

Structure sections along lines A-A, B-B, and C-C

LEGEND

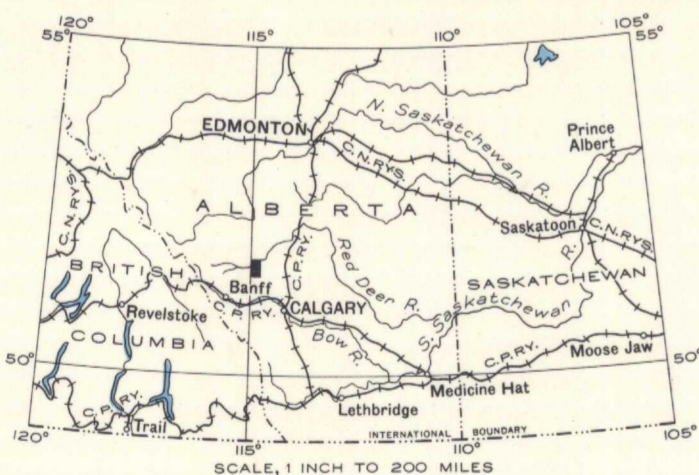
- GENOZOIC**
- TERTIARY**
- 6 PASKAPOO FORMATION: sandstone, shale, conglomerate
- CRETACEOUS**
- UPPER CRETACEOUS**
- 5 EDMONTON FORMATION: sandstone, shale, conglomerate, coal
- 4 BELLY RIVER FORMATION: sandstone, shale, conglomerate, coal
- MESOZOIC**
- 3 WAPIABI FORMATION: shale, thin limestone beds
- 2 CARDIUM FORMATION: sandstone, shale, conglomerate (appears on structure sections only)
- 1 BLACKSTONE FORMATION: shale and thin sandstone (appears on structure section only)
- Geological boundary (defined, approximate) .....  
Bedding (inclined, horizontal, overturned) .....  
Fault (defined, approximate) .....  
Anticlinal axis .....  
Synclinal axis .....  
Coal seam (approximate, assumed), shown on structure section only .....  
Oil well (unproductive) .....  
Adit .....  
Road and buildings .....  
Road not well travelled .....  
Bush road or trail .....  
Forest Reserve boundary .....  
Township boundary .....  
Section line .....  
Intermittent stream .....  
Stream disappearing in places .....  
Marsh .....  
Gravel bar .....  
Contours (interval 50 feet) .....  
Depression contour .....

Geology by B.R. MacKay, 1937.

Surveys and topography by the Topographical Survey, 1935. Cartography by the Drafting and Reproducing Division, 1939.

UNPRODUCTIVE OIL WELLS

1. Monarch Oil Company, Limited  
2. Cartier-Majestic, Limited  
3. Sunbeam Oil Company



DESCRIPTIVE NOTES

The area is accessible by motor roads from Calgary, the one in most common use leading into the northeast corner of the area from Olds on the Calgary-Edmonton highway.

Rock outcrops are plentiful on the ridges in the western part of the area and, farther east, a few are found along the banks of the principal streams. Elsewhere bedrock is obscured by glacial drift which, in the eastern part of the area, is in places over a hundred feet thick. Along the larger streams the drift has been carved into a series of terraces some of which are over a mile wide.

The map-area lies within the Foothills belt which forms the west flank of the Alberta syncline. This belt is underlain, in places, by at least 17,000 feet of Tertiary and Mesozoic sediments beneath which is a great thickness of Palaeozoic strata. The lowest exposed rocks in the map-area are those of the Wapiabi formation of Upper Cretaceous age. Beneath the Wapiabi the succession and respective thicknesses of formations to the top of the Palaeozoic can only be inferred from information obtainable elsewhere in the district and is believed to be about as follows: Cardium, 300 feet; Blackstone (Lower Cretaceous) 500 feet; and Fernie (Jurassic) 150 feet.

The Wapiabi formation has an estimated thickness of 1750 feet. It outcrops in a number of fault blocks and the maximum continuous exposure comprises about 600 feet of the uppermost beds. These consist of greenish, sandy shales with numerous interbeds of sandstone and of ironstone less than an inch thick. This assemblage has provided a marine fauna including *Baculites ovatus*. Underlying beds consist of dark grey and black marine shales containing occasional ironstone concretions and a few thin, yellowish-grey argillaceous bands some of which hold an *Odontaspis* fauna. An horizon about 1200 feet below the top has yielded *Scaphites ventricosus*, *Inoceramus Pontini*, and *Inoceramus exogyroides*. The base of the formation is nowhere exposed.

