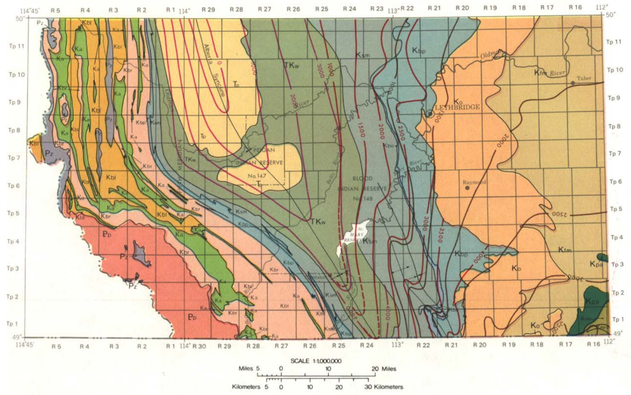
Alberta RESEARCH

GEOLOGY



SCALE 1:1000000
Miles 5 0 10 20 30 Miles
Kilometers 5 0 10 20 30 Kilometers

LEGEND

- Tp — Porcupine Hills Formation: *sandstone, shale*
- TKw — Willow Creek Formation: *shale, sandstone*
- Ksm — St. Mary River Formation: *sandstone, shale*
- Kbo — Blood Reserve Formation: *sandstone*
- Kbp — Bearpaw Formation: *shale*
- Ke — Oldman Formation: *sandstone, shale*
- Kfor — Foremost Formation: *sandstone, shale*
- Kbr — Belly River Formation: *sandstone, shale*
- Kpa — Pakowki Formation: *shale*
- Kmb — Milk River Formation (upper member): *shale, sandstone*
- Kmlr — Milk River Formation (lower member): *sandstone*
- Kc — Alberta Group: *shale*
- Kas — Blairmore Formation and older Mesozoic Formations: *sandstone, shale*
- Pz — Paleozoic: *limestone, dolomite, shale*
- Pc — Purcell Group: *limestone, dolomite, argillite, siltstone, quartzite*

ock unit boundary

tructure contour in feet above sea level on top of:
- St. Mary River Formation (-500)
- Oldman Formation (to depth of 1000 feet, approximately) (-1500)
- Milk River Formation (lower Member), (to depth of 1000 feet, approximately) (-1000)

