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REPORT ON THE POSSIBILITIES OF
OIL IN THE AREA FROM SODA CREEK
TO A POINT FIFTEEN MILES NORTH
OF QUESNEL, B.C.

A.I. ARLAND

June 11th 1930

GEOLOGICAL BRANCH
ASSESSMENT REPORT

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ON
THE POSSIBILITIES OF OIL
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MILES NORTH OF QUESNEL, B.C.

ANDREW J. ARLAND

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FROM SODA CREEK TO A POINT FIFTEEN MILES NORTH OF
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PERIOD OF
EXAMINATION

This area was examined from March 26 to June 10, 1930, during which period the writer was prospecting a coal property by diamond drill at the Australian Ranch.

LOCATION OF
PROPERTY

The area examined extends from Soda Creek to a point on the Fraser River about fifteen miles North of Quesnel. Examination was confined mainly to points close to the Fraser River as basalt flows cover much of the country on both sides of the river valley, and at points reach the river itself. The width of the strip not overlain by basalt is about two miles, but this varies much from place to place. The Pacific Great Eastern Railway runs the entire length of the property and gives a twice-weekly service to Vancouver. The property is easily reached from Vancouver by train to Ashcroft, thence by auto over 200 miles of good road to the Australian ranch.

There is a motor road on the East side of the Fraser from Soda Creek to Quesnel, and a wagon road on the West side of the river from Castle Rock Ferry to Quesnel. There are crossings at the Castle Rock and Alexandria ferries, and at the Quesnel bridge. The property is seen to be easily accessible, both by rail road and road.

TOPOGRAPHY

The area examined occupies the Fraser river valley from Soda Creek to a point fifteen miles above Quesnel. The river drops about three feet per mile over this distance. The valley is flat-bottomed and rises on the East side by terraces till the basalt cliffs are reached. The West side of the river is more precipitous as the basalt in general comes closer to the river. The distance between the basalt cliffs is roughly two miles at Australian, and is greater than this to the North. The basalt plateaus on each side of the river are marked by rolling topography. The elevation of the valley bottom at Australian is about 1550 feet, and that of the plateaus 2000 feet or more.

GEOLOGY

No detailed Geological Survey has been made of this district or of the districts immediately to the East and West. A very general description of this area, covered in this report, is given by Leopold Reinecke in Memoir 118 of the Geological Survey of Canada.

The known series of the Australian area are shown in the following Geological column:

Post Glacial	river sands and gravels of the terraces. unconformity.
Glacial	Glacial drift. unconformity.
Tertiary	Basalts unconformity Fraser river sediments. Unconformity.
Carboniferous	Limestones, volcanics, schists.
Devonian (?)	

Description of the formations.

Carboniferous

This contains the oldest rocks discovered in the area examined. The Carboniferous rocks outcrop in a narrow belt from Chimney Creek bridge to Soda Creek at the East side of Dragon Lake about $4\frac{1}{2}$ miles East of Quesnel, and in Baker Canyon West of Quesnel.

The lower part of the Carboniferous series consists of limestone, schists, phyllites, metamorphosed lavas, and fine quartzites, all of these being interbedded.

The upper part of the Carboniferous series consists of light grey limestones. The limestones vary much in quality, an impure bed being found at Dragon Lake, and a commercial bed, 99 per cent pure, being found at Soda Creek. The schists can be seen in cuts South of Soda Creek, and East of Dragon Lake.

The volcanics can be seen at Castle Rock, and East of Dragon Lake, where they are interbedded with limestone.

Tertiary

The Fraser River formation appears to rest unconformably on Carboniferous rocks. Owing to the covering of basalt, and the lack of a detailed Geological Survey, this is not proven, and so the Mesozoic may be represented.

The Fraser River formation consists of clays, coal beds, sandstones and conglomerates. The later two being porous and possible oil-bearing strata. The sandstones and conglomerates can best be seen at the Fraser River about a mile South of the mouth of Australian Creek. The best exposure of the carbonaceous clays is in a large cut on the Pacific Great Eastern Railway, about a mile South of Quesnel.

Basalts overly unconformably the Fraser River strata. Glaciation has reduced them to a few hundreds of feet in thickness.

Glacial

The whole district shows much evidence of glaciation. North of Quesnel much of the country has been stripped of basalt and South of Quesnel the basalt remaining is comparatively thin.

Post Glacial

The Fraser River valley is covered with a varying thickness of river gravels and sands. On Narcosli Creek, on the West side of the Fraser River, silt stands about 3000 ft. higher than the present river level.

STRUCTURE

A long anticline, extending from half a mile South of the Australian Ranch (Lot 4) to a point half a mile North of Quesnel, is indicated by outcrops of carbonaceous clay, coal seams, sandstones and conglomerates found at intervals over the distance. The direction of the structure is roughly North and South. The Fraser river follows fairly closely the axis of the structure. The following strikes and dips of the strata along the river define the two major sides of the structure.

At Doyle's ranch on the West side of the Fraser river, and almost opposite the mouth of Australian Creek, the strike is almost North and South, the dip being 20 degrees to the West.

On the East bank of the river, near the South-West corner of Lot 6730 and about $2\frac{1}{2}$ miles North of Australian Creek, there is a coal seam which strikes 185 degrees and dips 29 degrees to the East.

On the West bank of the river on Lots 7272 and 7273 outcrops of carbonaceous clay and coal can be traced for half a mile. These strike roughly North and South and dip 30 degrees to the West.

At a point 1 mile South of Quesnel in a large cut on the Pacific Great Eastern Railway, where the strata are largely burnt-out carbonaceous clays and coal seams, the strike is North and South and the dip a gentle one to the East.

On the West side of the river, about two miles South of Quesnel, the rocks strike North and South and dip 25 degrees to the West.

The structure is definitely closed on the South end. This is proven by two outcrops of coal on the West side of the Fraser, one on the East side, an outcrop of conglomerate on the West side, an outcrop of sandstone on the East side, and the correlation of these strata in a diamond drill hole on the East side of the river.

About a quarter of a mile North of the bridge over the Fraser river at Quesnel a coal seam is exposed on each side of the river. That on the East side of the river strikes North 50 degrees West and dips 20 degrees to the Northeast. That on the West side dips to the Northwest, but the angles of strike and dip were not obtainable due to slipping at the river's edge. About a mile up Baker Creek evidences were seen of a dip to the Northwest.

These outcrops indicate that the North end of the structure is closed.

The details of structure given above indicate an anticline twenty miles long and closed at both ends.

FAVORABLE
POINTS

- (1) A long closed structure has been proven.
- (2) Although comparatively narrow the structure is steeply dipping, with therefore a possible better concentration of oil. If oil were found it could be recovered with a minimum number of wells.
- (3) Oil has been discovered in the Tertiary formations in California.

- (4) The porous sandstones are suitable for the accumulation of oil.
- (5) The fossils indicate that the Fraser River formation is marine.

POSSIBILITIES

- (1) Mesozoic strata may locally underlie the Fraser river formation.
- (2) Oil may be found in the carboniferous. In spite of the metamorphism of the limestones, the unconformity following the carboniferous, oil may have been retained due to the interbedded character of the limestones, lavas and schists.

RECOMMENDATIONS

In view of the FAVORABLE POINTS and POSSIBILITIES enumerated above, I recommend that a hole be drilled for oil at the Northwest corner of Lot 4 or 5, this hole to be continued till limestone of the carboniferous strata is reached. The depth of this hole should not exceed 3000 feet.

Respectfully submitted,

"A.J. Arland, M.E."