Box 7

1983 FINAL REPORT
ON THE
MULLIGAN PROPERTY

NTS 92G/11E

by

S. Enns, Geologist
G. Hendrickson, P. Geophysicist

January 1984 Project 911 Vancouver, B.C.

FIELD COPY

Kidd Creek Mines Ltd

1983 FINAL REPORT
ON THE
MULLIGAN PROPERTY

Squamish Area, Vancouver Mining Division
NTS 92G/11E
Lat. 49° 41'N Long. 123° 04'W

by

S. Enns, Geologist
G. Hendrickson, P. Geophysicist

Owned and Operated by:
KIDD CREEK MINES LTD.

January 1984 Vancouver, B.C.

TABLE OF CONTENTS

TABLE OF CONTENTS

APPENDICES

LIST OF ILLUSTRATIONS

SUMMARY

This report presents results of fieldwork conducted on the Mulligan property between June 15 and August 30, 1983. The property consists of one claim (8 units) wholly owned by Kidd Creek Mines Ltd. and is located in the rugged Coast Range of southwestern British Columbia about 40 km north of Vancouver.

The fieldwork consisted of cutting and surveying an 11 line-km grid, 1:2500 scale geologic mapping, soil and rock sampling, and IP/Resistivity and magnetometer surveys.

The claims cover part of the Indian River Pendant within the Coast Range Complex. They are underlain by a calc-alkaline sequence of felsic to intermediate, subaerial(?) volcanic flows and related pyroclastic rocks of the Upper Jurassic to Cretaceous Gambier Group in contact with granodiorite. Quartz-pyrite-sericite alteration is associated with northwest-trending shear zones which are mineralized by semi-massive to massive lenses and stringers of pyrite, minor chalcopyrite and sphalerite.

Analytical results from approximately 200 soil samples collected from the B-Fe horizon do not show any significant or coherent soil anomaly pattern on the Mulligan grid. One out of a dozen rock samples collected on the property indicates the weak presence of Au in a narrow pyritic vein in an area weakly mineralized with base metals.

A moderately strong chargeability anomaly with short strike length was located in the middle of the

claim. Strong pyrite mineralization partially explains the cause of this anomaly. The magnetic survey revealed an unexplained, strong, dual magnetic anomaly with no IP response at the north end of the claim.

More prospecting and possibly trenching and drilling to determine the mineralized potential of the geophysical anomalies should be considered in coordination with further exploration on the Baldwin-McVicar property

Exploration expenditures on Mulligan during 1983 totalled approximately $19,000 of which $11,200 was applied as 7 years of assessment on the Mulligan 1 claim.

CONCLUSIONS

The geology of the Mulligan property is similar to that of the Baldwin-McVicar property. The base metals potential is, however, considered to be more limited.

Geophysics indicates a higher overall sulphide content on the Mulligan claim which generally increases toward the intrusive contact. A strong chargeability anomaly lies near the centre of the claim. It is caused by a pyritic shear(?) zone.

Possible Au potential associated with this shear(?) zone justifies further work by Kidd Creek.

RECOMMENDATIONS

Two areas recommended for more detailed future exploration are as follows:

1. The chargeability anomaly at 17+00W, crossing L52 and L54 should be tested by one 350 m drill hole inclined at -45° and directed west-southwest. All core should be systematically sampled and analysed for Au. The trench at the south end of this anomaly should be cleaned and resampled. Detailed prospecting in the immediate vicinity of the anomaly should also be carried out.

2. The region around station 15+00W on L52 should be prospected in detail and more sampling of pyritic veins and base metal veins should be conducted to determine the potential for Au in the vicinity of a single anomalous rock sample.

S. G. Enns

INTRODUCTION

Location, Access and Terrain

The Mulligan property (Lat. 49°41'N, Long. 123° 05'W) is located in southwestern British Columbia, about 7 km east-southeast of the port of Squamish (Figure 1). The claim is situated on Ray Creek, a tributary of the Stawamus River (Figure 2).

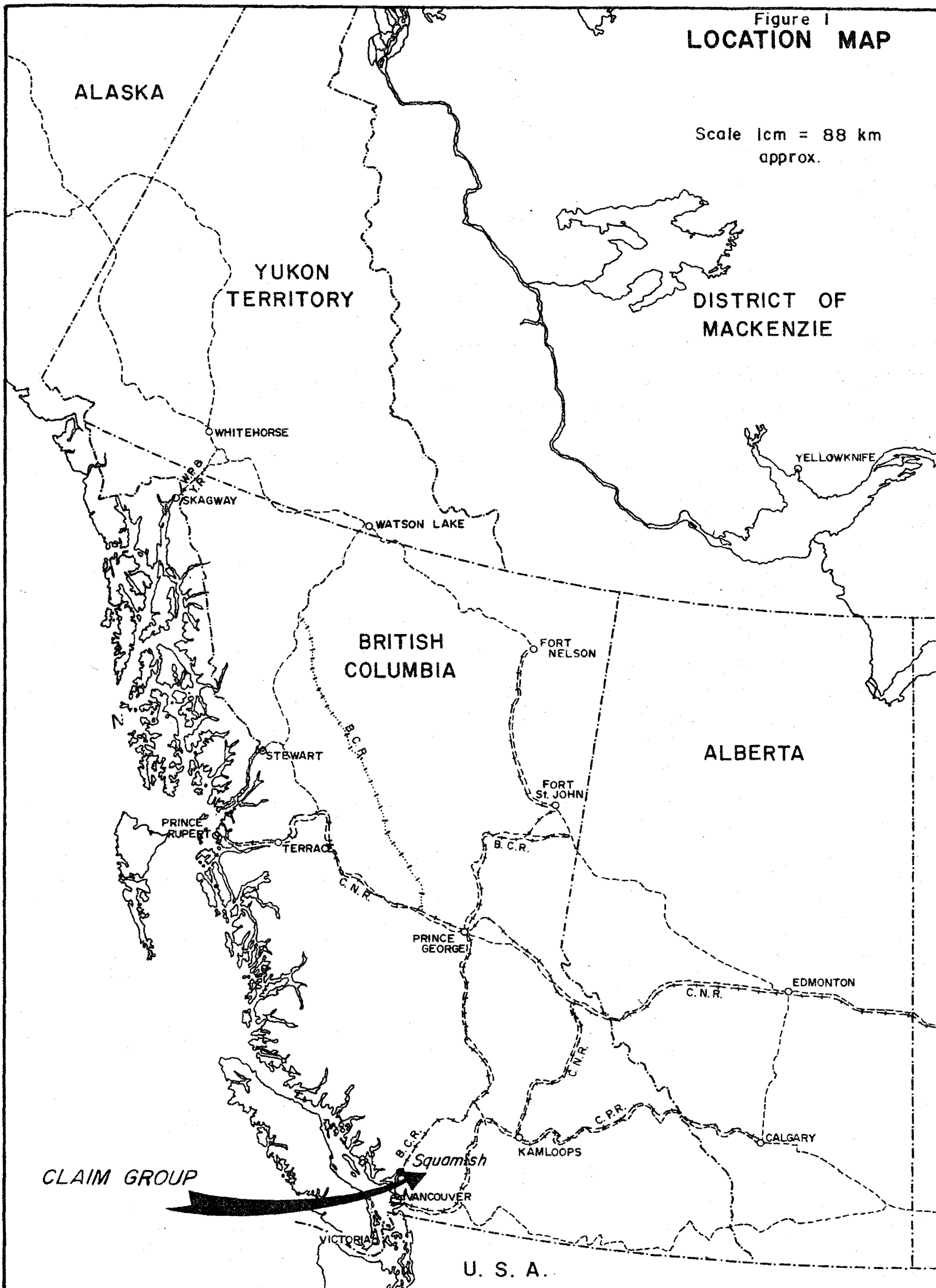
Access to the main area of the claim is by a logging road which turns south up the hill from the B.C. Hydro line maintenance road. This road winds its way up the hill ending up in Ray Creek basin; the upper 1 km of road is not driveable. Access to the extreme west end of the claim is by B.C. Hydro line access roads on either side of Ray Creek. The hydro line crosses the west side of the claim. The southwest corner must be approached from a road running north from the second Stawamus River bridge.

