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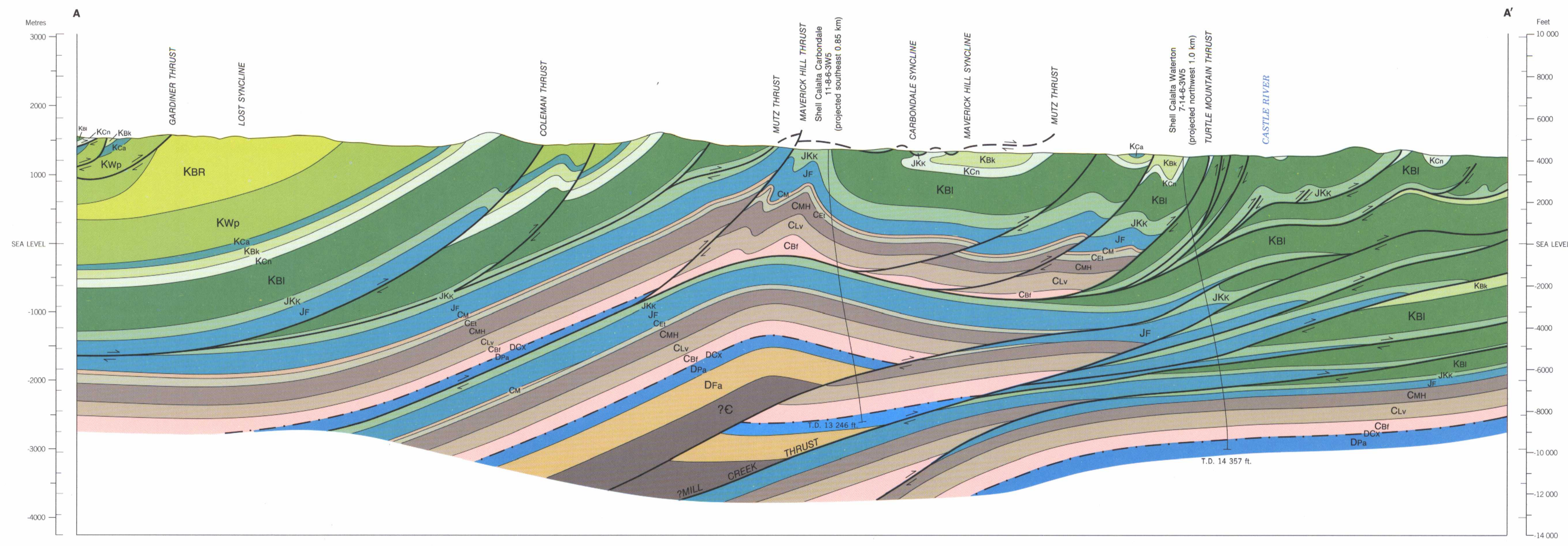
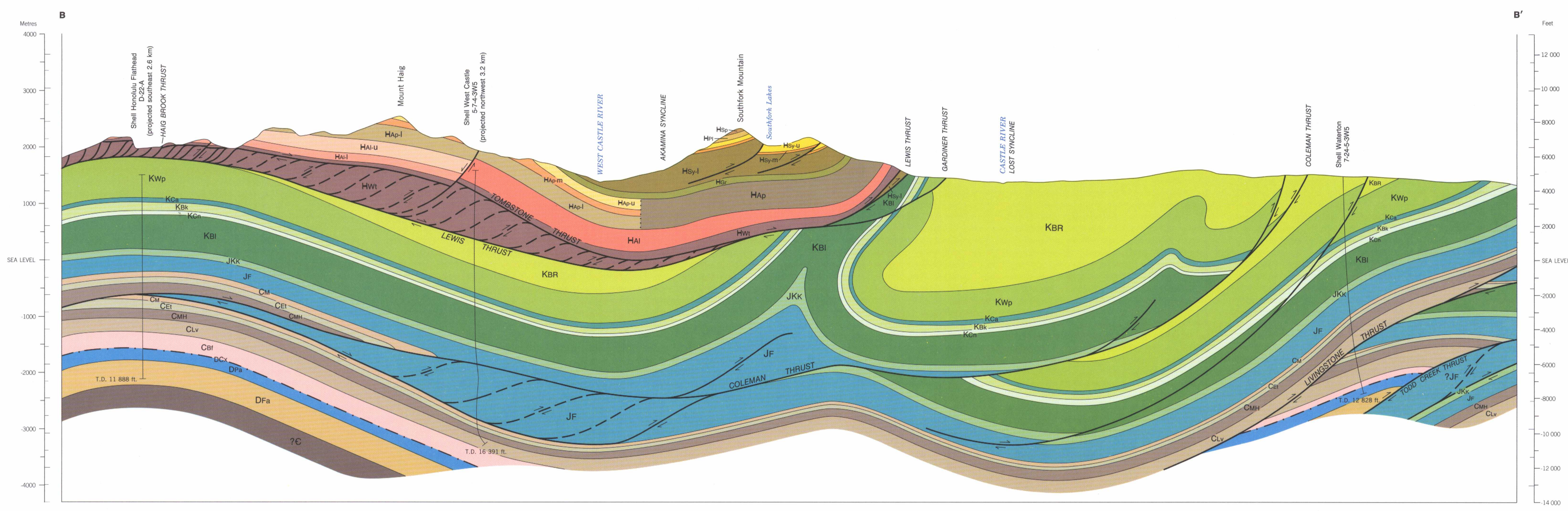
