# **Progress Report**

on the

# CHIEMIAINUS PROPERTY

# (Falconbridge Option)

Prepared for: LARAMIDE RESOURCES LTD.

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Vancouver, B.C.

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# 1.0 SUMMARY

The Chemainus property option agreement between Falconbridge and the Laramide was executed in June 1992, and in early July 1992 Falconbridge provided Laramide with reports, maps and assay data covering work done by Falconbridge on the Chemainus property during the period 1983-1990.

This material has been combined with geological, drill hole and assay data from the adjoining Lara property and a series of working plans and sections constructed.

At this time, the re-appraisal of the combined geological data from the Lara and Chemainus properties indicates two main exploration targets in the eastern half of the Chemainus claims:

- 1. The 262 Zone (chert exhalite) which dips northward from the Lara property onto the Chemainus claims; and
- 2. The 126 Zone (stringer mineralisation) intersected by Falconbridge drilling, in drill hole 90-126.

In addition to this work, preliminary lithogeochemical and geophysical investigations are underway to test the applicability of the most recent advances in these fields.

This report summarises the work done by Laramide on the Chemainus project during the period July 1st, 1992 to May 31st, 1993.

# 2.0 DATA EVALUATION

Material received from Falconbridge in early July 1992 consisted of 32 reports, three volumes of drill logs, two sets of geophysical sections (VLF-EM), and two computer disks and two tapes containing drill hole and assay data.

An inventory and index of all the data has been made, and summaries completed of the work done by Falconbridge and its predecessor Esso.

The same process of data study and evaluation had been carried out on the Minnova and Abermin data from the adjoining Lara property, to the south.

# 3.0 COMPILATION AND MERGING OF FALCONBRIDGE AND LARAMIDE DATA

#### 3.1 BASE MAP

The 1:10,000 base maps used by Falconbridge and Laramide were derived from compatible orthophotos, and a base map covering both properties was obtained by splicing the overlapping originals.

#### 3.2 DIAMOND DRILL HOLE DATA

#### 3.2.1 Collar Locations

In order to establish a plotting base for both sets of drill hole data, it was necessary to register them to a common plotting reference. Three grid line systems have been established on the properties by Falconbridge and Abermin. Falconbridge mapping, geochemical sampling, and geophysical surveys on the Chemainus claims were controlled by a north-south oriented grid, with lines generally spaced at 100-metre intervals. Abermin work on the Lara property was initially controlled by a north-south grid, which was superseded by a north-east oriented 'Mine Grid'.

Falconbridge and Minnova converted all drill holes to UTM system coordinates. The Falconbridge conversion was done by direct measurement (digitising) of the hole collar locations as plotted on the orthophoto base map. Minnova, however, calculated UTM coordinates from the original picket-line grid coordinates used by Abermin. In the Coronation Zone area, Minnova

surveyed drill hole collars before converting to UTM coordinates, but as none of the other holes were surveyed, the conversion was subject to grid errors and irregularities. To correct this problem, Laramide has digitised all the Abermin/Minnova holes from their plotted locations on the Lara orthophoto base map.

### 3.2.2 Drill Hole Data

Laramide has converted all Falconbridge and Minnova/Abermin data to a format which permits reproduction and plotting by Laramide's BORSURV/ AUTOCADD computer system.

Falconbridge and Minnova used a variety of computer programmes to process and plot drill hole information. Falconbridge employed PROLOG, LOG II, and AUTOCADD. Analytical data was tabulated on the drill hole sections. Minnova also used PROLOG, but plotting was done by the related TRELOG, and assays were displayed along the hole traces.

All Falconbridge drill hole and analytical data was contained in PDP tape backups. Laramide has downloaded this information to disk. Drill hole survey and geology data have been translated directly into Laramide's BORSURV file format. The Chemainus analytical database contains 8,644 core and 1,476 surface sample analyses. Both 'geochemical' anti 'lithogeochemical' samples are included and are designated as 'assay' and 'whole rock' data. Laramide has converted these to a single dBase file, from which either category can be extracted separately. A subset of this assay data, consisting of 'metal' assays, has been imported into the BORSURV files. Essentially the same procedure was used to convert the Minnova drill hole and assay data from the PROLOG to the BORSURV and dBase formats.

