

GEOPHYSICAL SURVEY

MOYIE 1-6 GROUPS

82G/5W

MOYIE, B. C.

20 MILES SOUTHEAST OF CRANBROOK, B. C.

49°, 155° S.W.

Alexander Smith, R. P. E.,

December 27, 1947 - November 30, 1948.

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Nov. 25/48

82G/5W

0041

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MAGNETOMETER REPORT

on

MOYIE GROUPS 1-6

FORT STEELE M. D.

BRITISH COLUMBIA.

by

ALEXANDER SMITH

REPORT OF MAGNETOMETER SURVEY

MOYIE 1-6 GROUPS

MOYIE, B. C.

I N D E X

	<u>Page</u>
Summary and Conclusions	1
Introduction	2
Geology	2
Method	3
Analysis of Results -	5
Group 6	5
Group 5	6
Moyie Lake Survey	
(Group 1-5)	7
1. North-South Anomalies	8
2. N.30°-40°E "	8
3. N.70°E.	8
4. Tailings Area	9

M A P S

1. Claim Map - Moyie Area - 1" = 1500'
2. Magnetic Survey - Moyie #6 Group - 1" = 200'
3. " " - Moyie #5 Group - "
4. " " - Moyie Lake
(Moyie 1-5 Groups - "

MAGNETOMETER REPORT

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Fort Steele M. D.

British Columbia.

SUMMARY AND CONCLUSIONS:

A detailed magnetometer survey of parts of the Moyie Area has shown that the St. Eugene veins yield distinct anomalies and that known faults and dykes in the Area can be traced with a magnetometer.

The most important results are the finding of -

1. A strong northeast striking anomaly on the Moyie #6 Group.
2. A N.70°W. anomaly extending out under the lake on the projection of the St. Eugene vein.
3. Another parallel "break" near the north end of the lake.
4. A N.30°E. anomaly indicating that the Chubb fault probably continues southwesterly to connect with the fault which offsets the sills in the Rudd Area.
5. A very strong anomaly over the tailings area but extending far beyond the known limits of the tailings. This last may have some additional significance.

INTRODUCTION:

The Moyie 1-6 Groups consist of 47 claims adjoining the St. Eugene and Aurora mines at Moyie, B. C. In November, 1947, a Geological Survey of these Groups was recorded as assessment work; for the detailed geology of the area the reader is referred to this work.

The Magnetometer Survey was undertaken to -

1. Prospect for the extension of the St. Eugene and Aurora veins out under the lake.
2. Test the possibility that the bedded replacement deposit lay under the lake on the axis of the Moyie anticline.
3. Test for other veins parallel to the St. Eugene veins.
4. Trace known or suspected faults under the lake or in areas of overburden.

GEOLOGY:

The Moyie area is underlain by the Aldridge formation of lower Purcell Age. The formation here consists principally of argillaceous quartzites and argillites. These sediments are folded into a broad open anticline whose axis strikes about N.20°E. This anticline plunges gently to the north at about 15°. At Moyie the general strike of the beds on the east side of the lake is northeasterly and on the west side of the lake northwesterly.

The various formations have different magnetic susceptibilities. In general higher readings were obtained over argillites areas than over beds of relatively pure quartzites. The variation here would be about 30 to 50 gammas.

Purcell dykes and sills give still higher readings. They could readily be traced through areas of overburden by a magnetic survey.

METHOD:

First a series of 4 traverses were run across the St. Eugene veins in the area of the mine. Three out of the four showed decided anomalies of up to 200 gammas over the vein. These anomalies were sharp and of the type to be expected over a steeply dipping relatively narrow vein. It was found that to be sure of detecting such anomalies it was necessary to have the Magnetometer stations along the traverse placed at no greater than 100 foot intervals, and that having obtained an indication of an anomaly intermediate stations were necessary to obtain an idea of its strength.

The work on Moyie Lake was done on the ice during the period December 1947 to April, 1948. A grid was laid out covering the entire lake. This consisting of lines 400 feet apart running N.10°E. with stations established every 100 feet along these lines. These stations were read with a Watts Vertical Component Askania type Magnetometer. At each station three readings were taken and averaged; then the instruments turned through 180° and another three read-

ings taken. A light car used on the ice greatly speeded the work of checking and enabled one to return each time to a central checking station. This greatly increased the accuracy of the survey. When this work was completed intermediate lines were run in the central part of the area. On these lines only one reading was taken before turning the instrument through 180°.