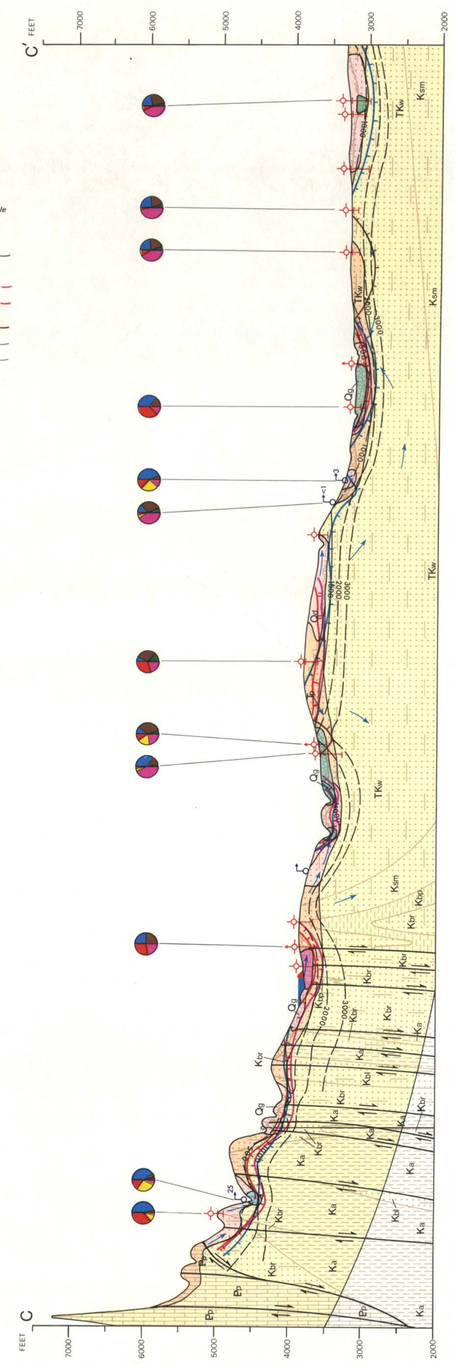
xis of anticline

xis of syncline

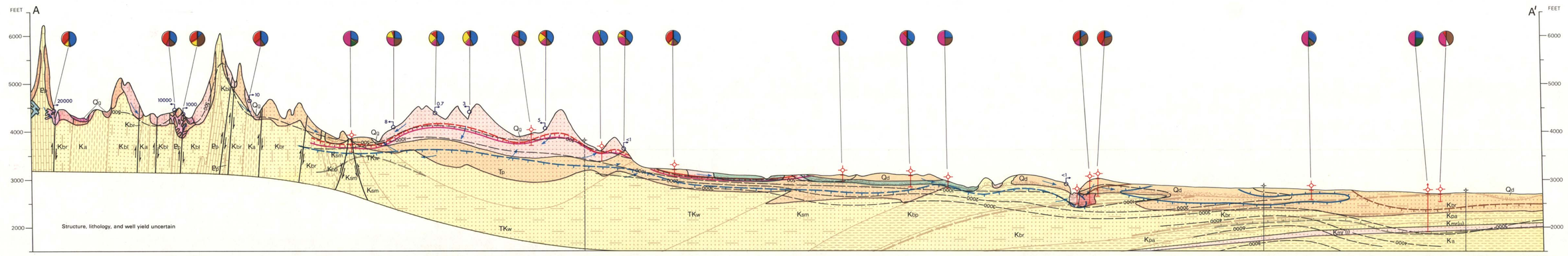
CONVERSION TABLE

LOGARITHMIC SCALE

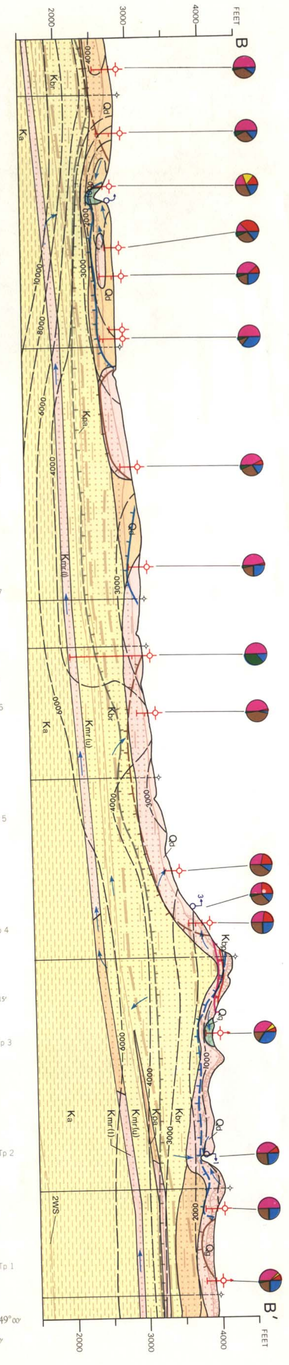
C C' FEET



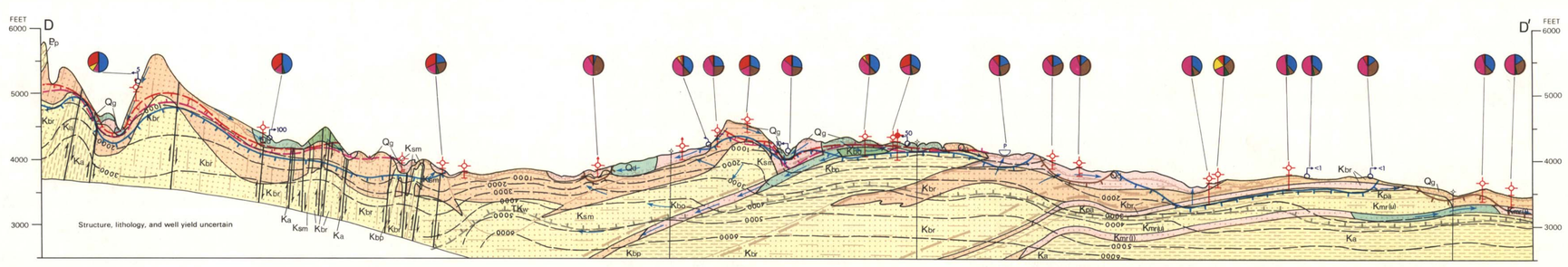
A A' FEET



B B' FEET



D D' FEET



SCALE 1:250000
Miles 5 0 5 10 15 20 25 30 Miles
Kilometers 5 0 5 10 15 20 25 30 Kilometers

HYDROGEOLOGICAL MAP LETHBRIDGE - FERNIE ALBERTA

NTS 82G-H

All elevations in feet above mean sea level

Vertical exaggeration of the hydrogeological profiles is approximately 20X

Hydrogeology by D. Tokarsky 1973, based on data collected in 1970 and 1971

Cartographic editing by A. Badry, A. Gill and F. Smith

An expanded legend and explanatory notes for use with this hydrogeological map series is available from Alberta Research, Edmonton, Canada

Map to accompany Report 74-1

KEY MAP

Sheet 1 of 2

MAIN MAP LEGEND

Topography

Surface contours (interval 100 feet below 5000 feet east of fifth meridian; interval 200 feet above 5000 feet east of fifth meridian; interval 500 feet west of fifth meridian)
- elevation
- depression

