KLEANZA CREEK

AMERICAN CREEK

KENDAL CREEK

"BIG" CREEK

SIMILA LAKE

X4285

X4260

4200

126,000 E

130,000 E

134,000 E

138,000 E

212,000 N

210,000 N

208,000 N

206,000 N

204,000 N

202,000 N

200,000 N

198,000 N

196,000 N

128,000 E

132,000 E

136,000 E

To accompany a report by A. R. Bullis, P. Eng. 3 Nov. 72

LEGEND

INTRUSIVE ROCKS
- Feldspar Porphyry
- Hornblende-Biotite Porphyry
- Aplite
- Lamprophyre

VOLCANIC ROCKS
- Water-lain red volcanic tuff (Hazelton)
- Andesite flows
- Docite (?) agglomerate ("Boulder conglomerate")
- Water-lain red volcanic tuff (Triassic ?)
- Breccia

SEDIMENTARY ROCKS
- Limestone-Boulder Conglomerate

- Quartz vein with dip
- Geological contact — known, with strike and dip
- " " — inferred, " " "
- Shear, strike with dip
- Bedding, " " "
- Fault plane, " " "
- or XX Outcrop
- Limits of gossan zone
- Logging road
- Glacier boundary
- Lake or pond

(true)

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4275 MAP #5

KENDAL CREEK

GEOLOGY

Scale: 1" = 400'

July — August, 1972

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — A. R. BULLIS

Prepared by Bullis Engineering Ltd.

126,000E

138,000E

212,000N

210,000N

1000

1200

1400

1600

1800

2000

2200

KLEANZA CREEK

KENDAL CREEK

2400

2600

2800

3000

3200

3600

3800

4000

4200

198,000N

196,000N

128,000E

136,000E

LEGEND

130N/120W Soil survey station with value in p.p.m. Zn

Anomalous sample or zone:
for samples high in organic material (e.g. swamp), anomalous values are considered to be greater than 300 p.p.m.
for samples low in organic material, anomalous values are considered to be greater than 130 p.p.m.

note: this map accompanies a "Soil and Silt Survey" map for copper over the same ground.

N (true)

Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4275 MAP #8

To accompany a report by A. R. Bullis, P.Eng. 3 Nov. 72

KENDAL CREEK PROPERTY
(near Terrace, B.C.)

SOIL and SILT SAMPLE SURVEY

ZINC

Scale: 1" = 400'

July-August, 1972

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. R. BULLIS

Prepared by Bullis Engineering Ltd.

KLEANZA CREEK

KENDAL CREEK

LEGEND

- 65 / 176N 120W — Soil survey station with value in p.p.m. Cu
- SH-21 0140 — Stream survey station with value in p.p.m. Cu
- 82 p.p.m. Cu contour (threshold). Values higher than 82 p.p.m. Cu in soils are considered anomalous. (for samples low in organic content) For samples high in organic content (e.g. swamps), anomalous values are greater than 550 p.p.m.
- Streams containing definitely anomalous values in Cu (silt sampling)
- Streams containing probably anomalous values in Cu (silt sampling)
- 3200 — Elevation contours: 200' interval
- * — Indicates swamps or high organic content in sample

Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4275 MAP #7

(true)

To accompany a report by A. R. Bullis, P.Eng. 3 Nov. 72

KENDAL CREEK PROPERTY
(near Terrace, B.C.)

SOIL and SILT SAMPLE SURVEY

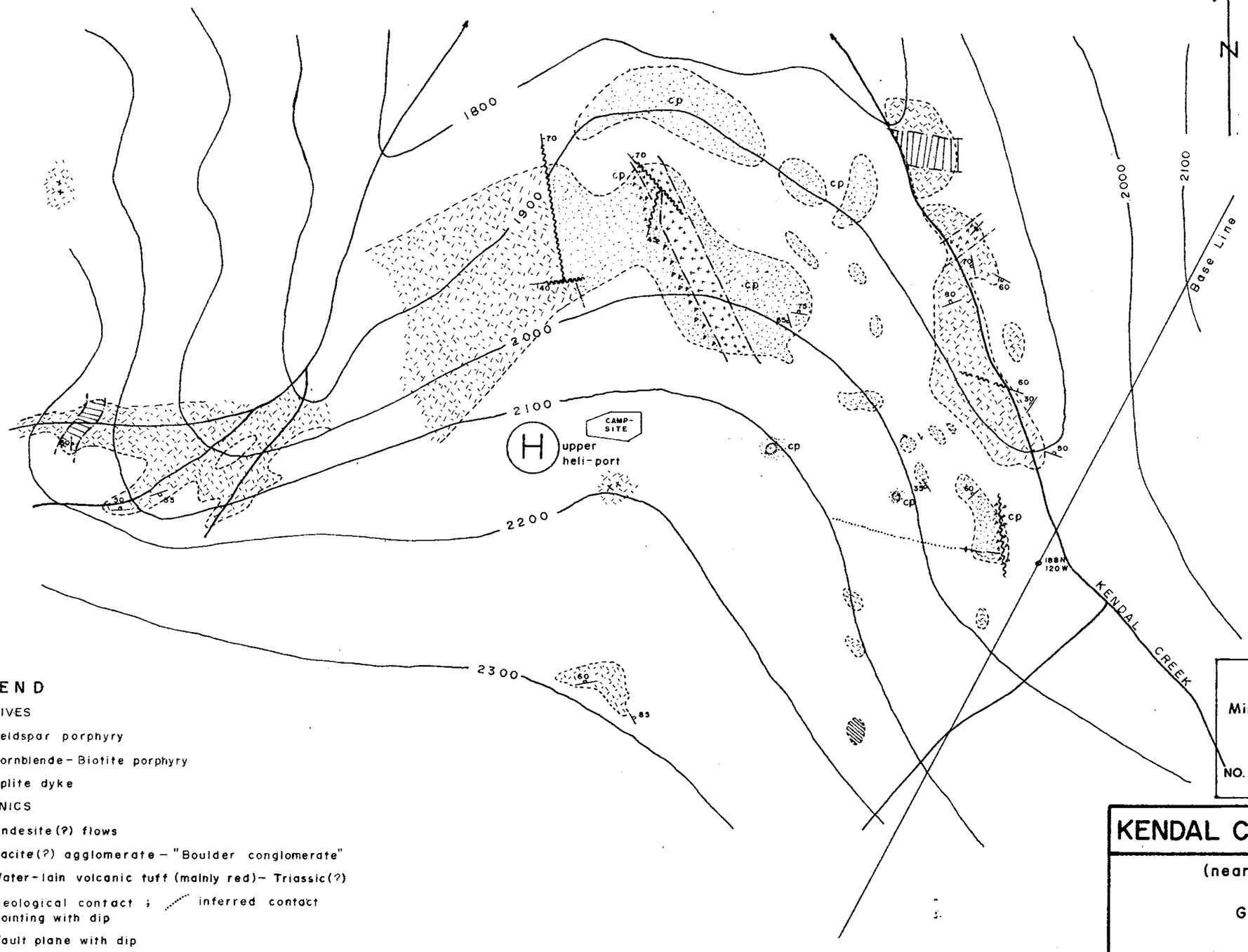
COPPER

Scale: 1" = 400'

July-August, 1972

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — A. R. BULLIS

Prepared by Bullis Engineering Ltd.



LEGEND

INTRUSIVES

- Feldspar porphyry
- Hornblende – Biotite porphyry
- Aplite dyke

VOLCANICS

- Andesite (?) flows
- Dacite (?) agglomerate – "Boulder conglomerate"
- Water-lain volcanic tuff (mainly red) – Triassic (?)
- Geological contact ; inferred contact
- 60 Jointing with dip
- 40 Fault plane with dip
- or xx Outcrop
- Stream
- Pit
- Breccia
- cp chalcopyrite

To accompany a report by A.R. Bullis, P.Eng. 3 Nov. '72

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4275 MAP #6

KENDAL CREEK PROPERTY

(near Terrace, B.C.)

GEOLOGY

Scale: 1" = 100'

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. R. BULLIS

Prepared by Bullis Engineering ltd. August, 1972

4275

103I/9E&W

Geological and Geochemical Reports

on

KDL Mineral Claims (Group)

KDL 1 to 24 & KDL 26, 28, 30 32.

Located 10 miles east of Terrace
in Omineca Mineral Division
Latitude 54 Longitude 128 N.E.

by

A.R. Bullis, B.A.Sc., P. Eng.

and

H.R. Bullis, B.Sc.

for

Coastal Mining Limited

and

Kendal Mining and Exploration Co. Ltd. (N.P.L.)

Field Work 20 Jun. to 6 Aug. 1972.
Report Preparation 1 Oct. to 30 Nov. 1972.

4275

K D L MINERAL CLAIMS

Kendal Creek Area

Omineca Mining Division

prepared for

Coastal Mining Limited

by

Bullis Engineering Limited

30th November, 1972.

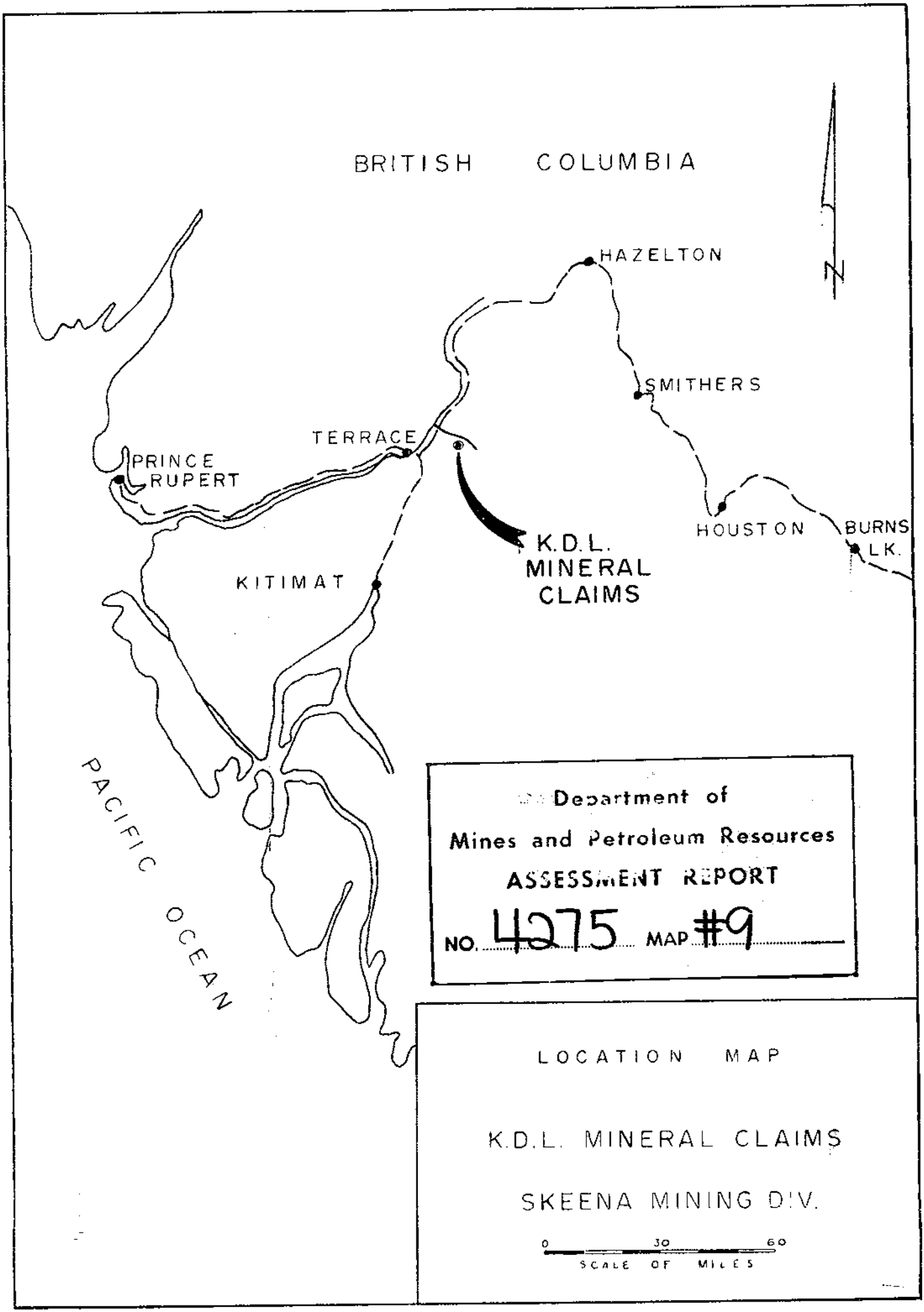

BRITISH COLUMBIA
N
HAZELTON
SMITHERS
TERRACE
PRINCE RUPERT
HOUSTON
BURNS LK.
K.D.L. MINERAL CLAIMS
KITIMAT
PACIFIC OCEAN
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4275 MAP #9
LOCATION MAP
K.D.L. MINERAL CLAIMS
SKEENA MINING DIV.
0 30 60
SCALE OF MILES

TABLE OF CONTENTS

SUMMARY

The property of Kleanza Mines Ltd. (now Kendal Mining Ltd.) consists of twenty-eight contiguous, located mineral claims situated on the O.K. Range near the Town of Terrace in the Skeena Mining Division.