About a dozen drill holes had been omitted from the Falconbridge database. These have been entered into Laramide's BORSURV file directly from the Falconbridge drill logs.

For ease of reference, Laramide has compiled a printout of all drill hole 'assay' and 'whole rock' analytical results. In the print out, all 'anomalous' values have been highlighted, using an arbitrary series of threshold values, based on a semi-statistical analysis of the data.

## 4.0 FIELD INVESTIGATIONS

A field visit was made to the Lara-Chemainus properties in early August 1992 by Ivor Watson and Les Westervelt, in company with Roy Knight. Three target areas were examined for access and to assess the potential for doing further field work.

- a) Coronation West Anita
- b) Randy North Zone northwestward projection
- c) Silver Creek 262 Zone area

Examination of the Silver Creek - 262 Zone area included a traverse down Silver Creek across the 262 Rhyolite sequence to the Fulford Thrust/Nanaimo sediments contact. The felsic volcanics are intensely fractured and sheared. Alteration is associated with intensity of deformation and there is local development of pyritic zones. Five short adits had been driven on the more prominent shear/pyrite zones. Outcrop extending up Silver Creek north of the Lara-Chemainus property boundary has not been mapped by Falconbridge or Minnova/Abermin. Although no obvious 262 Zone was seen, the section merits more detailed mapping and prospecting.

# 5.0 OFFICE STUDY: 262 AND 126 ZONES

#### 5.1 INTRODUCTION

Following the initial appraisal of the Falconbridge and Minnova data and the August field visit, two targets were selected for more detailed office study.

- 1. 262 Zone mineralised chert (exhalite)
- 2. 126 Zone stringer mineralisation

Both targets underlie the eastern half of the Falconbridge Chemainus property, and the 262 Zone projects to surface on the Laramide property close to the common boundary.

#### 5.2 **PROCEDURE**

Two series of 1:2,000 scale drill hole/geological and assay working sections were constructed to provide a preliminary interpretation of the geology, using Laramide's database of Falconbridge and Minnova information and the BORSURV/AUTOCADD plotting programmes.

The first series of sections covers the 262 Zone using the Minnova Mine Grid (north-east section lines) for control. The area covered extends 'along strike' from the Mine Grid line 61W at the eastern boundary of the Lara property, to line 93W, about 600 metres west of Silver Creek. Across strike, coverage extends from the Nanaimo sediments in the south to beyond the Laramide/Falconbridge property boundary in the north. Altogether 25 working sections have been constructed; nine of those, in diagrammatic form,

accompany this report, and are indicated by the black dashes on the 1:10,000 scale geological plan.

The second set of sections was drawn using the Falconbridge north-south grid for control, and combines Falconbridge and Minnova data to provide continuous cross-sections over both the 126 and 262 zones, as shown on the plan.

The Minnova and Falconbridge 1:5,000 geological plans were used to plot surface geology relevant to the 1:2,000 sections. Only 'hard' data was incorporated into the sections, i.e. mapped outcrops and trench exposures. The 1:5,000 geological plans were then modified to reflect Laramide's revisions and re-interpretations of the drill sections. The various magnetometer, VLF and I.P. surveys of the area were used to corroborate interpretation, where possible.

The geological revisions have been incorporated into the 1:10,000 geological plan of the eastern half of the Lara/Chemainus properties accompanying this report.