Great care was taken as it was known that the anomaly to be expected on the lake from the vein type structures would be small.

Additional surveys were made on the Moyie No. 5 and No. 6 Groups. A Sharpe instrument of the same type was used in this work. In each case a grid was laid out with lines 400 to 600 feet apart and stations every 100 feet along these lines.

The results of these surveys are plotted on 200 scale maps. The magnetic readings, after being corrected for diurnal changes, etc., were plotted on the maps without changing them over into gamma values. For the Watts instrument 1 scale division equals about 30 gammas and for the Sharpe instrument 1 scale division equals 15 gammas.

An idea of the relationship of the magnetic values to the geology can be obtained from superimposing these maps over the 200 scale geological maps submitted last year.

ANALYSIS OF RESULTS:

GROUP 6: - The following anomalies were found on this group. The geology was shown on the Tradedollar map sheet.

GROUP 6: (a) The course of the Purcell (diorite) dyke across the M.L. 15, 20 and adjoining Columbia claim can be traced by a magnetic high. To the southwest of M.L. 15 the dyke does not outcrop. Its course could probably be determined by a magnetic survey in this area.

(b) The magnetic high that extends south from the Columbia into the M.L. 20 and 16 is caused in part by a relatively flat lying Purcell sill about 8 to 10 feet thick that branches off the dyke. The sill does not outcrop to the south of the anomaly. It may die out in this area.

(c) The most interesting anomalies found on this group are those in a zone extending northeast across the M.L. 16, 17 and 21 claims. On the M.L. 16 claim there are some outcrops along this zone. These show minor faults in the small quartz veins trending northeast parallel to the magnetic anomalies. These outcrops show no mineralization or indications that they would yield an anomaly of such strength, and the suggestion is that the lenses of sulphide mineralization may occur along this belt. These anomalies merit some diamond drilling.

(d) In addition to the strong northeast trending anomalies discussed under (c), there is apparently a broader area of low magnetic intensity extending northeast

across the group. This is shown by the larger areas of plus 55 contour which lie on the northwest and southeast sides of this wider zone.

GROUP 5: The results in the central part of this area are badly distorted by the railway and highway and their telephone and power lines. The surface geology was shown on the Barkshanty map. The principal features shown are:

(a) A northeast belt of low intensity cutting across the M.L.38 and M.L.37 claims. This follows what is apparently a fault zone. The fault does not outcrop at any place but had been deduced from stratigraphic offsets. The magnetic survey strengthens the evidence.

(b) At the northeast end of the belt described under (a) there is a N.70°W draw which is followed by a magnetic low area. To the northwest there are outcrops of small quartz veins striking N.70°W parallel to the St.Eugene veins.

(c) A second fault zone, striking about due north across the M.L.37, 43 and 39 claims was shown on the Barkshanty map. An anomaly follows this fault but is modified by the nearby paralleling power and telephone lines.

(d) A northwest trending "high" extends between the railway and the highway and continues easterly just north of boundary between M.L.38, M.L.39 and M.L.43, M.L.37.

(e) If the readings adjacent to the railway

and highway are disregarded a "high" area shows arching around the northerly part of the group paralleling the stratigraphy. This marks the upper argellite horizon of the Aldridge formation which occurs just below the Creston contact.

MOYIE LAKE SURVEY: (Groups 1-5) To avoid confusion claim boundaries have been left off the 200 scale map but are shown on the 1500 scale claim map. A portion of the lake is covered by the Cambrian and Lakeshore crown granted claims, but the balance is entirely on claims of the Moyie 1-5 groups. In addition to the contour map submitted magnetic profiles were made of these traverses but because of their bulk have not been included. These profiles show up some small variations more clearly than the contours. Accuracy of the order of 5 gammas was obtained on the ice.

The effect of the depth is not very apparent on the contour map. Moyie lake has been sounded. The results are recorded in "Geology of the Cranbrook Map Area, S. J. Schofield, Geological Survey of Canada, Memoir 76 (Map on page 129). The lake is in places 200 feet deep. In the deeper areas, as is to be expected, the variations were smaller and more gradual. On approaching the shore line, i.e., within 100 feet of the shore, some irregularity was usually apparent. This may in part be due to presence of numerous Purcell diorite boulders in the gravels and glacial drift.