Geology

- Geological boundary
- Thalweg of buried valley: defined; approximate
- Fault (on profiles only)

QUATERNARY
- Qd — Unconsolidated deposits
- Qg — Gravel

TERTIARY
- Tp — Porcupine Hills Formation

TERTIARY AND CRETACEOUS
- TKw — Willow Creek Formation

CRETACEOUS
- Ksm — St. Mary River Formation
- Kbo — Blood Reserve Formation
- Kbp — Bearpaw Formation
- Kbr — Belly River Formation
- Kpa — Pakowki Formation
- Kmb — Milk River Formation (upper member)
- Kmlr — Milk River Formation (lower member)
- Ka — Alberta Group
- Kbl — Blairmore Formation and older Mesozoic Formations

PRECAMBRIAN
- Pc — Purcell Group
- White Specks marker (2WS)

Lithology

- Gravel
- Sand
- Sand and gravel
- Sandstone
- Sandstone and argillite
- Shale
- Sandstone and shale
- Coal
- Carbonate rocks

Hydrography

- Lake or slough, perennial
- Lake or slough, seasonal
- Marsh, muskeg
- Stream, perennial
- Stream, intermittent
- Natural pond or water hole
- Surface water divide
- Area of noticeable salt precipitates

Hydrometry

- Stream gauging station
  - Average annual discharge in cubic feet per second (333)
  - Year of commencement of observations (1970)
  - Number of years averaged for average annual discharge figure (3)
  - Drainage area in square miles (118)
- Lake level recording station
- Source of Data:
  - Surface Water Data Alberta
  - (Inland Waters Branch, Department of Energy, Mines and Resources)

Hydrogeology

- Spring, flow rate unknown
- Spring, flow rate known
- Nonpumping water level contour (2800)
- Direction of groundwater flow
- Groundwater divide
- Boundary of area of artesian flow
- Line east of which water level contours are based on Milk River sandstone

Groundwater Probability†

Range of average expected yield of wells (in imperial gallons per minute)

Probable: estimated from quantitative information (pump tests, bail tests, etc.)

Possible: estimated from qualitative information (flow regime, lithology, etc.)

- +500
- 100-500
- 25-100
- 5-25
- 1-5
- <1

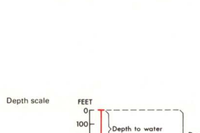
Yield area boundary

†The indicated average expected yields to wells are predictions based on the best data available at the time of map compilation; due to data shortcomings and special conditions, local discrepancies between predicted and actual yields are inevitable. Multiaquifer completion may be necessary to obtain the yield indicated.

Wells and Other Artificial Works

- Water well, nonflowing
- Water well, flowing
- Water well, nonproducing
- Well, shallow depth
- Water well, 20-year safe yield calculated from apparent transmissivity
- Water well, 20-year safe yield calculated from a good bail test or a short pump test
- Water well, 20-year safe yield calculated from a pump test of sufficient length to reflect regional hydraulic conditions
- Adjacent wells
- Test well with more than one piezometer in a single borehole or with groundwater data collected from several depths during drilling
- Observation well with automatic recorder
  - Mean annual water level fluctuation in feet
  - Year of commencement of observations
  - Years of record averaged for mean annual water level fluctuation figure
- Seismic shothole reported to have flowed

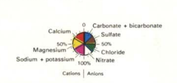
Depth scale



- Location of Research Council of Alberta test well — RCA
- Gas well*
- Abandoned well, drilled for oil or gas*
- Structure testhole*
- Spring catchment
- Line of hydrogeological profile — A A'

*Vertical line portion of oil, gas or other exploratory test well symbols used on hydrogeological profiles indicates well depth; dashed portion indicates surface casing interval.

Hydrochemistry



Note: When the yellow Mg pie sector is absent, Ca + Mg are represented as a unit by the red pie sector

Total dissolved solids in parts per million:
- defined — 500
- approximate — 500

Isogram along which calcium and magnesium constitute 60 percent of total cations*; teeth indicate direction of lesser calcium and magnesium content:
- defined
- approximate

Isogram along which sodium and potassium constitute 60 percent of total cations*; teeth indicate direction of lesser sodium and potassium content:
- defined
- approximate

Isogram along which carbonate and bicarbonate constitute 60 percent of total anions*; teeth indicate direction of lesser carbonate and bicarbonate content:
- defined
- approximate

Isogram along which sulfate constitutes 60 percent of total anions*; teeth indicate direction of lesser sulfate content:
- defined
- approximate

Isogram along which chloride constitutes 60 percent of total anions*; teeth indicate direction of lesser chloride content:
- defined
- approximate

*Determined on equivalents per million basis