Coast Mining Company optioned the property in an agreement dated June 1st, 1972, and an exploration programme commenced on June 20th, 1972.

The programme consisted of geological mapping and soil sampling.

The property is underlain by Triassic (?) sedimentary and volcanic rocks and by the "lower division" of the Hazelton Group. These units are comprised of greywacke, banded volcanic sandstone, volcanic breccia and some flows intercolated with fine clastic material. The volcanic-sedimentary series are, apparently, conformable in the vicinity of the property. These series have been intruded by dykes related to the Coast Range intrusives; the dykes vary from narrow lamprophyre and basic types to porphyritic and aplitic types that range up to 500 feet in width. The sedimentary-volcanic sequence has been folded into a broad syncline which plunges gently to the east. The rocks have been shattered by numerous branches of the Dardenelle Fault which strike north-west across the property. The faults control the location of the large porphyry and aplite

dykes and fault movements have produced the blocky fracturing (shattering effect) which controls the introduced sulphide mineralization.

A large "gossan" zone at Kendal Creek, which is readily discernible from the air, is approximately 3,000 x 8,000 feet in extent and is oriented east and west. The most interesting rocks, from an economic point of view, occur within the "gossan" zone where two rock types contain disseminated chalcopyrite as well as pyrite. The large porphyry dykes exposed in Kendal Creek and its tributaries contain chalcopyrite across an exposed width of 500 feet. A chip sample, taken over 400 feet of the freshest rock, averaged 0.05% copper.

The best mineralization on the property is found near the upper helicopter pad where "boulder conglomerate" and dacitic tuff contain "blebs", crystals and disseminated chalcopyrite. The boulder conglomerate occupies an area 800 x 400 feet in extent and the conglomerate is about 50 feet thick. The remnant is limited along strike and is apparently cut off by faulting down dip. The grade of the remnant is probably ¼% to ½% copper, judging from a number of chip and grab samples taken by previous workers.

The geochemical programme included both soil and silt sampling. After separating those samples that contained organic matter, which has abnormally high background values

in copper and zinc, the results showed that anomalous zones exist over the known mineralization in the porphyry dykes and dacitic "boulder conglomerate". Anomalies also exist over swampy areas that have been identified as such and, therefore, discounted. There are, however, a number of anomalous samples on lines 216 N and 204 N that are not readily explained by either known mineralization or swampy conditions.

Correlation between the copper anomalies and the zinc anomalies is marked.

CONCLUSIONS

1. The "gossan zone" has been caused by the oxidation of iron sulphides. The rock has been shattered by movement along numerous branches of of the Dardanelle Fault and the iron mineralization is concentrated in the joints and fractures.

2. Two rock types contain copper mineralization:

   (i) porphyry dykes, which are large and sparsely mineralized throughout, contain only small amounts of copper.

   (ii) the remnant of dacitic "boulder conglomerate" contains ¼% to ½% copper, as estimated from earlier sampling data. However, the remnant is limited in volume and it is too small to be mined by itself and the "boulder conglomerate" has not been found in place elsewhere on the property.

3. Several soil anomalies point to areas that will require additional investigation to determine the cause of the anomalous conditions.

Respectfully submitted,

A. R. Bullis, P. Eng.

30th November, 1972.
DELTA, B.C.

PART I

INTRODUCTION

Coast Mining Company, a wholly owned subsidiary of The Hanna Mining Company Ltd., entered an agreement with Kleanza Mines Ltd., Box 580, Terrace, B.C., to explore a mineral property on Kendal Creek. Bullis Engineering Ltd. were engaged to do the field work. The work consisted of:

(a) Geological mapping of the property on a scale of 1 inch equals 400 feet. The base maps were prepared by McElhanney Surveying & Engineering Ltd. of Vancouver.

(b) Soil sampling of a portion of the property. The samples were taken at 200 foot centres on lines spaced at 400 foot intervals. The samples were analysed at the Vancouver Geochemical Laboratories, 1503 Pemberton Ave., North Vancouver, by the hot acid extraction/ atomic absorption method.

The programme began on 20th June, 1972, and the field work was completed by 6th August, 1972.

The field crew was composed of two geologists and five assistants, all employed full time. A total of 15.9 miles of line were cut and marked on the property. The cost of the field work, including mobilization, soil analyses and base map, was $21,077.69. Map and report preparation brought the total cost to $23,205.69.

LOCATION & ACCESS

The property of Kleanza Mines Ltd. (now Kendal Mining Ltd.) is located on the O.K. Range in the Terrace area of B.C. The co-ordinates of the centre of the property are 54°32' North Latitude and 128°20' West Longitude; the area is shown on the N.T. Sheet 103 I (Eastern Half).

The Town of Terrace is situated on the Canadian National Railway line that serves the port of Prince Rupert and is at the junction of the branch line that serves the Port of Kitimat.

All-weather, paved highways connect Terrace with Kitimat, Prince Rupert and the British Columbia highway system. The area is served by Canadian Pacific Airlines with daily, scheduled flights from Vancouver and Prince Rupert to the all-weather airport at Terrace.

The claim group is located on the east slope of the O.K. Range and lies astride Kendal Creek and its tributaries. Access to the claim group is difficult because the are no roads on the east slopes of the O.K. Range. A good logging road extends up the north side of Kleanza Creek and crosses the north end of the property. Kleanza Creek, of which Kendal Creek is a tributary, is deep and swift; crossings can only be made with the aid of a boat. The most convenient method of access is by helicopter from the Terrace airport to the landing pad above Kendal Creek at an elevation of 2100 feet.

PROPERTY

The property, as set out in the option agreement dated June 1st, 1972, contains twenty located Mineral Claims. The Claims were staked by E. R. Anderson of Terrace, B.C., on May 6th, 1971, and were recorded on 26th May, 1971. The record numbers are:

Name of Claim	Record Number
KDL #1 - 20 inclusive	103884 to 103903 inclusive

The Claims were transferred to R.H. Bates on May 27th, 1971, at Terrace via a Bill of Sale of Mineral Claims.

Kleanza Mines Ltd. (N.P.L.) was granted an option to purchase the KDL Group from Bates on August 12th, 1971. Coastal Mining Company subsequently obtained an option from Kleanza Mines Ltd. (N.P.L.) to explore and develop the KDL Mineral Claims commencing December 31st, 1971.

Mr. R.H. Bates staked eight additional claims which adjoin the original group on the north and north-east. The new claims are named the KDL #21, 22, 23, 24, 26, 28, 30 and 32 and were staked in July, 1972. The claims were included by mutual agreement in the original option with Coastal Mining Company dated June 1st, 1972.

HISTORY

The history of the area was given by W.M. Sharp, P. Eng., in his report dated August 1971. His review is reproduced verbatim below:

"The first documented evidence of prospecting activity within the locality appears to be that provided by B.C. Dept of Mines Bull. No. 3, 1915, and comprises a note to the effect that M.C. Kendal was working placer

ground in Kleanza Creek at the mouth of 5 Mile (Kendal) Creek. With this, it is probable that Kendal was the first to note the presence of copper mineralization within the actual 'gossan' exposures, or from related 'float' deposits within Kleanza Creek. Local (Terrace) opinion is to the effect that M.C. Kendal staked the first claims on the Kendal Creek showings between 1925-27. No significant exploration appears to have been accomplished between 1927-65.

"In 1965 Coast Range Explorations Ltd. staked the 6-claim 'M.C.' group to cover the Kendal Creek gossan and the subordinate zone (extension?) on the easterly-adjacent creek. The Ventura Syndicate, acting for the above group, carried out geological mapping, and geochemical silt and soil surveys within the 'M.C.' group - the latter survey comprising 90 samples, principally from creek courses and adjacent bank soils. The laboratory analyses revealed significant concentrations of silt and soil Cu and Mo within the local drainages; however, no follow-up exploration was carried out in spite of the fact that the subsequent report notes that this would be advisable in view of the fact "that about three-quarters of the area of interest is obscured by overburden." The claims were allowed to lapse.

"In late 1969, the Kendal Creek Syndicate (unregistered) was formed by Messrs. R.H. Bates and J. Carlson of Terrace. This syndicate staked the 44-claim 'H' group and carried out general prospecting to the extent allowed by its limited financial resources.

"During 1970, McIntyre Porcupine optioned the 'H' group. Subsequent exploration comprised a 10 sq. mi. (contract) aeromagnetic survey, construction of the trail to the 2140 heliport and of two additional heliports, geochemical soil sampling (Mo-Cu-Zn) over a 5000' x 3500' area straddling the main 'gossan' (intrusives and flanking volcanics), and supplementary geological mapping and sampling.

The 'KDL' group was staked in May, 1971, with preliminary mapping and sampling of the '2150' bench area accomplished by Mr. Bates since that date.

GENERAL

Prior to the programme described in this report, exploration of the property gave encouraging, although incomplete, results. In large measure, this was due to limiting factors such as inclement weather and lack of time and money to pursue exploration beyond the preliminary examination stage.

The Ventura Syndicate's silt sampling programme indicated anomalous amounts of copper and molybdenum along Kendal Creek and its tributaries within and downstream of the 'gossan' zone.

The McIntyre soil sampling programme located large Cu-Mo anomalies on either side of Kendal Creek. The best anomalies were found west of Kendal Creek.

The airborne magnetometer survey was not successful in pin-pointing anomalous zones that were directly related to the known mineralization. The large intrusive dykes that cross Kendal Creek may be indicated by the magnetic-low anomaly that trends in an east-west direction.

A limited amount of rock sampling in the vicinity of the upper helicopter landing pad showed interesting values over good widths. The samples were taken by W.M. Sharp, P. Eng., R.H. Bates and personnel from Phelps Dodge Corp.

All the foregoing factors demonstrated that the property had an economic potential, although zones of proven economic worth had not been disclosed. Coast Mining Company acquired an option on the property at this stage and initiated the exploration programme described in this report.

COSTS

The programme of exploration by Bullis Engineering Ltd. for Coastal Mining Company cost $21,077.69 for mobilization, soil analyses, base map preparation and the field work. Report and map preparation in the office were an additional $2,128.00. The total cost of the programme was, therefore, $23,205.69.

A grid of blazed and flagged lines was used as a basis for the soil sampling and geological programmes; 15.9 miles of line were cut and marked for the grid.

An analysis of the costs follows:

	$
Topographic Map Preparation	3,775.00
Mobilization (Vehicles, Helicopters, etc.	1,301.73
Geological Mapping	5,369.76
Soil Sampling, Field Work	8,092.00
Soil Sampling Van. Geochem. Labs. Analysis	1,399.20
Demobilization (Vehicles, Helicopter, etc.)	1,140.00
	21,077.69
Report and Geological Map Preparation	2,128.00
TOTAL:	$23,205.69

PERSONNEL EMPLOYED

Duties	Name	Address
Geologists and Supervisors	A.R. Bullis, B.A.Sc., P.Eng.	Delta, B.C.
	H.R. Bullis, B.Sc.	Delta, B.C.
Soil Samplers and Line Cutters	A.G. Cook	Victoria, B.C.
	R. Wesson	N. Vancouver, B.C.
	S. Bobardt	Delta, B.C.
	M. Bullis	Delta, B.C.
	D. Jagger	Delta, B.C.

PART II

REGIONAL GEOLOGY

The Terrace region is described by S. Duffel and J.G. Souther in G.S.C. Memoir 329, which was published in 1964. The area is underlain by Paleozoic sediments and volcanic rocks, which have been intruded and altered by Coast Intrusives.

The Coast Intrusives of the Terrace district have been divided into four distinct facies by Souther, who describes them as:

(a) Gabbro facies (olivene bearing).

(b) Pyroxene quartz diorite facies.

(c) Inner facies (biotite-hornblende).

(d) Border facies (hornblende biotite).

The gabbro and pyroxene quartz diorite facies form separate, small intrusive bodies that are earlier than the main body of the batholith. The phases of the main body resemble one another closely and are difficult to classify for this reason. The inner facies includes biotite-granodiorite and adamellite of three different ages. The border facies consists of three distinct zones of (1) hornblende

granodiorite, (2) an intermediate zone of migmatite, and (3) an outer zone of hornblende diorite and/or quartz diorite.

The Paleozoic rocks which were intruded by the Coast Intrusives, appear to be dragged upward during the emplacement of the intrusives. "They conform to the igneous contracts and most commonly dip away from them", according to Souther.

The O.K. Range, in the vicinity of Kendal Creek, is underlain by Triassic (?) sedimentary and volcanic rocks and by the "lower division" of the Hazelton Group.