The effect of stratigraphy can be seen on the contours and on the profiles; in the latter case the trend

of the sediments shows as broad curves. North of the St. Eugene veins the sediments trend northeasterly across the lake. In the southern part of the lake the axis of the anticline lies under the lake.

The following are the principal types of anomalies noted:

1. North-south trending lows and highs of about 30 gammas intensity. These occur near the western side of the lake, principally to the north of the St. Eugene and Aurora veins. It is thought they may represent a north-south zone of faulting; the so-called Moyie Lake fault. It is to be realized that on north-south traverses weak north-south anomalies may be more apparent than real. However, every effort was made to eliminate this fact by returning hourly to a central check station.

2. Anomalies trending N.30°-40°E. are found to the south of the St. Eugene mine. On the Glencairn Creek and Rudd geological sheets a fault known as the Chubb fault was mapped having this orientation. The anomalies of this trend lie near the projection of this fault out under the lake. Part of the northeasterly trend may result from stratigraphy. In the southern portion of the lake the N.20°E axis of the anticline is under the lake.

3. Anomalies trending N.70°W:

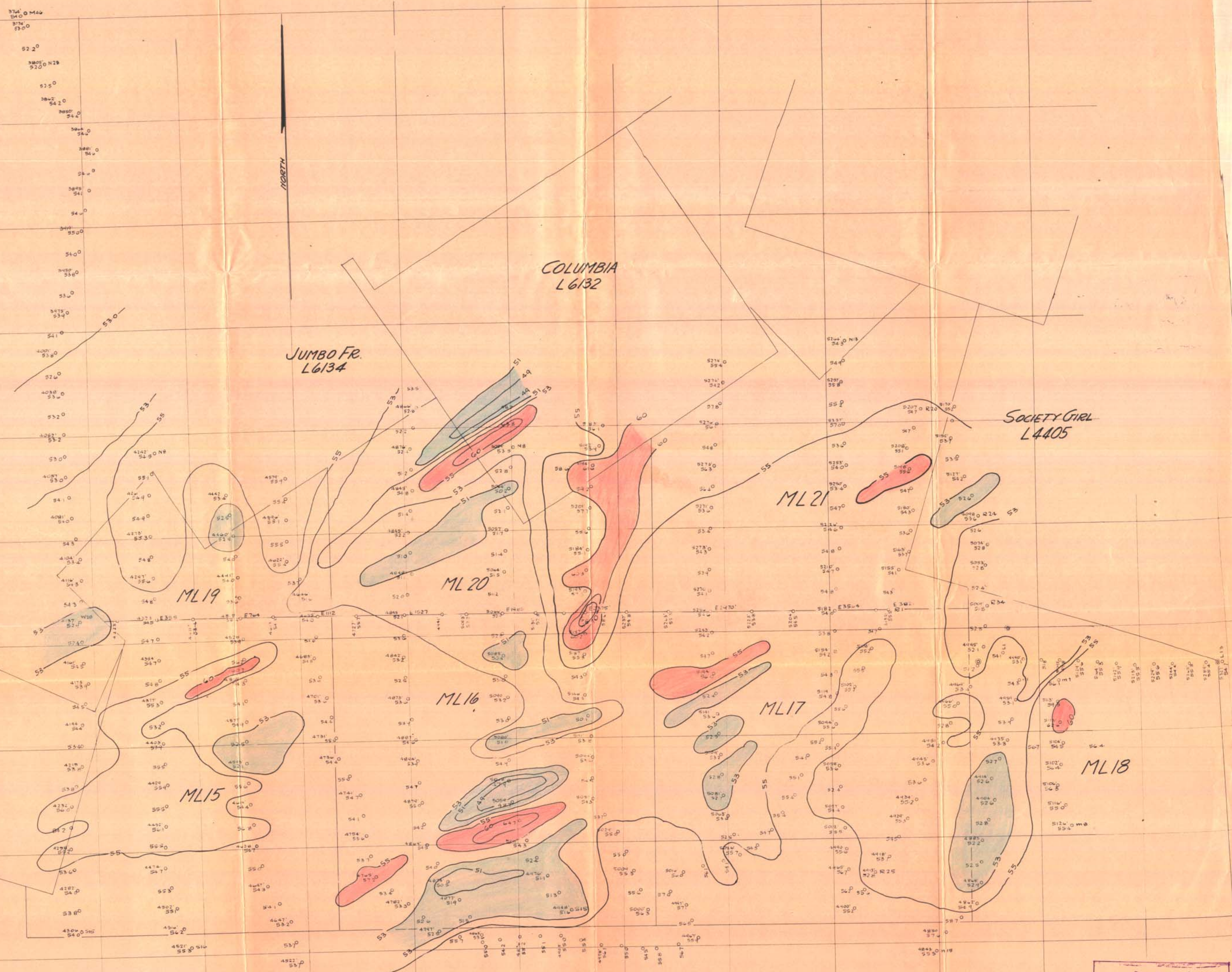
- (a) A break of irregularity in the magnetic contours can be traced westerly from the projection of the St. Eugene veins out under the lake nearly to the north-south

