THE GEOLOGY OF AMCO CLAIMS 43, 44, 45, 46 and 47 FRACTIONS SHEEP CREEK, B. C.

82F/3E

by

W. W. Moorhouse

Sheep Creek, B.C. Aug. 29, 1953

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C O N T E N T S

IN THE CITY OF NELSON
IN THE PROVINCE OF
BRITISH COLUMBIA
TO WIT:

I, JAMES ERIC LLOYD EVANS, of the City of Toronto in the County of York, in the Province of Ontario, Manager and Geologist, make oath and say as follows:-

1. THAT I am the manager and geologist for Amco Exploration, Inc. in Canada, and as such have knowledge of the facts hereinafter deposed to.

2. AMCO EXPLORATION, INC. owns five claims at Sheep Creek, in the Nelson Mining Division, in the Province of British Columbia. These claims are as follows:-
Amco 43, Amco 44, Amco 45, Amco 46, Amco 47.

3. During the period from July 29th, 1953, to August 15th, 1953, Amco Exploration, Inc. incurred expenditures for geological assessment on the above claims. This work wa s carried out by Dr. W. W. Moorhouse, Mr. C. V. G. Phipps and Mr. L. Jacob, Jr., under the direction and supervision of John M. Powelson, P. Eng.

4. THAT the said J. M. Powelson, P. Eng. holds a license to practise geological engineering within the Province of British Columbia which license is in good standing.

5. The said Dr. W. W. Moorhouse performed fourteen days of work between the period from July 29th, 1953, to August 15th, 1953, at a salary rate of $700.00 per month and was paid $350.00

$350.00

6. The said Mr. Charles V. G. Phipps performed fourteen days of work between the period from July 29th, 1953, to August 15th, 1953, at a salary rate of $450.00 per month and was paid $225.00. $225.00

7. The said Mr. L. Jacob, Jr., performed fourteen days of work between the period from July 29th, 1953, to August 15th, 1953, at a salary rate of $250.00 per month and was paid $125.00. $125.00

$700.00

SWORN before me at the City of Nelson in the Province of British Columbia, this 29th day of August, 1953.

James Lorne Lloyd Evans

David James Robertson

A Notary Public in and for the Province of British Columbia

AMCO EXPLORATION, INC.
68 YONGE STREET
TORONTO 1, CANADA

August 29, 1953

Mr. K. D. McRae
Gold Commissioner
Nelson, British Columbia

Dear Sir: Re: Application to apply Geological Survey - Amco Exploration, Inc.

This is to advise that the services of Messrs. C. V. G. Phi_ps and L. Jacob, Jr., both geologists were required in conjunction with those of Dr. Moorhouse to the extent as outlined in the affidavit of evidence of expenditures, in order to complete the geological survey in sufficient detail in time to permit recording of same; also in order to enable mapping in adjacent areas to be completed during the field season.

Yours very truly,
AMCO EXPLORATION, INC.

J. ERIC L. EVANS
Manager & Geologist

JELE/em

THE GEOLOGY OF AMCO CLAIMS 43, 44, 45, 46 and 47 FRACTIONS

SHEEP CREEK, BRITISH COLUMBIA

LATITUDE 49° LONGITUDE 117°

SOUTHEAST QUADRANT

by

W. W. MOORHOUSE

Done Under the Supervision of

J. M. POWELSON
Registered Engineer of British Columbia

WORK DONE

July 29th - August 15th, 1953

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Accompanied by Geological Outcrop Map of Amco 43, 44, 45, 46 and 47 Fractions, Sheep Creek, B. C.

THE GEOLOGY OF AMCO CLAIMS 43, 44, 45, 46 and 47 FRACTIONS

SHEEP CREEK, B. C.

