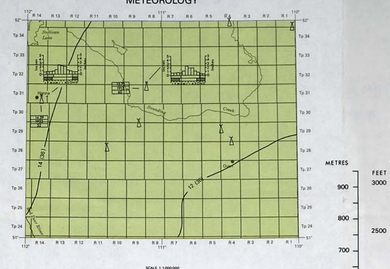
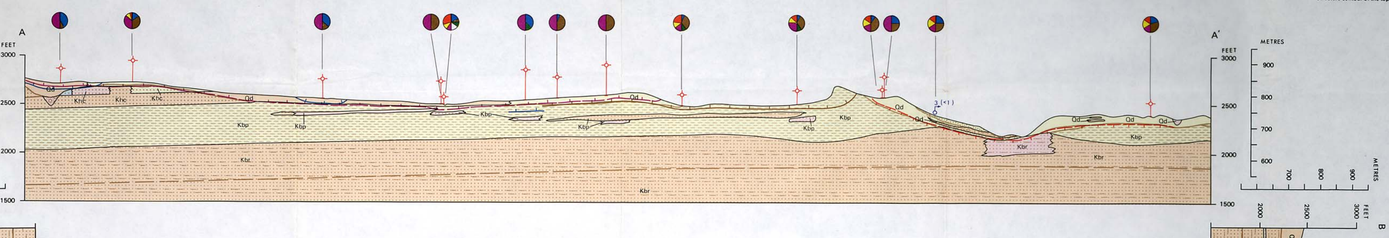
Alberta RESEARCH COUNCIL

METEOROLOGY

LEGEND

Isohyet, mean annual precipitation in inches (cm) 14 (36)
Mean annual precipitation in inches (cm):
less than 15 inches (38 cm)
Meteorological station
Standard rain gauge
Precipitation data:
Mean annual precipitation estimated in inches
Year of commencement of observations
Number of years in average
Mean monthly precipitation
Period when surface is usually snow-covered
Period with mean daily temperatures below freezing

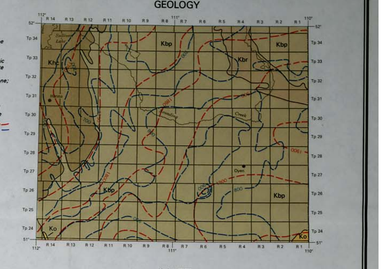




GEOLOGY

LEGEND

Horseshoe Canyon Formation: gray feldspathic, clayey sandstone; gray bentonitic mudstone and carbonaceous shale; concretionary ironstone beds, scattered coal and bentonite bed of variable thickness, minor limestone beds; continental
Khc
Bearpaw Formation: dark gray blocky shale and silty shale; greenish glauconitic and gray clayey sandstone; thin concretionary ironstone and bentonite beds; marine
Kbp
Belly River Formation: gray to greenish gray, thick-bedded feldspathic sandstone; gray clayey siltstone, mudstone; concretionary ironstone beds; nonmarine
Kbr
Oldman Formation: pale gray, thick-bedded, medium-to coarse-grained, feldspathic sandstone; gray clayey siltstone, mudstone; dark gray and brown carbonaceous shale; ironstone concretionary beds; nonmarine
Ko
Structure contour on the base of the Oldman Formation 1100
Structure contour of the top of the First White Specks zone 600



MAIN MAP LEGEND

Topography

Surface contours and elevation in feet (interval 100 feet) 3000

Geology

Geological boundary
Buried valley boundary

QUATERNARY

Qd Unconsolidated deposits

CRETACEOUS

Khc Horseshoe Canyon Formation
Kbp Bearpaw Formation
Kbr Belly River Formation
Top of Basal Oldman Sandstone

Lithology

Gravel
Sand and gravel
Sand
Sandstone
Clay
Shale
Coal

Hydrography

Lake or slough, perennial
Lake or slough, seasonal
Saline lake
Marsh, muskeg
Area inundated during floods
Stream, perennial
Stream, intermittent
Surface water divide

Hydrogeology

Spring, flow rate unknown
Spring, flow rate in igpm (liser)
Nonpumping water level contour in the bedrock (elevation in feet: followed by metres in brackets) 2500 (760)
Direction of groundwater flow

Groundwater Probability†

Range of average expected yield of wells in imperial gallons per minute (liser)
Probable: estimated from quantitative information (pump tests, bail tests, etc.)
Possible: estimated from quantitative information (flow regime, lithology, etc.)

