

LAND FORM AND GEOLOGICAL MAP OF WELLS COUNTY, NORTH DAKOTA

EXPLANATION

GLACIAL LANDFORMS

- E** END MORaine. A ridge-like accumulation of drift, chiefly till, with moderate to high local constructional relief generally greater than 50 feet in a square mile with an overall and/or internal linear pattern (lines represent individual crests).
 - Es. Streeter end moraine. Southwest Wells County.
 - Eh. Heimdal end moraine. Northeast Wells County.
 - Em. Martin end moraine. Northwest corner of Wells County.
 - Epg. Pony Gulch end moraine. Western Wells County.

- G** GROUND MORaine. A gently undulating accumulation of drift, chiefly till, with low local constructional relief generally less than 20 feet in a square mile; commonly occurs behind end moraine.

- D** DEAD-ICE MORaine. A hummocky accumulation of drift, chiefly till, lacking linear trends, with high constructional relief, numerous kettles, non-integrated drainage and ice-disintegration features.

- Oc** COLLAPSED OUTWASH. A hummocky accumulation of drift, chiefly sand and gravel, with moderate to high relief and numerous kettles.

- Le** ELEVATED LAKE PLAIN. A level or gently undulating accumulation of lake sediments, generally stratified, with low relief that lies from 5 to 15 feet above the surrounding dead-ice moraine.

- Lc** COLLAPSED LAKE TOPOGRAPHY. A rolling accumulation of lake sediments with low to medium local relief, generally less than 20 feet in a square mile.

- WASHBOARD MORAINES. Straight to arcuate low, linear ridges of drift, chiefly till, which are commonly concentrated in groups on ground moraine and which parallel successive positions of the wasting ice margin; most easily traced on air photos.

- KAME. A mound-like or conical hill of drift, chiefly sand and gravel, with ice-contact faces.

- ESKER OR DISINTEGRATION RIDGE. Elongate and narrow ridge of drift, chiefly sand and gravel, generally stratified, sinuous or straight; may bifurcate.

- LINEATIONS. Narrow, streamlined ridges of varying length, width and height composed of till or sand and gravel, with long axes parallel to the presumed direction of ice movement. They are difficult to see in the field but apparent on air photos.

PROGLACIAL LANDFORMS

- Op** OUTWASH PLAIN. Gently undulating to nearly flat accumulation of drift, chiefly sand and gravel, generally stratified.
 - Op₁. Upper outwash plain graded to the Martin end moraine.
 - Op₂. Lower outwash plain graded to a source northwest of Wells County.

- TERRACE. Benchlike surface found along the sides of the James and Sheyenne River valleys above the modern alluvial floodplain and underlain by sand and gravel.

- MELT-WATER TRENCH. A trench through which meltwater flowed away from the glacier and which was cut, in part or entirely, by that water.

- Lp** LAKE PLAIN. Gently undulating to nearly flat accumulation of drift, chiefly silt and clay, generally stratified.

NONGLACIAL LANDFORMS

- Af** ALLUVIAL FLOODPLAIN. A strip of relatively smooth land of varying width adjacent to a stream, built chiefly of alluvium and covered by water during times of flood.

- LAKES. Perennial and intermittent lakes and large sloughs.

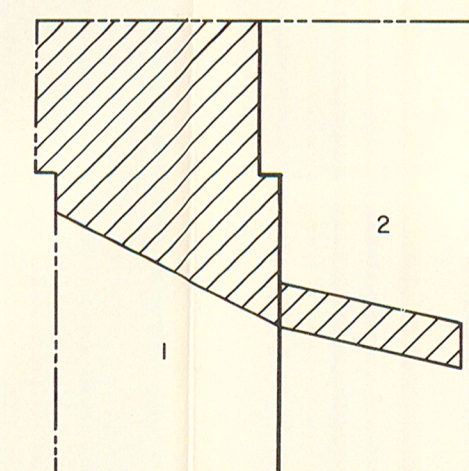
- STREAMS. Either perennial or intermittent streams.

BEDROCK

- x** BEDROCK EXPOSURE. An isolated exposure of Cretaceous Pierre shale (Kp) or Cretaceous Fox Hills sandstone (Kfh).