Introduction

The five claims described in this report are located in the Nelson Mining Division, on Bennett Creek and its tributaries, about 1½ miles south of Sheep Creek and about 3 miles east of the Salmo-Nelway highway. The claims are fractions bounded on the east by the original A mco block of claims, by the Cat group on the west and by the Ed No. 2, Ed No. 1 Fraction and Lucky Jim mining claim on the north. On the south they are bounded by Schorl 10 and open ground.

Method of Survey

The information on which this report and the accompanying map are based was obtained during the summer of 1953. The claims were mapped by means of tape and compass surveys spaced at intervals of approximately 150 feet. The traverses were tied into the surveyed boundaries of the claims. The country is for the most part fairly open, so that all outcrops have been examined and mapped by this procedure. The results of this survey have been plotted on the accompanying map on a scale of 300 feet to the inch. Maps of the individual

claims are also being drawn up on a scale of 100 feet to the inch.

Topography

The claims are located on the east slope of Nevada Mountain, extending south almost to the divide between Sheep Creek and Lost Creek. The highest elevations are along the south boundary of Amco 45 Fraction, namely 5590 feet above sea level. From this point the ground slopes steeply and uniformly down to the northeast, as a spur which is separated from the main east flank of Nevada Mountain by a minor tributary of Bennett Creek. The lowest point on this group of claims lies just east of the northwest corner of Amco 46 Fraction, along Bennett Creek, which is here at an elevation of a little over 3800 feet. In the southern and higher part of the block of claims, rock outcrops are abundant and often of considerable size. The drift cover increases downhill, and along Bennett Creek itself, there is a continuous cover of gravel and drift which effectively blankets the bedrock.

Most of the block of claims has been burned over, and is covered by a rather sparse and low second growth, consisting largely of poplar, alders, scrub maple and willow. Scattered conifers, including pine, spruce, and tamarack remain in moist hollows and creek

bottoms, and the southern and higher sections are covered with an open growth of small pine and spruce, which increase in abundance and size downhill to the east, towards the valley of Bennett Creek.

General Geology and Stratigraphy

The rocks exposed on the claims comprise sediments classified by Walker (GSC Memoir 148) as the Pend Oreille series and by Little (GSC Paper 50-19) as the Laib Group (equivalent to the Maitlen phyllite of Park and Cannon, U.S.G.S. Professional Paper 202). These sediments have been cut by granites satellitic to the Sheep Creek stock, which are presumed to be related to the Nelson batholith. The stratigraphic succession, as worked out in mapping the main Amco block of claims in 1952 was as follows:

Unit	Lithology	Thickness
"J"	Black argillite	?
"I"	Grey dolomite	?-600
"H"	Grey to black argillaceous limestone	?-350
"G"	Dark grey dolomite	?-130
"F"	Black argillite	?-600
"E"	Dolomite, hornfels, argillite, limestone	?-300
"D"	Limestone, coarse grained, massive to thin bedded	?-800
"C"	Brown argillite, schistose argillite, recrystallised chert, limestone, hornfels	?-600
"B"	^{1}Limestone, argillaceous	0-150
	^{2}Spotted biotite schist	0-650
	^{1}Limestone, impure	0-40
	^{2}Biotite schist, spotted	0-130

Unit	Lithology	Thickness
"A"	Limestone-dolomite breccia	?-140
	Schistose purple-brown argillite and schist	?-110
	Crystalline limestone	?-100
Reno Quartzite	Schist and quartzite	

[1]probably repetition of lower bed by folding
[2]probably metamorphosed equivalent of unit "C"

Of the above units, only unit "F" is exposed on the claims examined in the present survey. The argillite of this unit is cut by granite, and these two constitute the predominant rock types exposed. In this report, we will therefore confine our discussion to these alone.

Lithology

Unit "F": Unit "F", in the five claims included in this survey, is a singularly monotonous rock. Wherever exposed it is a fissile black argillite, easily scratched with the pick. It is usually characterized by a sprinkling of shiny black spots, which presumably represent metamorphic silicates, such as andalusite. In Amco 44 Fraction silicates of this type appear as grey spots on the weathered surface. Invariably the joint and cleavage planes, where exposed to the weather, are very rusty, due to the oxidation of disseminated pyrrhotite, which is characteristic of the rock. In many places, also, the argillite has been injected by thin seams of quartz, which appears to be generally unmineralized.