anomaly described under (1) above. The feature is weak but apparently is of sufficient continuity to show up on the contours.

(b) Near the north end of the lake another N.70°W zone is more clearly marked. It lines up with a vein structure on the east side of the lake.

4. Tailings: By far the strongest anomaly recorded is that south of the St. Eugene mine near the old mill-site. Here variations of up to 350 gammas were found. This is probably due to the iron content of the tailings from the St. Eugene mill. The anomaly, however, appears to extend westward across the lake, beyond the deepest part of the lake and 800 feet or so beyond the area where the tailings are known to have accumulated. This effect may be due to the tailings, but there is a possibility, not to be overlooked, that some other factor may be present. Lying as it does beneath the Chubb fault and near the axis of the anticline, the area should be structurally favorable for ore deposition. The extent and tonnage of the tailings should be determined; if they are found to be much more restricted in area than the anomaly, further testing is warranted.

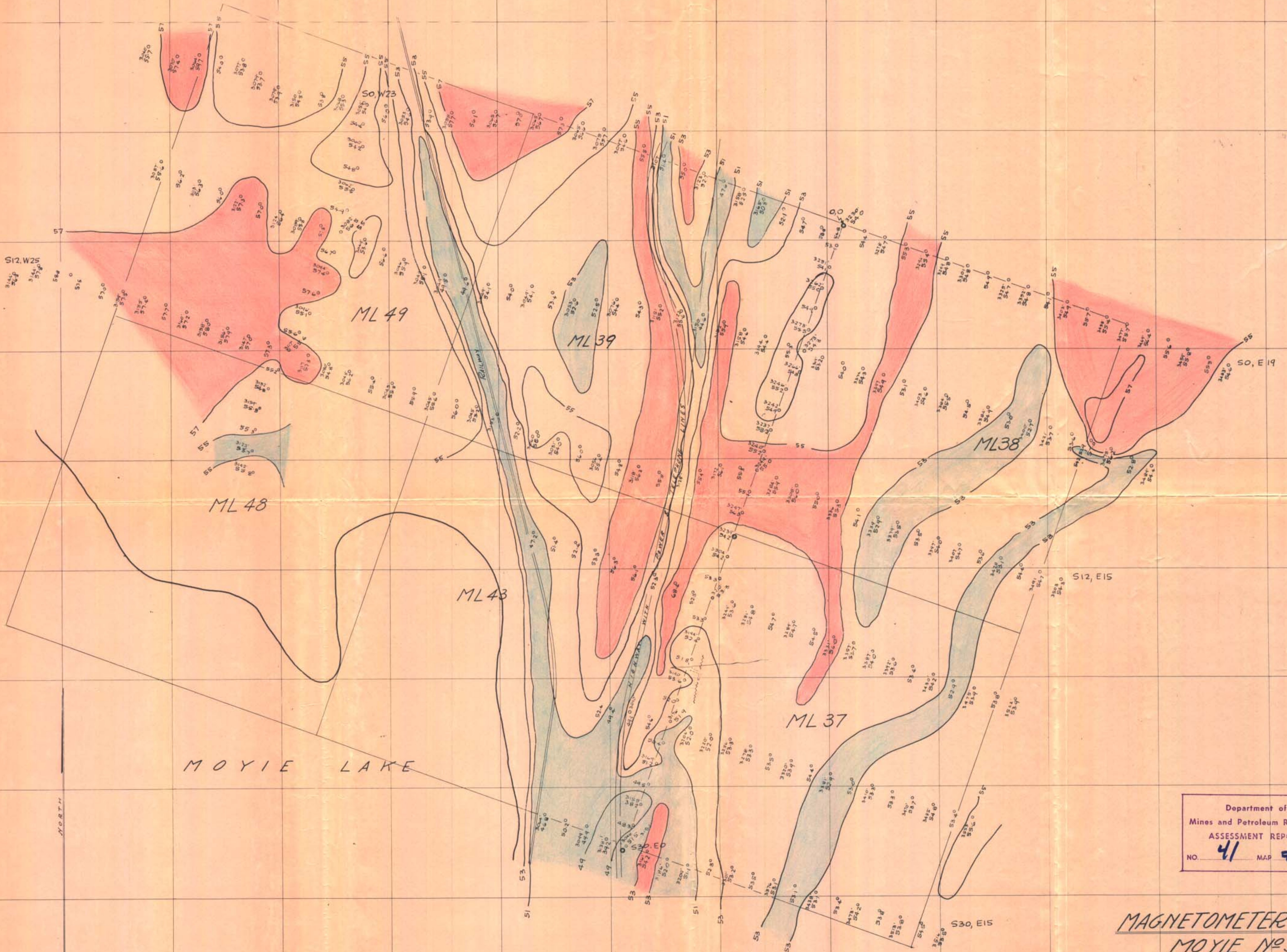
Alex Smith.

