

LEGEND

CRETACEOUS
UPPER CRETACEOUS

- 14 BLACKSTONE FORMATION: shale, silty shale; minor siltstone and sandstone (marine)
- 13 DUNVEGAN FORMATION: sandstone, siltstone, silty shale (marine and non-marine)

LOWER CRETACEOUS

- 12 'FORT ST. JOHN' GROUP: silty shale; minor siltstone and sandstone (marine)
- 11 LUSCAR FORMATION: sandstone, shale, conglomerate, coal (non-marine)
- 10 CADOMIN FORMATION: conglomerate; minor sandstone (non-marine)
- 9 NIKANASSIN FORMATION: sandstone, shale (marine and non-marine)

JURASSIC

- FERNIE GROUP
- 8 Shale, silty shale, siltstone; minor sandstone (marine)

TRIASSIC

- 7 WHITEHORSE FORMATION: limestone, dolomite, argillaceous and arenaceous limestone and dolomite (marine)
- 6 Calcareous shale, silty shale, siltstone, arenaceous dolomite, sandstone (marine). Lower part of Triassic

PENNSYLVANIAN (?)

- 5 ROCKY MOUNTAIN FORMATION (?): quartzitic and calcareous sandstone, chert, phosphatic conglomerate (marine)

MISSISSIPPIAN

- 4 RUNDLE FORMATION: limestone and dolomite (marine)

MISSISSIPPIAN AND DEVONIAN

- 3 BANFF FORMATION: calcareous shale, argillaceous limestone (marine). Includes at the base, shale, silty shale, and limestone of the Devonian Exshaw formation

DEVONIAN

- 2 PALLISER FORMATION: limestone (marine)

CAMBRIAN (?)

- 1 Sandstone, feldspathic sandstone, conglomerate (marine)

Rock outcrop, area of outcrop x x x x
Bedding (horizontal, inclined, vertical, overturned) + / x
Fault (defined, approximate, assumed) wavy line
Fault (arrow indicates direction of dip) wavy line with arrow
Anticlinal axis (arrow indicates direction of plunge) curved arrow
Synclinal axis (arrow indicates direction of plunge) curved arrow
Coal outcrop x
Fossil locality circle with dot

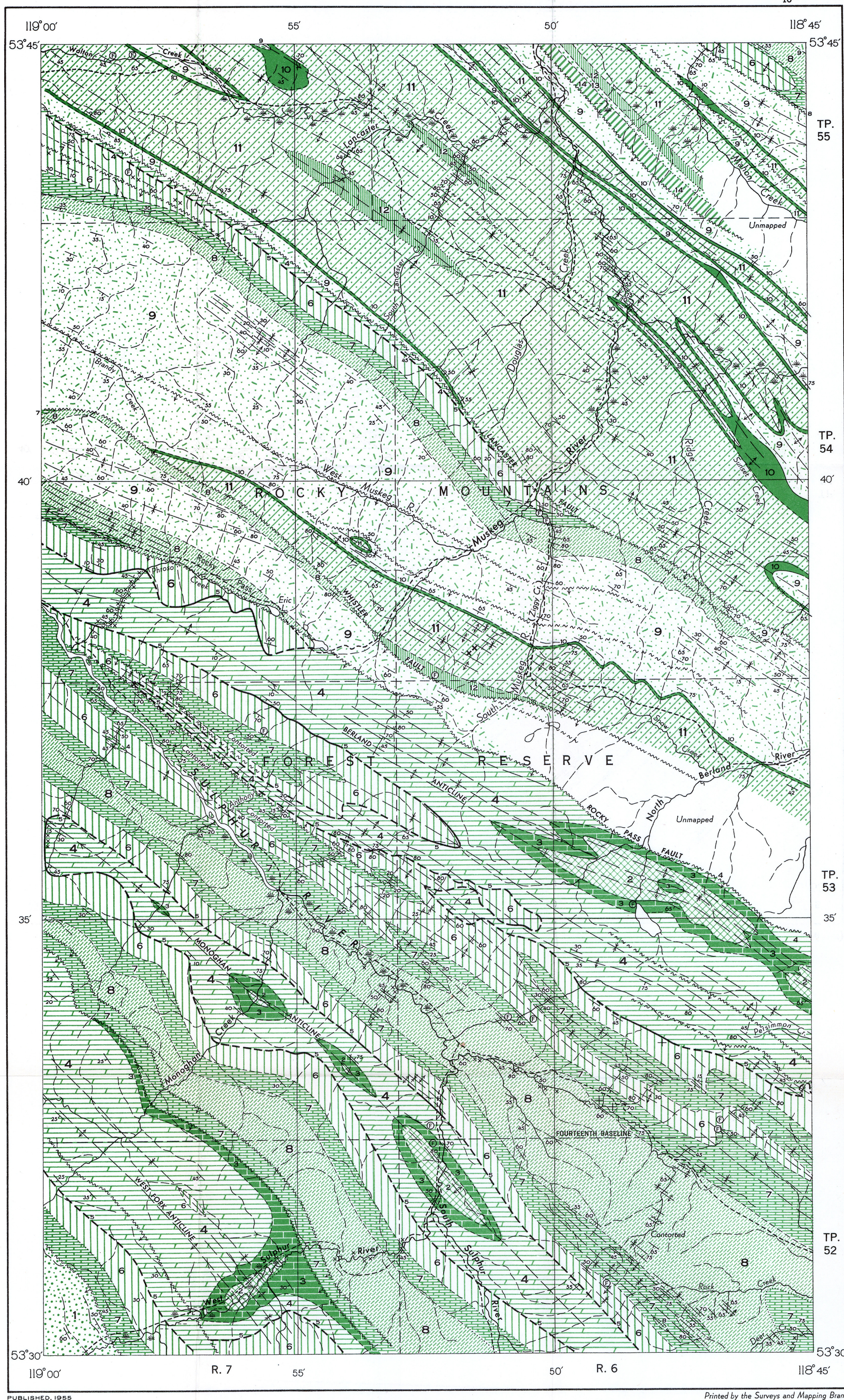
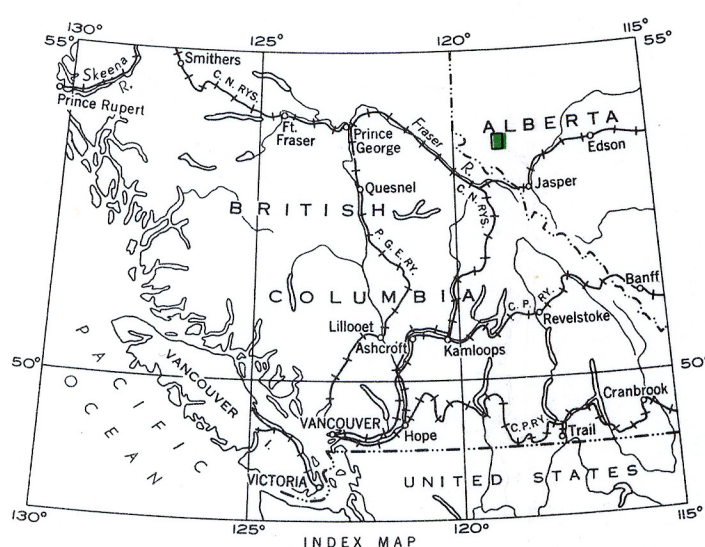
Geology by E. J. W. Irish, 1954