A little black limestone occurs interbedded with

the argillite. Such limestone occurs in quite narrow beds. The maximum width exposed is 2 to 5 feet. Also, a few zones of tactite were observed, the maximum width exposed being about 2 feet. These variations are quite rare in the area mapped.

Granite: The granite is coarse grained, siliceous, pink to white biotite granite, generally massive and free from any foliation or banding. In composition it is probably a granodiorite or adamellite. The principal variations are in the presence of pegmatitic and aplitic zones and dikes. These appear to occur quite erratically throughout the area mapped. The pegmatitic phases are characterized by the presence of fairly coarse biotite and muscovite, and in some cases, of small red garnets.

The contact of the granite and argillite is remarkably sharp, where exposed. The granite is fine grained and tends to be aplitic near the contact. The argillite shows very little change even in the immediate vicinity of the contact. A very striking contact is exposed near the northeast corner of Amco 46 Fraction. Here the argillite is separated from the granite by a breccia consisting of fine grained aplitic or felsitic fragments in a matrix of quartz. The quartz is slightly vuggy. The argillite is not well exposed at the contact, but the little that can be observed has been fractured and seamed with quartz. However, the fragments do not

appear to have been rotated or granulated, so that it cannot be properly said to have been brecciated in a structural way. In view of the nature of the contact, the writer believes that it is an intrusive breccia, in which an early chilled phase of the granite was brecciated by subsequent renewal of intrusion. The granite appears to grade into the quartz of the silicified breccia, which tends to bear out the conclusion presented. The lack of distinctive brecciation or shearing in the argillite indicates that this contact is not a faulted one, and that the granite has not been intruded along a pre-existing fault, as has been suggested by Little in some parts of the area.

Structural Geology

The structural pattern in the main argillite area is deceptively simple in appearance. Most of the argillite in Amco 43 and 44 Fractions has in general rather low dips, which fluctuate rather rapidly in any one east-west section. The general picture appears to be that of a series of gentle folds of short amplitude plunging gently north. One of these folds is delineated clearly by a thin bed of limestone in the southwest corner of Amco 44 Fraction. In a few places, where exposures are favourable, however, Z-shaped dragfolds may be observed, which suggest that the relatively gentle dips are for the most part not measured on bedding but on foliation, and that the

argillite has actually been rather intensely deformed. Cutting across the gentle dips noted, in a few places, are sheared zones, generally with an approximate north-south strike, which have rather steep dips, either to the east or west. No marker horizons are present in the monotonous argillites, but in some places these shears give the impression of being minor faults. Going north and downhill towards the granite, the main argillite body tapers out and the dips become steeper.

The flat attitude of much of the argillite, and the general lack, except locally, of contortion, is a surprising feature when one considers the nearness of the granite in the area mapped. It is possible that this flat attitude is a reflection of the structure shown by the dolomite of unit "I" in the main Amco block to the east. As noted in the report on this block last year, the dolomite forms a broad, flat structural area, with fluctuating gentle dips, and a general inclination of between 20° and 30° to the north. This structure has been referred to the mechanical competence of the dolomite in question. It is possible that the similar dips in the argillite in the group of claims under discussion is due to the fact that the dolomite formerly existed in this area, and had a controlling influence on the fold pattern produced, but has since been eroded off. Although during folding the argillites failed incompetently, the presence of this competent mass above may be presumed to have

impressed on it a spurious appearance of simple gentle folding.

Bedding and foliation can rarely be distinguished in the argillites. This is largely due to the fact that the argillite does not show distinctive beds; rusty coatings on joint surfaces etc., also interfere with the distinction of bedding and cleavage. It is also highly likely, that with complex Z-type folds, the bedding and foliation are largely parallel and that distinction between them is only locally possible.