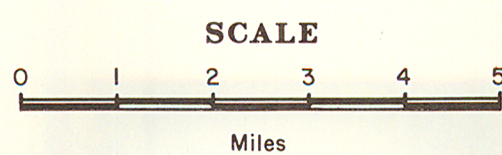
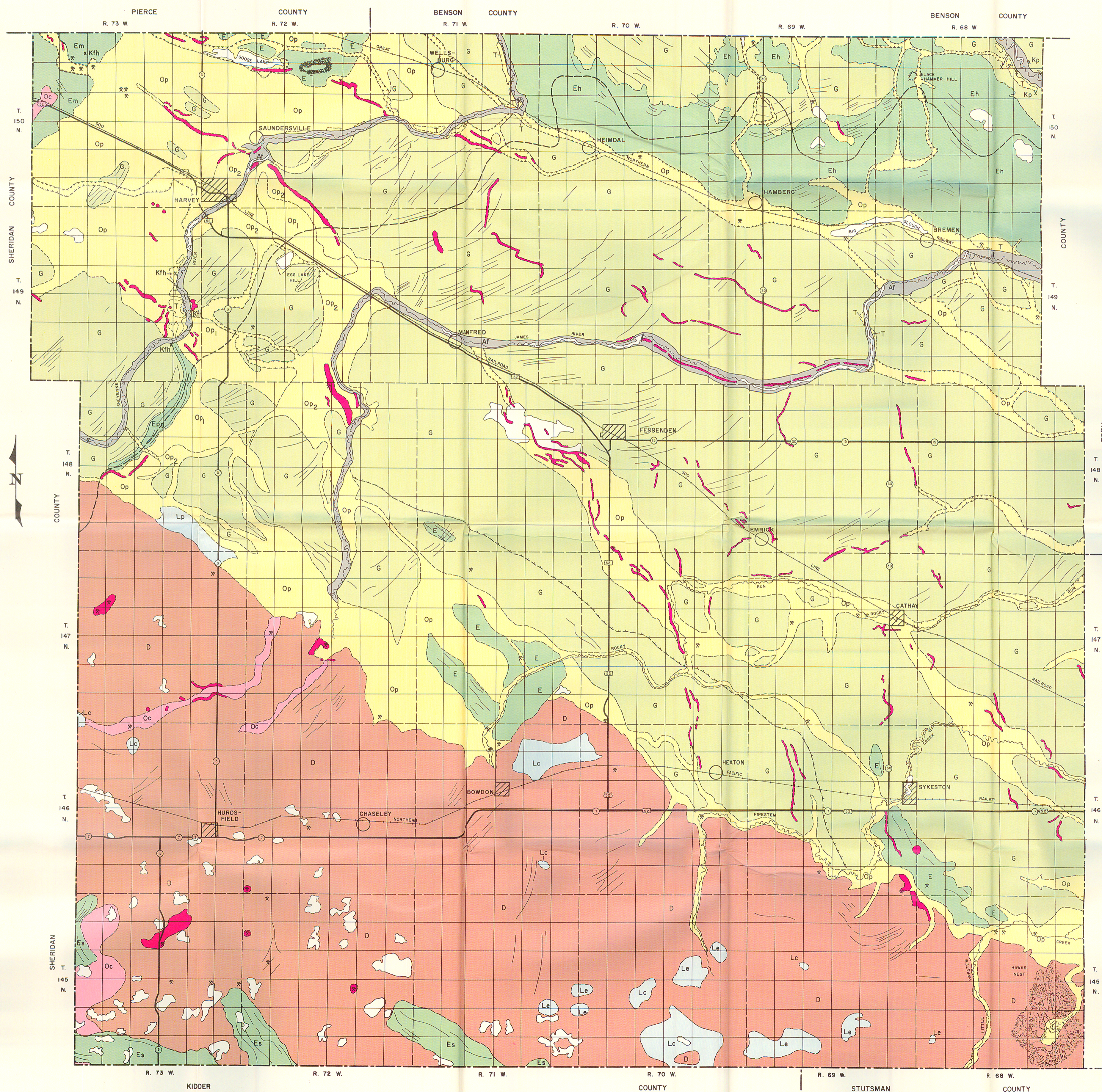
MAP SYMBOLS