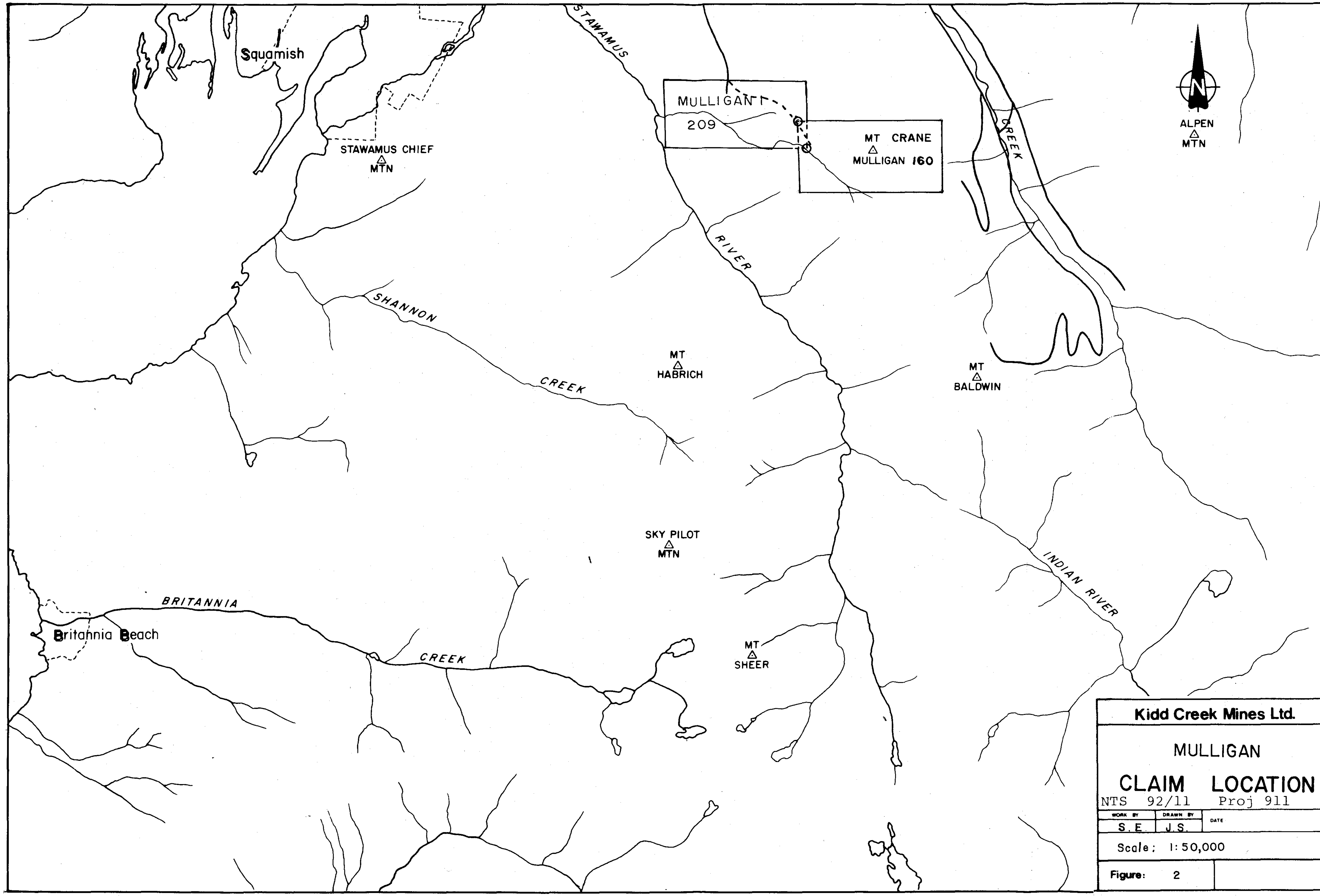
Terrain on the claim is varied with elevations ranging from 400 m to 1250 m. The steepest topography is situated in the western part of the claim. Forty degree slopes are common here; Ray Creek canyon is particularly hazardous. Upper Ray Creek basin is relatively flat with alpine swampy clearings. Most of the property is timbered; approximately 35 percent has been logged and is covered with second growth brush accompanied by partly regenerated timber.

Annual periods of heavy rainfall in spring and fall characterize the moderate climate of this region. Heavy snowpack may be anticipated until early summer. The entire property was clear of snow by July 7 in 1983. By mid-October, permanent snow may be expected.

Figure 1

LOCATION MAP




Squamish
STAWAMUS CHIEF MTN
STAWAMUS
MULLIGAN I
209
MT CRANE
MULLIGAN 160
CREEK
ALPEN MTN
RIVER
SHANNON
CREEK
MT HABRICH
MT BALDWIN
SKY PILOT MTN
INDIAN RIVER
BRITANNIA
Britannia Beach
CREEK
MT SHEER
Kidd Creek Mines Ltd.
MULLIGAN
CLAIM LOCATION
NTS 92/11 Proj 911
WORK BY S.E.
DRAWN BY J.S.
DATE
Scale: 1:50,000
Figure: 2

Property Definition

The Mulligan 1 currently consists of a single MGS claim comprised of 8 units (200 hectares) as shown in Figure 2. This claim was staked September 29, 1977 and recorded on October 7, 1977. The annual work requirement is $1600. 1983 field work applied to assessment ($11,600) should keep the claim in good standing until 1992.

1983 PROGRAMME

The 1983 fieldwork explored the property for Au and base metals sulphides in conjunction with fieldwork conducted on the nearby Baldwin-McVicar property.

The work consisted of line cutting, grid surveying, geological mapping, soil sampling and a detailed IP/resistivity and magnetometer survey.

Van Alphen Exploration of Smithers, B.C. completed 11-km of line cutting on the property. East-west grid lines were spaced at 200 m intervals cut to a specified average width of 0.9 m and deviation of less than 25 m per km. Hazardous slopes in the deeply incised Ray Creek terminated some of these lines where local slopes averaged more than 45°.

Grid stations were chained at 20 m intervals using a clinometer and slope corrections were added. Existing roads, streams, claim posts and trenches were tied into the grid.

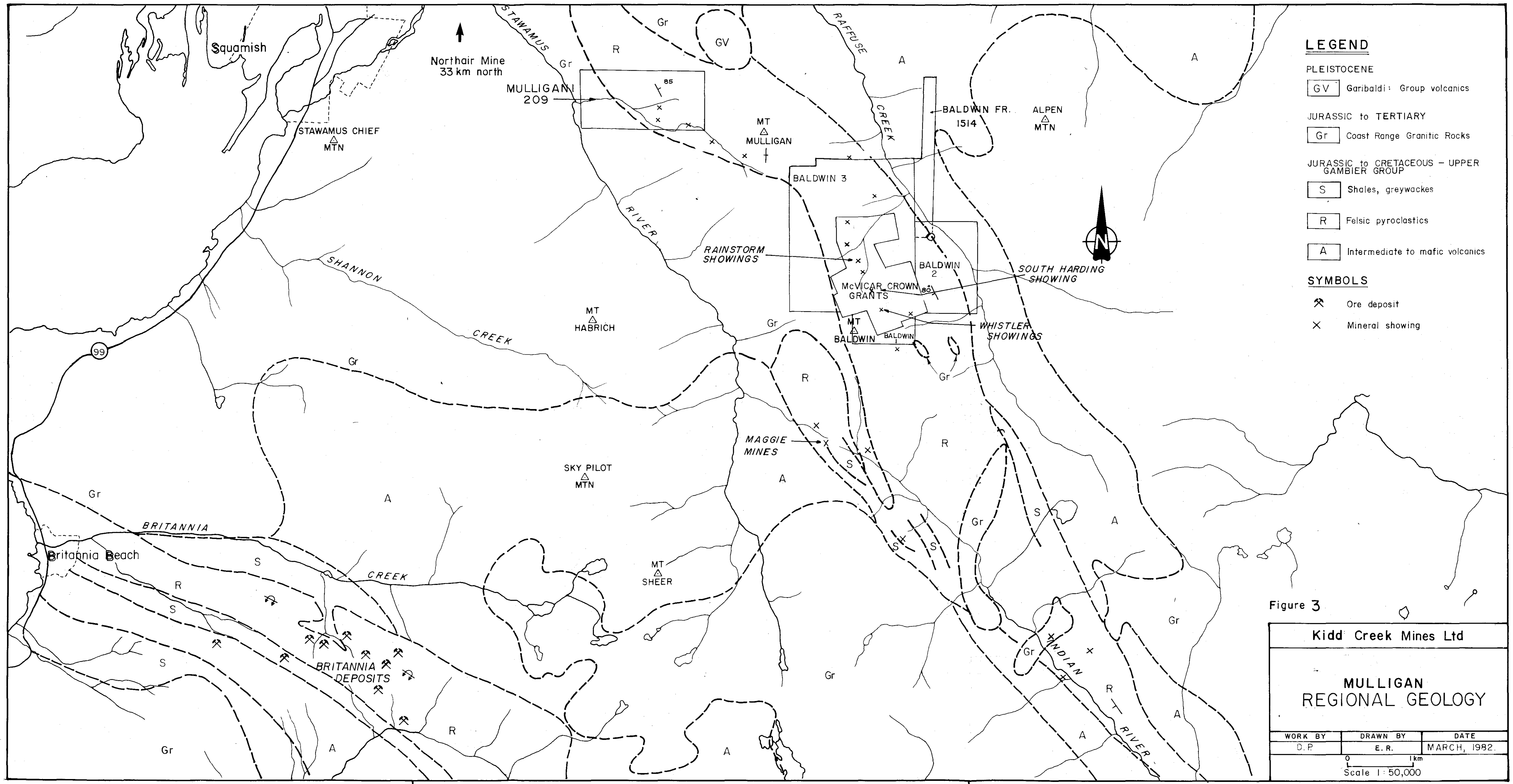
For future computer storage of numerical data, the UTM co-ordinates of station 10+00W on L50 are given as Zone 10, 496,100 E 5,503,300 N. This station is at an elevation of 1160 m.