The Triassic (?) rocks are comprised of a basal limestone-boulder conglomerate with greywackes, banded volcanic sandstone, siltstone, chert and fine volcanic breccia lying conformably above the basal conglomerate. The banded volcanic sandstone and tuffs, which lie above and interbedded with the greywacke, are readily distinguished in outcrop by their red, purple and green coloration.

The Hazelton Group is made up of a "lower" and an "upper" division. Only the "lower" division is present on the O.K. Range in the vicinity of Kendal Creek. The lower division is comprised of "massive bedded, coarse breccia, some minor andesitic flows, intercolated finer clastic

material representing argillaceous sedimentation, and perhaps some water lain tuff" according to Duffel & Souther.

Intrusive dykes form a distinct and important group within the region. They are broadly divided by Duffel & Souther into four major groups:

(1) Porphyritic
(2) Lamprophyre
(3) Aplite
(4) Basalt

All these intrusive types are found in the vicinity of Kendal and Kleanza Creeks. According to Duffel & Souther, the various types of intrusives possess a zonal arrangement with respect to the larger masses of Coast Intrusive. The porphyritic dykes are most abundant at some distance away from the contact, while aplite dykes appear in greater numbers closer to the contact. Lamprophyre dykes are found within the Coast Intrusives as well as within the volcanic and sedimentary rocks. The basalt dykes and sills show no marked zonal arrangement. All four groups of dykes were found within the mapped area along Kendal and Kleanza Creeks.

The structures within the rocks of the O.K. and Bornite Ranges are (1) simple, broad folds, and (2) faults accompanied by intensely shattered zones. The sediments

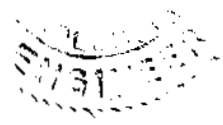
and volcanic rocks form a conformable sequence that have been folded into a broad syncline that plunges slightly north of east. Dips are gentle for the most part, except where faulting has dragged the members into steeply dipping attitudes. Souther states that where the sedimentary and volcanic rocks are in close proximity to the Coast Intrusives, the dips become much steeper due to the upward movement of the Intrusives during emplacement.

The most important fault within the region under discussion is the Dardanelle Fault, which can be traced for at least ten miles in a north west direction from a point on Mt. Attree, west of the Zymoetz River, to Kleanza Creek on the east side of the O.K. Range. The fault is located within the valleys and canyons of Kendal Creek and its tributaries.

LOCAL GEOLOGY

The property is underlain by volcanic and sedimentary rocks of Triassic (?) to Jurassic age, according to the age correlation given by Duffel and Souther. The Jurassic rocks are part of the Hazelton Group which rests conformably on the Triassic rocks. The sequence appears to be unbroken in the Kendal Creek area; Duffel & Souther state that "the contact is arbitrarily drawn" on the map accompanying Memoir 329.

The lithology of the Triassic rocks varies from limestone-boulder conglomerate through fine volcanic breccia to banded tuffs and siltstones. According to Duffel & Souther, the limestone-boulder conglomerate forms the basal unit; it consists of pebbles and cobbles of limestone, andesite and "chert" cemented in a matrix of calcite, chert and tuffaceous material. The conglomerate was found near Simila Lake on the top of the O.K. Range. Most exposures were seen on the ridge west of the lake and on the western slope of the Range. No outcrops were found in Kendal Creek, although limestone-boulder conglomerate float was seen in the Creek. The conglomerate strikes west to north-west and dips up to 45 degrees to the north-east.



Beds of red, purple and grey-green tuff and fine volcanic agglomerate conformably overlie the conglomerate. The "red tuff" forms a distinct lithological unit that lies in an arc around the headwaters of Kendal Creek; these rocks were found in outcrop from a point near the headwaters of "Big Creek", around Simila Lake and covers the O.K. Range to the headwaters of American Creek, one mile north-west of Kendal Creek. The "red tuff" appears to be unaltered and is little affected by the fracturing and faulting caused by the movement on the Dardenelle Fault.

The red beds are overlain by a massive series of blocky-fracturing flows and tuffs that outcrop in the canyons of Kendal Creek and its tributaries. These rocks are grey to grey-green in colour, fine-grained for the most part, with some coarse "sandstone" or fine agglomerate. The blocky-fracturing rocks have all been more-or-less affected by the shearing and shattering caused by movement along several branches of the Dardanelle Fault. Duffel & Souther place the contact between the "lower" division of the Hazelton Group and the Triassic rocks somewhere within the series of "blocky-fracturing" volcanic rocks; the contact is not readily discernible in the field. The series appear to be conformable and with little change in lithology from bottom to top.

There is one exception to this general condition; a remnant of dacitic tuff which contains many rounded boulders outcrops on the west side of Kendal Creek at an elevation of 2,000 feet. The dacitic "boulder-conglomerate" is quite unlike the "limestone-boulder" conglomerate found at the base of the Triassic (?) rocks; the material comprising both the matrix and the boulders in the dacite conglomerate appear, in hand specimens, to be very similar. This remnant is an important rock type from the economic point of view because disseminated chalcopyrite is found throughout the "boulder conglomerate" and it is the most favorable host rock that has been found in the sedimentary and volcanic series. The remnant occupies a dip-slope and extends along strike for about 800 feet in a north-west direction; it is about 400 feet wide and approximately fifty feet thick.

The sedimentary and volcanic series have been intruded by dykes which vary from basaltic to aplitic. Duffel & Souther note that "broadly, the dykes (of the Terrace area) fall into four major groups"; all four types are found on the KDL claims in Kendal Creek. The least numerous and smallest of these are the lamprophyre and basalt dykes. Two small lamprophyre dykes were seen in Kendal Creek at elevation 1,500 feet; they are five to six feet wide, strike 330 degrees and dip 45 to 50 degrees west. The rock has a fine-grained,

grey groundmass with lath-like phenocrysts of hornblende and pyroxene. The rock contains small discrete grains of magnetite and finely disseminated pyrite. Pink feldspar is also present as very narrow, indistinct veins. The dykes are more magnetic than are the volcanic and sedimentary rocks. A swarm of lamprophyre dykes were seen about three miles west of the junction of Kendal and Kleanza creeks in road cuts at an elevation of 1,000 feet. Here the dykes vary from four to fifteen feet in width, are more basic than those noted in Kendal Creek, and have the distinctive lamprophyre texture; they strike east-west and dip steeply to the south.

Aplite dykes were found at a number of places along Kendal Creek and its tributaries. Two dykes that are well exposed were seen at an elevation of 1800 feet in Kendal Creek, one was found in a tributary at an elevation of 2200 feet, and another was seen in lower Kendal Creek at an elevation of 1000 feet. The dykes are composed of fine-to-medium grained, greyish white plagioclse feldspar. Very little quartz was noted, but all dykes have fine pyrite disseminated throughout and all display the typical sugary texture of aplite. The aplite dykes range in width from fifteen to fifty feet and all dip steeply to vertically. They strike east-west, north-south, north-east and north-west and are controlled by the fracture pattern induced by faulting.

The most important group of dykes, both in size and in economic mineral content, are the porphyry dykes that occupy much of the creek bottom along Kendal Creek. The porphyry is composed of irregular-shaped phenocrysts of plagioclase in a groundmass of light-grey material. Many of the dykes have rounded quartz "eyes" and all contain hornblende and/or biotite that show some degree of chloritic alteration. Almost all the porphyry dykes are mineralized with chalcopyrite and pyrite as "speckled" disseminations throughout the rock. The porphyry dykes vary in width from twenty feet to a maximum of four hundred feet and are steeply dipping. Rarely, one might dip at 35 to 40 degrees. There are some dykes which do not show the marked porphyritic texture described above, but which have been included with the "porphyry dykes"; these dykes were seen only in limited outcrops and may be small "stocks" or "bosses" of diorite or granodiorite related to the larger coast intrusives which surround the O.K. Range. The non-porphyritic rocks are generally less mineralized than the porphyritic types.

The large porphyryr dykes strike roughly east and west while the smaller ones strike north-west and north-east. All the dykes appear to be controlled by three major sets of fractures which are related to the faulting on the Dardenelle fault in the north-west direction and along fold axes in the

east-west and north-east direction.

The sedimentary and volcanic rocks of the Triassic (?) formation and Hazelton groups range in lithology from banded tuff, siltstone, fine volcanic agglomerate and/or breccia to grey-green and green andesitic flows. The flow rocks are almost indistinguishable from the massive tuff; no flow structure or amygdules were noted in the vicinity of Kendal Creek. However, some of the green andesitic rock is porphyritic, white feldspar and dark green pyroxene form the phenocrysts in a matrix of grey-green to dark green, fine-grained chloritic material

The sequence from the basal "limestone-boulder" conglomerate of Triassic (?) age through to the andesitic flows of the Hazelton formation appears to be conformable in the vicinity of Kendal Creek. There are two horizons of "red beds", (shallow water deposits) which are separated by four to five thousand feet of grey-to-green tuffs, breccia and flows. The lower "red beds" are located on the O.K. Range at the head-waters of Kendal Creek and lie stratigraphically above the basal "limestone-boulder" conglomerate and are undoubtedly part of the Triassic (?) formation; the upper "red beds" are found north of Kleanza Creek and are part of the Hazelton Formation, possibly comprising part of the "upper division", as described by Duffel & Souther.

Between these "red-bed" horizons lie all the various rock types described elsewhere; all are distinguished by grey-to-green coloration and most possesses a blocky-fracturing characteristic.

STRUCTURE

The volcanic sedimentary and flow rocks in the vicinity of Kendal Creek have been folded into a broad syncline; the fold axis strikes a few degrees north of east and crosses Kleanza Creek near the junction with Kendal Creek. Secondary folds are rare; no small folds were noted on the KDL claims.

The synclineal structure is best illustrated by the trace of the lower "red-beds" which forms an arc around the head-waters of Kendal Creek. The formational units above the lower "red-beds" are fractured and mineralized to such a degree that major structural features are masked and no evidence of folding was noted along Kendal Creek.

Faulting has played a dominant role in the structural evolution of the area; the major movement has taken place along the numerous branches of the Dardenelle Fault. The branches of the Dardenelle Fault strike from 280 to 310 degrees and dip from 55 degrees to vertical, either to the south-west or north-east. A second set of faults strikes 70 degrees and dip steeply, mainly to the north. These faults appear to be related to the fold axes but the field evidence of close correlation is lacking. A third set of faults were mapped near the head-waters

of a Kendal Creek tributary where faults striking 20 degrees to 35 degrees and dipping 55 degrees to the west are exposed in the canyon walls.

The volcanic flows and related sediments have been disrupted and fractured to a marked degree by the movement on the faults; all the rock exposed in the Kendal Creek canyons exhibits close "blocky" jointing. The canyon walls are very unstable due to the fracturing and talus slopes are composed of small "cobbles" and rubble. Kendal Creek has downcut rapidly through the crackled zone and the canyons are steep-walled and deep.

The large and small dykes are more-or-less controlled by fracture channels provided by movement on the faults; the dykes exhibit "blocky" fracturing but to a lesser degree than the volcanic wall rocks.

ECONOMIC GEOLOGY

The rocks in the Kendal Creek area contains sulfides of iron, copper, molybdenum, zinc, lead and silver. The iron sulfide mineralization is readily discernible in the canyons of Kendal Creek where the oxide product forms a large "gossan" area of rusty-weathering rock. The "gossan" zone is an irregular shaped area, approximately 3,000 feet by 8,000 feet, with the long axis oriented in the east-west direction. The orientation of the gossan coincides with the strike of many of the large porphyry dykes and with the east-west faulting and fracturing. Pyrite occurs in almost every rock type on the east side of the OK Range as fine, disseminated crystals and is an indigenous constituent of the rock. However, the pyrite content increases markedly within the gossan area; much of the pyrite within the zone occurs on fractures and joints and has been introduced during one, or more, periods of mineralization. The pyrite has been exposed on the blocky fracturing during the rapid erosion of Kendal Creek and subsequent oxidation has produced the rusty hues that distinguish the gossan zone.

The copper mineralization, as chalcopyrite mainly, is almost entirely restricted to,one, the porphyry dykes and,

two, the boulder conglomerate which is exposed as a "remnant" in the vicinity of the upper heliport. The mineralized porphyry dykes and the boulder conglomerate are all located within the gossan zone.

The porphyry dykes contain both pyrite and chalcopyrite as disseminated grains and blebs within the rock. Pyrite is also found on the joint fractures within the dykes and is, therefore, closely related to the introduced pyrite of the gossan zone. The large porphyry dyke, which is exposed in Kendal Creek between elevations 1425 and 1475 feet, contains pyrite and chalcopyrite uniformly disseminated throughout the dyke with approximately ten times as much pyrite present as there is chalcopyrite. The rock is quite fresh in the creek bottom due to the rapid erosion and scouring action of the creek itself and good exposures across the dyke were seen. Chip samples, taken by A. Ashton and I. Battersby in 1971, across three hundred feet on the north side of the dyke and across one hundred feet on the south side of the dyke assayed:

North - 300 ft, 0.06% Cu; Trace Mo.