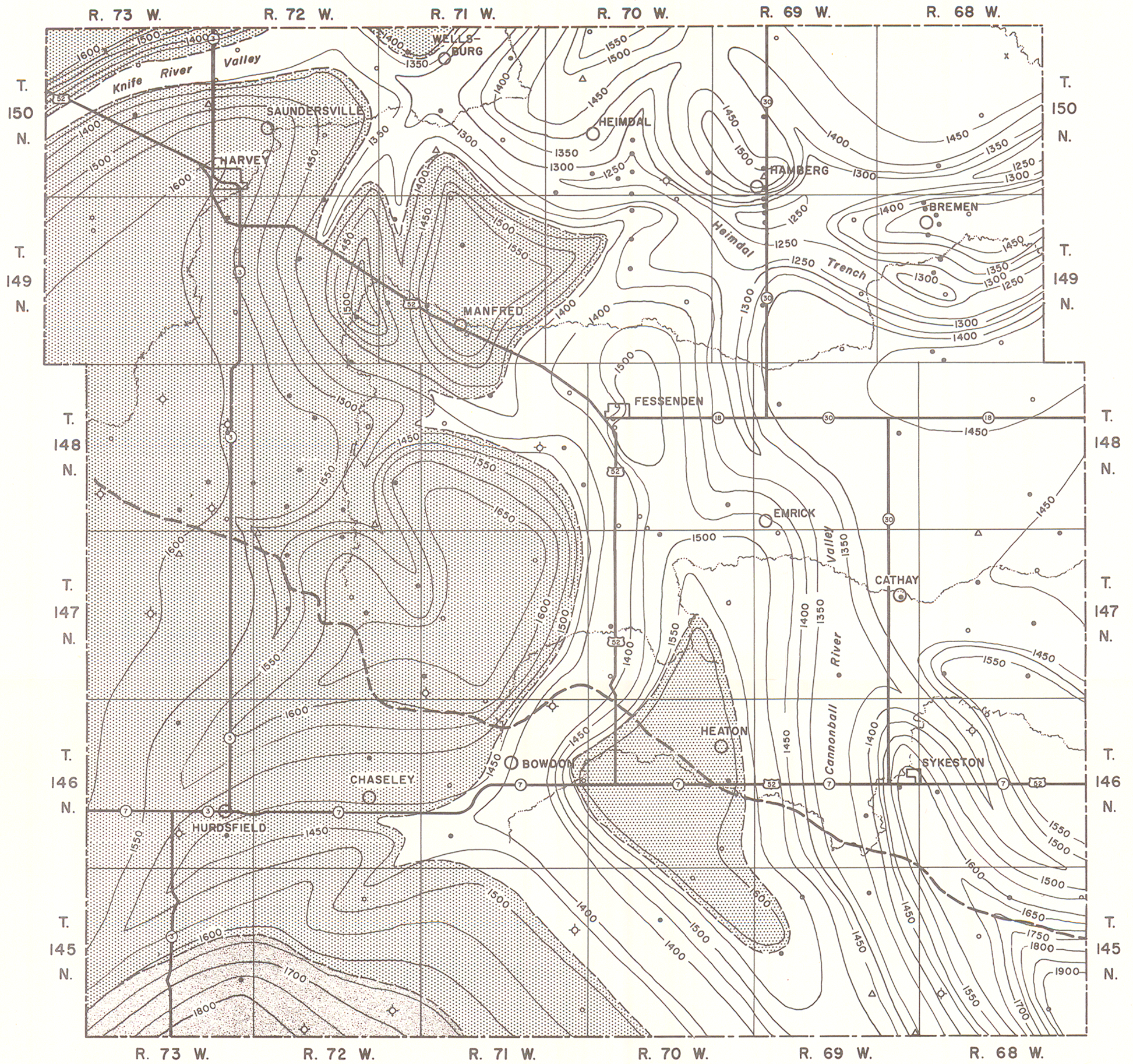
- STATE HIGHWAY
- FEDERAL HIGHWAY
- RAILROAD
- GRAVEL PIT
- GEOLOGIC CONTACT
- CONTINENTAL DIVIDE
- EDGE OF LOW EAST-FACING ESCARPMENT ON THE GROUND MORaine.