REGIONAL GEOLOGY

As shown by Figure 3, the property lies within a belt of intermediate volcanic and volcaniclastic rocks belonging to the Cretaceous Gambier Group which forms part of the Indian River Pendant. This pendant is one of many remnants of stratified rock within the Coast Crystalline Complex. Regional grade of metamorphism is generally greenschist rank and strong contact metamorphism is present near some plutonic bodies.

The pendant, measuring about 4 km by 20 km, trends north-northwest and is connected to the Britannia Belt (10 km to the southwest) by a "bridge" of volcanic rock. The Indian River Pendant tapers to the southeast and is in contact with younger Garibaldi volcanic rocks to the north. This pendant generally contains a greater proportion of pyroclastic material and a smaller marine sedimentary component, than the Britannia Belt.

Rocks of the Indian River Pendant probably are correlative with the upper part of the Gambier Group of Upper Jurassic to Lower Cretaceous age. Details of regional geology are described by Roddick (1965) and James (1929) as listed in the Bibliography.



LEGEND
PLEISTOCENE
GV Garibaldi Group volcanics
JURASSIC to TERTIARY
Gr Coast Range Granitic Rocks
JURASSIC to CRETACEOUS - UPPER GAMBIER GROUP
S Shales, greywackes
R Felsic pyroclastics
A Intermediate to mafic volcanics
SYMBOLS
Ore deposit
Mineral showing
Squamish
Northair Mine
33 km north
MULLIGAN I
209
STAWAMUS CHIEF MTN
MT MULLIGAN
BALDWIN FR. 1514
ALPEN MTN
BALDWIN 3
BALDWIN 2
RAINSTORM SHOWINGS
SOUTH HARDING SHOWING
McVICAR CROWN GRANTS
WHISTLER SHOWINGS
MT BALDWIN
MT HABRICH
SKY PILOT MTN
MAGGIE MINES
MT SHEER
Britannia Beach
BRITANNIA CREEK
BRITANNIA DEPOSITS
STAWAMUS RIVER
SHANNON CREEK
RAFFUSE CREEK
INDIAN RIVER
99
Figure 3
Kidd Creek Mines Ltd
MULLIGAN
REGIONAL GEOLOGY
WORK BY D.P.
DRAWN BY E.R.
DATE MARCH, 1982
Scale 1 : 50,000

PROPERTY GEOLOGY

Introduction

Geologic mapping was conducted at a scale of 1:2,500 using a cut grid for control. Bedrock was mapped along and approximately 50 m either side of cut lines and along some stream beds.

The outcrop available for mapping is generally quite sparse; less than 3 percent exposure is mainly limited to steeper slopes and incised stream beds. Much of the outcrop is moss-covered except for bedrock slopes undergoing active erosion.

Lithology

The property geology is shown on Figure 4 and is very similar to the geology on the Baldwin-McVicar property. A volcanic sequence consisting of felsic to intermediate flows and related pyroclastic rocks underlies most of the property. This sequence is in contact with Coast Range granodiorite which is generally restricted to the southwest third of the claim.

Seven units were mapped on the property, the descriptions of which are given in Appendix B. The geology, as mapped in 1983, is generally similar to the geology as mapped by DeLancey in 1978. Contacts as shown by Figure 4, have, however, been simplified.

The volcanic succession on the Mulligan property is comprised of rhyolite to dacite flows and felsic pyroclastic rocks, andesite flows and minor pyroclastic rocks, and rare black argillite. The felsic flows and pyroclastic rocks are by far the most abundant based on mapping of a few scattered outcrops. They appear across the claim as a single band of felsic volcanic rocks. Interbedding of the rhyolite and dacite flows with pyroclastic equivalents and rare black argillite is indicated along the road 100 m north of 18+00W on L60. As implied by designated unit numbers on Figure 4, the relative ages of units within the succession have been inferred from the Baldwin-McVicar cross sections.

A single sample of rhyolite was collected for whole rock analysis. This sample was plotted on an AFM diagram together with the Baldwin-McVicar samples and falls within the calc-alkaline field. The plot shown at the end of Appendix B indicates that the sampled felsic flow at Mulligan is the most siliceous rock of all samples from both properties. Several outcrops at approximately 15+00W along the washed out road cut near L58 also indicate their highly siliceous composition by the presence of abundant quartz phenocrysts. The quartz porphyry rhyolite here contains about 10 percent double-terminated quartz crystals and is the most quartz-rich flow noted either on the Mulligan or Baldwin-McVicar properties.

Andesite flows and related pyroclastic rocks are interbedded with felsic components and occur in greatest abundance near the granodiorite contact.

Structure

The volcanic stratigraphy has a northwesterly strike. A single attitude in argillite indicates a steep northwest dip. The magnetic data also generally indicates a steep westerly dip to the beds. Interbedding of rhyolite and tuffs is more prevalent than indicated by the geology map. This is supported by the variable apparent resistivity pattern, shown on Figure 8.

Numerous northwest-trending subvertical shear zones have been identified by mapping. The shear zones are accompanied by development of quartz sericite schist with varying amounts of pyrite.

The granodiorite contact subparallels stratigraphy. In places it is accompanied by intense fracturing zones related to faults. These faults have controlled the position of Ray Creek due to the more fractured nature of bedrock. A complex intrusive contact relationship is indicated at about 20+00W on L 52 and 21+00W on L 54.

Mineralization

Numerous small pits, a few trenches, several short adits, and a vertical shaft were driven by prospectors on the property. These are located as shown on Figure 4.

Most of the mineral occurrences are pyritic shear zones; pyrite is accompanied occasionally by small amounts of chalcopyrite and minor sphalerite. The pyrite content is variable and occurs as strong disseminations, veinlets and stringers; it is rarely semi-massive. True widths of massive pyrite reach a maximum of 0.5 m.

The strongest mineralization was seen in a long trench located immediately north of L 52 at about 17+00W. Poorly exposed bedrock and boulders display two types of pyrite: the common medium-grained, disseminated and veined variety of pyrite, and an unusual, very aphanitic muddy-looking pyrite. The latter type of pyrite closely resembles sedimentary pyrite in appearance. Little or no visible chalcopyrite was noted. This trenched showing also marks the south end of the strongest chargeability anomaly on the property.

A small, 10 to 15 m shaft, driven at about 12+00 W just north of L 50 appears to have intersected barren rock. Granodiorite and pyritic andesite and dacite are represented on the dump.

An area of strong pyrite and weak clay and chlorite alteration was noted within granodiorite at about 25+00W, north of L54 on the west side of the claim. Conspicuous limonite development is present in the talus. Very minor chalcopyrite accompanies pyrite along fractures here and there.

The best base metal showing in this area is the main vein on the adjacent Crane claim. This showing has been trenched and drilled with disappointing results. Mineralization consists of a band (up to 0.1 m wide wide), of strongly disseminated to semi-massive pyrite with chalcopyrite and minor sphalerite seams. It appears to be a silicified, shear-controlled zone with an attitude of 050°/80E. Host rock is coarse lapilli tuff with white and grey cherty rhyolite clasts, black altered intermediate volcanic clasts and rare pyritic clasts. The tuff is clast-supported. The texture of some of the pyrite mineralization suggests recrystallization.

Discussion

The nearby Baldwin-McVicar geology extends westward onto the Mulligan property. Similar lithology at Mulligan suggests a subaerial environment but relative stratigraphic position of the Mulligan sequence is unknown. Weaker copper and zinc mineralization appear to be present with the structurally controlled pyrite zones indicating a limited base metal potential compared with

Baldwin-McVicar. The target on the Mulligan property is a Au-bearing pyritic zone which may be strongly controlled by structures such as faults or shears.

