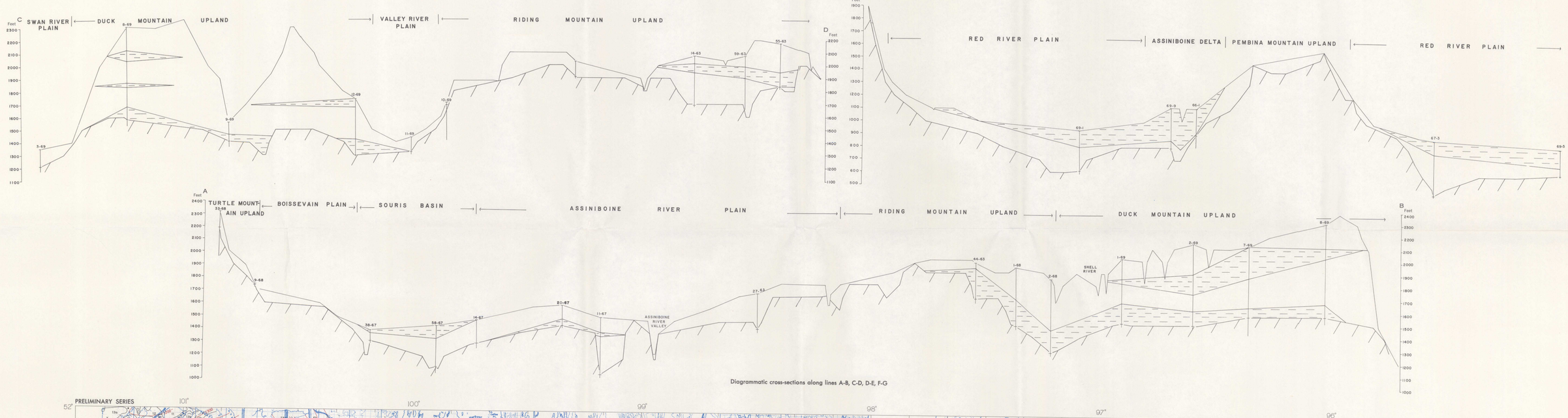
CANADA
DEPARTMENT OF ENERGY, MINES AND RESOURCES
GEOLOGICAL SURVEY OF CANADA

MANITOBA
DEPARTMENT OF MINES AND NATURAL RESOURCES
MINES BRANCH

CROSS-SECTION LEGEND

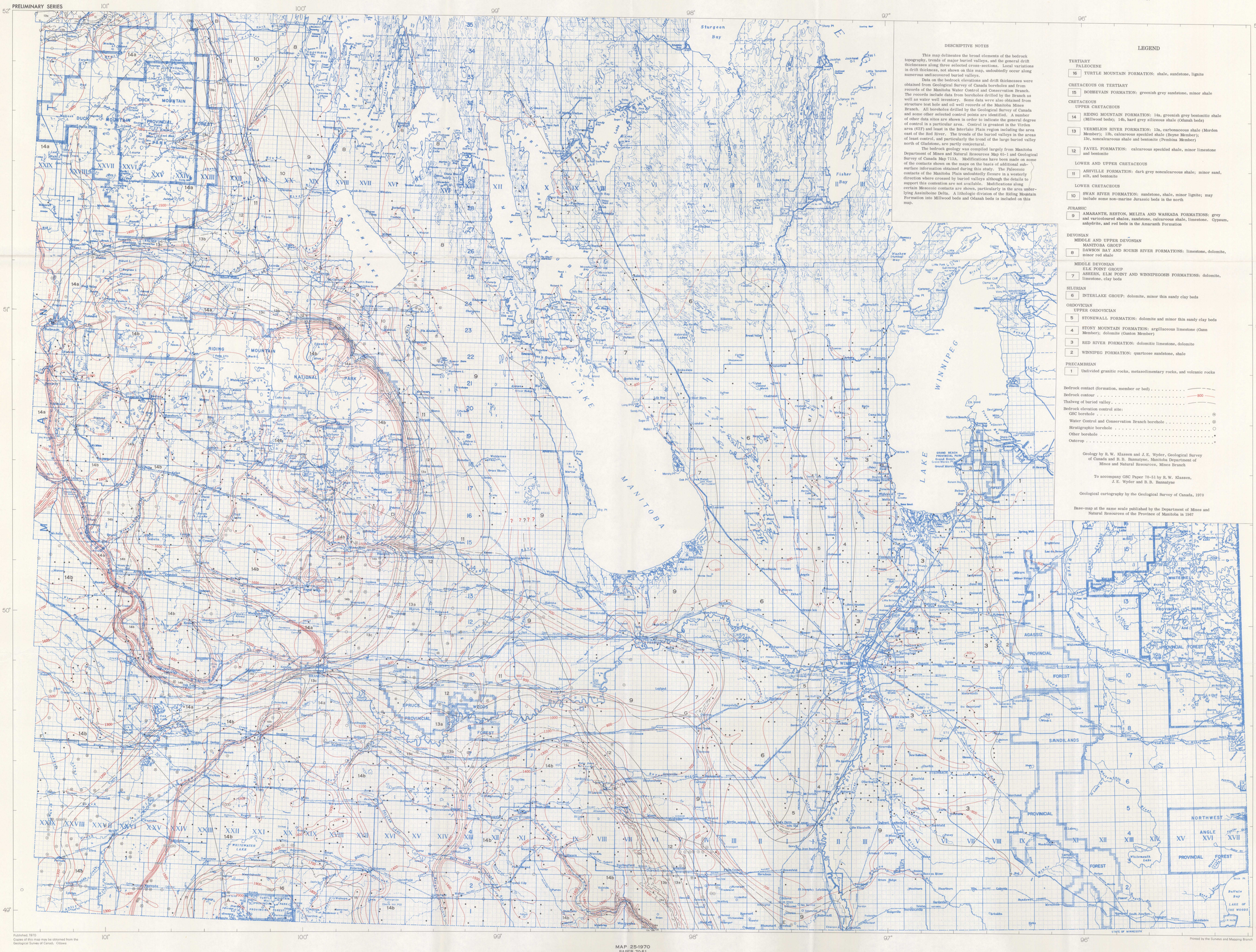
Stratified drift
Till
Bedrock

GSC borehole 1-69
Water Control and Conservation Branch borehole . . . . . WCC



Diagrammatic cross-sections along lines A-B, C-D, D-E, F-G

PRELIMINARY SERIES



DESCRIPTIVE NOTES

This map delineates the broad elements of the bedrock topography, trends of major buried valleys, and the general drift thicknesses along three selected cross-sections. Local variations in drift thickness, not shown on this map, undoubtedly occur along numerous undiscovered buried valleys.

Data on the bedrock elevations and drift thicknesses were obtained from Geological Survey of Canada boreholes and from records of the Manitoba Water Control and Conservation Branch. The records include data from boreholes drilled by the Branch as well as water well inventory. Some data were also obtained from structure test hole and oil well records of the Manitoba Mines Branch. All boreholes drilled by the Geological Survey of Canada and some other selected control points are identified. A number of other data sites are shown in order to indicate the general degree of control in a particular area. Control is greatest in the Virden area (62F) and least in the Interlake Plain region including the area east of the Red River. The trends of the buried valleys in the areas of least control, and particularly the trend of the large buried valley north of Gladstone, are partly conjectural.

The bedrock geology was compiled largely from Manitoba Department of Mines and Natural Resources Map 65-1 and Geological Survey of Canada Map 713A. Modifications have been made on some of the contacts shown on the maps on the basis of additional sub-surface information obtained during this study. The Paleozoic contacts of the Manitoba Plain undoubtedly flexure in a westerly direction where crossed by buried valleys although the details to support this contention are not available. Modifications along certain Mesozoic contacts are shown, particularly in the area underlying Assiniboine Delta. A lithologic division of the Riding Mountain Formation into Millwood beds and Odanah beds is included on this map.

LEGEND

TERTIARY
PALEOCENE
16 TURTLE MOUNTAIN FORMATION: shale, sandstone, lignite

CRETACEOUS OR TERTIARY
15 BOISSEVAIN FORMATION: greenish grey sandstone, minor shale