South - 100 ft, 0.03% Cu; Trace Mo.

(Although the dyke is approximately five hundred feet wide at this point, the south-central section was not sampled because the rock was not as fresh here as elsewhere).

A large porphyry dyke, which was located in a tributary of Kendal Creek at an elevation of 2000 feet, strikes east-west and is approximately 150 feet wide. Although no samples were taken from this dyke, the visible sulfide content in outcrop is comparable in amount with that found in the large dyke which was sampled.

The most attractive area on the property and the one which has created the most interest to date is the "remnant" of mineralized "boulder conglomerate" located in the vicinity of the upper heliport and base camp. A brief description of the "remnant" was given on Page 15 under the heading "Local Geology" and a map of the remnant on a scale of one inch equals one hundred feet is appended to the report.

The "remnant" is composed of dacite (?) tuff and fine dacite agglomerate with many rounded "boulders" of similar material. The "boulders" range from fist size up to three or four feet in diameter; they do not appear to have a preferred orientation and they make up less than one quarter of the rock volume. Concentric spheres of

fine tuffaceous material form onion-like structures around some of the "boulders"; these onion-like spheres were observed to interlock from one boulder to another which indicates that the concretions around the boulders are secondary in origin.

The rock is grey to grey-green in color and contains carbonate stringers and fracture-fillings of siderite or ankerite. Sulfides of iron and copper occur as disseminated crystals and as fracture fillings; the chalcopyrite forms irregular shaped "knots" up to one inch in length in the breccia. The ratio of chalcopyrite to pyrite is about one to one and is the best ratio observed anywhere on the KDL claims.

A fifty-foot porphyry dyke, which cuts the "boulder conglomerate", is exposed on the bluff about two hundred feet east of the base camp. The dyke strikes north-east and dips steeply and it also contains disseminated pyrite and chalcopyrite.

The "boulder conglomerate" is apparently cut off by faulting in Kendal Creek as it was not found in place east of the creek. Several large boulders of the "conglomerate" were located in the east bank of the creek but all appear to be "float".

The "remnant" occupies a dip slope; the foot-wall of the remnant strikes 115 degrees and dips 35 degrees to the north-east. Locally, the "boulder conglomerate" is limited in volume; it is wedge-shaped in cross section and forms an irregular oval in plan. The total volume is approximately 300,00 cu. yds., or about 600,000 tons, and this volume includes the 50 feet of porphyry dyke.

Although no attempt was made to sample the "boulder conglomerate" during the recent work, a number of earlier workers have taken grab and chip samples from the boulder conglomerate. The results are listed below:

Sampler	Type	Width	Cu	Mo	Au	Ag
W.M. Sharp	Chip	100ft	0.37%	-	-	-
" "	Chip	170ft	0.02%	-	-	-
" "	Chip	30ft	0.18%	-	-	-
" "	Channel	3ft	0.44%	-	0.005 ozs	0.40ozs/ton
(Unknown)	Grab	-	0.68%	-	-	-
(")	Grab	-	0.44%	-	-	-
R.H. Bates	Grab	100ft(?)	0.55%	0.02%	-	-
" "	Grab	400ft	1.60%	-	0.01 oz	0.57 ozs.

(The last sample selected from the best outcrops).

An accurate grade of the "boulder conglomerate" cannot be calculated from the limited number and type of samples tabled above; the copper content of the "conglomerate" appears to lie between one quarter and one half percent. In summary, the "conglomerate" contains disseminated copper mineralization which is rather uniformly distributed; there are areas that obviously contain more than ½% copper and there are also zones within the "conglomerate" that obviously contain much less than ¼% copper.

Respectfully submitted,

A. R. Bullis, P. Eng.

30th Nov. 1972
DELTA, B.C.

PART III

SOIL & SILT SAMPLE SURVEY - KENDAL CREEK

The soil-sampling programme was conducted over thirteen claims; eight claims were covered entirely and five claims partially. The claims sampled were the KDL 1, 3, 5, 7, 9, 10, 11, 12 (wholly) and KDL 6, 21, 22, 28 and 30 (partially). In addition, approximately 150 acres, lying north of Kleanza Creek and adjacent to the claim group, was sampled. Reconnaissance lines were extended east and west of the claim group and silt samples were taken in the general area of Kendal Creek.

416 soil samples and 96 silt samples were gathered in the Kendal Creek area and of these, 360 soil and 54 silt samples were taken on the KDL Mineral Claims. The others were taken in areas of interest adjacent to the KDL group. The soil samples were taken on a chain-and-compass grid at 200 foot intervals along lines that were 400 feet apart. Augers, with head diameters of 1½ inches and over-all lenghts of 3½ feet, were used for the extraction of the soil. Silt samples were scooped by hand from the streams and the sites "tied in" by altimeter to topographic base maps.

All the samples were sent to Vancouver Geochemical Laboratories in North Vancouver, B.C. where they were processed using hot HC104 and HNO3 digestion and analysed by instrumental atomic absorption. The machines used were the "Techron AA5" and "AA1000".

The results from the soil and silt surveys were evaluated using statistical and graphical methods. A reference to these particular methods can be found in Economic Geology, volume 64, 1969, P.P. 538-550 (C. Lepeltier).

About 30 of the soil samples were taken from swampy areas and, consequently, had a high organic content. Some of these samples had high values and because organic material is known to have a background level higher than soils, the samples rich in organic materials were processed as a separate population.

The method used to evaluate the soil samples not having a high content was as follows:

(a) twelve to fifteen frequency groups having equal intervals in parts per million were determined. The re-required interval was calculated using the following formula:

$$\text{Interval equals } \frac{\text{(Highest value) minus (Lowest value)}}{\text{Desired number of groups}}$$

The data revealed a wide spread between the highest value (3500 ppm Cu.) and the lowest value (5 ppm Cu.) and, therefore, only the lower 98% of the samples were used in the calculation (i.e. those containing less than 215 ppm Cu.); the rest were considered anomalous;

(b) each sample was placed in its appropriate group;

(c) the frequency; the cumulative frequency and the percentage cumulative frequency of each group was determined;

(d) percentage cumulative frequency versus parts per million was plotted on "three cycle log, versus probability" graph paper.

The resulting curves give the background, threshold and anomalous values of the population as well as information regarding the number of different populations present.

Graph No. 1 shows a two-slope curve that indicates an excess of high values present in the population. The "threshold" value is taken to be that point at which the break in the slope occurs (i.e. 82 ppm Cu.) and any values above that are considered anomalous for those samples low in organic content.

Similar calculations were made for the soil samples having a high organic content and, while the results from a small population are not as accurate as those from a large population, it was evident that the threshold value for this group lies between 500 and 1000 ppm.

All the sample sites and values were plotted on a 1 inch equals 400 foot scale map and the anomalous zones are shown on the map. The highest values are on and around the known chalcopyrite "showings" near the base camp. Other strong "highs" are associated with swamps. A number of anomalous samples not associated with known mineralization occur on lines 216N and 204N.

Two separate populations of silt samples are readily seen from the data plotted on Graph No. 2. On first plotting, samples were included that had been taken from an area about two miles further to the north-east. The population having the higher background originated on the KDL Claims; the population having the lower background originates from the area to the north-east. After these two groups of samples had been separated and re-plotted on Graph 3, the background values from stream samples on the KDL property were found to be 100 ppm Cu. and that anomalous

values were greater than 250 ppm Cu. The silt survey anomalies coincide with the soil survey anomalies.

Similar calculations were made on the data for zinc and the following conclusions drawn: anomalous values for soil samples having a low organic content are greater than 300 ppm; anomalous values for soil samples having a high organic content are greater than 550 ppm. The correlation between zinc and copper anomalies is strong, as shown on the accompanying maps.

Respectfully submitted,

H. R. Bullis, B. Sc.

30th Nov. 1972

DELTA, B.C.

ARB

CERTIFICATE OF QUALIFICATIONS

I, Hugh Ralph Bullis, do hereby state that:

1. I am a graduate of the University of British Columbia and have been granted the degree of Bachelor of Science in Geology.

2. I have been practising my profession as a geologist for four years.

H. R. Bullis

H. R. Bullis, B.Sc.

CERTIFICATE OF QUALIFICATIONS

I, Albert Ralph Bullis, do hereby certify that:

1. I am a practising geological engineer with residence at 5215 Saratoga Drive, Delta, B.C.

2. I am a graduate of the University of British Columbia and have been granted the degree of Bachelor of Applied Science.

3. I have been practising my profession as a geological engineer for twenty years.

4. I am a member of the Association of Professional Engineers of British Columbia and a member of the Association of Professional Engineers of Ontario.

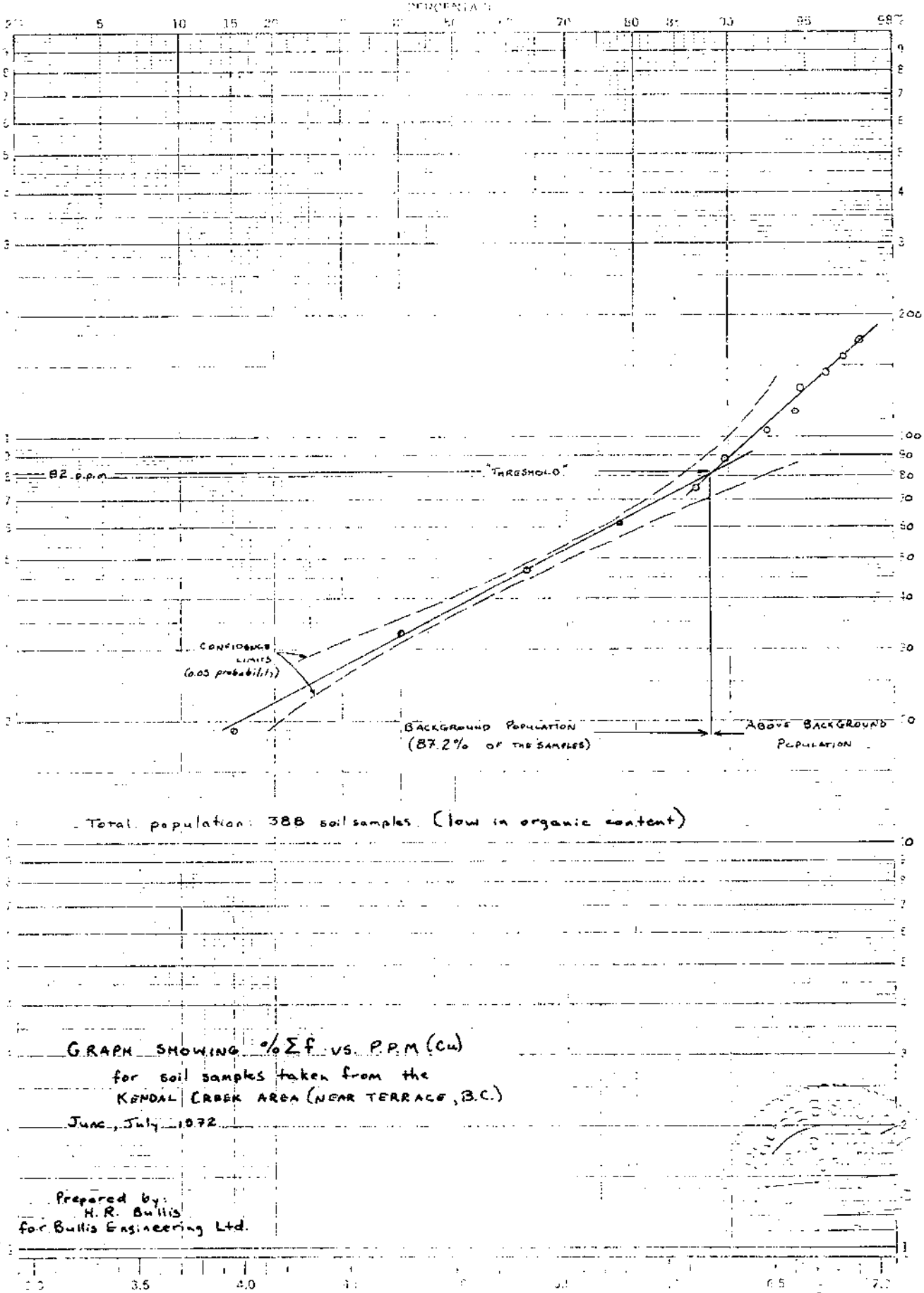
5. The accompanying report is based on information obtained by the author during the exploration programme from 20th June to 6th August, 1972. Additional information was obtained from the reports listed in "References".

6. I have no interest, directly or indirectly, in the property or securities of Kendal Mining and Exploration Co. Ltd. (N.P.L.) or in Coastal Mining Limited, nor do I expect to receive any.