A gradual increase in disseminated pyrite on fractures, as the granodiorite contact is approached, indicates a degree of control by granodiorite on this style of pyrite occurrence, (quite likely as an overprinting on the stratigraphy). This implies at least two generations of pyrite formation.

The strong pyrite zone cut by an old trench at approximately 17+00W on L54 is regarded as interesting despite the absence of accompanying visible base metal sulphides. Only one sample was collected at this locality because of poor bedrock exposure over most of the trench length. More sampling would be helpful in determining the Au potential of this zone.

GEOCHEMISTRY

Introduction

Exploration for gold and base metal mineralization was aided by soil geochemistry and selective rock sampling.

Approximately 200 soil samples were collected along cut grid lines and along several abandoned roads. Sample spacing was approximately 50 m. The B-Fe horizon was systematically sampled at depths ranging from 20 to 75 cm; on average the B-Fe depth at the Mulligan property was shallower than on the Baldwin-McVicar claims. Sample excavations were made using a heavy mattock with a root-cutting edge.

Humic podsols developed on glacial drift, predominate on the west-facing slope covered by partially logged off mature timber. Most of the property is well drained.

Samples were collected by hand in Kraft paper envelopes, dried and shipped to Acme Analytical Laboratories in Vancouver, B.C., where they were dried and sieved. The minus 80 mesh fraction was analysed as follows:

> A 0.5 gm sample was digested with 3 ml of 3:1:3 HCl: HNO_3:H_2O for 1 hr at 90°C then diluted to 10 ml with H_2O and analysed by ICP method for Cu, Pb, Zn and Ag. Au analysis used a similar digestion for a 10 gm sample. Au was extracted with MIBK and analysed using AA with a lower detection limit (5 ppb).

Visibly altered and mineralized rock was also systematically sampled by collecting approximately 1 to 2 kg unweathered rock. About 12 samples were collected, one of which was collected for whole rock analysis. The altered and mineralized rock consists of pyritized, silicified, often quartz-veined and sericite-altered volcanic rock. Visible mineralization consists of varied quantities of pyrite accompanied by minor chalcopyrite and sphalerite.

All rock samples were crushed to minus one-quarter inch, split and then pulverized at Acme Analytical Laboratories, Vancouver, B.C. The digestion, extraction and analysis of rock samples was the same as that described for soil.

Analytical Control

In conjunction with the soil survey on nearby Baldwin-McVicar property, analytical control was employed to determine the quality of geochemical data produced by Acme Analytical Laboratories. A known reference control standard and a blind duplicate split were submitted with each 40-sample batch to check laboratory accuracy and precision respectively.

A grey Carolin Gold tailings sample was used for the reference control standard. It has a mean value of 1660 $\pm$ 195 ppb Au. Ideally, several control standards with lower values in the range 100 to 500 ppb should have been used. Individual replicate results are listed in Appendix D of the Baldwin-McVicar 1983 Final Report (Enns, 1983).

The Cu, Zn and Pb results are very good based on graphical plots of the blind duplicate split samples given in Appendix D in the above cited report. Most samples fall within ± 10 percent precision limits. Ag results are good for all samples with greater than 0.5 ppm; about 50 percent of the total samples fall within ± 20 percent precision limits. However, the precision limits increase drastically below 0.5 ppm values as the lower detection limit for Ag is approached. The arsenic data shows poor precision with less than 30 percent of the samples falling within ± 20 percent precision limits. Three highly contaminated samples are evident. The As analysis by ICP determination are not considered reliable.

Au data show poor precision with the majority of the samples clustered near the lower detection limit. Approximately 60 pulps from the Baldwin-McVicar property, with a range between 5 and 325 ppm, were re-analysed at the end of the season. These data show wide variation of calculated percent precision limits which have a range of 0 to 37 percent and a high standard deviation about the mean, again suggesting poor analytical precision across this broad range. The analytical Au data are deemed good enough to indicate Au content semi-quantitatively.

Orientation Survey

An orientation survey was conducted to determine background and anomalous values in soils, metal distribution with various soil horizons and optimum size fraction for analysis. This orientation was achieved by sampling six soil profiles, three from the Baldwin-McVicar property and three from Maggie Mine's Au showing, situated in the adjacent Indian River drainage. Between three and five horizons were sampled at each site. All samples except the organic horizon samples were then screened into triplet groups consisting of -10 + 80, -80 + 200 and -200 mesh fractions, which were analysed for Cu, Pb, Zn, Ag, As by ICP. The Au was analysed by atomic absorption and neutron activation methods. Chemex Labs of North Vancouver, B.C. performed the analysis.

The data indicated that although sampling of the C horizon would be preferable because of higher Au values inherent in this horizon, the more practical sampling of the easily recognizable B-Fe horizon was more than adequate. The -80 mesh screen size was found to be a good one to analyse. As expected, Cu, Pb and Ag in most samples show a slight increase with finer fractions but the same is true of Zn only in anomalous soils. Less than 40 ppb Au are background values, those exceeding 100 ppb are definitely anomalous. Although As values tend to increase with elevated Au values this limited increase, in addition to questionable As IPC analysis precision, indicates that As is not a useful Au pathfinder element.

Presentation of Results

Analytical results for soil samples are shown in Figures 5 and 6. The analytical results for rocks are shown in Figure 10, which shows locations of all geochemical samples on the Mulligan property.

Visual inspection of results and the knowledge of metal values at the nearby Baldwin-McVicar property were used to establish threshold values. The following element values were used to define first and second order anomalies, herein termed strong and weak anomalies:

Element	Strong Anomaly	Weak Anomaly	Background
Au	> 100 ppb	> 50 ppb	5 - 10 ppb
Ag	> 2 ppm	> 0.9 ppm	0.1- 0.3 ppm
Cu	> 200 ppm	> 100 ppm	10 -20 ppm
Pb	> 150 ppm	> 75 ppm	10 -20 ppm
Zn	> 300 ppm	> 200 ppm	75 -100 ppm

Au values exceeding 1000 ppb in rock were considered to be of interest and possible significance. Because rock samples were grab samples, Cu, Pb, Zn and Ag values were generally ignored except as guides to relative strength of base metals present in the sample and to determine metal associations.

Results

The data do not show any significant and coherent soil anomaly on the Mulligan property. Instead, isolated anomalous samples are present within a low background of base metal values. This may in part be the result of heavy masking of hydromorphic dispersion by the thick glacial cover which occupies much of the property.

The strongest individual Cu and Zn sample is situated on L58 at 22+00W and nearby the strongest Au sample (560 ppb) is located on the same line at 22+50W.

A broad but very weak Ag anomaly lies along L58 from 18+00W northeast to the baseline.

None of the two mentioned anomalies are related to known mineralization. Their source is unexplained. The former is underlain by felsic pyroclastic rocks and the latter by rhyolite flows.

The two isolated Cu and Pb anomalous soil samples along L54N between 18+00W and 17+00W and the sample at 18+00W on L52N may be related to weak base metal mineralization associated with shear zones mapped in this vicinity. The strongest chargeability anomaly also underlies this region.

About 12 rock samples were collected from mineralized and altered shear zones on the property. The best sample, containing 1000 ppb Au and 14.4 ppm Ag, came from a location at approximately 15+00W south of L52 where bedrock had been stripped of vegetation cover. A quartz veined zone with minor sphalerite and chalcopyrite cuts across pyritic felsic lapilli tuff host rock. The sample was taken from a 2 cm wide pyrite seam.

For the Induced Polarization survey, current electrodes (AB) were stainless steel while potential electrodes(MN) were porous ceramic pots filled with copper sulphate and containing a copper electrode. These more elaborate potential electrodes are considered necessary to prevent undesirable electrode polarization in a high accuracy survey such as this. This type of potential electrode works on the principle that an electrode immersed in a solution of one of its own salts cannot polarize.

The Schlumberger electrode array was used for the following reasons:

(a) simple anomaly shape

(b) provides some information on dip

(c) least affected by topography

(d) better signal-to-noise ratio for a given depth of investigation (important when using a small portable transmitter).

(e) operational ease in rough topography

(f) good lateral resolution provided "MN" is kept small

Transmitter dipole separation on the survey was fixed at 140 m horizontal and the receiving dipole separation was fixed at 20 m horizontal. However, slope distance electrode separation varied considerably with the topography. The current dipole (AB), while remaining parallel to, was separated from the receiving dipole (MN) by a few metres. This separation avoided or reduced any inductive and/or capacitive coupling problems. In addition, three slices of the decay curve were monitored to ensure curve shape was normal. Extra effort was made to ensure electrode contacts with the ground were always well under 50 k ohms. The care taken with the survey, plus strong primary signals (generally much greater than 50 mV) ensured data accuracy to within one or two milli-seconds. The survey tested the 10 to 70 metre depth with prime emphasis on the upper 25 metres. A curve showing the typical depths of investigation characteristics for the array (assuming homogeneous ground) is included as Appendix C.