CRETACEOUS
UPPER CRETACEOUS
14 RIDING MOUNTAIN FORMATION: 14a, greenish grey bentonitic shale (Millwood beds); 14b, hard grey siliceous shale (Odanah beds)
13 VERMILION RIVER FORMATION: 13a, carbonaceous shale (Morden Member); 13b, calcareous speckled shale (Boyne Member); 13c, noncalcareous shale and bentonite (Pembina Member)
12 FAVEL FORMATION: calcareous speckled shale, minor limestone and bentonite
LOWER AND UPPER CRETACEOUS
11 ASHVILLE FORMATION: dark grey noncalcareous shale; minor sand, silt, and bentonite
LOWER CRETACEOUS
10 SWAN RIVER FORMATION: sandstone, shale, minor lignite; may include some non-marine Jurassic beds in the north

JURASSIC
9 AMARANTH, RESTON, MELITA AND WASKADA FORMATIONS: grey and varicoloured shales, sandstone, calcareous shale, limestone. Gypsum, anhydrite, and red beds in the Amaranth Formation

DEVONIAN
MIDDLE AND UPPER DEVONIAN
MANITOBA GROUP
8 DAWSON BAY AND SOURIS RIVER FORMATIONS: limestone, dolomite, minor red shale
MIDDLE DEVONIAN
ELK POINT GROUP
7 ASHERN, ELM POINT AND WINNIPEGOSIS FORMATIONS: dolomite, limestone, clay beds

SILURIAN
6 INTERLAKE GROUP: dolomite, minor thin sandy clay beds

ORDOVICIAN
UPPER ORDOVICIAN
5 STONEWALL FORMATION: dolomite and minor thin sandy clay beds
4 STONY MOUNTAIN FORMATION: argillaceous limestone (Gunn Member); dolomite (Ganton Member)
3 RED RIVER FORMATION: dolomitic limestone, dolomite
2 WINNIPEG FORMATION: quartzose sandstone, shale

PRECAMBRIAN
1 Undivided granitic rocks, metasedimentary rocks, and volcanic rocks

Bedrock contact (formation, member or bed) . . . . . .
Bedrock contour 800
Thalweg of buried valley . . . . . .
Bedrock elevation control site:
GSC borehole . . . . . ⊙
Water Control and Conservation Branch borehole . . . . . ⊗
Stratigraphic borehole . . . . . ○
Other borehole . . . . . •
Outcrop . . . . . ×

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To accompany GSC Paper 70-51 by R. W. Klassen, J. E. Wyder and B. B. Bannatyne

Geological cartography by the Geological Survey of Canada, 1970

Base-map at the same scale published by the Department of Mines and Natural Resources of the Province of Manitoba in 1967

Published, 1970
Copies of this map may be obtained from the Geological Survey of Canada, Ottawa

Printed by the Surveys and Mapping Branch

MAP 25-1970
PAPER 70-51
GEOLOGY

BEDROCK TOPOGRAPHY AND GEOLOGY OF SOUTHERN MANITOBA

MANITOBA - ONTARIO

Scale 1:500,000 Échelle

Miles 8 0 8 16 24 Miles
Kilometres 12 0 12 24 36 Kilomètres