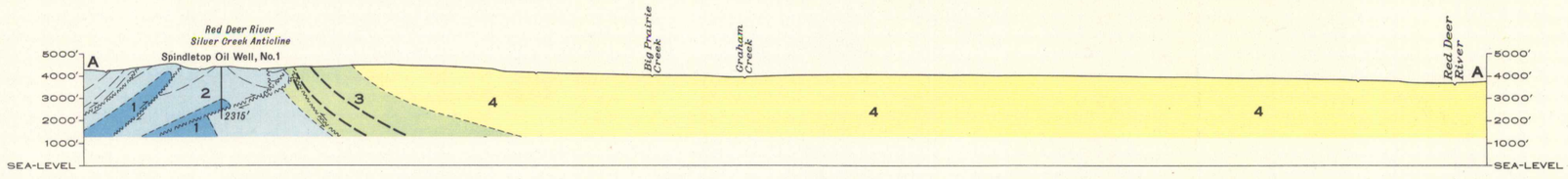
CANADA

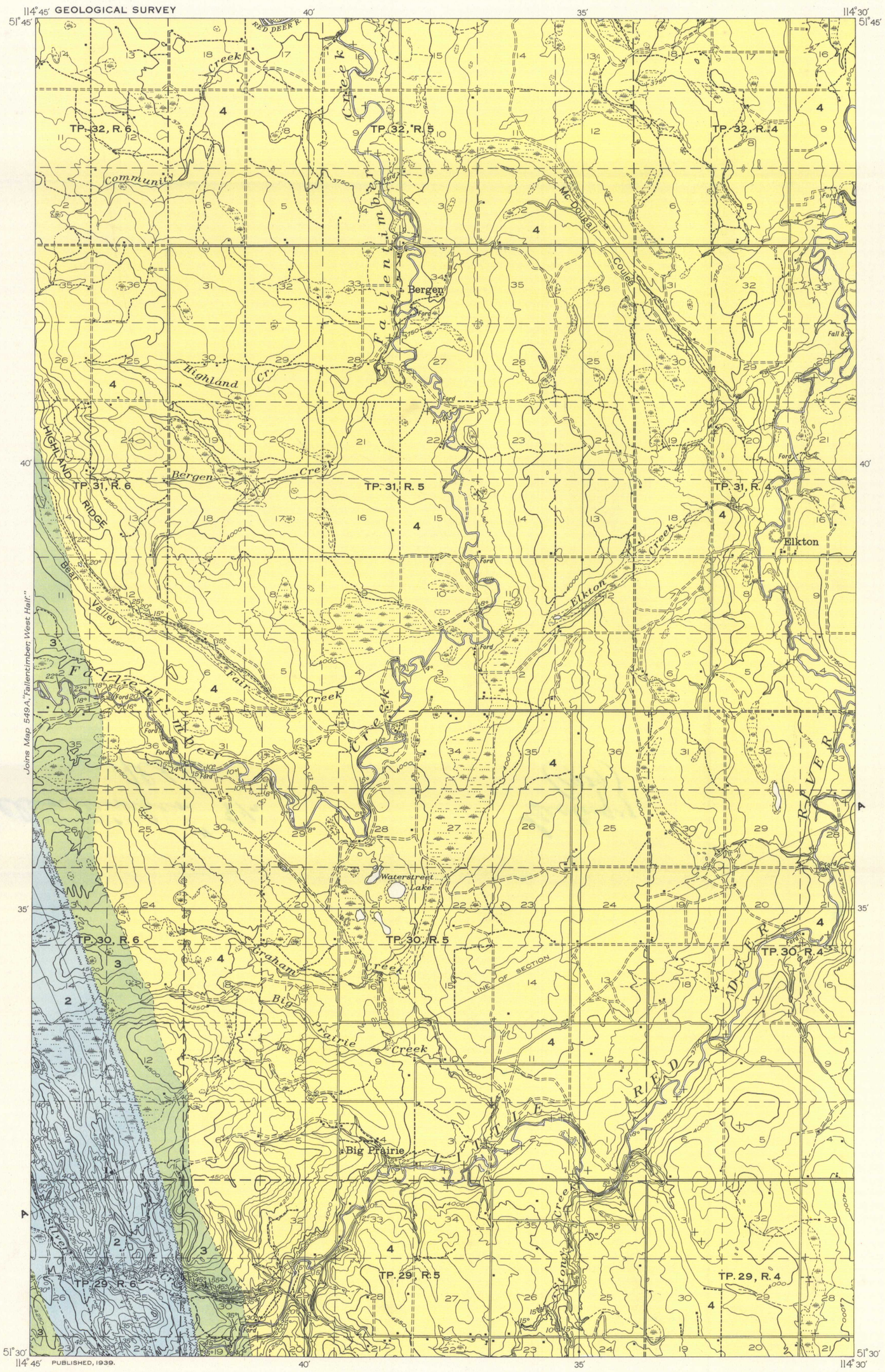
DEPARTMENT OF MINES AND RESOURCES

MINES AND GEOLOGY BRANCH

BUREAU OF GEOLOGY AND TOPOGRAPHY



Structure section along line A-A



LEGEND

CENOZOIC

TERTIARY

4 — *PASKAPOO FORMATION: sandstone, shale, conglomerate*

CRETACEOUS

UPPER CRETACEOUS

MESOZOIC

3 — *EDMONTON FORMATION: sandstone, shale, conglomerate, coal*

2 — *BELLY RIVER FORMATION: sandstone, shale, conglomerate, coal*

1 — *WAPIABI FORMATION: shale, thin limestone beds (appears on structure section only)*