For the magnetic survey a base station magnetometer was run continuously (sampling every 10 seconds) to monitor the diurnal shift of the earth's magnetic field. A portable magnetometer was used with the sensor attached to a tall staff to ensure against errors created by magnetic objects on the operator. Both magnetometers were total field microprocessor-controlled instruments capable of performing automatic diurnal corrections and plotting when connected to each other and a suitable printer. These state of the art instruments proved to be very convenient to use and durable under field conditions. A base station standard of 56000 nanotesla was assumed for all diurnal corrections.

An additional procedure not normally needed but essential on this project was the supply of studded boots to the crew to assist in climbing the steep, vegetated and often slippery slopes.

Discussion of The Results

A moderately strong, (more than 40 m sec) short strike length chargeability anomaly exists on lines 52 and 54 north at approximately 17+00W. This anomaly consists of several parallel bands extending to approximately 18+60W. The trenching done by a previous operator at the south end of this anomaly uncovered pyrite in shear zones which partially explains the source of the anomaly. The structural pattern suggested by the shape of this anomaly is unusual.

Other weaker chargeability anomalies exist, however, pyrite observed in outcrop tends to explain these. All of the chargeability zones tend to flank the granodiorite intrusive.

The resistivity plan shows the intrusive on the west side of the grid to be very resistive (> 5000 ohm-m) which is normal. Most of the grid excluding the intrusive area is underlain by rocks of approximately 500 to 1000 ohm-m values typical of tuffaceous rocks or metasediments. Intermediate volcanic rock probably occurs in areas where the resistivity increases to 2000 to 3000 ohm-m. The resistivity map is a useful geologic tool when calibration in outcrop areas is possible.

The magnetic survey revealed strong dual anomalies on line 58N at approximately 18+50W. These anomalies have appreciable width, however, they do not have any direct chargeability response; thus magnetite is the likely cause. Dip of these two anomalies is steep to the west.

Strong, yet erratic magnetite concentations in the intrusive at the western end of line 50N are quite unusual. The intrusive on other lines tends to be relatively non-magnetic, which is normal.

Other minor magnetic zones exist, however, they are not of interest other than for giving local dip indications, most of which suggest a steep westerly dip to the strata.

Conclusion

The fact that the anomalies tend to follow the eastern flank of the intrusive suggests they are related to contact metamorphic effects. Additional trenching and sampling is warranted on the main chargeability anomaly to ensure the gold potential is fully tested. If the results of this proposed trenching are negative, there would be little reason to continue geophysical work on the property.

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APPENDIX A
Property History

Property History

In the early 1900's, several open-cuts and adits were driven on lenses of massive to semi-massive pyrite outcropping in upper Ray and Little Ray Creeks. Local concentrations of chalcopyrite and sphalerite are associated with a few of these showings. Claims at that time included the Bruce, Radiant and Contact groups.

In 1929, a "Radiore Electrical Survey" was conducted in the area of Ray Creek basin by Radiant Copper Ltd. The survey indicated a number of weak conductors, which appeared to be caused by "pyritic shear zones."

Later work focused on a copper showing at the head of the basin; (on the Crane claim) three diamond drill holes tested this showing but results were unencouraging.

In March 1977, M. Levasseur staked the Crane claims (Figure 2) over the Ray Creek basin area; assessment work included some Cat trenching on the copper showing. On October 1977, Texasgulf Inc., (now Kidd Creek Mines Ltd.,) staked the Mulligan 1 claim centred on Ray Creek. On March 13, 1978 the Crane claim was optioned by Texasuglf Inc. from Eagle River Mines, who had acquired the ground from M. Levasseur.

During 1978, work on the property included geological mapping at a scale of 1:5,000, limited geochemical (silt and soil sampling along Ray Creek and in Ray Creek basin) and limited geophysical (VLF and horizontal loop follow-up) surveys. The Crane claim option was dropped in 1979.

In 1982, the Mulligan 1 claim was covered as part of a larger airborne magnetic and VLF-EM survey flown by Aerodat Ltd. Results over the property were negative.

APPENDIX B

Description of Lithologies

Unit 1 consists of andesitic pyroclastic rock located mainly in the southwest part of the property near the granodiorite contact. This lithology is massive and weathers dark green to brown; fresh rock is a dark green colour. Clasts range in size from lapilli to block tuff and are composed of andesite and minor granodiorite. This unit is interbedded with andesite.

Unit 2 is a dark green andesite flow which weathers to massive outcrop. The rock consists of about 15 percent subhedral to euhedral white plagioclase phenocrysts about 1 mm in size and up to 5 percent hornblende phenocrysts about 0.5 mm in size. Matrix is aphanitic dark green to black in colour.

Unit 3 is composed of felsic to intermediate pyroclastic rock which occurs as a broad northwest- trending band. This unit is intimately interbedded with felsic flows. Outcrops commonly display knoby differential weathering of clasts. Clasts range in size from ash tuff to block tuff; coarse lapilli tuff are most common. Clast composition is heterogeneous, composed of cherty rhyolite, dacite and minor andesite. The matrix is fairly siliceous in places, elsewhere it appears to be composed of a dirty mixture of chlorite-rich material.

Near the granodiorite contact this unit contains significant pyrite as 2 to 3 percent medium- to coarse-grained disseminations, and as fracture fillings; pyrite locally reaches a total of 7 to 8 percent in places.

Unit 4 occurs as a broad band of felsic flows which trend northwest across the claim. The composition varies from rhyolite to dacite. In appearance, this rock is pale grey, grey-green or white and often siliceous (cherty).

Outcrops weather white and are massive. Locally, up to 10 percent double terminated quartz crystals are present, and range in size from 1 to 3 mm. 10 to 15 percent euhedral to subhedral feldspars are the most common phenocrysts and range in size from 1 to 4 mm. In places, delicately laminated flow textures are present.

Unit 5 is a black argillite of restricted occurrence interbedded with felsic pyroclastic rocks. A bedding attitude dipping steeply to the northeast was observed along a road cut at about 18+00W north of L 50 but argillite bedding is regarded as unreliable due to its structural incompetence.

Unit 6 is a medium- to coarse-grained, grey granodiorite which underlies the southwest third of the property. The granodiorite belongs to the Coast Range intrusions and is probably an offshoot from the Squamish batholith.

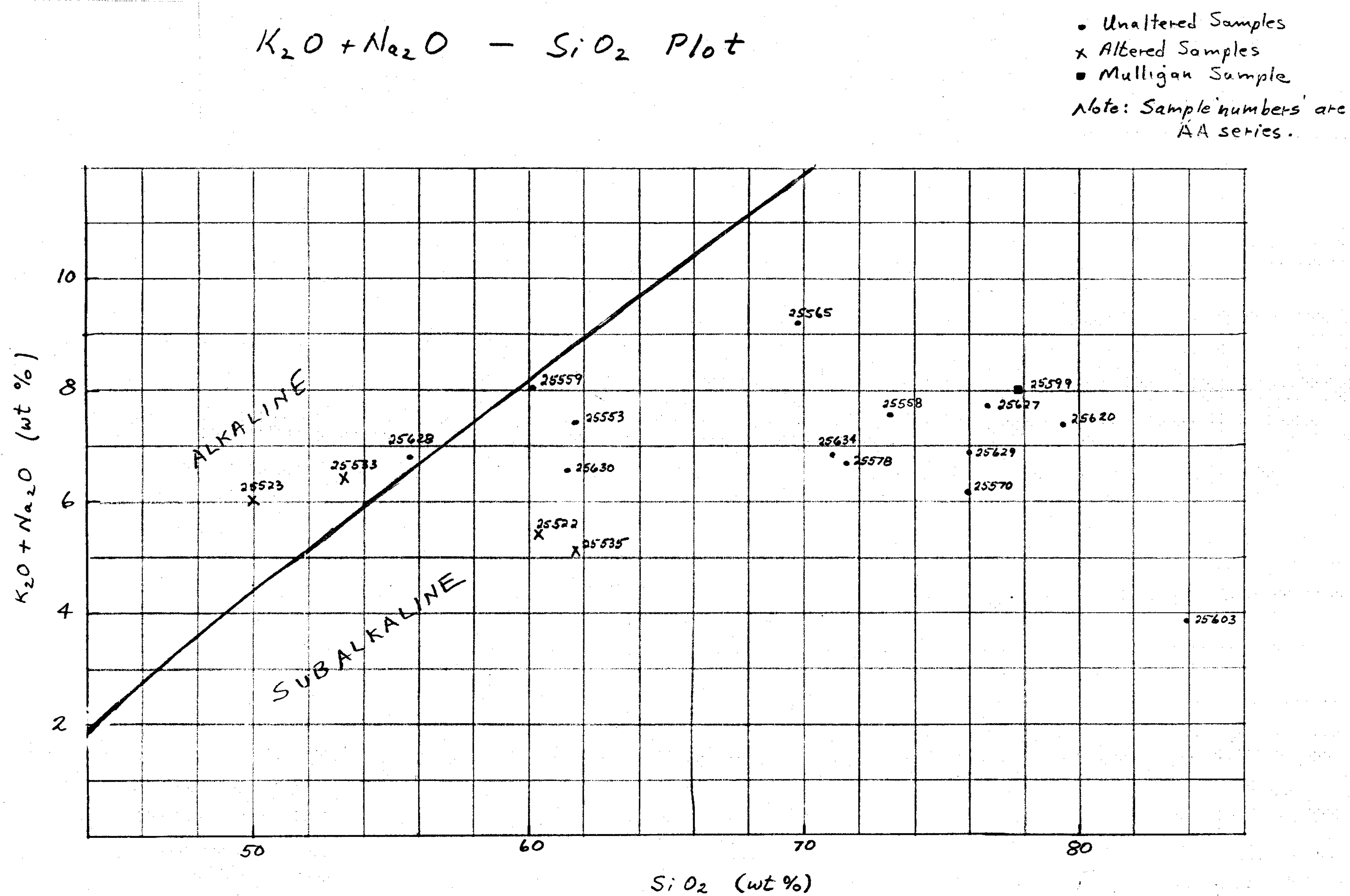
A complex dyking relationship between the granodiorite and andesite is indicated at about 21+00W on L 54 and 20+00W on L 51. This contact is further complicated by extensive faulting and fracturing.