### 5.3 262/126 ZONES - BACKGROUND

The **262** Zone was first intersected in Minnova hole 89-262. This hole was collared about 30 metres south of the Falconbridge Laramide property boundary and 400 metres east of Silver Creek (Section 90W Mine Grid). The zone here consists of a pyritic chert-tuff exhalative bed within the lower part of a sequence of felsic volcanics (262 Felsics/Rhyolite) and assays 1.42% Cu over 1.14 metres. Subsequent drilling has traced the host felsic unit over a strike length of over 4,500 metres, and the zone can be tentatively identified for about 2,500 metres of that length. The zone dips moderately northwards into the Falconbridge property.

The **126 Zone** was intersected in Falconbridge hole 90-126 (Section 11+50W Falconbridge grid) which was collared on the north boundary of the Brent 1 claim. The mineralised zone consists of chalcopyrite in quartz veins hosted by chloritic volcanic flows/tuffs, which overlie a thick sequence of felsic volcanics, identified by Falconbridge as the 'Sharon rhyolite'. The zone assays 2.17% Cu over 5.64 metres.

Falconbridge, on the basis of similar mineralisation, lithology and stratigraphy, has suggested that the 126 Zone is the extension of the Sharon Zone, which is exposed in trenches and adits, and is cut by hole 85-7, respectively 1,400 and 1,150 metres to the southeast of hole 126.

The nearest drill holes which might intersect the 126 Zone are at least 800 metres distant, east and west, from hole 126, and the great depth of overburden in this area (100 metres at Hole 126) effectively masks any magnetic or electrical geophysical response over a strike distance of 1,700 metres.

## 5.4 262/126 ZONES - SUMMARY

The 1:10,000 plan of the eastern half of the Lara-Minnova properties accompanying this report has been modified to reflect our re-interpretation of the geology. These modifications are based mainly on the new series of drill sections combining Laramide and Falconbridge data. Some of the more significant changes are discussed briefly below.

 Analysis and re-interpretation of the geology of the east half of the Falconbridge property (Holyoak claims) has identified a possible synformal structure between Silver and Solly creeks along the Laramide Falconbridge boundary. The mineralised 262 chert may represent the southern up dip edge of a massive sulphide sheet located within the synform beneath a gabbro sill. The northern edge of the synform appears to be truncated by steeply inclined faults.

- We have eliminated most of the extrapolated lithological contacts and interpreted fold axes in the area around drill 126 on the Chemainus property. This is an area of widespread deep overburden in which drill holes are too sparse and too widely spaced to provide continuity and interpretation of structure in an environment of such lithological and structural complexity.
- The drill hole sections east of Silver Creek (29, 30, 31 and 32W) suggest that the large gabbro intrusion between the 262 Felsics and the volcanic sequence on the Chemainus claims has been displaced by faulting in this area at least. Here and in the Sharon area, Falconbridge has noted steep or south-dipping gabbro contacts, observations at odds with the concept of a moderately northerly-dipping sill. The geologist who most recently mapped this area for BCMEMPR, Nick Massey, considers the gabbro to be a near vertical dyke. Our sections suggest a third possibility, that of a synform structure underlain by prospective rhyolitic volcaniclastic rocks. The form and nature of this gabbro intrusion is significant with regard to the effect it may have on the continuity and extent of the 126 and 262 zones.
- The geology of the Lara claims east of the Coronation Zone has been revised to incorporate the results of Minnova's 1989 and 1990 drilling. The sections show that the host 262 Zone felsic volcanics can be traced over a strike length of at least 4,500 metres and the 262 Zone or stratigraphic equivalents can be identified for about 2,500 metres of that distance. The Minnova drilling also indicates significant displacements by northerly-striking cross faults, recognisable by offsetting of the Nanaimo sediments contact. This is particularly evident between 20W and 27W (Falconbridge grid) and in the area around 11+50W. In the latter area there is an apparent? horizontal displacement of 400 metres.

# 6.0 LITHOGEOCHEMICAL STUDIES - Pearce Element Ratio (PER) Studies

Recent developments in lithogeochemistry involve the use of Pearce Element Ratio Analysis to identify the effect of hydrothermal alteration associated with VMS mineralising events, and to separate that effect from those of crystal fractionation and sorting present in the volcanic rocks prior to mineralisation.