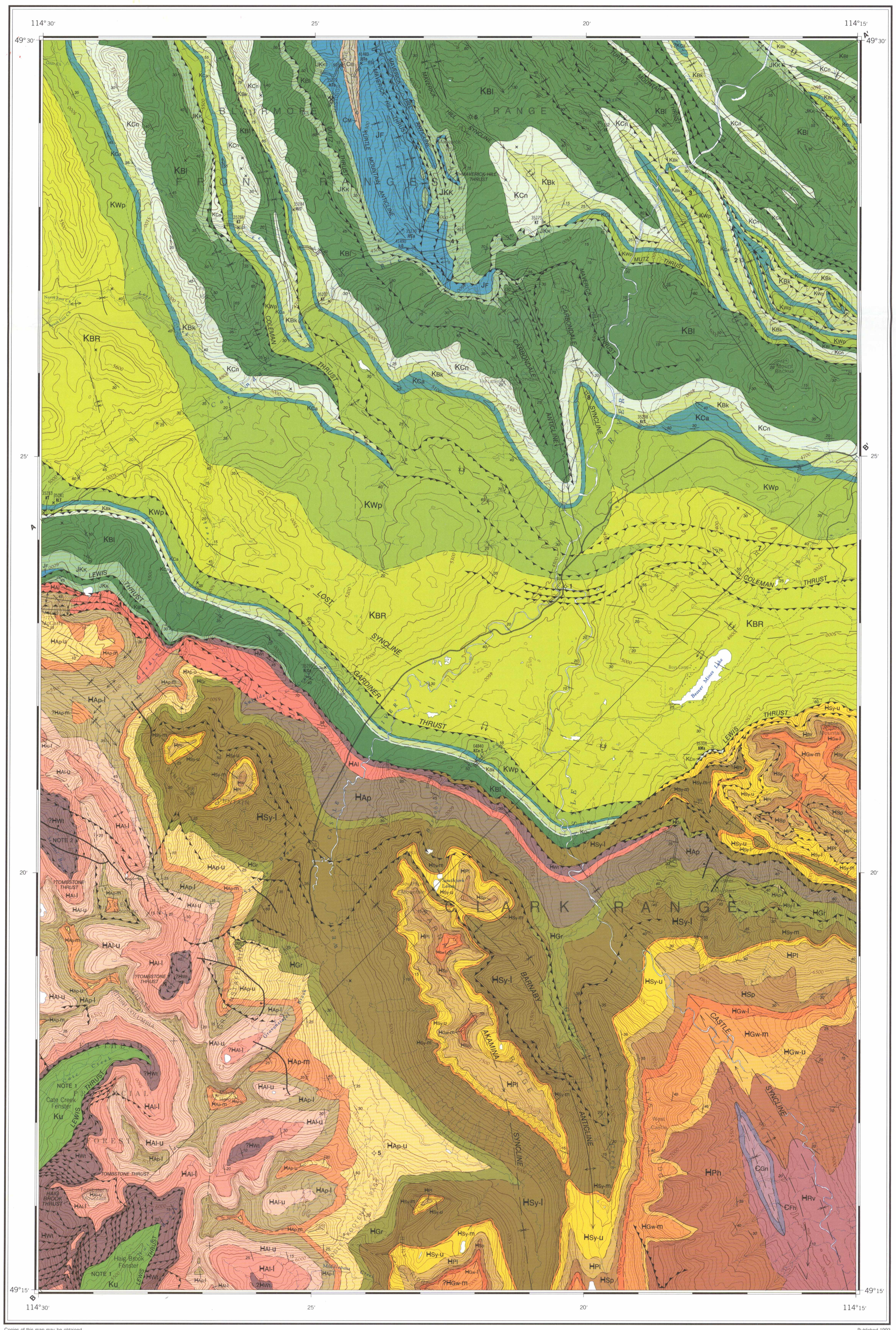
GEOLOGICAL SURVEY OF CANADA — COMMISSION GÉOLOGIQUE DU CANADA