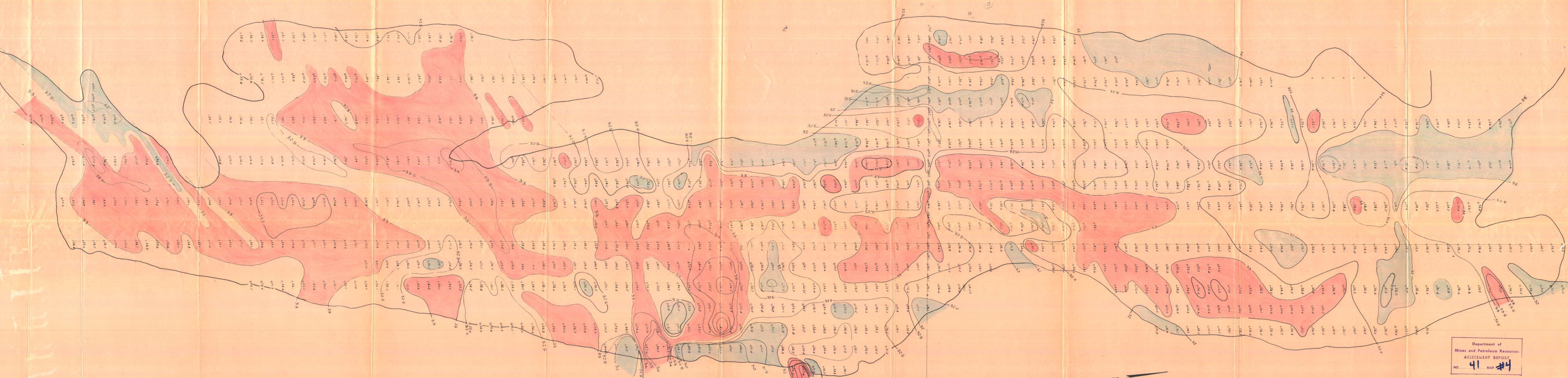


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ASSESSMENT REPORT
NO. 41 MAP #2

MAGNETOMETER SURVEY
MOYIE No 6 GROUP

MAGNETIC VALUES & CONTOURS ARE GIVEN IN
INSTRUMENT SCALE DIVISIONS
1 SCALE DIVISION = 15 GAMMAS ±
MAGNETIC LOW 53.4 BELOW MAGNETIC HIGH ABOVE 55.6
SCALE 1" = 200'





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ASSESSMENT REPORT
NO. 41 MAP #4

MAGNETOMETER SURVEY
MOYIE 1-5 GROUPS
MOYIE LAKE

MAGNETIC VALUES & CONTOURS ARE GIVEN IN
INSTRUMENT SCALE DIVISIONS
1 SCALE DIVISION = 30 GAMMAS ±
MAGNETIC LOW ■ MAGNETIC HIGH ■
SCALE 1" = 200'