By using molar instead of weight concentrations, material transfers can be related to chemical reactions. Thus metasomatic alteration haloes can be detected and used as indicators to VMS deposits. The process also allows the identification of cogenetic melts, e.g. it might be possible to establish whether the Coronation, 262, and Sharon Zone felsics are the same 'units', inferring repetition by folding or faulting, or are derived from different melts, and are therefore stratigraphically stacked.

The UBC Mineral Deposit Research Unit (MDRU) is currently making a preliminary analysis of Falconbridge/Laramide analytical data to determine if distinct element ratio trends can be recognised. If this is successful and these trends can be related to lithological units, identification of VMS alteration and trends thereof will be attempted.

# 7.0 SEISMIC STUDIES

A study is to be carried out in early June by a group that has developed seismic survey interpretation to a high degree of sophistication in the oil exploration industry and is interested in applying this technique to mineral exploration.

Following studies of the Lara-Chemainus data and a field inspection, the geophysicists have decided to make a preliminary survey, using lightweight portable equipment, to test the ability of the system to identify lithological changes, structure interfaces and sulphide zones. Traverses will be made across the Coronation Zone and across key geological successions encompassing the Nanaimo contact, the 'host' felsic units, and the gabbro intrusion.

Further work will depend on the success of the test studies.

# **8.0 RECOMMENDED WORK**

#### 8.1 262 ZONE

- The first phase of any further work on the 262 mineralised chert zone should be detailed mapping, prospecting and sampling of the very important geological section exposed along Silver Creek. The creek provides almost continuous outcrop spanning the sequence of Myra Formation volcanic rocks from the Nanaimo sediment contact north through the projection of the Coronation and 262 Zones and their host 'felsics', the gabbro intrusion, and the rhyolite volcanics adjacent to the 126 Zone. Our reconnaissance traverse of the creek in August 1992 indicated that more detailed mapping and sampling is required and that outcrop north of Line 37W on the creek has not been recorded on either Falconbridge or Minnova/Abermin maps. This is inexpensive but very valuable exploration.
- It is recommended that trenching be undertaken to expose the 262 Zone on the Lara property up-dip from the 90-262 hole intersection. Field examination in August and Abermin mapping suggest that overburden is shallow in this area. Access to the area is excellent.
- Thirteen possible drill sites spanning a strike length of 3,000 metres have been selected between Mine grid lines 91W and 62W. The holes have been positioned to test the 262 Zone 200 metres down-dip from known intersections. In most cases, a second and third hole can be drilled from the same location to provided 100-metre down-dip 'step-outs' should the first hole prove successful.

It is hoped that the lithogeochemical and geophysical seismic test work now underway will provide additional data that will help in defining targets more closely. At this stage the writer favours an initial drill test close to the original intersections obtained by Laramide holes 89-262 and 90-2.

#### 8.2 126 ZONE


This zone may represent a stringer zone 'below' a VMS deposit. At this stage, it is not clear which direction is 'up' and the proximity of the gabbro intrusion, as well as some doubt as to its form and attitude, make selection of drill sites very difficult. Here again, the lithogeochemical and/or seismic studies may help.