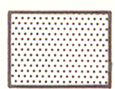
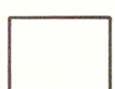


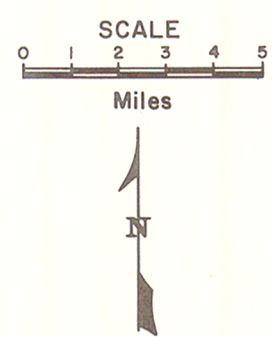
Geology on Plate I based on mapping by:
 1) George A. Faigle (1963)
 2) Ronald J. Kresl (1963)

Entire county was field checked in 1966. Shading shows area that was partially or entirely remapped.





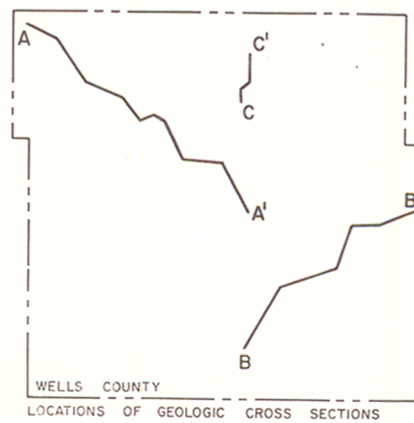
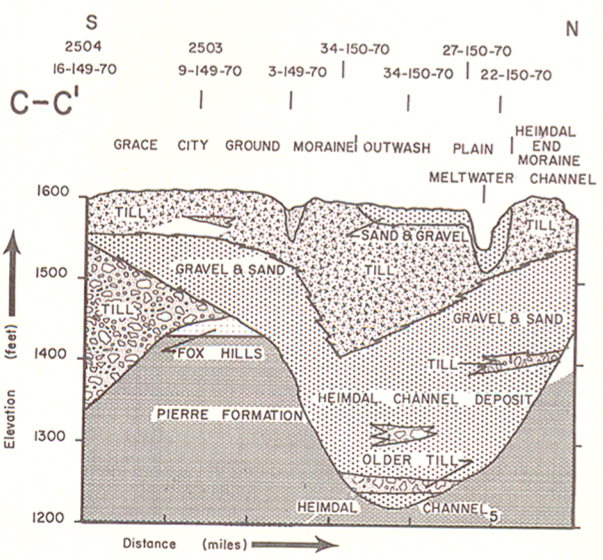
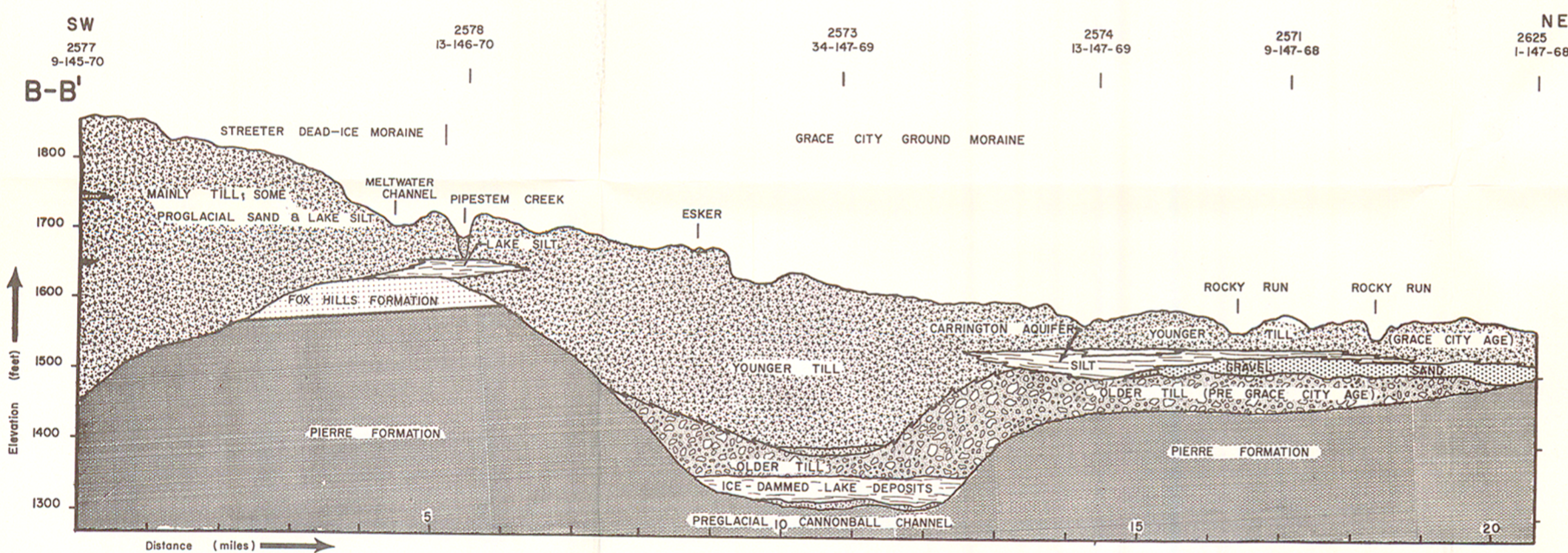
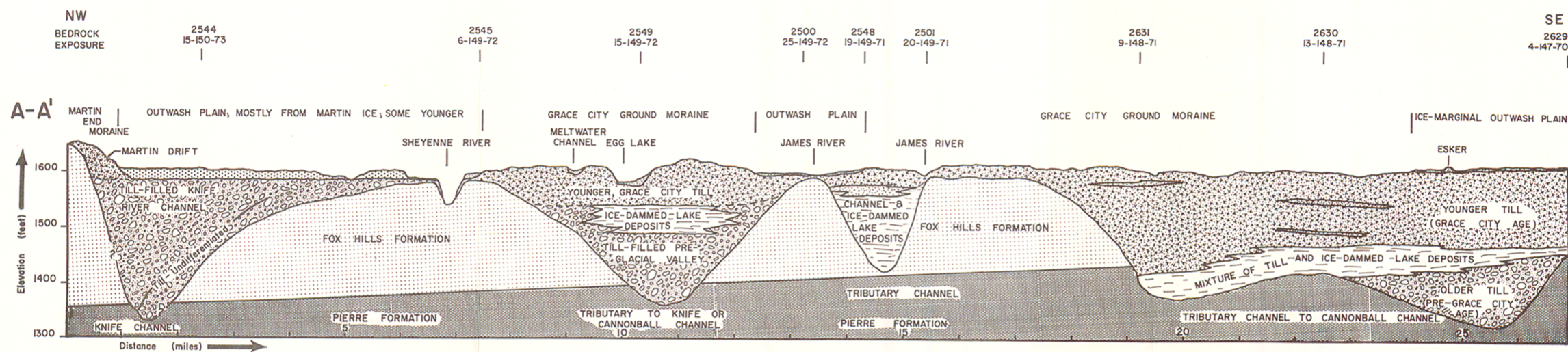
-  Hell Creek Formation
-  Fox Hills Formation
-  Pierre Formation



- x Bedrock Outcrop
- Bedrock Top (Lithologic Log Available)
- Bedrock Top (Lithologic Log Not Available)
- △ Approximate Bedrock Top
- ◇ Oil Exploratory Well
- 1500— Contour Line On Top Of Bedrock
- 1450— Contour Line On Top Of Bedrock
- - - Bedrock Contact
- - - Missouri Coteau Escarpment

Plate 2. Typographic map of the bedrock surface of Wells County showing bedrock subcrop pattern beneath the glacial drift.

GEOLOGIC CROSS-SECTIONS OF WELLS COUNTY, NORTH DAKOTA



EXPLANATION

| | | | |
|--|-----------------------------------|--|--|
| | TILL OF GRACE CITY AGE | | OUTWASH DEPOSITS, MAINLY SAND & GRAVEL |
| | TILL OLDER THAN GRACE CITY AGE | | CRETACEOUS FOX HILLS FORMATION SILTSTONE |
| | LAKE DEPOSITS, MAINLY SILT & CLAY | | CRETACEOUS PIERRE FORMATION SHALE |

Plate 3. Geologic cross-section of Wells County, North Dakota.