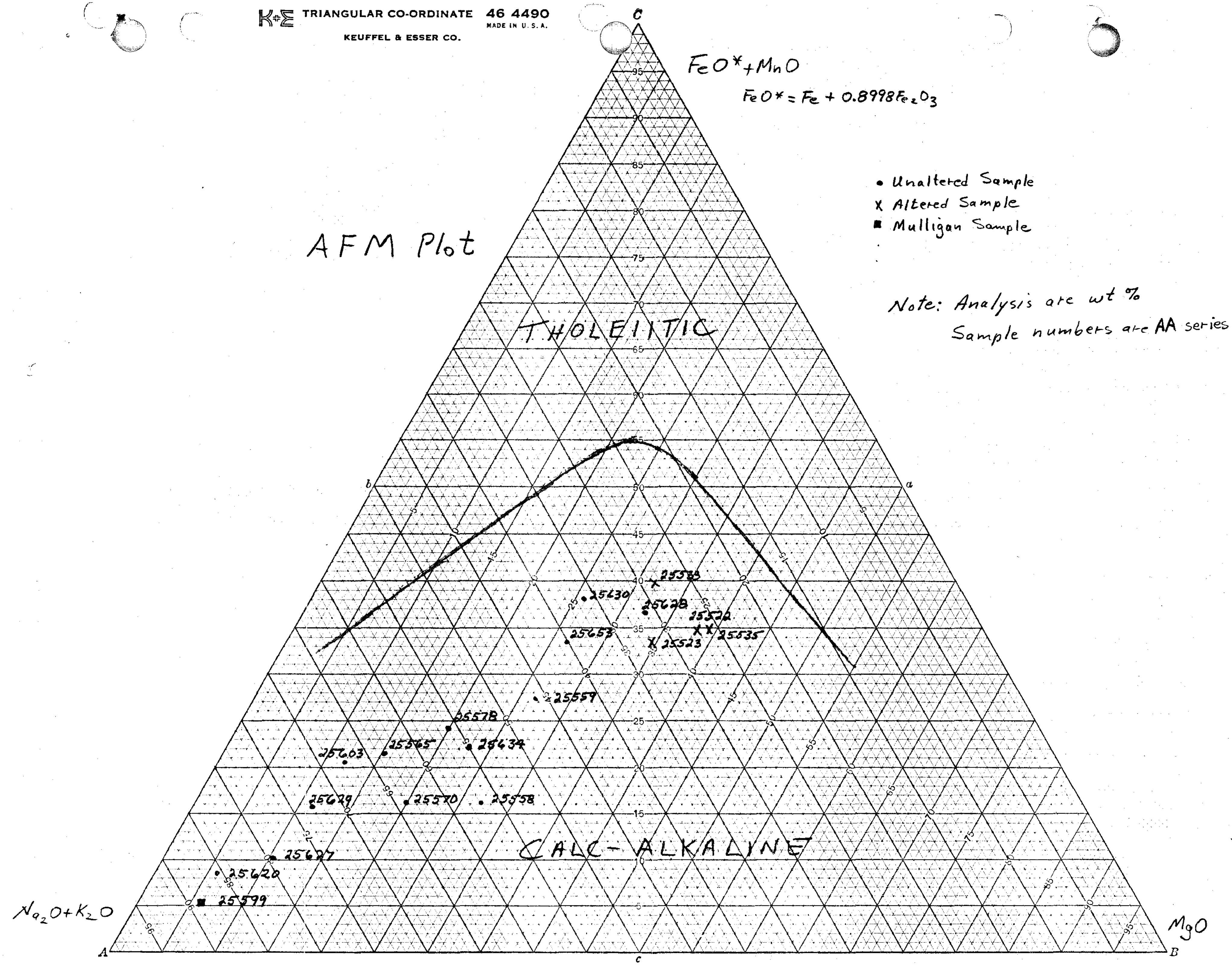
Inclusions of dacite and andesite are present along the west end of L 58 and L 60. Some of the rock mapped as andesite on L 60 may also be post-granodiorite dykes related to late stages of the Coast Range intrusion.

An isolated, small outcrop of medium-grained syenite was mapped at 9+00W along L 60 just outside the claim boundary. This lithology was assigned unit 6a; little data is available on this lithology which is assumed to be related to the Coast Range intrusions.

Unit 7 is a black basalt dyke related to the Garibaldi volcanic rocks of late Tertiary age.