#### 8.3 ANITA-CORONATION TREND

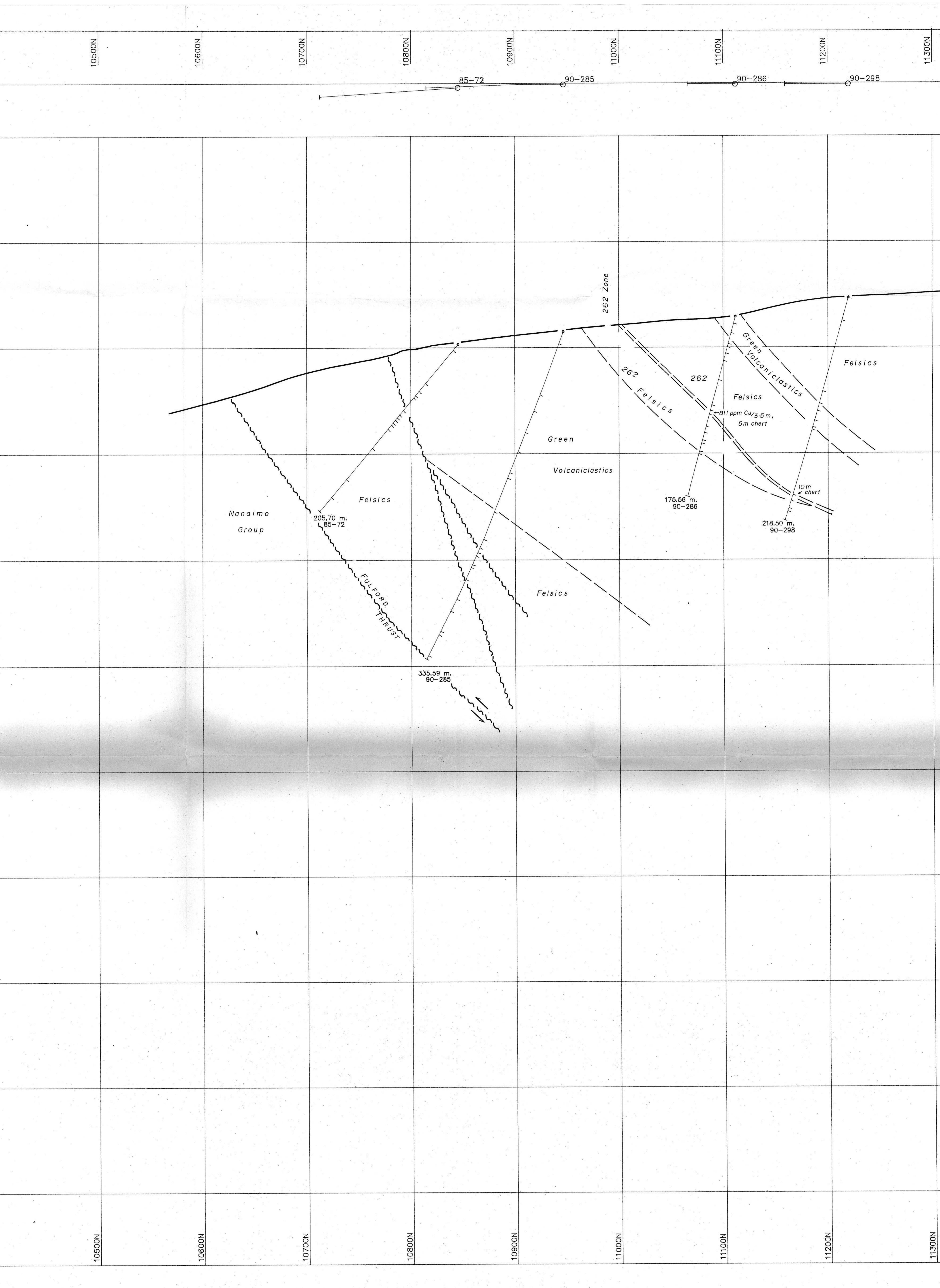
This trend has not been explored in great detail, and there is a sparsity of drill information between the two zones. It is not known whether the Anita and Coronation zones represent the same mineralising event. As a first step, detailed geological mapping and prospecting of the area is recommended. Further work would depend on results.

#### 8.4 RANDY NORTH ZONE - NORTHWESTERLY EXTENSION

The area along strike and northwest of the Randy Zone is also poorly known. Former Abermin employees who cut grid lines in this moderately rugged and drainage-incised part of the property claim to have seen outcrop, although none has been mapped. A preliminary prospecting venture should be made into this area and, if exposure does exist, a more intensive mapping, prospecting and sampling programme should be mounted along the Randy North trend.