Structure cross-section along A-A′



Structure cross-section along B-B′



Published 1993

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100 West Pender Street, Vancouver, B.C. V6B 1R8

MAP 1838A

GEOLOGY

BEAVER MINES

(West Half)

WEST OF FIFTH MERIDIAN

ALBERTA – BRITISH COLUMBIA

Scale 1:50 000 - Échelle 1/50 000

Kilometres 1 0 1 2 3 4 Kilomètres

Universal Transverse Mercator Projection | Projection transverse universelle de Mercator

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Canada

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LEGEND

MESOZOIC

CRETACEOUS

UPPER CRETACEOUS

- KBR — *BELLY RIVER FORMATION: grey and green sandstone; silty, grey and green shale. Includes St. Mary River and Bearpaw formations south of Beaver Mines Lake*
- ALBERTA GROUP (KBk – KWp)
- KWp — *WAPIABI FORMATION: dark grey shale; silty shale; thin beds of fine grained, grey sandstone*
- Ku — *WAPIABI AND BELLY RIVER FORMATIONS, undivided*
- KCa — *CARDIUM FORMATION: fine to coarse grained, grey sandstone; silty shale; conglomerate*
- KBk — *BLACKSTONE FORMATION: dark grey, silty and concretionary shale; thin beds of fine grained, grey sandstone; basal chert-pebble conglomerate*

LOWER CRETACEOUS

- KCn — *CROWSNEST FORMATION: agglomerate; red, green, yellow, and brown tuffaceous shale; green and grey tuffaceous sandstone; minor trachytic flows*
- KBl — *BLAIRMORE GROUP, undivided: grey and greenish grey sandstone; green, silty mudstone (Beaver Mines Formation); grey sandstone and shale in the lower part (Gladstone Formation); basal chert- and quartzite-pebble conglomerate (Cadomin Formation)*

JURASSIC AND LOWER CRETACEOUS

- JKK — *KOOTENAY GROUP, undivided: dark grey and black carbonaceous shale; fine to coarse grained, light and dark grey sandstone and siltstone; medium volatile bituminous coal (Mist Mountain Formation). Coarsening-upward sequence of grey and brown sandstone at the base (Morrissey Formation)*

JURASSIC

- JF — *FERNIE FORMATION: dark grey to black shale; silty shale; thin beds of grey sandstone; thin beds of black limestone; basal coquina and phosphate-pebble conglomerate. May include thin Lower Triassic Sulphur Mountain Formation on the west flank of the Blairmore Range*

PALEOZOIC

CARBONIFEROUS

UPPER CARBONIFEROUS

SPRAY LAKES GROUP (CM)

- CM — *MISTY FORMATION: fine grained, grey, dolomitic sandstone; minor limestone and chert*

LOWER CARBONIFEROUS

RUNDLE GROUP (CLv – CEt)

- CEt — *ETHERINGTON FORMATION: black and grey dolomite and limestone; grey sandstone; minor green and maroon shale, and chert breccia*
- CMH — *MOUNT HEAD FORMATION: dark grey and black, cryptocrystalline to coarse crystalline limestone; grey and buff, fine to medium crystalline dolomite; dolomite and limestone breccia; black calcareous shale and green shale. Structure sections only*
- CLv — *LIVINGSTONE FORMATION: massive, grey, fine to coarse crystalline limestone; grey, crinoidal limestone; cherty, grey limestone and dolomite. Structure sections only*
- CBf — *BANFF FORMATION: dark grey and black, cherty and argillaceous limestone; black siltstone and mudstone; banded chert. Structure sections only*

DEVONIAN AND CARBONIFEROUS

UPPER DEVONIAN AND LOWER CARBONIFEROUS

- DCX — *EXSHAW FORMATION: black, silty shale; grey siltstone and limestone. Structure sections only*

DEVONIAN

UPPER DEVONIAN

- DPa — *PALLISER FORMATION: massive, dark grey and brownish grey limestone and dolomite; brown, crystalline dolomite. Structure sections only*
- DFa — *FAIRHOLME GROUP AND ALEXO FORMATION, undivided: dark grey, silty and argillaceous limestone; dark and light grey dolomite; siltstone and sandstone. Structure sections only*