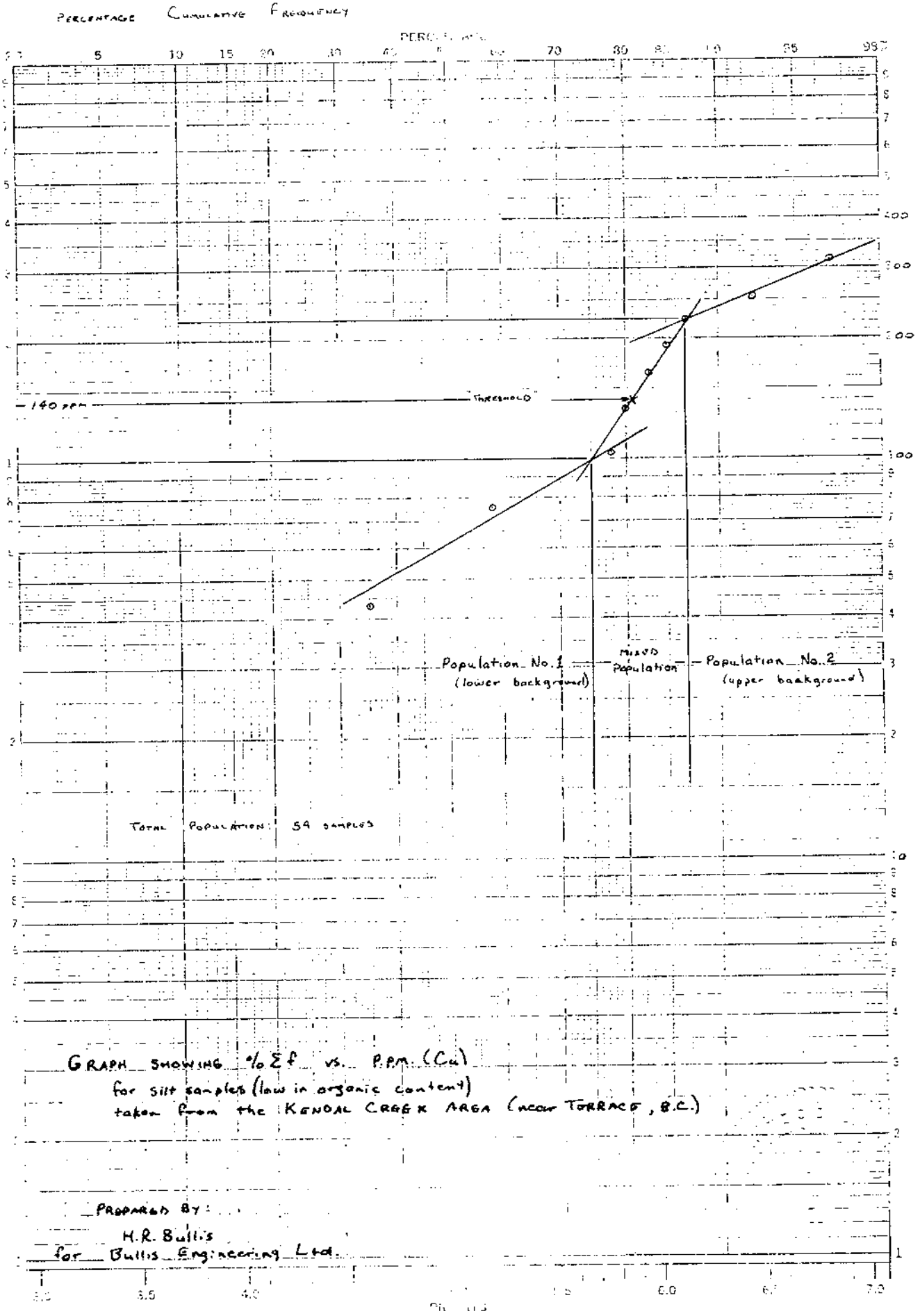
A. R. BULLIS, P.Eng.

November 30th, 1972.
DELTA, B.C.

PERCENTAGE CUMULATIVE FREQUENCY



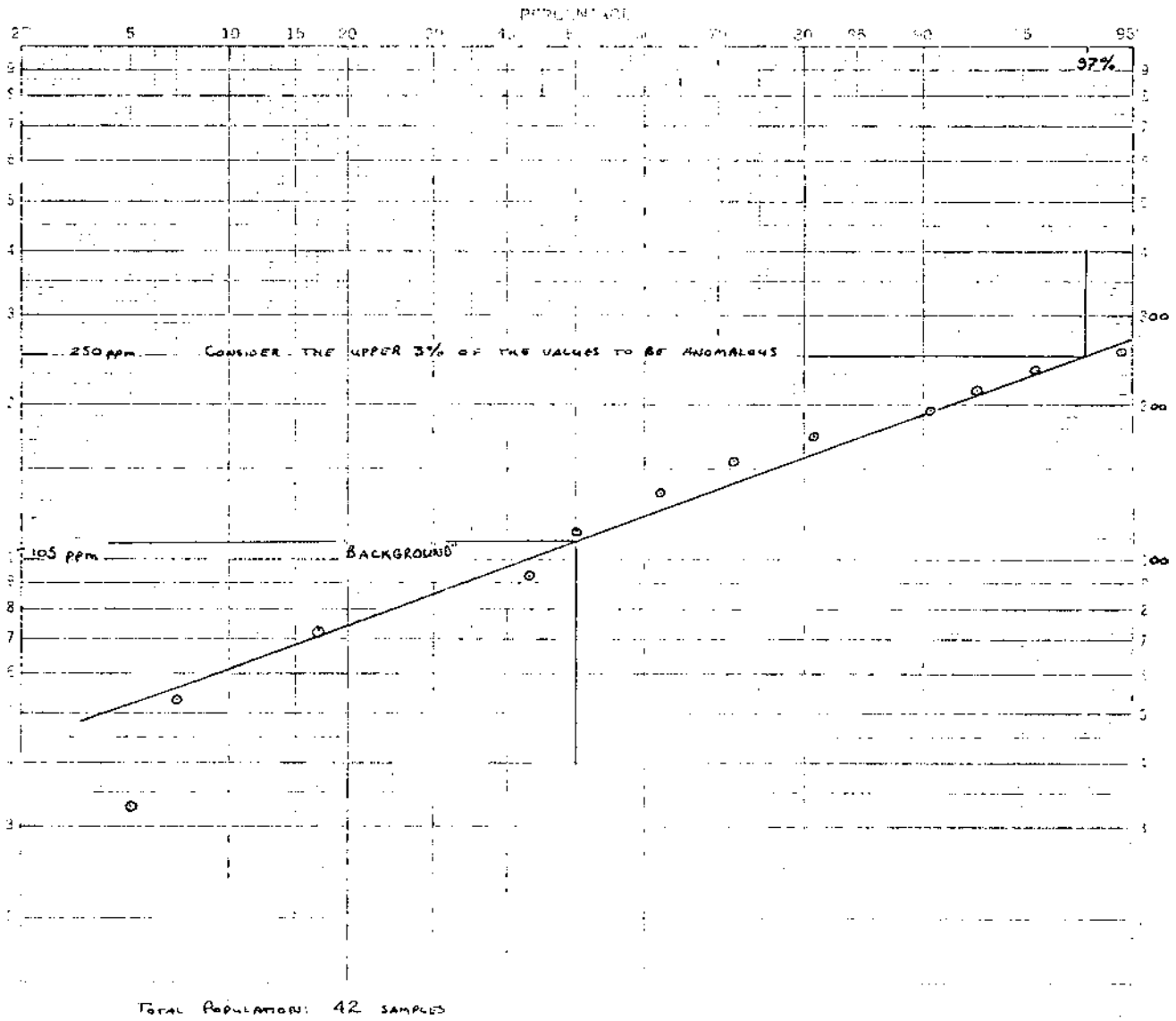
GRAPH No. 1



GRAPH SHOWING % Σ f vs. P.P.M. (Cu)
for silt samples (low in organic content)
taken from the KENDAL CREEK AREA (near TERRACE, B.C.)

PREPARED BY:
H.R. Bullis
for Bullis Engineering Ltd.

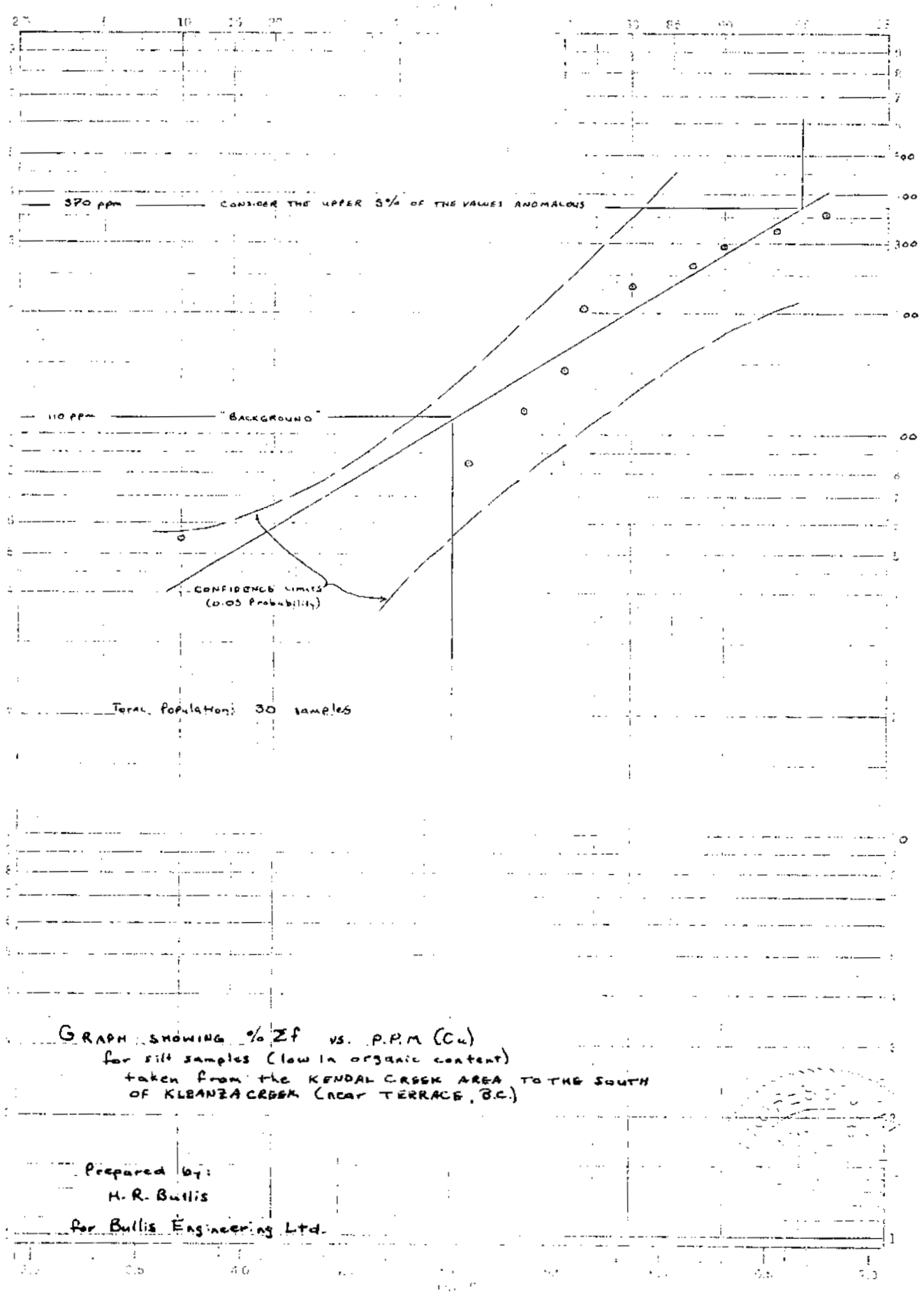
GRAPH No. 2



GRAPH SHOWING % Σf vs. P.P.M (Cu)
for silt samples (high in organic content)
taken from the KENDAL CREEK AREA (near TERRACE, B.C)

Prepared By:
M.R. Bullis
for Bullis Engineering Ltd.