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


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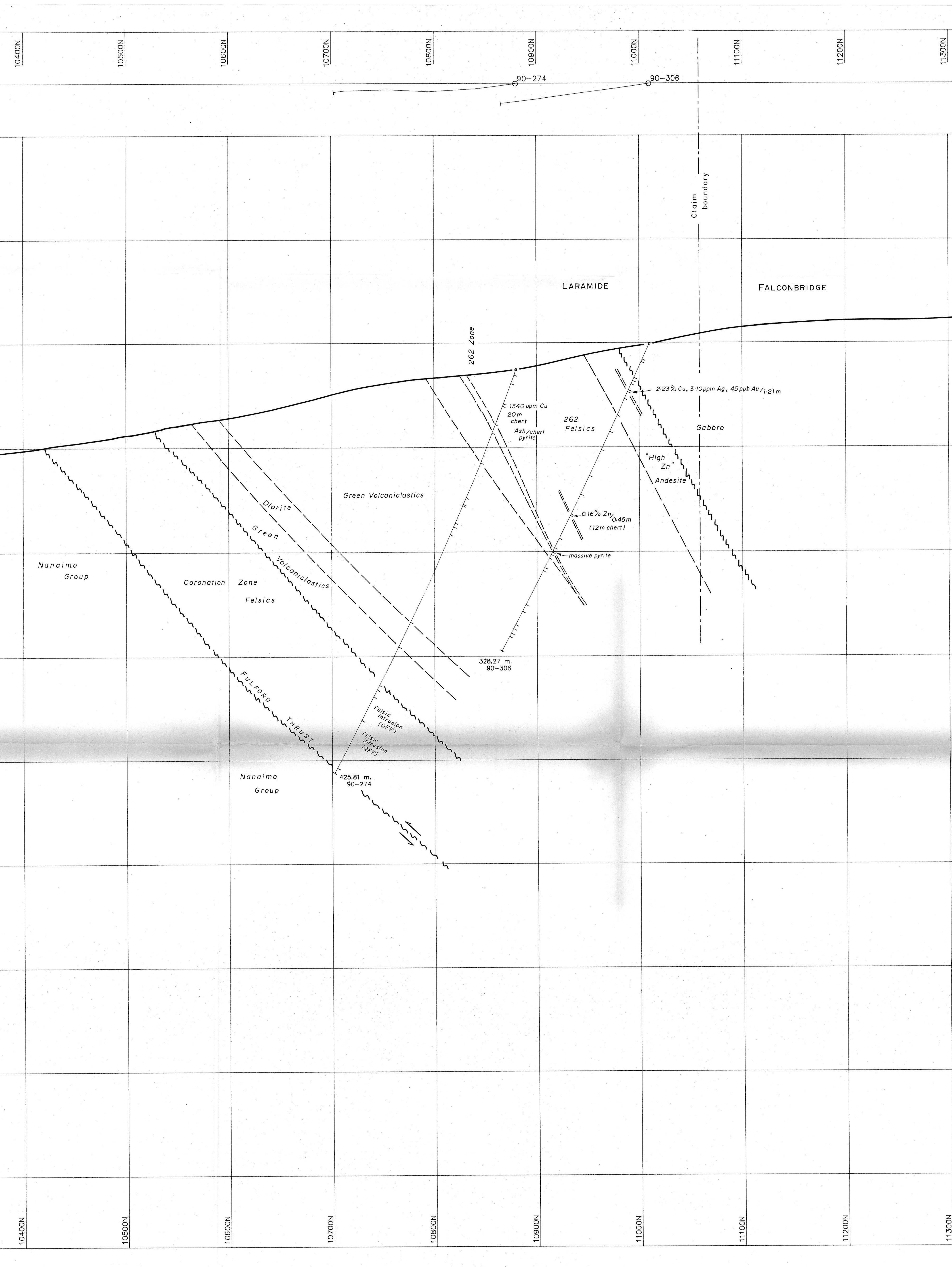
