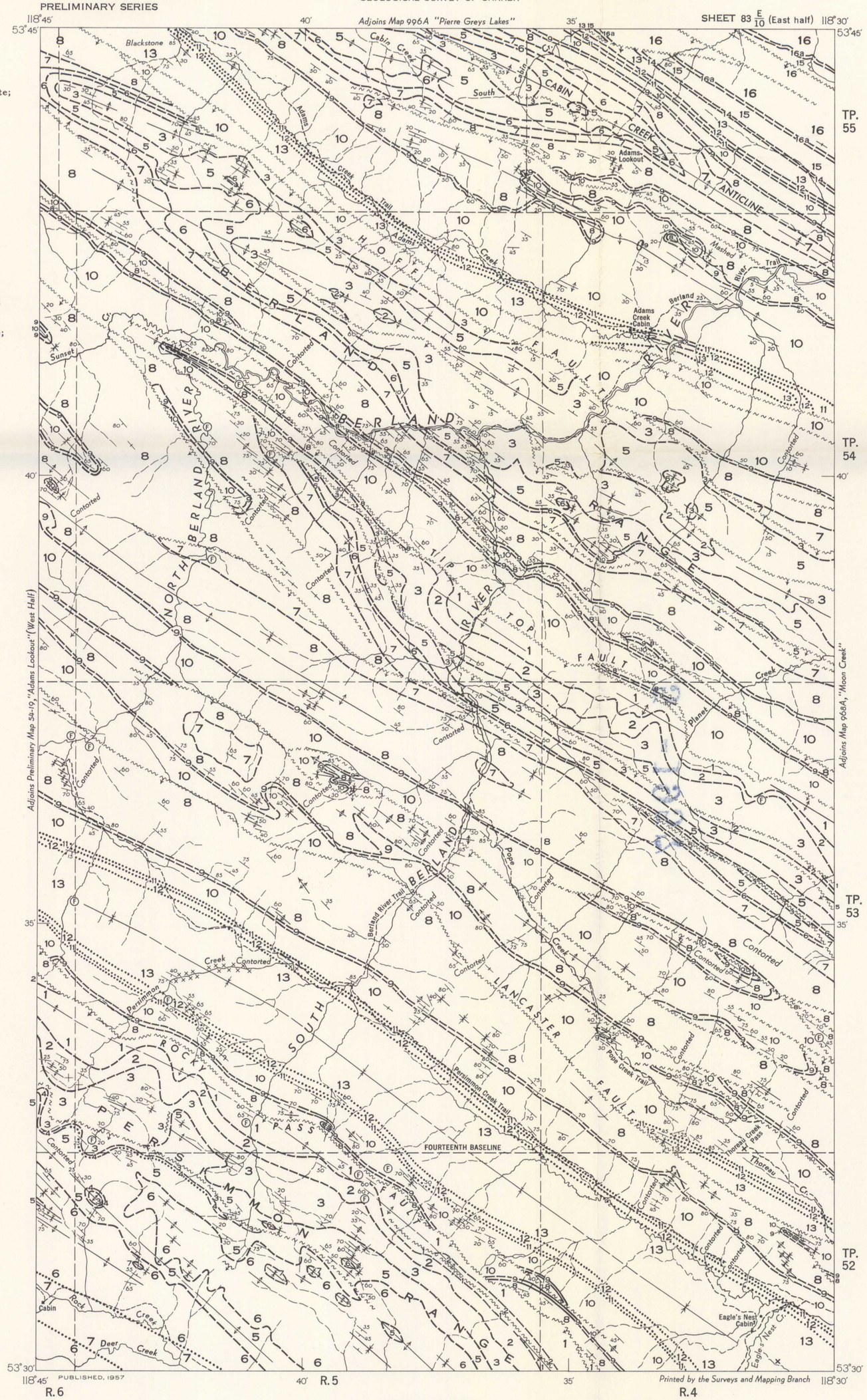
CANADA

DEPARTMENT OF MINES AND TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA

PRELIMINARY SERIES

SHEET 83 $\frac{E}{10}$ (East half)



LEGEND

MESOZOIC

CRETACEOUS

UPPER CRETACEOUS

16 BRAZEAU FORMATION: sandstone, shale, conglomerate; nonmarine; 16a, Solomon sandstone member at base; marine

15 WAPIABI FORMATION: shale, sandy shale; marine

14 BIGHORN FORMATION: hard sandstone, sandy shale; marine

13 BLACKSTONE FORMATION: silty shale, sandstone, siltstone; marine

12 DUNVEGAN FORMATION: hard sandstone, sandy shale; marine and nonmarine

LOWER CRETACEOUS

'FORT ST. JOHN' GROUP

11 Silty shale; minor siltstone and sandstone; marine

10 LUSCAR FORMATION: sandstone, shale, conglomerate; coal; nonmarine

9 CADOMIN FORMATION: conglomerate; minor sandstone; nonmarine

8 NIKANASSIN FORMATION: sandstone, shale; marine and nonmarine

JURASSIC

FERNIE GROUP

7 Shale, silty shale, siltstone; minor sandstone; marine

TRIASSIC

6 WHITEHORSE FORMATION: limestone, dolomite, argillaceous and arenaceous limestone and dolomite; marine

5 Calcareous shale, silty shale, siltstone, arenaceous dolomite, sandstone; marine

PALAEOZOIC

PENNSYLVANIAN(?)