GRAPH No. 3

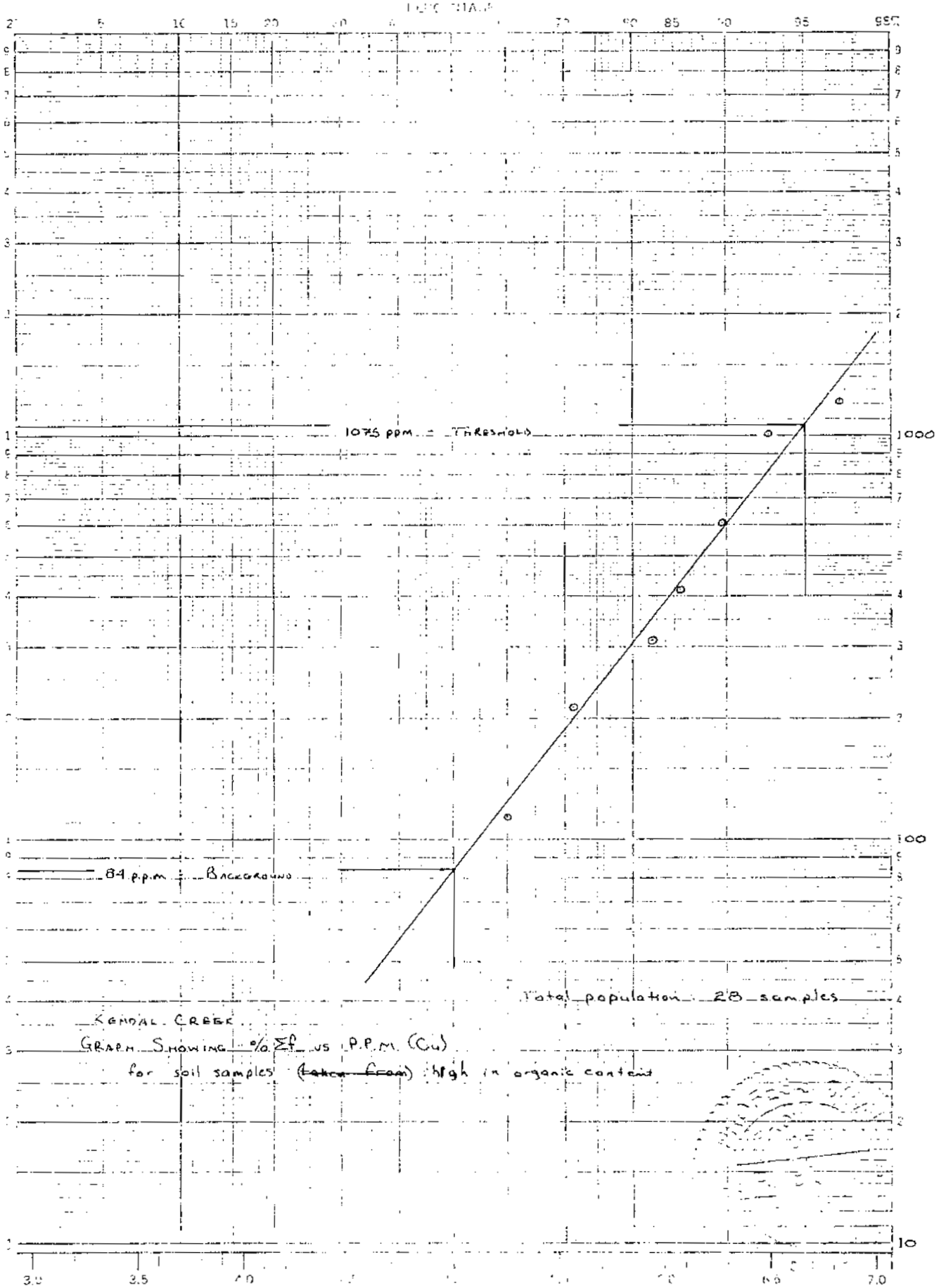


GRAPH SHOWING % Zf vs. P.P.M (Cu)
for silt samples (low in organic content)
taken from the KENDAL CREEK AREA TO THE SOUTH
OF KLEANZA CREEK (near TERRACE, B.C.)

Prepared by:
H. R. Bullis
for Bullis Engineering Ltd.

GRAPH No. 4

Percentage Cumulative Frequency



KENDAL CREEK.

GRAPH SHOWING %Σf vs P.P.M. (Cu)

for soil samples ~~taken from~~ high in organic content

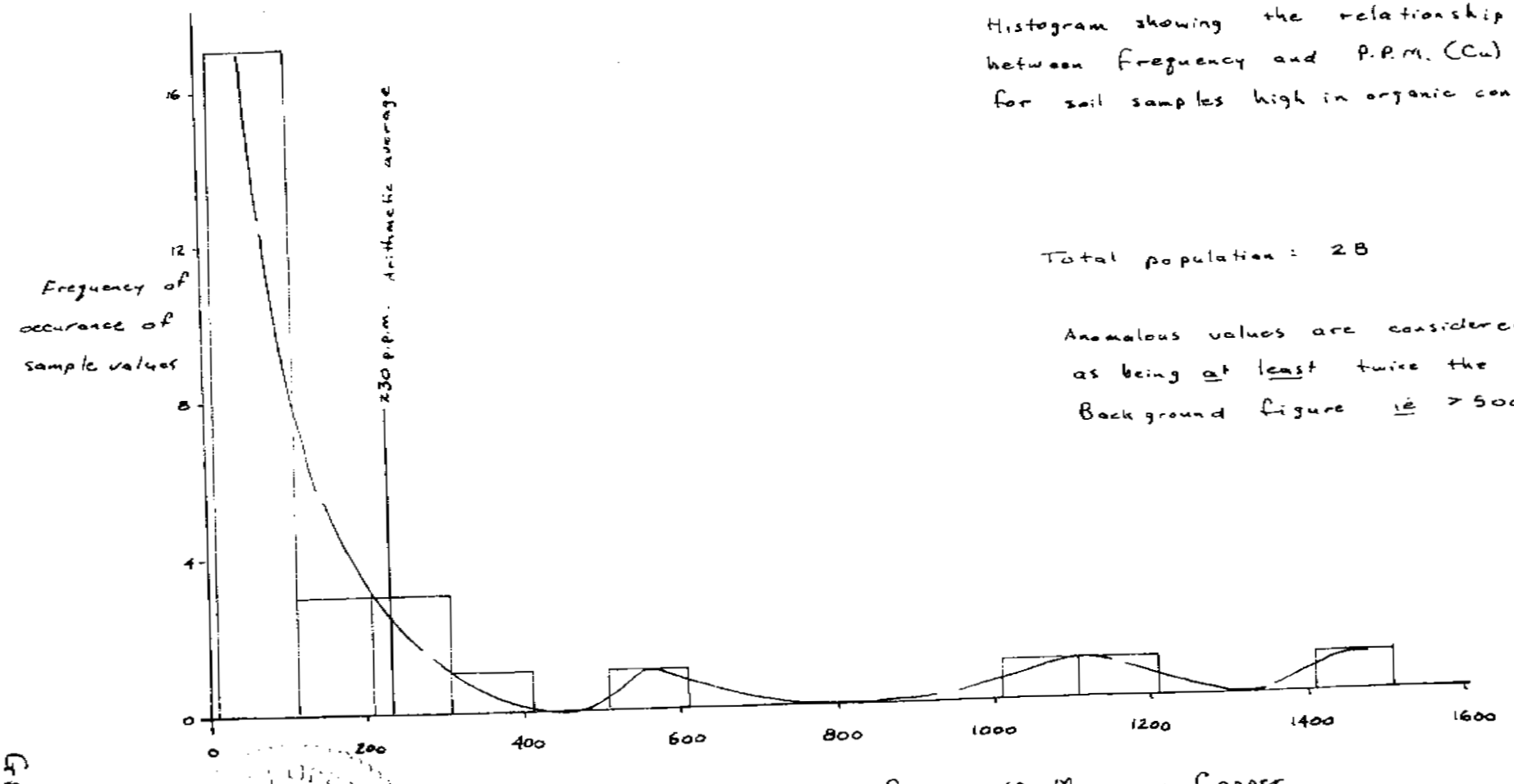
GRAPH No. 5

KENDAL CREEK

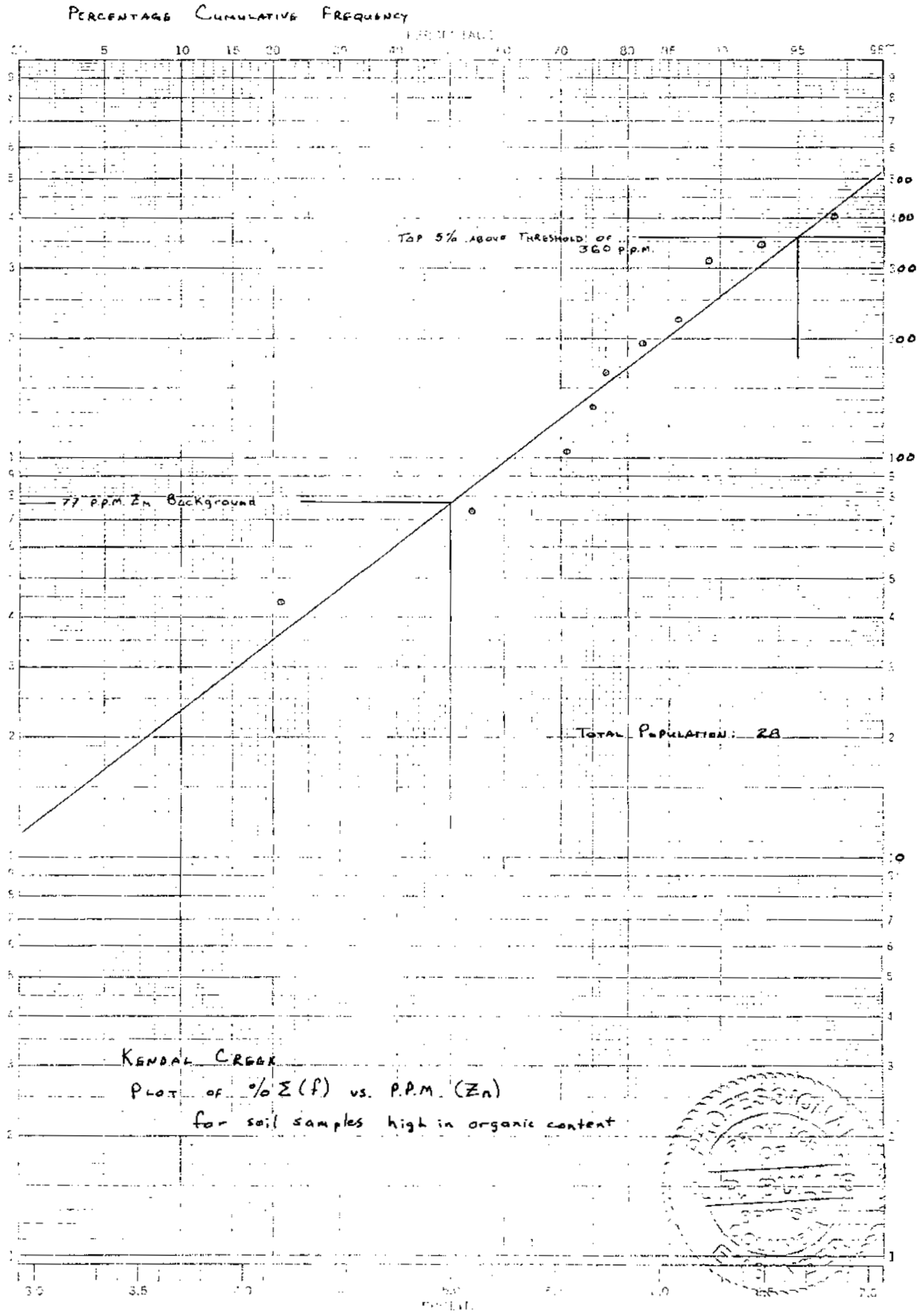
Histogram showing the relationship between Frequency and P.P.M. (Cu) for soil samples high in organic content

Total population : 28

Anomalous values are considered as being at least twice the Background figure ie > 500 ppm