100-500	(8-38)
25-100	(2-8)
5-25	(0.4-2)
1-5	(0.1-0.4)
<1	(<0.1)

Yield area boundary

† The indicated ranges of yield are intended to serve as a preliminary guide based on the best data available at the time of compilation. Due to data shortcomings and special conditions, local discrepancies between predicted and actual yields are inevitable. Multiacquifer completion may be necessary to obtain the yield indicated.

Wells and Other Artificial Works

Depth Scale
FEET 0 100 200 300 400
Depth to water
Depth of well or seismic shot hole

Water well, nonflowing
Water well, nonproducing
Recharge well
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
Locations of Alberta Research Council test well ..... ARC
Shothole, flowing
Other testholes (oil-well, gas-well etc.)
Spring catchment
Storage reservoir for surface water
Line of hydrogeological profile ..... A A'

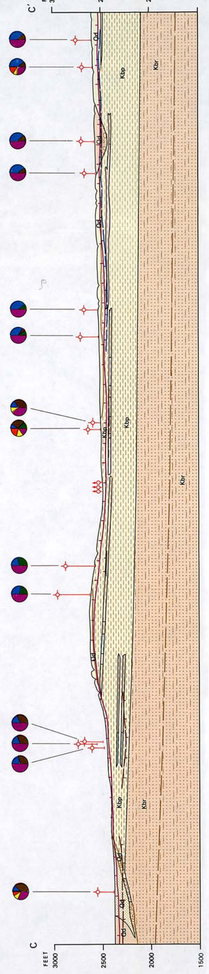
Hydrochemistry

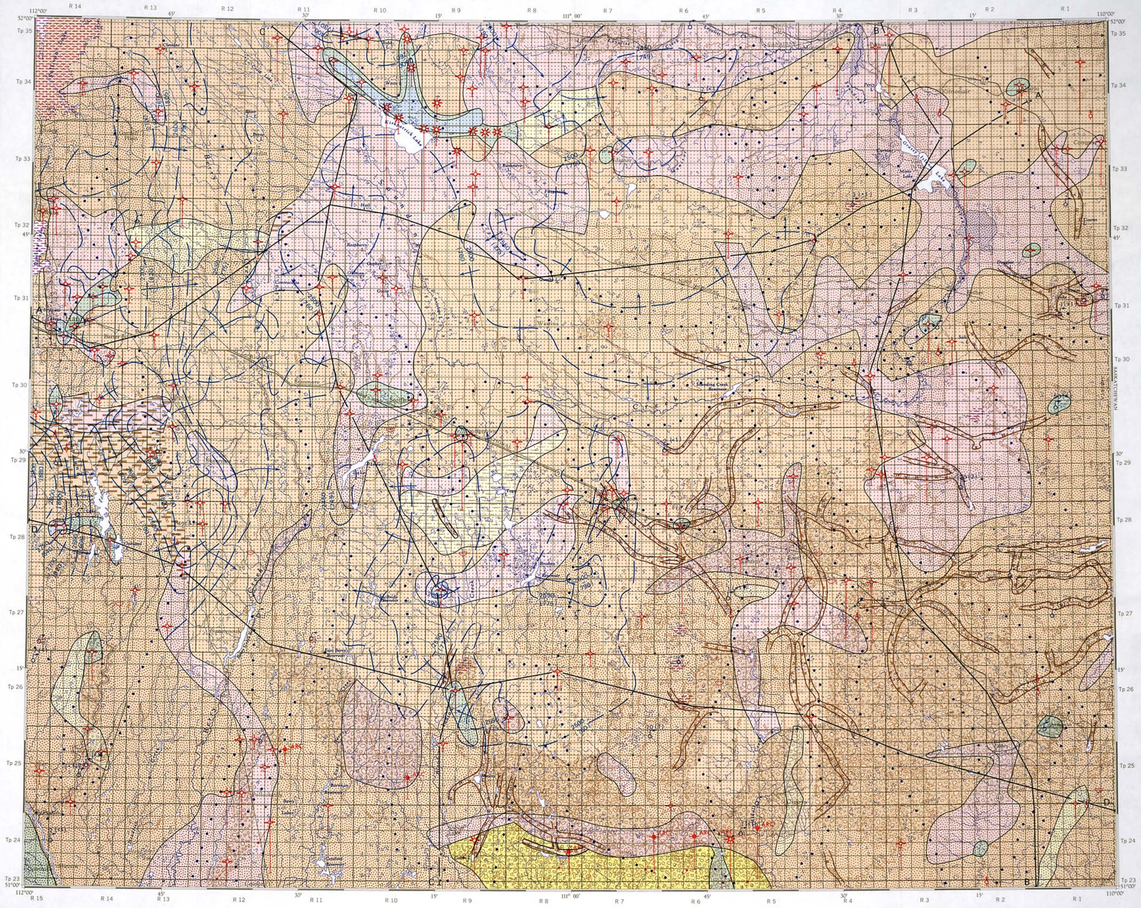
Calcium, Magnesium, Sodium + potassium, 50%; Carbonate + bicarbonate, Sulfate, Chloride, Nitrate, 50%
Cations | Anions