4 ROCKY MOUNTAIN FORMATION(?): thin- to medium-bedded, brown quartzitic sandstone and chert; marine

MISSISSIPPIAN

3 RUNDLE FORMATION: limestone and dolomite; marine

2 BANFF FORMATION: calcareous shale, argillaceous limestone; marine; includes at base shale, silty shale, that may represent the Exshaw formation of Devonian age

DEVONIAN

1 Limestone and dolomite; marine

Rock outcrop

Geological boundary (defined, approximate, assumed)

Bedding (horizontal, inclined, vertical and overturned)

Fault (defined, approximate, assumed)

Fault (arrow indicates direction of dip)

Anticlinal axis (arrow indicates direction of plunge)

Synclinal axis (arrow indicates direction of plunge)

Coal outcrop

Fossil locality

Geology by J. K. Eccles, 1954, 1955

Trail

Township boundary (unsurveyed)

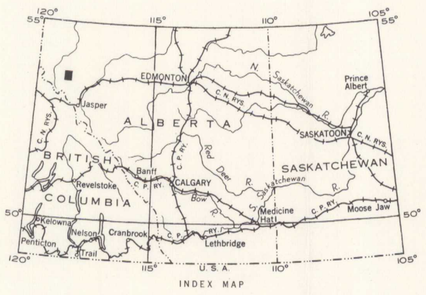
Stream (position approximate)

Approximate magnetic declination, 25°30' East

Cartography by the Geological Cartography Unit, 1957

Air photographs covering this map area may be obtained through the National Air Photographic Library, Topographical Survey, Ottawa, Ontario

In response to public demand for earlier publication, Preliminary Series maps are now being issued in this simplified form, thereby effecting a substantial saving in time. There is no loss of information, but the maps will be clearer to read if all or some of the map-units are hand-coloured.



INDEX MAP

DESCRIPTIVE NOTES

The map-area is characterized by ridges and valleys paralleling the northwesterly trending structures. In general the topography is controlled by the marked difference in resistance to erosion of the strata involved, their thickness and structure. The maximum relief is about 5,000 feet. Timber-line is between 6,000 and 6,500 feet above sea-level and all ridges below these elevations are forested, except where the timber has been burned or the soil is too thin for trees to grow.

The map-area is underlain by a succession of marine and non-marine sedimentary strata ranging in age from Devonian to Upper Cretaceous. These strata have been folded along northwesterly trending axes and have been displaced by longitudinal thrust faults. Thus the formations outcrop in long, relatively narrow, northwesterly trending bands.

Devonian (1) rocks immediately overlie the Tip Top and Rocky Pass faults. Their thickness is about 1,660 feet and they have not been subdivided. The oldest Devonian strata consist of dark grey to black, thin-bedded, shale and argillaceous limestone, overlain by dark grey to black, thin- to medium-bedded limestone and dolomite which, in turn, is overlain by dark grey to black, light to medium grey weathering, thick-bedded to massive limestone and dolomite.

The Banff formation (2) is about 580 feet thick and consists of interbedded dark grey to black, calcareous shale and argillaceous, nodular limestone. The basal beds, about 60 feet thick, may be equivalent to the Exshaw formation of Devonian(?) age, but, although the basal contact is sharp, the upper contact is transitional.

The Rundle formation (3) lies conformably and gradationally on the Banff, the contact being placed at the base of the lowest, thick, dark grey to black limestone bed. The formation is approximately 1,330 feet thick and consists of dark grey to black, thick-bedded to massive limestone in the basal 200 feet, overlain by interbedded, dark grey-brown, thin-bedded, limestone and dark grey, thin-bedded vuggy dolomitic limestone, overlain by thick-bedded to massive, medium to dark grey, light grey weathering, fine to medium crystalline, limestone and dolomite, with dark coloured chert nodules and lenses in the upper part.

The Rocky Mountain formation (4) lies with apparent conformity on the Rundle. It is 102 feet thick at Eagles Nest Pass just south of the map-area and about 60 feet thick in the southwest corner of the area. Small remnants occur on the crest of Cabin Creek anticline in the north. Elsewhere the formation is absent or not exposed.