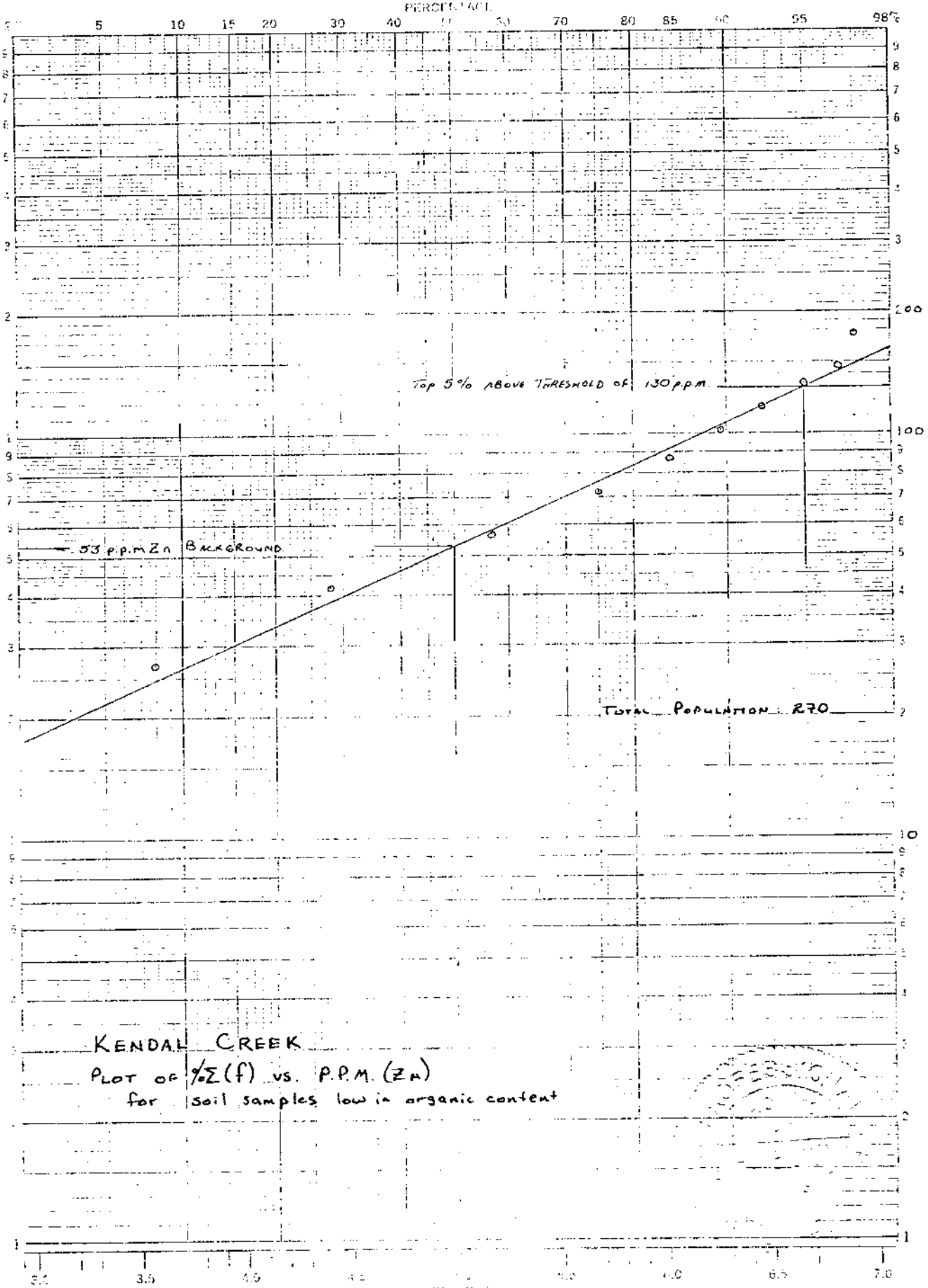


GRAPH No. 6


PERCENTAGE CUMULATIVE FREQUENCY
PERCENTAGE
5
10
15
20
30
40
50
60
70
80
90
95
98
99
TOP 5% ABOVE THRESHOLD OF 360 P.P.M.
77 P.P.M. Zn Background
TOTAL POPULATION: 28
PARTS PER MILLION - ZINC
500
400
300
200
100
10
KENDAL CREEK
PLOT OF % Σ (f) vs. P.P.M. (Zn)
for soil samples high in organic content
3.0
3.5
4.0
4.5
5.0
5.5
6.0
PROBABILITY
X 3 LOG CYCLES
45 8080

GRAPH NO. 7

PERCENTAGE CUMULATIVE FREQUENCY



KENDAL CREEK

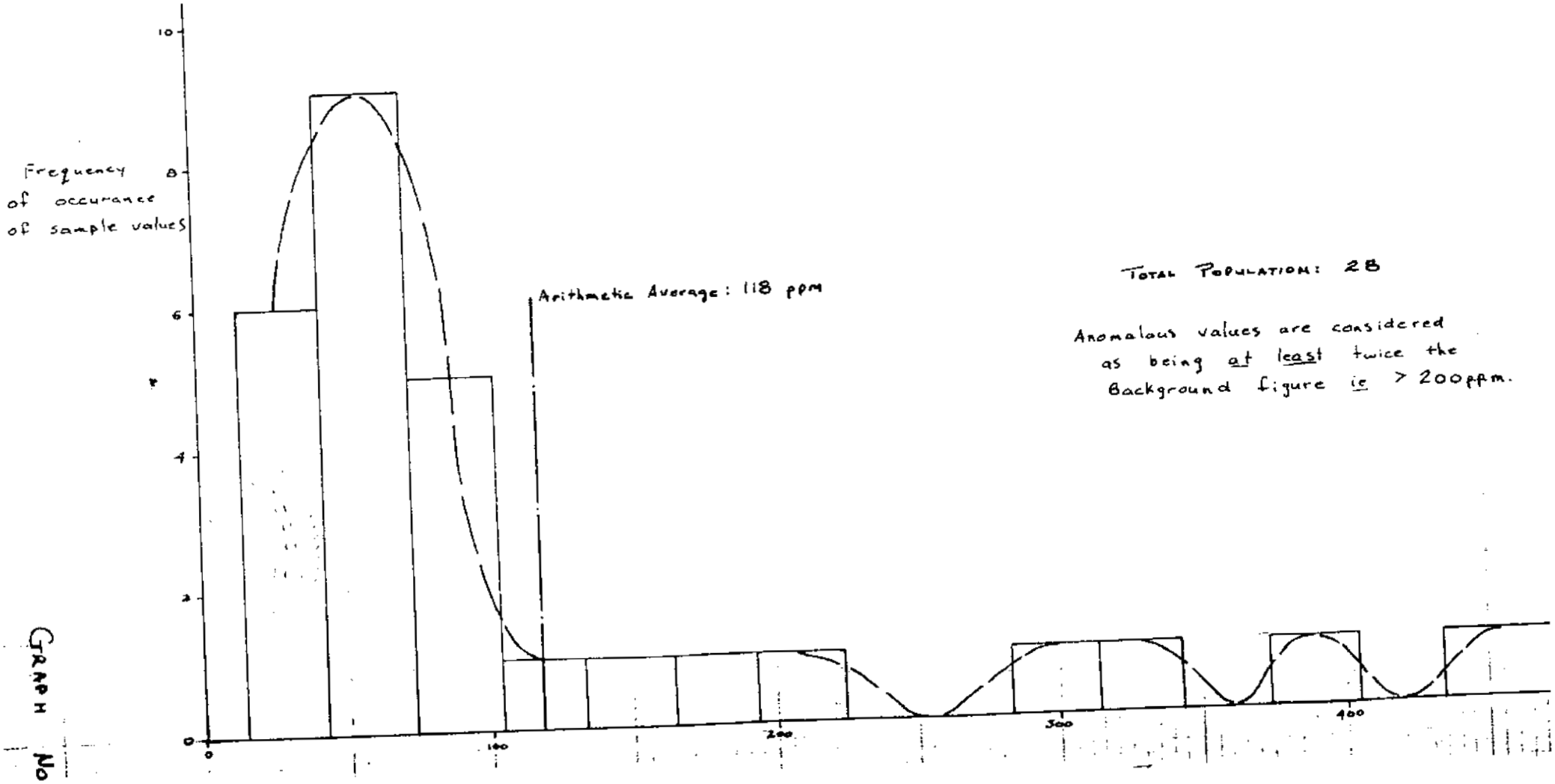
PLOT OF $\%\Sigma(f)$ VS. P.P.M. (Zn)

for soil samples low in organic content

GRAPH No. 8.

KENDAL CREEK.

HISTOGRAM SHOWING THE RELATIONSHIP
of FREQUENCY VS. P.P.M. (Zn)
FOR SAMPLES high in organic content



TOTAL POPULATION: 28

Anomalous values are considered as being at least twice the Background figure ie > 200ppm.

GRAPH No

REFERENCES

1. Geology of Terrace Map Area
   by S. Duffel and J.G. Souther
   G.S.C. Memoir 329 (1964).

2. Report on KDL Claims
   by W.M. Sharp, P.Eng.
   dated August 1971.

3. Economic Geology, C. Lepeltier,
   Volume 64, 1969; pp. 538 to 550.

Vancouver Geochemical Laboratories Ltd.

1521 PEMBERTON AVENUE NORTH VANCOUVER, B.C., CANADA TELEPHONE 604-988-2172

GEOCHEMICAL ANALYTICAL REPORT

REPORT No. 72-44-006 DATE August 1, 1972
Job No. 72-167
SAMPLES SUBMITTED BY Bullis Engineering COMPANY Hanna Mining
SHIPPED VIA picked up at Greyhound FROM Terrace, B.C.
REPORT ON 382 samples for Cu,Zn DATE SAMPLES ARRIVED July 27, 1972

* * *

COPIES OF THIS REPORT SENT TO: **TRANSMITTED BY:**

(1) Hanna Mining Company Limited Mail
(2) Bullis Engineering Mail
(3)

SAMPLES SIEVED OR GROUND TO -80 MESH WEIGHT USED 0.5g
FINAL VOLUME 10 ml ALIQUOT USED n/a

* * *

METHOD OF ANALYSIS: Instrumental Atomic Absorption
EXTRACTION: Hot $HClO_4$ & HNO_3 digestion
DETECTION: Techtron AA5 & AA1000

SAMPLES ASSIGNMENT: (a) PREPARED SAMPLES: filed
(b) REJECTS: discarded

* * *

ANALYST(S) P.N. TYPIST dcw
SUPERVISING CHEMIST C.Chun CHECKED BY C. C. Chun

COSTS:

SHIPPING CHARGE	$	5.25
SAMPLE PREPARATION	$	76.40
ANALYSIS	$	573.00
OTHER	$	---
TOTAL	$	654.65

Vancouver Geochemical Laboratories Ltd.

1521 PEMBERTON AVENUE NORTH VANCOUVER, B.C. CANADA TELEPHONE 604-988-2172

COMPANY Hanna Mining Company REPORT 22-44-006 PAGE 1 OF 10

MARKING	Cu	Zn
122N-120W	20	41
124	14	38
126	16	20
128	36	49
130	35	41
132	15	36
134	58	70
136	55	52
138	24	33
140	8	20
142	18	27
144	16	53
146	28	44
148	15	42
150	22	45
152N-120W	15	25
152N-121W	13	35
154N-120W	45	57
156N-120W	44	40
156N-122W	155	85

MARKING	Cu	Zn
156N-124W	60	50
26	26	40
28	68	67
30	48	30
32	56	67
34	42	32
36	15	42
38	25	46
40	32	52
42	15	62
44	35	90
46	90	226
48	80	192
156N-150W	24	42
154N-120W	30	30
158N-120W	26	42
21	48	40
23	54	45
158N-125W	15	23

REMARKS

Vancouver Geochemical Laboratories Ltd.

1521 PEMBERTON AVENUE NORTH VANCOUVER, B.C. CANADA TELEPHONE 604-988-2172

COMPANY **Hanna Mining** REPORT NO. 72-44-006 PAGE 2 OF 10

MARKING	Cu	Zn
160N-129W	26	55
31	14	30
33	12	48
35	16	40
37	18	56
39	75	103
41	168	110
43	20	75
45	100	76
47	50	43
160N-149W	174	118
162N-120W	16	34
164N-120W	10	28
22	28	115
24	30	57
26	28	71
28	48	70
30	10	30
32	10	20
164N-134W	15	51

MARKING	Cu	Zn
164N-136W	52	77
38	65	52
40	15	40
42	32	67
44	44	70
46	16	36
48	32	73
164N-150W	10	75
166N-120W	5	15
168N-120W	38	71
21	28	52
23	58	68
25	30	52
27	15	72
29	50	72
31	16	42
35	15	40
37	35	27
168N-139W	35	25

REMARKS

Vancouver Geochemical Laboratories Ltd.

1521 PEMBERTON AVENUE NORTH VANCOUVER, B.C. CANADA TELEPHONE 604-988-2172

COMPANY Hanna Mining REPORT NO. 72-44-006 PAGE 3 OF 10

MARKING	Cu	Zn
168N-141W	30	43
43	54	48
45	24	50
168N-147W	20	46
170N-120W	36	53
172N-120W	34	39
22	20	40
24	65	55
26	52	53
28	60	28
30	21	52
32	46	87
34	38	75
36	94	104
38	35	80
40	680	68
42	65	65
44	45	46
46	34	37
172N-146+76W	100	83

MARKING	Cu	Zn
174N-120W	50	50
176N-120W	65	85
21	20	30
23	18	42
25	95	105
27	26	45
29	14	32
31	40	44
33	38	40
35	118	130
37	44	51
39	190	42
176N-140+62W	56	80
178N-120W	40	73
180N-120W	28	50
180N-122W	88	43
24	25	36
26	45	48
180N-128W	75	70

REMARKS

All values are reported in parts per million unless otherwise noted. Values are believed to be correct to the best knowledge of the laboratory based on the method and instruments used.

Vancouver Geochemical Laboratories Ltd.