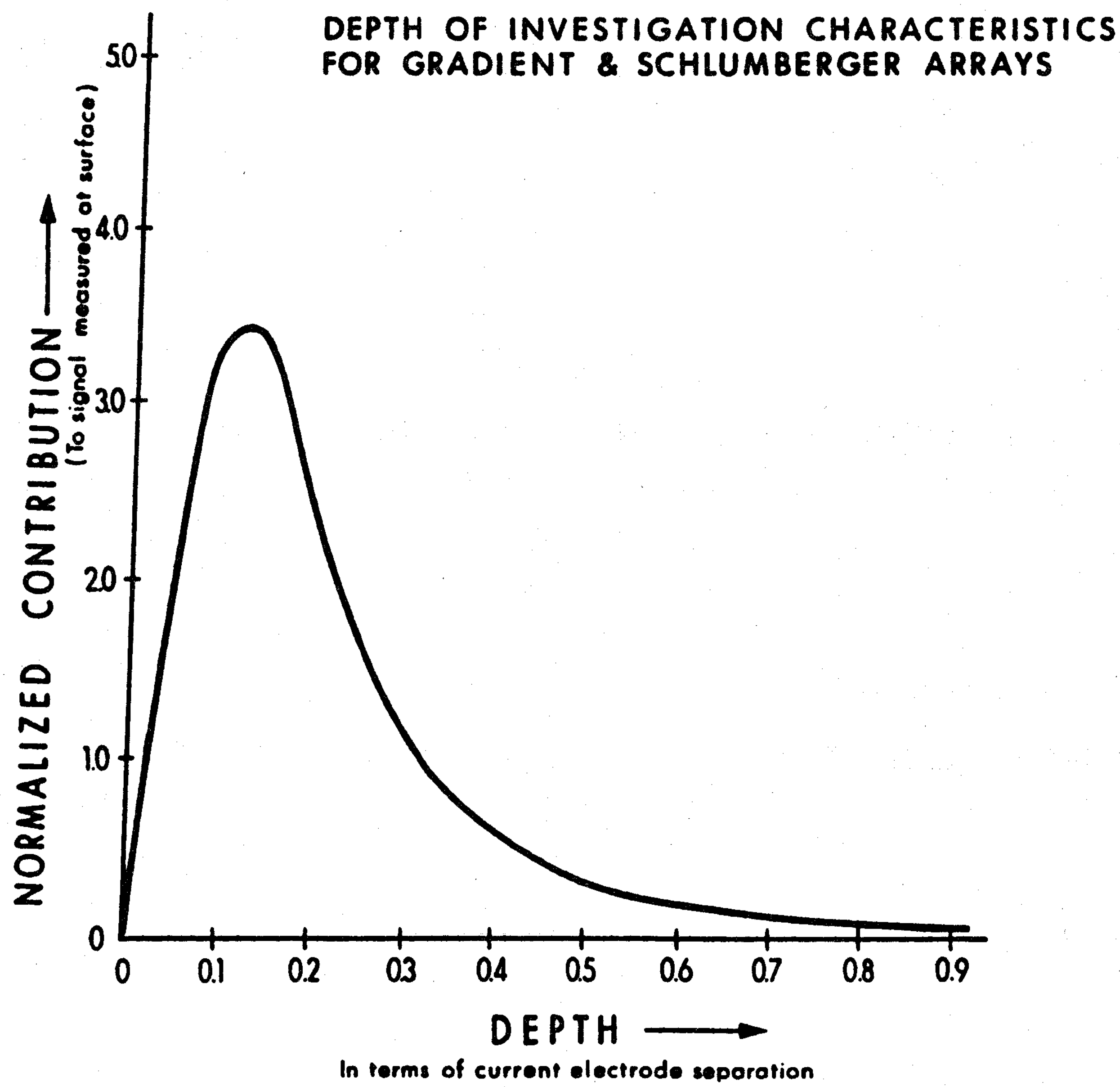
$K_2O + Na_2O$ — SiO_2 Plot




AFM Plot
FeO*+MnO
FeO* = Fe + 0.8998Fe2O3
• Unaltered Sample
X Altered Sample
■ Mulligan Sample
Note: Analysis are wt %
Sample numbers are AA series
THOLEIITIC
CALC-ALKALINE
Na2O+K2O
MgO
A
B
C
a
b
c
25630
25628
25522
25535
25523
25653
25559
25578
25565
25634
25603
25629
25570
25558
25627
25620
25599

APPENDIX C

Depth of Investigation Characteristics and Schlumberger Arrays



Taken from a paper by: B.B. Bhattacharya & Indrajit Dutta
Geophysics Vol. 47 No. 8 page 1201

APPENDIX D

Project Costs and

Statements of Expenditure for Assessment

PROJECT EXPENDITURES

Project: MULLIGAN Project # 911 AFE # EE 211

01	Salaries and Wages	CDN$ 10,588.65
02	Fringe Benefits	
03	Camp Expense	1,404.00
04	Shipping and Storage	
05	Travel Expenses	
07	Office and Technical Supplies	
08	Communications	
11	Geological	
12	Geophysical Programs	743.75
13	Geochemical Programs	1,806.75
14	Photogrametry	
15	Drafting, Publications and Maps	
16	Assaying Charges	
17	Auto Operation and Maintenance	720.00
18	Aircraft Charter - Fixed Wing	
19	Aircraft Charter - Helicopter	
21	Equipment Purchases and Maintenance	
22	Heavy Equipment Contracting	
23	Surveying and Line-cutting	3,300.00
24	Drilling and Logging	
61	Property Acquisition - Purchase	
63	Property Acquisition - Staking	
65	Government Fees	560.00
66	Option Payments	
	Other	
	TOTAL	19,123.15

AFE No. 211

APPENDIX D

STATEMENT OF EXPENDITURES

Mulligan 1

SUMMARY OF WORK: Line cutting and Grid survey

PERIOD OF WORK: June 28 to August 29, 1983

COSTS:

Line cutting	July 2 - July 5, 1983			
VanAlphen Exploration, Smithers, B.C. 11 line km @ $300				3,300.00
Grid Surveying	June 29 - July 7, 1983			
Personnel - Kidd Creek Mines Ltd.				
S. Enns	(geologist)	4 days @ 185.39	741.56	
F. Renaudat	(geol. assist.)	3 days @ 65.38	196.14	
P. Mouldey	(geologist)	2 days @ 72.11	144.22	
B. Holmes	(geol. assist.)	3 days @ 55.76	167.28	
			1,249.20	1,249.20
Room and Board:		12 man-days @ $27		324.00
Transportation:				
Airways Rental, Vancouver, B.C. Jimmy 4 x 4 day days @ $30				210.00
				$ 5,407.20

$4,800 of this work to be applied to:

Mulligan 1 (Rec. No. 209 Oct) for 3 years

APPENDIX D

STATEMENT OF EXPENDITURES

Mulligan 1

SUMMARY OF WORK: Geological Mapping, Geochemical Survey, Geophysical Survey
PERIOD OF WORK: June 28 - August 29, 1983
COSTS:

Personnel - Kidd Creek Mines Ltd.	July 1 - August 20, 1983		
F. Renaudat (geol. assist.)	5 days @ 65.38	326.90	
M. Peters (geol. assist.)	4 days @ 55.76	223.00	
S. Enns (geologist)	4 days @ 185.39	741.56	
P. Mouldey (geologist)	4 days @ 72.11	288.44	
G. Hendrickson (geophysicist)	1 days @ 185.39	185.39	
D. Flentge (geophys.)	9 days @ 69.23	623.07	
T. Huttemann(geophys. assist.)	10 days @ 63.46	634.60	
		3,022.96	3,022.96
Room and Board:	40 man-days @ $27		1,080.00
Transportation:			
Redhawk Rentals, Burnaby, B.C. Toyota Diesel 4x4	12 days @ $25		300.00
Airways Rental, Vancouver, B.C. Jimmy 4 x 4	7 days @ $30		210.00
Magnetometer Rental:			
Scintrex, Richmond, B.C. MP 3 - 1 week pro-rated @ $2,975/mo			743.75
Geochemical Analysis:			
Acme Analytical Laboratories, Vancouver, B.C. 219 soil samples for Cu, Pb, Zn, Au, Ag @ $ 8.25			1,806.75
Report Preparation:			500.00
			$ 7,763.46

$6,400 of this work to be applied to:

Mulligan 1 (Rec. No. 209 Oct) 4 years

MT MULLIGAN
1200
1300
1500
1400
RAY CREEK
300 E
100 E
200 E
300 E
400 E
L300N
L250N
L200N
L150N
L100N
L50N
L00N
Limit of Talus
To accompany Assessment Report
on
Mulligan Group
by
P.R. Delancey
November, 1978
LEGEND
Cu Pb Zn ○ Soil Sample Site Values in ppm
388 ● Anomalous Value
Cu Pb Zn △ Silt Sample Site Values in ppm
4 w.d. Road
Trail
Limit of Talus
Fig. 16
Texasgulf Inc.
MULLIGAN - CRANE (WEST SHEET)
GEOCHEMISTRY
WORK BY
DRAWN BY
DATE
DRW,G NO.
H.R.S., G.N.M.
E.R.
5th October '78
0
25
50
75
100
125
Scale in Metres 1 : 1250

○ Soil Sample Au, Ag (ppb, ppm)

	Weakly Anomalous	Strongly Anomalous
Au	> 50 ppb	>100 ppb
Ag	> 0.9 ppm	> 2.0 ppm

Kidd Creek Mines Ltd.

MULLIGAN

Au, Ag GEOCHEMICAL RESULTS

NTS 92/11 Proj 911

WORK BY	DRAWN BY	DATE: DEC. ,1983.
S.E.	J.S.	

50 25 0 100 200m

SCALE IN METRES 1 : 2500

Figure: 5

○ Soil Sample Cu, Pb, Zn (ppm)

	Weakly Anomalous	Strongly Anomalous
Cu	>100	>200
Pb	> 75	>150
Zn	>200	>300

Kidd Creek Mines Ltd.

