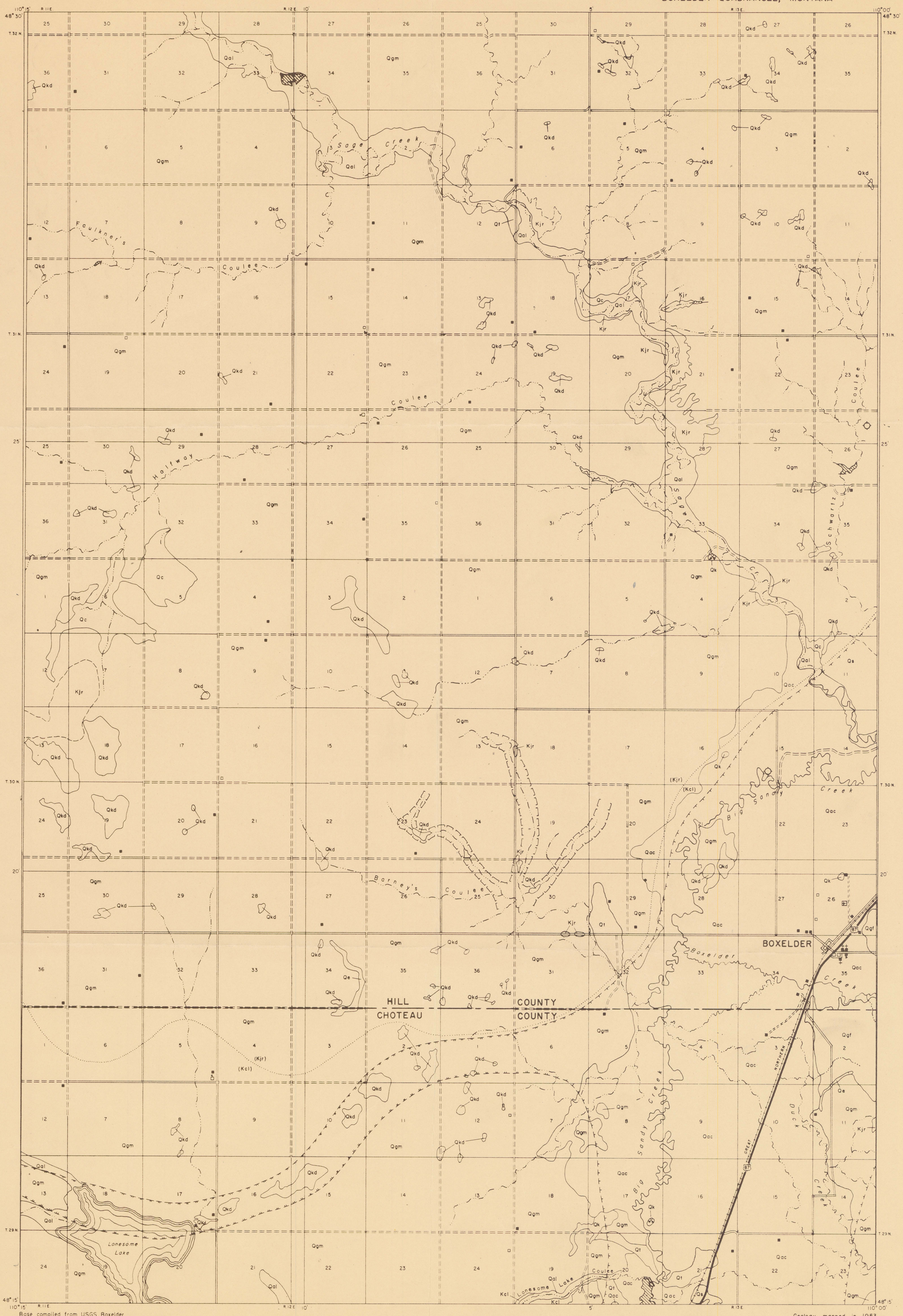
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