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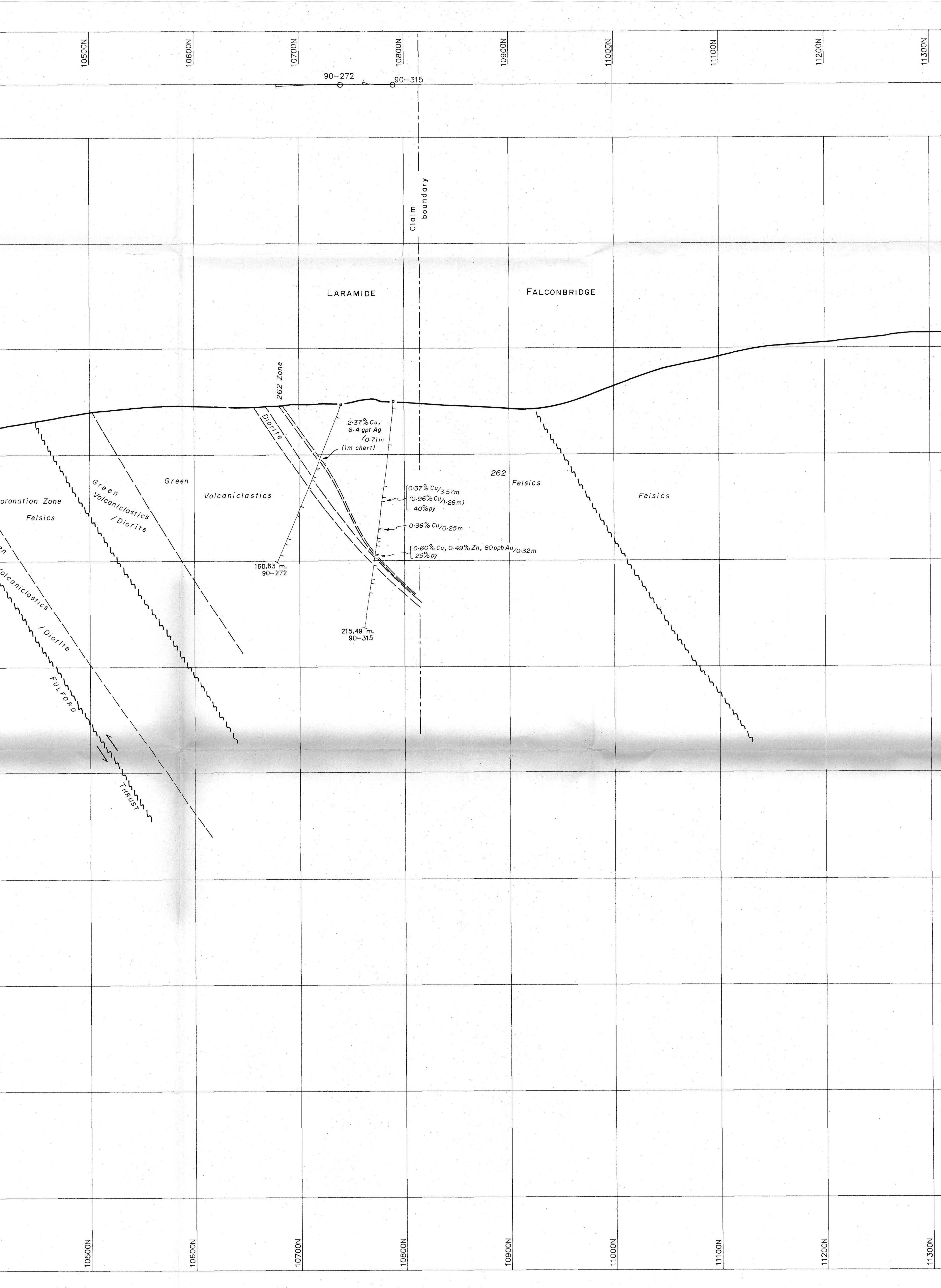