Metamorphism

As already noted, the argillites are characterised by the development of shiny crystals on the cleavage surfaces. These crystals are black, rectangular in form, and are probably andalusite and/or cordierite. While the argillites are somewhat hornfelsic in appearance, they lack the massiveness and hardness of typical hornfelses. It is likely that the strong development of cleavage prior to intrusion has prevented the development of the characteristic massive properties of hornfelses. The argillites also fail to show any marked change in metamorphism in the vicinity of the granite contacts. No distinct zones of metamorphism were noted in the process of mapping. Lenses of tactite within the argillites are further evidence of rather thorough contact metamorphism, and probably represent

dolomitic zones in the sedimentary series before metamorphism.

Correlation

As noted in the earlier part of this report, the rocks are tentatively assigned to the Laib group of Little. There is some reason on the basis of lithology alone, for correlating these black argillites with the Ordovician Active formation (equivalent to the Ledbetter of Park and Cannon). Black argillites of this age outcrop north of the area under discussion (e.g. on Porcupine Creek) and south of the area, in B. C. and Washington. On the other hand no graptolites have so far been observed in the argillites on either the main block of Amco claims or on the group at present under discussion. Correlating the argillites and the associated dolomites with the Ordovician would moreover require a major fault or unconformity between these rocks and the underlying argillites and limestones, since the thickness of the latter formations is not sufficient to equal the thicknesses which have been proved in adjacent areas for Laib and Maitlen rocks. No definite evidence of either major fault or unconformity has so far been discovered. The complicated structure and variable lithology of the area as a whole precludes any categorical statements in this connection, and it is possible that further geological studies in the area, and/or diamond

drilling, may enable us to demonstrate that one or other of these alternatives is actually the case. At present, however, the information available to us leads us to believe that the series of units listed above the Reno forms a conformable series which is best considered to belong to the Laib.

The granites are younger than any of the consolidated formations recognized in the area mapped. Lithologically they are similar to the Sheep Creek stock and certain phases of the Nelson batholith. These are therefore tentatively regarded as Mesozoic intrusives belonging to the same period of igneous activity as the Nelson batholith.

W. W. MOORHOUSE

J. M. POWELSON
Registered Engineer of
British Columbia

GEOLOGICAL OUTCROP MAP

of

AMCO 43,44,45,46 & 47 FRACTIONS.

SHEEP CREEK B.C.

AUGUST 1953

LEGEND

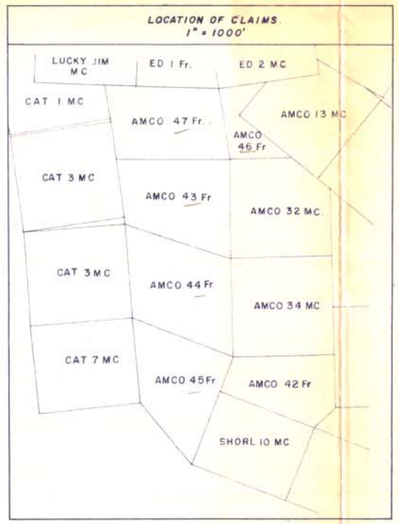
ROCK TYPES

- a — Argillite
- l — Limestone
- g — Granite

SYMBOLS

- Outcrop boundary
- Approximate outcrop boundary
- Float + possible outcrop
- Geological boundary
- Approximate geological boundary
- Dip of bedding
- Dip of bedding or foliation
- Dip of foliation
- Horizontal bedding
- Horizontal foliation
- Pitch of lineation
- Joints
- Pitching anticlinal axis.

LOCATION OF CLAIMS
1" = 1000'



SCALE

1 inch = 300 feet

0 100 400 600 800 1000

Co. Ltd. Macdonald
J. P. Macdonald
P. Eng. B.C.

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Map # 1