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

MISSOURI RIVER BASIN
MAPPING AND MINERAL RESOURCE INVESTIGATIONS
BOXELDER QUADRANGLE, MONTANA



Base compiled from USGS Boxelder Quadrangle topographic map, 1906

APPROXIMATE MEAN DECLINATION 1952

PRELIMINARY MAP OF THE

GEOLOGY OF THE BOXELDER QUADRANGLE, MONTANA

Scale 1:48,000

1 0 1 2 MILES

1953

Geology mapped in 1953
by R. M. Lindvall

OPEN FILE REPORT
This report and/or map is preliminary and has not been edited or reviewed for conformity with Geological Survey standards or nomenclature.

EXPLANATION

QUATERNARY

Recent

Qal | Qc

Alluvium and Colluvium

Alluvium (Qal). Interbedded light-brown to gray clay, silt, sand, and fine gravel. Unconsolidated, moderately permeable, 1 to more than 20 feet thick. Not mapped along minor streams. Colluvium (Qc). Interbedded light-brown to gray clay, silt, and sand. Unconsolidated, slightly permeable; 1 to 10 feet thick.

Qac

Alluvium-colluvium (undifferentiated)

Interbedded light-brown to gray clay, silt, sand, and gravel. Unconsolidated, slightly to moderately permeable; 1 to more than 100 feet thick.

Qkd

Kettle deposits

Dark gray plastic clay containing minor amounts of silty clay, silt, and sand. Unconsolidated, slightly permeable; 1 to 10 feet thick.

Qt

Terrace deposits

Interbedded light-brown silt, sand, and gravel. Unconsolidated, permeable. 10 to 20 feet thick.

Qs

Sand deposits

Light-brown to gray, well-sorted, medium to fine-grained sand. Unconsolidated, highly permeable; 10 to 50 feet thick.

Pleistocene — Wisconsin stage

Qk

Kame deposits

Stratified or semi-stratified light-brown sand and gravel containing minor amounts of silt and clay. Unconsolidated, permeable; 5 to 25 feet thick.

Qe

Esker deposits

Stratified or semi-stratified sinuous ridges of light-brown sand and gravel. Minor amounts of silt and clay. Unconsolidated, permeable; 5 to 25 feet thick.

Qgf

Glaciofluvial deposits

Interbedded light-brown silt, sand, and gravel. Minor amounts of clay, cobbles, and boulders. Unconsolidated, permeable; 5 to 30 feet thick.

Qgm

Ground moraine

Unstratified mixture of buff to light-gray clay, silt, and sand, containing minor amounts of pebbles, cobbles, and boulders. Compact but unconsolidated, slightly permeable; 5 to 50 feet thick; in filled pre-glacial valleys as much as 200 feet thick.

CRETACEOUS

Upper Cretaceous — Montana group

Kjr

Judith River formation

Interbedded light-gray to buff, thin-bedded to massive sandstone, and gray to buff clay and shale. Thin coal beds in upper part of formation and in filled pre-glacial valleys as much as 200 feet. About 500 feet thick.

Kcl

Claggett shale

Brownish-gray marine shale. Upper 150 feet is sandy, yellowish-gray; lower 100 feet contains bentonite beds as much as 18 inches thick. Calcareous concretions abundant throughout formation. 450 to 500 feet thick.

Contact
(Dashed where approximately located)

(Kjr)
(Kcl)
Concealed bedrock contact
(Symbols in parenthesis indicate the concealed bedrock)

Gravel pit

Abandoned oil or gas well

Channel of pre-glacial Missouri River

Channel of pre-glacial Marias River

Segment of glacial meltwater channel

Intermittent stream

Boxelder Creek
Permanent stream

Dam and reservoir

Building (occupied)

Cemetery

Building (unoccupied)

School

Church

87
Hard surfaced road (U. S. Highway)

Improved road

Unimproved road