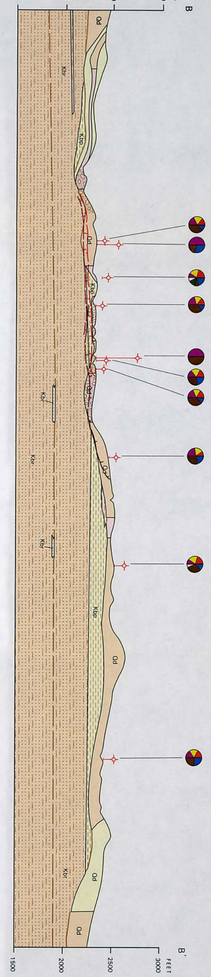
Note: When the yellow Mg pie sector is absent, Ca + Mg are represented as a unit by the red pie sector.

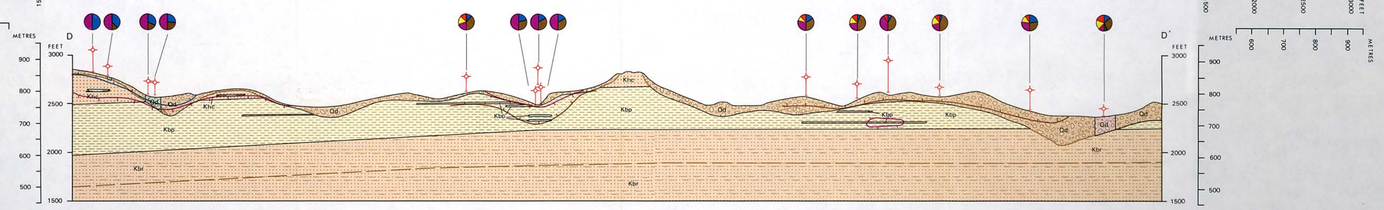
Isogram along which calcium + magnesium constitute 60 percent of total cations*; teeth indicate direction of lesser calcium + magnesium content, defined:
Isogram along which sodium + potassium constitute 60 percent of total cations*; teeth indicate direction of lesser sodium + potassium content, defined:
Isogram along which carbonate + bicarbonate constitute 60 percent of total anions*; teeth indicate direction of lesser carbonate + bicarbonate content, defined:
Isogram along which sulfate constitutes 60 percent of total anions*; teeth indicate direction of lesser sulfate content, defined:
Isogram along which chloride constitutes 60 percent of total anions*; teeth indicate direction of lesser chloride content, defined:

* determined on equivalents per million basis

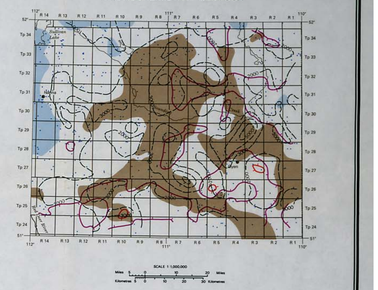








HYDROCHEMISTRY: BEDROCK

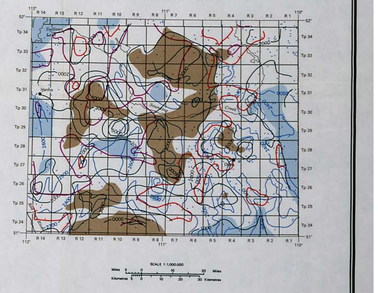


LEGEND

Data control point marking the location of a well with a chemical analysis
Total dissolved solids in parts per million, defined: 2000
Carbonate + bicarbonate constituting over 60 percent of total anions*
Sulfate constituting over 60 percent of total anions*
Isogram along which calcium + magnesium constitute 60 percent of total cations*; teeth indicate direction of lesser calcium + magnesium content, defined:
Isogram along which sodium + potassium constitute 60 percent of total cations*; teeth indicate direction of lesser sodium + potassium content, defined:

* determined on equivalents per million basis

HYDROCHEMISTRY: DRIFT



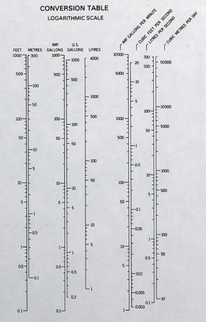
LEGEND

Data control point marking the location of a spring or well with a chemical analysis
Total dissolved solids in parts per million, defined: 3000
Nonpumping water level contour in the drift (elevation in feet) 3000
Carbonate + bicarbonate constituting over 60 percent of total anions*
Sulfate constituting over 60 percent of total anions*
Isogram along which calcium + magnesium constitute 60 percent of total cations*; teeth indicate direction of lesser calcium + magnesium content, defined:
Isogram along which sodium + potassium constitute 60 percent of total cations*; teeth indicate direction of lesser sodium + potassium content, defined:

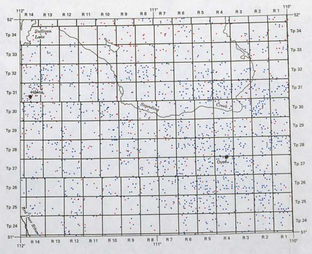
* determined on equivalents per million basis

CONVERSION TABLE

LOGARITHMIC SCALE



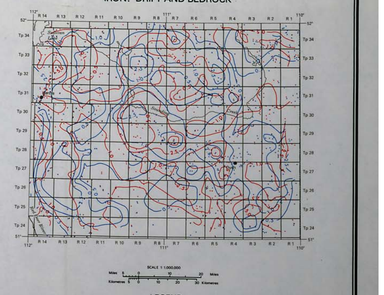
DATA DENSITY



LEGEND

Data control point marking location of a well with water level information only
Data control point marking location of a well with yield information (i.e. production tests)
Data control point marking location of a hydrogeological surface feature

IRON: DRIFT AND BEDROCK



LEGEND

Data control point marking location of a well or surface feature in the drift
Data control point marking location of a well in the bedrock
Total iron content in the drift, in parts per million: defined 1.0
Total iron content in the bedrock, in parts per million: defined 2.3

All elevations in feet above mean sea level.

Vertical exaggeration of the hydrogeological profiles is approximately 40X.

An expanded legend and explanatory notes (Report 72-12) for use with this hydrogeological map series is available from Alberta Research Council, Edmonton, Canada.

Map to accompany Report 78-2.

Hydrogeology by D.M. Borneuf.

Drafted by J.K. Matthie

Cartographic editing by A.R. Campbell.

HYDROGEOLOGICAL MAP OYEN ALBERTA

NTS 72-M

Base map provided by Surveys and Mapping Branch, Department of Energy, Mines and Resources, Ottawa; modified by Surveys Branch, Alberta Transportation, Edmonton.

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