CAMBRIAN

MIDDLE CAMBRIAN

- ЄGn — *GORDON FORMATION: micaceous green shale; grey, fine crystalline limestone; minor limonitic quartz sandstone*

MIDDLE CAMBRIAN OR (?)OLDER

- ЄFh — *FLATHEAD FORMATION: pale orange, medium and coarse grained, conglomeratic, quartz sandstone; basal quartzite and conglomerate*
- Є — *Cambrian formations, undivided. Structure sections only*

PROTEROZOIC

HELIKIAN (MIDDLE PROTEROZOIC)

PURCELL SUPERGROUP (HWt – HRv)

- HRv — *ROOSVILLE FORMATION (Kintla Formation*, Member D): green and grey argillite, siltstone, and sandstone; oolitic limestone; stromatolitic dolomite*
- HPh — *PHILLIPS FORMATION (Kintla Formation*, Member C): red quartzite, sandstone, siltstone, and argillite*
- *GATEWAY FORMATION (HGw-l – HGw-u)*
- HGw-u — *Upper part (Kintla Formation*, Member B): grey and green sandstone; greyish green siltstone; grey and maroon argillite*
- HGw-m — *Middle part (Kintla Formation*, upper part of Member A): red siltstone and sandstone; thin beds of greyish green siltstone*
- HGw-l — *Lower part (Kintla Formation*, lower part of Member A): yellowish grey and red sandstone; colour laminated siltstone; red argillite*
  **Formation name, now abandoned, used on the geological map of the Beaver Mines area by Hage, 1943; GSC Map 739A*
- HSp — *SHEPPARD FORMATION: pale greyish green dolomite, dolomitic siltstone and sandstone; chloritized and pillowed andesite*
- HPl — *PURCELL LAVA: dark green, chloritized, amygdaloidal and pillowed andesite*
- *SIYEH FORMATION (HSy-l – HSy-u)*
- HSy-u — *Upper part: green, grey, and red argillite; light grey, molar tooth dolomite; algal limestone and dolomite*
- HSy-m — *Middle part: grey algal dolomite*
- HSy-l — *Lower part: grey and green argillite; grey dolomite and limestone; grey algal limestone and dolomite; oolitic limestone*
- HGr — *GRINNELL FORMATION: red argillite; red and white sandstone and siltstone; intraformational conglomerate*
- *APPEKUNNY FORMATION (HAp-l – HAp-u)*
- HAp-u — *Upper part: green and maroon argillite; greyish green and pale red quartzite*
- HAp-m — *Middle part: green argillite; white and grey quartzite*
- HAp-l — *Lower part: green and black argillite; white and pale greyish green quartzite; buff weathering dolomite*
- HAp — *APPEKUNNY FORMATION, undivided*
- *ALTYN FORMATION (HAl-l – HAl-u)*
- HAl-u — *Middle and upper parts: grey, platy, buff weathering, fine crystalline dolomite; massive, gritty, algal dolomite; black argillite*
- HAl-l — *Lower part: dark grey argillite; thin bedded, buff weathering, grey dolomite and limestone*
- HAl — *ALTYN FORMATION, undivided*
- HWt — *WATERTON FORMATION: colour laminated, grey, green, and red dolomite and limestone; thin bedded, grey, and green argillite. Includes pre-Waterton strata in the West Castle River area*

Outcrop examined, bedding attitude not measured ×
Geological boundary (defined, approximate, assumed)
Bedding, top known (horizontal, inclined, overturned, assumed overturned) 25 35 45
Fault, extension (solid circle indicates downthrow side; defined, approximate)
Fault, thrust or high-angle reverse (teeth indicate upthrust side; defined, approximate, assumed)
Anticline (arrow indicates direction of plunge; defined, approximate, assumed)
Syncline (arrow indicates direction of plunge; defined, approximate, assumed)
Anticline and syncline (asymmetrical; long arrow points in direction of dip of axial surface)
Anticline and syncline (overturned)
Fossil locality, GSC catalogue number 41490
Paleontological age (determined); for explanation of time symbols see Geological Survey of Canada, Paper 76-1B, pages 263-265 JETo
Tentative formational assignment ?KCa
Coal mine (abandoned)
Stratigraphic section
Line of structure section A A′
Change in mapping precision; stratigraphic subdivisions are amalgamated at dotted line. Structure sections only HAl HAl-u HAl-l
Borehole (gas, dry and abandoned)

Geology by D.K. Norris 1958, 1960, 1961 and 1989

ACKNOWLEDGMENTS

Geological synthesis based on field observations, data from exploratory wells, and airphoto interpretation by D.K. Norris 1958, 1960, 1961 and 1989.