Trail dashed line
Township boundary (unsurveyed) dotted line
Stream (position approximate) wavy line
Marsh wavy line with dots

Approximate magnetic declination, 25°42' East

Cartography by the Geological Cartography Unit, 1955

Geographical names subject to revision



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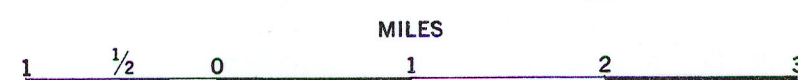
PRELIMINARY MAP 54-19

ADAMS LOOKOUT

(WEST HALF)

WEST OF SIXTH MERIDIAN
ALBERTA

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



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

DESCRIPTIVE NOTES

Most of the area is characterized by ridges and valleys that parallel the northwesterly structural trend. The nature of the topography has been controlled, to a large degree, by the markedly different resistance to erosion offered by the various bedrock formations, together with their thicknesses and structure. Timber-line is between 6,000 and 6,500 feet above sea-level and all ridges below this altitude are forested, except where the timber has been burned. The maximum relief is about 5,000 feet.

The map-area is underlain by a succession of marine and non-marine sedimentary strata ranging in age from Cambrian (?) to Upper Cretaceous. The strata have been folded along northwesterly trending axes and displaced by strike thrust faults that parallel the axis of the folds. As a result, the formations are, in general, exposed as long, relatively narrow, northwesterly trending bands and tongues.

Formation 1 is thought to be the oldest exposed in the map-area. These strata, consisting of more than 1,500 feet of quartzite and conglomerate, occur in the extreme southwestern corner of the area where they have been thrust northeastward over Triassic limestones and now lie with approximately the same attitude as the underlying Triassic beds. No fossils were found, but their geographic position relative to probable Cambrian strata to the southeast suggests that they also may be of that age.

The PALLISER formation (2) of Devonian age is exposed in the core of three anticlines in the southwestern half of the map-area. There are good outcrops of the formation where these anticlines are cut by the following streams; North Berland River and Persimmon Creek, Sulphur River, and Monaghan Creek.

The BANFF formation (3) has a similar distribution to that of the Palliser. Its strata weather readily to form brown to buff shaly debris. Thicknesses of 530 and 526 feet were measured but these include 60 to 80 feet of dark grey to black, buff weathering shale and silty shale at the base, which may be equivalent to the Exshaw formation of Devonian age. Wherever seen, there is a distinct lithological change between the massive dolomite of the Palliser and the softer, black shale of the Exshaw. The Exshaw is, however, transitional upward into the Banff by the intercalation of thin limestone beds, and for this reason has been included with the Banff.