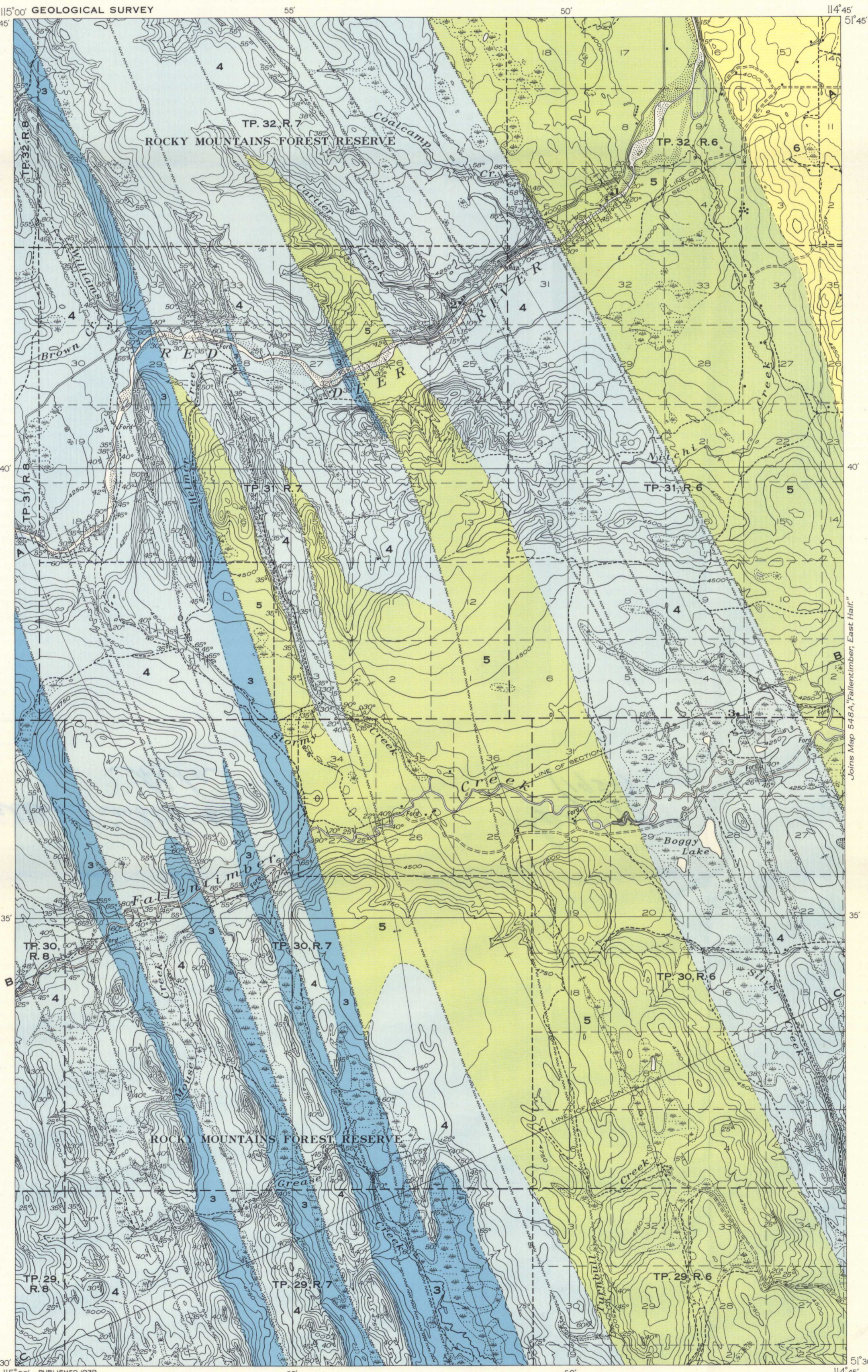
The Belly River formation consists of a series of white, grey and brown sandstones interbedded with light green to black shales and an occasional lens of conglomerate containing quartzite and chert pebbles. Associated with these strata are thin beds of bentonite, bands of ironstone, and a few thin coal seams. The formation is broken by faults and is largely obscured by drift so that it is difficult to estimate its thickness. This is believed to increase from about 3600 feet on the east to about 3900 feet on the west.

The Edmonton formation consists largely of light buff, grey and brown sandstones interbedded with greenish and dark brown sandy and blocky shales. Associated with these strata are a few beds of bentonite, a few of carbonaceous shale, at least two coal seams three to six feet thick, and a thin bed of conglomerate made up of chert and quartzite pebbles. The formation is faulted and exposures are few. The thickness is estimated at, roughly, 3000 feet. The base has been drawn at an horizon 750 feet below the coal seam being mined at Red Bell mine, where there is a conspicuous change in the sediments.

Most of the Paskapoo formation consists of hard, light grey, buff and yellow, brown-weathering sandstones some of which are interbedded with light bluish-grey to dark olive-green sandy and blocky shales. There are also a few thin beds of bentonite and carbonaceous shale and a few thin coal seams. At several horizons there are beds containing shells, fish scales and vertebrate remains all of fresh-water origin. Only the lowermost 1200 feet of the formation is represented within the map-area. In the adjacent map-area to the east it reaches a total estimated thickness of 5300 feet. Outcrops are few and are confined to the erosion scarp of the Red Deer river.

The economic mineral possibilities of the district are mainly dependent on whether, where favourable structures exist, commercial quantities of oil and gas occur in the uppermost Palaeozoic sediments (limestones) or have accumulated in porous horizons in overlying Mesozoic strata. In this connection, four anticlinal structures in the area merit attention. These are the Monarch, Red Deer-Silver Creek, Grease Creek, and Red Deer-Fallentimber Creek structures. Drilling has been undertaken on the first two of these but, as yet, has not reached below the base of the Belly River formation. Considering the probable thickness of the formations to be penetrated and their structure, as indicated on the accompanying cross-sections, the minimum distance from the surface to the Palaeozoic limestone in any of these structures is estimated to be at least 7500 feet. There is a possibility, however, of encountering oil and gas in porous horizons of the overlying formations.

Several seams of high volatile, bituminous coal, thick enough to be commercially mineable, occur in the lower part of the Edmonton formation. One of these, averaging 2' 10" in thickness, is being mined in a small way as occasion demands, at the Red Bell mine on Red Deer river.



MAP 549A  
FALLENTIMBER  
(WEST HALF)

WEST OF FIFTH MERIDIAN  
ALBERTA

Scale, 63,360 or 1 Inch to 1 Mile  
Miles  
Approximate magnetic declination, 24°30' East.

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