SCHEDULE OF WELLS

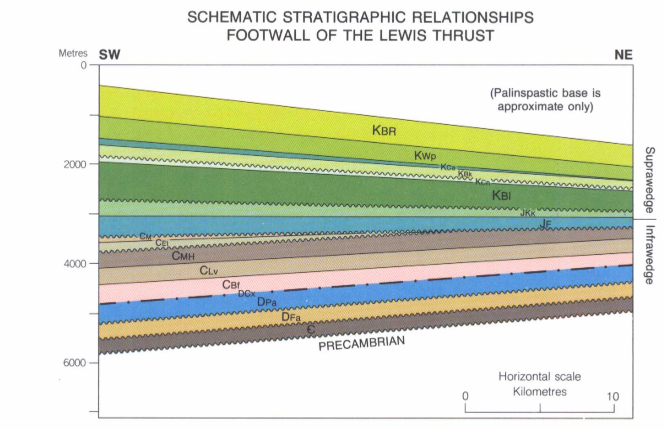
1. *Kelly well 16-16-5-3W5*
2. *Shell Calalta Carbondale 6-12-6-3W5*
3. *Shell Calalta Waterton 7-14-6-3W5*
4. *Shell Calalta Carbondale 11-8-6-3W5*
5. *Shell West Castle 5-7-4-3W5*
6. *Shell et al. Waterton 7-20-6-3W5*
7. *Shell Waterton 7-24-5-3W5*
8. *Shell Home Waterton 11-34-5-3W5*

Note: Well listing is in order of spudding date.

NOTES

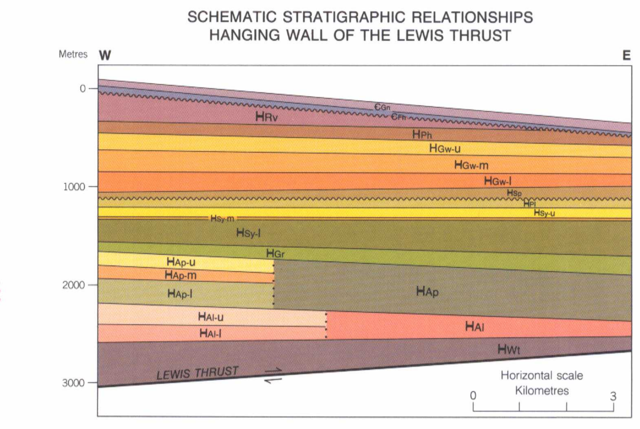
1. The structure of the Alberta Group and Belly River Formation in the Haig Brook and Cate Creek fensters is poorly understood because of slumping and poor exposure.
2. The Lewis Thrust and the Cretaceous rocks in its footwall may be present at the headwaters of St. Eloi Brook.

SCHEMATIC STRATIGRAPHIC RELATIONSHIPS
FOOTWALL OF THE LEWIS THRUST



Unconformity

SCHEMATIC STRATIGRAPHIC RELATIONSHIPS
HANGING WALL OF THE LEWIS THRUST



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JUN JUIN 21 1994
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Geological cartography by J.H. Waddell, Institute of Sedimentary and Petroleum Geology, Geological Survey of Canada

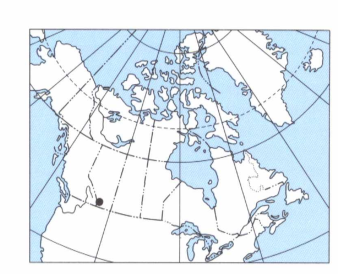
Any revisions or additional geological information known to the user would be welcomed by the Geological Survey of Canada

Base map at the same scale published by the Surveys and Mapping Branch in 1977

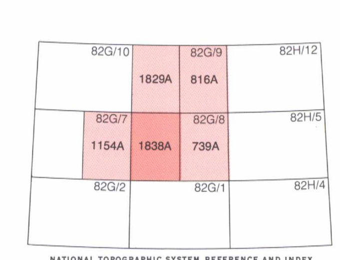
Copies of the topographical edition of this map may be obtained from the Canada Map Office, Department of Natural Resources Canada, Ottawa, Ontario, K1A 0E9

Approximate magnetic declination 1993, 18°09′ East, decreasing 6.5′ annually

Elevations in feet above mean sea level



INDEX MAP



NATIONAL TOPOGRAPHIC SYSTEM REFERENCE AND INDEX TO ADJOINING GEOLOGICAL SURVEY OF CANADA MAPS

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1838A