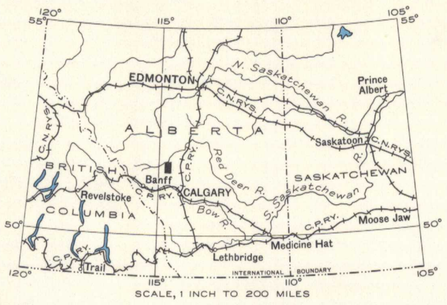
- *Geological boundary (defined, approximate)*
- *Bedding (inclined, horizontal)*
- *Fault (defined, approximate)*
- *Anticlinal axis*
- *Synclinal axis*
- *Coal seam (approximate), shown on structure section only*
- *Oil well (unproductive)*
- *Adit*
- *Road and buildings*
- *Road not well travelled*
- *Road along township boundary*
- *Bush road or trail*
- *Church*
- *School*
- *Post Office*
- *Cemetery*
- *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 WELL

1...Spindletop Oil Well, No.1



SCALE, 1 INCH TO 200 MILES

DESCRIPTIVE NOTES

The area is accessible by motor roads from the Calgary—Edmonton and Calgary—Banff highways. Cremona, the terminus of a 32-mile spur line from Crossfield on the Canadian Pacific Railway, lies just east of the area, 2½ miles north of its south-eastern corner.

Rock outcrops are few and occur mainly along the principal stream channels and the ridges in the southwest corner of the map-area. Elsewhere bedrock is obscured by boulder clay and by fluvioglacial sands and gravels.

The map-area lies within the Foothills belt which forms the western flank of the Alberta syncline. This belt is underlain in most places by a great thickness of Tertiary and Mesozoic sediments, beneath which there is probably a thick succession of Palaeozoic strata. The lowest exposed rocks in the area are those at the base of the Belly River formation, and no drilling to date has penetrated below the upper part of the Wapiabi formation. The thicknesses of the Wapiabi and of the formations between it and the top of the Palaeozoic can only be inferred from information obtainable elsewhere in the district, and are believed to be about as follows: Wapiabi (Upper Alberta), 1750 feet; Cardium, 275 feet; Blackstone (Lower Alberta), 900 feet; Blairmore, 2000 feet; Kootenay (Lower Cretaceous), 400 feet; and Fernie (Jurassic), 150 feet.

The top of the Wapiabi formation is exposed in the centre of the faulted Silver Creek anticline on Little Red Deer River, less than ½ mile south of the map-area. It has been penetrated in the Spindletop Well at a depth of 1460 feet. The well continued in greenish sandy shales of the Wapiabi formation to a depth of 1970 feet where it encountered a fault and reentered the sandstones of the Belly River formation.

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 largely made up of quartzite and chert pebbles. Associated with these shales 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. An estimate of the thickness, as measured from the Belly River—Wapiabi contact, in the Spindletop Well, up to the Belly River—Edmonton contact, 1½ miles west of the well site, is 3600 feet.

The Edmonton formation is about 3000 feet thick. It consists largely of light buff, grey, and brown sandstones interbedded with greenish and dark brown sandy and blocky shales. Associated with these shales are a few beds of bentonite, a few of carbonaceous shale, at least two coal seams three to eight feet thick, and a thin bed of conglomerate made up of chert and quartzite pebbles. Exposures of the formation are few and are confined almost wholly to the valley of Silver creek. The lowest, exposed member is a coal seam that is being worked at the Silver Creek Coal mine. This seam is in faulted contact with bentonitic sandstones of the Belly River formation and is believed to mark approximately the same horizon as the coal seam of the Red Bell mine, on Red Deer river, which lies 750 feet above the base of the Edmonton formation.

The Paskapoo formation consists of a thick series 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 an occasional thin coal seam.

The base of the formation has been drawn at the bottom of a sandstone bed, 115 feet thick, that outcrops on Little Red Deer river. There are sufficient outcrops of the formation to indicate its prevailing, low dips, and to permit a fairly accurate computation of its maximum thickness, amounting to 5300 feet, within the map-area.

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 the Red Deer River—Silver Creek anticline merits consideration. This structure is the most easterly major anticlinal fold in this part of the foothills belt and has a feeding ground from both the east and the west, that on the east being the more extensive. The anticline is disrupted by a series of westerly-dipping faults (*See* structure section) the most easterly of which outcrops less than half a mile east of the crest of the fold. Along this fault the Belly River beds have been overturned and thrust eastwards over steeply eastward-dipping coal-bearing beds of the Edmonton formation. At the Silver Creek Coal mine the contact of the vertical to overturned, westerly-dipping Belly River beds west of the fault, and the steeply eastward-dipping Edmonton beds east of the fault gives the appearance of an unbroken anticlinal fold. The Spindletop Well is located on the crest of the anticline but encounters easterly-dipping beds beneath the fault plane.

Taking into consideration the probable thickness of the formations to be penetrated and their structure, as indicated on the accompanying cross section, the minimum distance from the surface to the Palaeozoic limestone is estimated at 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 sufficiently thick to be mined commercially occur in the lower part of the Edmonton formation. One of these was mined in a small way several years ago at the Bituminous Coal mine on Silver creek. Where exposed near the mine this seam has a maximum thickness of 8 feet but it is very carbonaceous in its upper part and is badly crushed by the overriding fault block. It occurs 1445 feet stratigraphically below the top of the Edmonton formation. Another coal seam, of better quality, 2200 feet below the top of the Edmonton formation, is being worked at the Silver Creek Coal mine on Silver creek. It is 3½ feet thick and supplies fuel for local drilling purposes and domestic use.

PUBLISHED, 1939.

MAP 548A

FALLENTIMBER

(EAST HALF)

WEST OF FIFTH MERIDIAN

ALBERTA

Scale, 1/63,360 or 1 Inch to 1 Mile

Miles 1 0 1 2 3

Approximate magnetic declination, 24°30' East.