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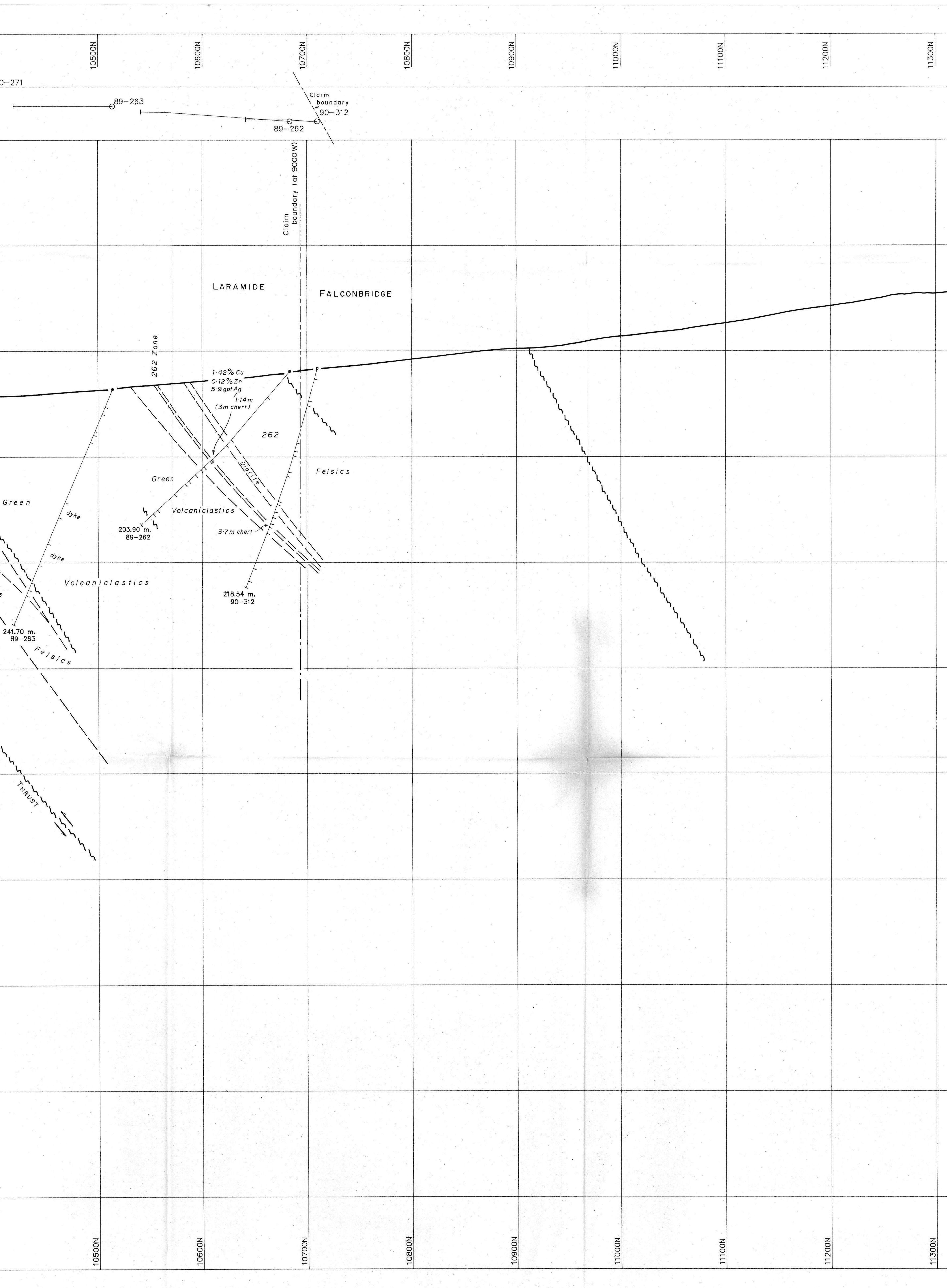
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