The RUNDLE formation (4) lies conformably above the Banff. Rundle strata underlie wide bands along the Berland, Monaghan, and West Fork anticlines and a narrow strip in the northwestern part of the area where a few hundred feet of the formation is exposed above the Lancaster fault. Some beds are porous to vuggy and are composed of light grey chert and dark grey chert. The contact between the Banff and Rundle formations is gradational and has been arbitrarily placed at the base of the lowest thick limestone bed. The Rundle formation is approximately 1,290 feet thick.

The ROCKY MOUNTAIN formation (5) lies apparently conformably above the Rundle. It was seen wherever the top of the Rundle is exposed and its thickness ranges from 50 feet in the northeast to 80 feet in the southwest. Between 50 and 60 feet from the top of this formation is a lenticular, dark grey conglomerate up to 2 feet thick composed of pebbles and grains of quartz and chert with phosphatic nodules. The lithology of this unit, including the phosphate conglomerate, and its stratigraphic position, suggest correlation with the Rocky Mountain formation which is of Pennsylvanian age.

Strata of unit 5 are overlain disconformably by rocks of Triassic age (6) that underlie much of the southern part of the map-area. The lower part, consisting of black shales and siltstones, has yielded no fossils but is similar lithologically to beds farther to the northwest that are of Lower Triassic age. The upper part of this unit, composed of sandstone, dolomitic sandstone, and dolomite, yielded a Middle Triassic (Anisian) fauna and grades upward into the limestone, shaly limestone, and calcareous shale of the Whitehorse formation (7). The Whitehorse is at least 1,000 feet thick, a thickness comparable to that in Kvasa Flats map-area to the northwest where an Upper Triassic fauna occurs near the top.

The Whitehorse formation is overlain disconformably by strata of the FERNIE group (8). These strata occur in six separate bands within the map-area. The upper contact of the Fernie group is transitional into the overlying Nikanassin formation with an increase in the number and thickness of intercalated sandstone beds. The contact has been placed, for purposes of mapping, at the base of the lowest bed of sandstone over 10 feet thick. The group is between 500 and 600 feet thick.

The NIKANASSIN formation (9), of Lower Cretaceous age, is exposed over a large part of the northern half of the area. The thickness of the formation could not be measured but it is known to be considerably more than 1,000 feet.

The CADOMIN formation (10) overlies the Nikanassin formation. It is confined to the northern half of the map-area where it occurs as long narrow bands outlying numerous structures and forming conspicuous outcrops. It is a distinctive and excellent horizon marker. The formation consists mainly of a hard, closely packed and well-cemented conglomerate of black, grey, green, and red chert and white quartzite in a matrix of quartzitic sandstone. The pebbles are well rounded and range from 1/4 inch to 4 inches in diameter. Locally beds and lenses of sandstone occur within the conglomerate. The thickness ranges between 50 and 100 feet.

The LUSCAR formation (11) which occurs conformably above the Cadomin conglomerate, underlies a large, irregular area in the north-eastern part of the map-area and a narrow band in the middle. Nowhere within the map-area are Luscar strata well exposed and the thickness could not be ascertained. In adjacent areas the formation is approximately 2,000 feet thick.

The Dunvegan formation (13) and the Blackstone formation (14) are not exposed within the map-area but outcrop on Muskeg River just to the north.

The dominant structural features of the map-area are northwesterly trending, complex folds and strike thrust faults. Deformation has resulted in considerably more crumpling of the Mesozoic formations than the more massive Palaeozoic strata, and is particularly evident immediately to the northeast of the larger overthrust faults. Major anticlines are well developed and two of these, the Berland and Monaghan folds, plunge to the northwest. In most cases major synclines have been partly obscured by overthrusting from the southwest. Although there appears to be no large thrust along the northeast limb of the Monaghan anticline within this map-area, the Fernie shales, which underlie part of the valleys of Sulphur River and Deer Creek, are intensely sheared and contorted. The major faults are southwesterly dipping northwesterly trending thrusts. The straightness of the traces of most of these indicates that the dip of the fault surfaces is fairly steep at the present erosion surface.

The coal-bearing Luscar formation is poorly exposed and, although coaly debris was seen at a few places, the only seams actually located occur on the high ridge between Ziggy Creek and Muskeg River. There two seams occur, each at least 6 feet thick and about 200 feet apart. Their stratigraphic position within the formation could not be ascertained.

No wells have been drilled for oil or gas in the map-area. Southwest of the Rocky Pass fault Devonian and Carboniferous strata are exposed at the surface and are underlain by thrust faults, so that there seems little possibility of the presence of oil or gas in this region. North of the Rocky Pass fault possible oil or gas structures may be present although surface indications do not appear promising. Samples of the conglomerate in the Rocky Mountain formation (?) were taken at several localities. All show the presence of phosphate but no quantitative analyses have yet been made.

PRELIMINARY MAP 54-19

ADAMS LOOKOUT

ALBERTA

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