Beds of Triassic age disconformably overlie the Rundle and Rocky Mountain(?) formations. The Lower part (5) consists of 935 feet of black shale and siltstone, overlain by about 900 feet of sandstone, dolomitic sandstone, and dolomite. The Whitehorse formation (6) comprises about 800 feet of limestone, shaly limestone and calcareous shales, lying with a gradational contact on the lower part of the Triassic.

The Fernie group (7) disconformably overlies the Whitehorse formation, and is transitional upward into the Nikanassin formation. It consists of about 900 feet of black shale with intercalated sandstone beds in the upper part. The sandstone beds are thicker and more numerous upwards.

The Nikanassin formation (8) gradationally overlies the Fernie group, the contact being drawn at the base of the lowest sandstone bed over 10 feet thick. It consists of hard, grey, quartzose sandstones interbedded with shale and sandy shale. The upper part is more shaly and in places contains some carbonaceous shale. The thickness could not be measured because of structural complications, but is probably about 1,000 feet.

The Cadomin formation (9) is a distinctive conglomerate, outcropping conspicuously throughout the map-area. It consists mainly of a hard, closely packed and well cemented black, grey, green, and red chert and white quartzite pebbles in a matrix of quartzitic sandstone. The pebbles are well rounded and range from 1/4 inch to 5 inches in diameter. Locally beds and lenses of sandstone occur within the conglomerate. The thickness ranges between 50 and 100 feet.

The Luscar formation (10) is not well exposed and the thickness was not ascertained. It is, however, about 2,000 feet thick in Moon Creek map-area to the east. The formation, in general, consists of fine- to medium-grained, grey to grey-brown yellowish brown weathering, thin- to medium-bedded sandstones interbedded with dark grey to greenish grey and black shales. Coal seams are present in the upper part.

The 'Fort St. John' group (11) apparently overlies the Luscar formation conformably, but the contact could not be seen. The group is exposed mainly on Persimmon Creek and on Berland River at its confluence with Adams Creek. It is sheared and contorted. It is about 400 feet thick in Moon Creek map-area to the east.

The Dunvegan formation (12) conformably and transitionally overlies the 'Fort St. John' group. It is about 380 feet thick on Berland River at its confluence with Adams Creek. The formation consists of a basal, massive to thick-bedded, quartzitic sandstone about 80 feet thick, overlain by about 90 feet of dark grey to black shale, which is succeeded by about 100 feet of thin-bedded, poorly cemented sandstone and shaly sandstone, overlain in turn by about 110 feet of medium- to thick-bedded quartzitic sandstone.

The Blackstone (13), Bighorn (14), and Wapiabi (15) formations are poorly exposed or badly contorted. These formations are about 1,800 feet, 240 feet, and 1,500 feet thick, respectively, in Moon Creek map-area to the east.

The Brazeau formation (16) conformably and transitionally overlies the Wapiabi formation. The basal Solomon sandstone member (16a), about 100 feet thick, is a distinctive, hard, grey to greenish weathering greenish grey sandstone, slabby and buff weathering. It is overlain conformably by about 100 feet of soft, greenish grey, sandy shale and sandstone which grades upwards into about 1,000 feet of pebble conglomerate and conglomeratic sandstone. This formation is more than 6,000 feet thick in Moon Creek map-area.

The dominant structural features of the map-area are northwesterly trending compound folds and thrust faults. Rocks of Devonian and Mississippian age, dipping southwestward at moderate angles, overlie the southwesterly dipping Rocky Pass and Tip Top faults. Mississippian strata are also exposed above the Hoff fault and in the core of the Cabin Creek anticline in the north. The overlying Mesozoic strata are broadly to closely folded, locally contorted, and broken by several southwesterly dipping, probably steeply inclined, thrust faults. The anticline above the Hoff fault plunges both to the northwest and southeast and strata on its southwestern flank are repeated by a southwesterly dipping fault. The area of exposed Mississippian rocks in the Cabin Creek anticline represents a culmination in this structure as younger Mesozoic strata appear along strike in both directions. The structure is underlain by southwesterly dipping thrust faults, most evident in Pierre Greys Lakes map-area to the north. No wells have been drilled within the map-area.

The coal-bearing Luscar formation is poorly exposed, but coal debris is present at numerous localities in the map-area, especially in the southeast. On Thoreau Creek Pass 45 feet of beds contain two 3-foot coal seams separated by interbedded shales and 1-inch coal seams. These seams are probably a continuation of the coal seams on Thoreau Creek in the southwest Moon Creek map-area.

MAP 5-1957

ADAMS LOOKOUT

(EAST HALF)

WEST OF SIXTH MERIDIAN

ALBERTA

Scale: One Inch to One Mile = $\frac{1}{63,360}$

Miles

1 ½ 0 1 2 3

PRELIMINARY MAP 5-1957

ADAMS LOOKOUT

ALBERTA

SHEET 83 $\frac{E}{10}$ (East Half)