MULLIGAN

Cu, Pb, Zn GEOCHEMICAL RESULTS

NTS 92/11 Proj 911

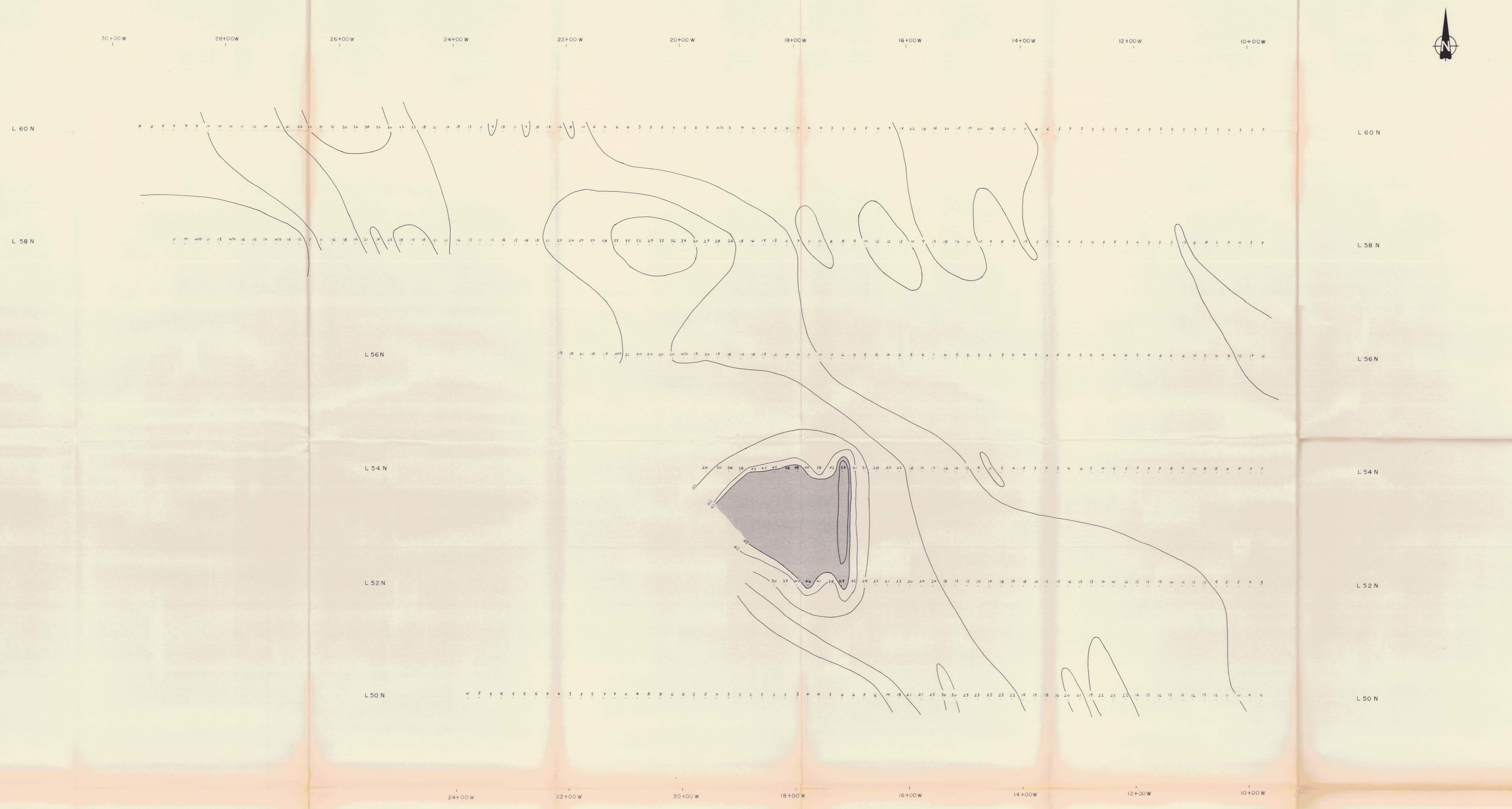
WORK BY	DRAWN BY	DATE
S.E.	J.S.	DEC. , 1983.

50 25 0 100 200m

SCALE IN METRES 1 : 2500

Figure: 6

Steve Enns. Peter ~~Gerry~~ Delaney 688-5476.



Kidd Creek Mines Ltd.

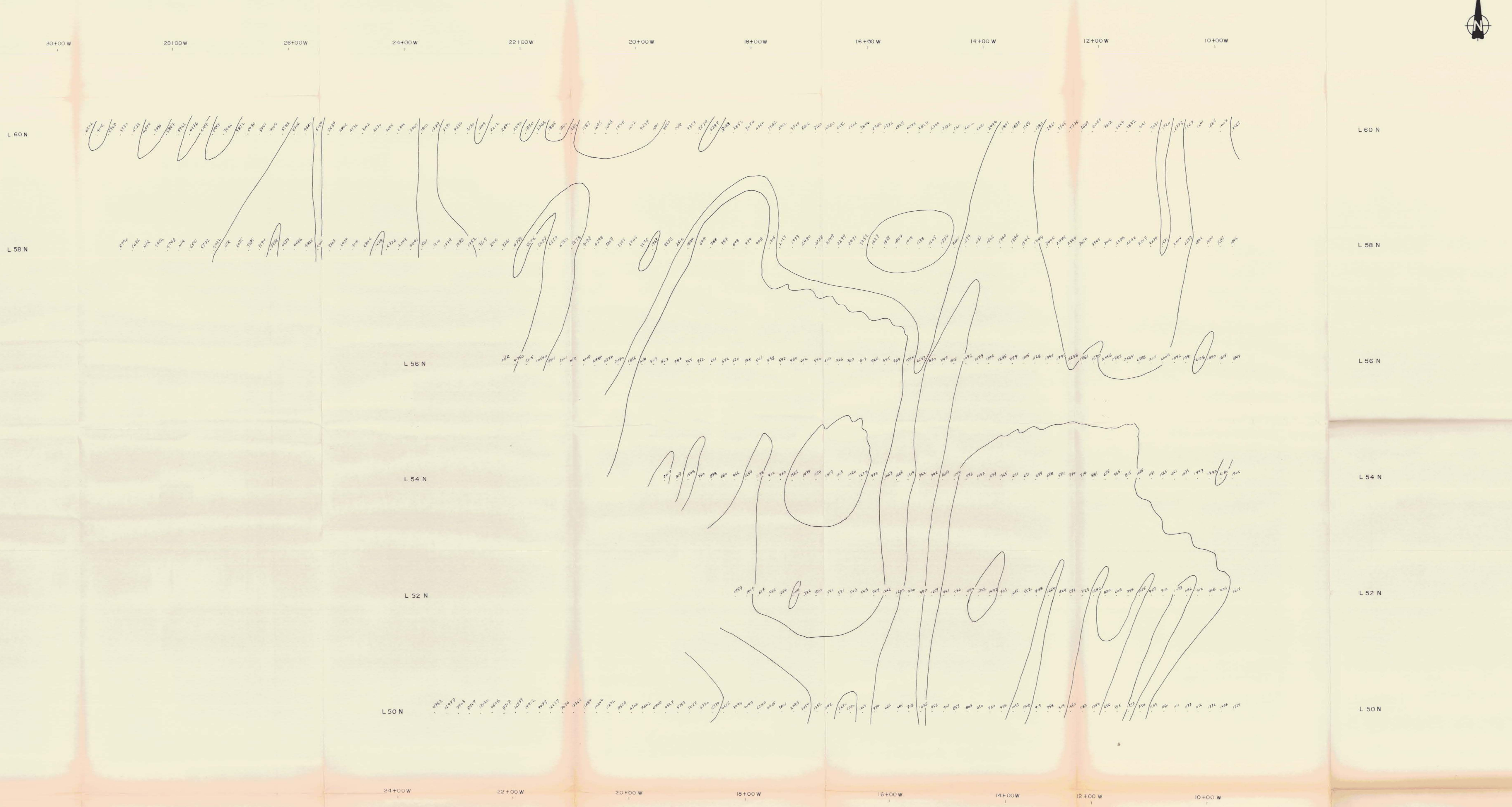
MULLIGAN
APPARENT CHARGEABILITY PLAN

SCHLUMBERGER ARRAY
AB = 140m
MN = 20m
CONTOUR AT : 10,20,30,40,45,50 'MSEC'

WORK BY	DRAWN BY	DATE: 83/12/6
G.H.	D.C.	

SCALE IN METRES 1: 2500 NTS 92/11 Proj 911

Figure: 7



Kidd Creek Mines Ltd.

MULLIGAN
APPARENT RESISTIVITY PLAN

SCHLUMBERGER ARRAY
AB = 140m
MN = 20m
CONTOURS AT: 1000, 2000, 5000 OHM-METERS

WORK BY	DRAWN BY	DATE: 83/12/6
G.H.	D.C.	

50 25 0 100 200m
SCALE IN METRES 1:2500 NTS 92/11 Proj 911

Figure: 8

Kidd Creek Mines Ltd.

MULLIGAN
MAGNETIC INTENSITY
PLAN of PROFILES

TOTAL FIELD DATA
PROFILE SCALE: 100 NANOTESLA / CM

WORK BY	DRAWN BY	DATE: 83/12/6
G.H.	D.C.	

50 25 0 100 200 m
SCALE IN METRES 1:2500 NTS 92/11 Proj 911

Figure: 9