1521 PEMBERTON AVENUE NORTH VANCOUVER, B.C. CANADA TELEPHONE 604-988-2172

COMPANY Hanna Mining REPORT No. 72-44-006 PAGE 4 OF 10

MARKING	Cu	Zn		
180N-130W	30	60		
32	32	51		
34	52	62		
36	35	56		
180N-138W	52	41		
182N-120W	14	36		
184N-120W	46	57		
21	140	60		
22	58	82		
23	66	107		
24	24	57		
25	40	46		
26	70	62		
27	40	41		
28	135	198		
28+81W	46	57		
29	48	46		
31	68	57		
184N-133W	68	62		
185N-121W	290	51		

MARKING	Cu	Zn		
185N-122W	36	72		
23	32	52		
24	44	78		
25	68	62		
26	44	56		
27	26	42		
185N-128W	48	90		
186N-121W	52	305		✓
22	38	48		
23	45	102		
24	90	100		
25	35	85		
26	40	57		
186N-126+71W	30	57		
187N-120W	1100	453		✓
21	210	385		✓
22	190	306		✓
23	52	60		
187N-124W	58	72		

REMARKS

Vancouver Geochemical Laboratories Ltd.

1521 PEMBERTON AVENUE NORTH VANCOUVER B.C. CANADA TELEPHONE 604-988-2172

COMPANY Hanna Mining REPORT No. 72-44-006 PAGE 5 OF 10

MARKING	Cu	Zn	
187N-125W	45	46	
187N-126W	175	72	
188N-120W	95	175	
1	1360	312	
2	84	72	
3	18	27	
4	106	86	
5	50	62	
25+71W	110	57	
188N-130W	65	40	
189N-120W	1800	640	
1	1900	1100	
2	750	376	
3	3500	3600	
189N-124W	430	198	
190N-120W	60	60	
192N-120W	106	51	
194W	69	82	
196	25	57	
198N-120W	55	80	SW

MARKING	Cu	Zn	
200N-120W	56	186	✓
1	170	116	
3	45	45	
200S-125W	65	73	
202N-120W	1200	418	✓
204N-64W	58	75	
68	132	90	
72	26	40	
76	70	98	
80	326	146	✓
84	55	51	
88	48	92	
92	358	97	
96 organic	1100	96	SW
100	40	37	
104	40	50	
108	46	48	
112	90	45	
204N-116W	204	67	

REMARKS

Vancouver Geochemical Laboratories Ltd.

1521 PEMBERTON AVENUE NORTH VANCOUVER, B.C. CANADA TELEPHONE 604-988-2172

COMPANY Hanna Mining REPORT NO. 72-44-006 PAGE 6 OF 10

MARKING	Cu	Zn		
204N-120W	158	83		
22	460	435		
24	45	71		
204N-126W	84	72		
206N-120W	45	64		
208N-120W	1520	82		SW
21	70	68		
23	580	312		SW
25	60	62		SW
27	30	22		
208N-129W	126	98		SW
210N-120W org.	1200	182		(SW)
212 N-120W "	362	473		SW
22 "	225	403		(SW)
24	62	82		
26	24	32		
28	28	39		
212N-130W	65	68		
214N-120W	92	62		
216N-72W	34	36		

MARKING	Cu	Zn		
216N-75W	200	85		
76	162	236		✓
80	135	105		
84	138	142		✓
88	100	123		
92	105	123		
96	110	64		
100	69	107		SW
104	48	98		
108	100	105		
112	175	210		✓
116	46	92		
120	60	65		
121	40	102		
123	58	73		
125	45	42		
127	60	81		SW
216N-129W	145	138		✓
218N-120W	45	67		

REMARKS

Vancouver Geochemical Laboratories Ltd.

1521 PEMBERTON AVENUE NORTH VANCOUVER, B.C. CANADA TELEPHONE 604-988-2172

COMPANY Hanna Mining REPORT No 72-44-006 PAGE 7 OF 10

MARKING	Cu	Zn	
220N-120W	23	15	
22 org.	213	145	sw
24 "	122	52	sw
26 "	235	213	sw
28	38	50	
220N-130W	18	25	
222N-120W	70	56	
224N-120W org.	76	55	sw
21	30	45	
23	34	32	sw
25 org.	248	36	sw
27 "	42	325	sw
224N-129W	15	26	
226N-120W	20	23	
228N-120W	85	48	
22	25	137	
24	7	36	
26	24	47	
23	40	65	
228N-130W	19	45	

MARKING	Cu	Zn		
230N-120W	48	53		
232N-120W	59	40		
1	35	65		
3 org.	22	20		sw
5	14	22		sw
7	17	36		
232N-129W	30	25		
234N-120W	68	52		
236N-120W	55	70		
2	15	73		sw
4	40	120		
6	58	180		✓
236N-128W	60	165		✓
238N-120W	23	34		
240N-120W	20	38		
1	8	24		
3	67	68		
5	38	96		
240N-127W	20	52	✓	

REMARKS

Kwanika Creek

Vancouver Geochemical Laboratories Ltd.

1521 PEMBERTON AVENUE NORTH VANCOUVER, B.C. CANADA TELEPHONE 604-985-2172

COMPANY Hanna Mining Limited REPORT No. 72-44-006 PAGE 8 OF 10

MARKING	Cu	Zn		
240N-129W	28	60		
242N-120W	35	75		
244N-120W	56	90		
2	34	52		
4	35	45		
6	24	57		
28	6	20		
30	55	85		
244N-132W	63	83		
246N-120W	30	100		
H-401	248	243		
2 organic	206	260		
3	465	248		
4	135	136		
5	62	145		
6	224	275		
7	65	170		
8	64	195		
409	100	105		
H-410	60	98		

MARKING	Cu	Zn		
SH-1	300	252		\
2	350	390		✓
3	290	345		\
4	180	436		
5	240	375		\
6 organic	242	318		\
7 "	175	225		
8 "	295	216		✓
9 "	75	185		
10 "	155	175		
11 "	185	330		
2 "	120	268		
3 "	92	125		
4 "	80	75		
5 "	54	295		
6 "	85	420		
7	218	188		\
8 organic	214	1400		\
SH-19 "	35	145		

REMARKS

All values are reported in parts per million unless specified otherwise. All values are believed to be correct to the best knowledge of the analyst based on the method and instruments used.

Vancouver Geochemical Laboratories Ltd.

1521 PEMBERTON AVENUE NORTH VANCOUVER, B.C. CANADA TELEPHONE 604-988-2172

COMPANY Hanna Mining REPORT NO. 72-44-006 PAGE 9 OF 10

MARKING	Cu	Zn
SH-21	140	215
2	42	152
3 organic	118	270
4	35	200
5 organic	65	210
6 "	66	150
7	56	77
8	25	98
29 organic	26	48
30 "	22	40
100 "	80	120
1 "	84	107
2 "	125	142
3 "	170	228
4 "	92	85
5 "	88	90
6 "	126	96
7 "	135	84
8 "	140	90
SH-109 "	108	103

MARKING	Cu	Zn
SH-110 organic	150	82
1 "	155	255
2 "	192	225
3 "	160	135
4 "	175	140
5 "	137	102
6 "	75	82
7 "	102	112
8 "	105	106
19	80	70
20	107	90
1	78	123
2 organic	90	100
3 "	93	113
4 "	69	92
5 "	115	144
6	78	83
7	80	88
SH-128	66	75

REMARKS

All ppm Zn values are believed to be [illegible] method and instrument used

Vancouver Geochemical Laboratories Ltd.

1521 PEMBERTON AVENUE NORTH VANCOUVER, B.C. CANADA TELEPHONE 604-988-2172

COMPANY Hanna Mining REPORT N72-44-006 PAGE 10 OF 10

MARKING	Cu	Zn		
SH-129	75	70		
30	62	74		
1	78	90		
SH-132	93	110		
0-N organic	54	14	(sw)	
4	38	24		
8	30	44		
12	15	48		
16	8	12		
20	12	18		
24	7	15		
28N	3	58		
2-0N	125	52		
4	35	43		
8	85	77		
12	44	60		
16	40	45		
20	38	70		
24	35	55		
2-28N	22	35		

MARKING	Cu	Zn		
L3-00+00 org.	36	42		sw
4	325	285		✓
8 organic	32	58		(sw)
12 "	13	52		(sw)
16	42	122		
20	17	60		
24 organic	60	58		(sw)
28 "	25	73		(sw)
32	18	65		
L3-36+00 org.	40	62		(sw)
196N-122W	26	40	/	

REMARKS

Vancouver Geochemical Laboratories Ltd.

1521 PEMBERTON AVENUE NORTH VANCOUVER, B.C., CANADA TELEPHONE 604-988-2172

GEOCHEMICAL ANALYTICAL REPORT

REPORT No. 72-44-009 DATE August 25, 1972
Job No. 72-229
SAMPLES SUBMITTED BY Bullis Engineering COMPANY Hanna Mining Limited
SHIPPED VIA ..... FROM filed
REPORT ON 127 samples for Mo,Cu DATE SAMPLES ARRIVED August 21, 1972

* * *

COPIES OF THIS REPORT SENT TO: **TRANSMITTED BY:**

(1) Hanna Mining Limited — Mail
#506-1200 W. Pender Street
(2) Vancouver, B.C.
(3) Bullis Engineering Limited — Mail
#206-1318 56th Street Delta, B.C.

SAMPLES SIEVED OR GROUND TO -80 MESH WEIGHT USED 0.5g
FINAL VOLUME 10 ml ALIQUOT USED n/a

* * *

METHOD OF ANALYSIS: Instrumental Atomic Absorption
EXTRACTION: Hot $HClO_4$ & HNO_3 digestion
DETECTION: Techtron AA5 & AA1000

SAMPLES ASSIGNMENT: (a) PREPARED SAMPLES: filed
(b) REJECTS: discarded

* * *

ANALYST(S) D.W., W.L. TYPIST dcw
SUPERVISING CHEMIST C.Chun CHECKED BY C.Chun

COSTS:

SHIPPING CHARGE	$	---
SAMPLE PREPARATION	$	---
ANALYSIS	$	190.50
OTHER	$	---
TOTAL	$	190.50

KENDAL CREEK

Vancouver Geochemical Laboratories Ltd.

1521 PEMBERTON AVENUE NORTH VANCOUVER, B.C. CANADA TELEPHONE 604-988-2172

COMPANY Hanna Mining Limited REPORT No. 70-44-009 PAGE 1 OF 4

MARKING	Mo	Cu		
180N-128W	2	18		
182N-128W	2	21		
384N-114W	4	27		
6	2	20		
18	5	28		
20	4	23		
2	2	31		
4	7	67		sw
6	4	37		
28	2	8		
30	4	12		
2	4	25		
4	3	10		
6	6	58		
38	5	12		
40	4	40		
384N-142W	4	48		
386N-128W	4	22		
388N-106W	3	46		
388N-108W	4	43		

MARKING	Mo	Cu		
388N-110W	2	38		
2	3	31		
4	3	49		sw
6	3	52		sw
18	4	13		
20	3	16		sw
2	3	30		
4	4	27		
388N-128W	4	30		
390N-128W	3	52		
392N- 98W	4	190		
100	4	32		
2	3	73		
4	2	60		
6	4	45		
8	4	24		
10	4	31		
2	3	35		
390N-114W	2	58		

REMARKS

KENDAL CREEK

Vancouver Geochemical Laboratories Ltd.

1521 PEMBERTON AVENUE NORTH VANCOUVER, B.C. CANADA TELEPHONE 604-988-2172

COMPANY Hanna Mining Limited REPORT No. 82-44-009 PAGE 2 OF 4

MARKING	Mo	Cu		
392N-116W	4	30		
18	2	52		
20	4	66		
2	4	38		
4	2	28		
6	4	24		
28	nd	50		
30	6	29		
2	4	68		
4	5	42		
6	6	31		
38	9	62		
40	8	43		
392N-142W	7	35		
394N-100W	4	65		
396N- 86W	4	52		
88	3	35		
90	4	56		
2	4	42		
396N- 94W	2	27		

MARKING	Mo	Cu		
396N- 96W	4	46		
98	4	48		
100	4	50		
OM BL 100	3	58		
2	5	23		
4	5	27		
8	4	30		
10	3	68		
2	2	66		
396N-114W	2	32		
398N-100W	6	40		
400N- 86W	4	33		
88	4	62		
90	4	31		
4	6	35		
6	4	20		
98	3	18		
100	6	65		
400N-102W	4	16		

REMARKS nd= none detected

KENDALL CREEK

Vancouver Geochemical Laboratories Ltd.

1521 PEMBERTON AVENUE NORTH VANCOUVER, B.C. CANADA TELEPHONE 604-988-2172

COMPANY Hanna Mining Limited REPORT NO. 72-44-009 PAGE 3 OF 4

MARKING	Mo	Cu
4CON-104W	6	38
6	3	36
8	3	180
10	3	65
2	2	22
4	2	37
6	2	36
18	3	65
20	3	30
2	2	28
4	6	18
6	4	47
4CON-128W	4	22
M-1	5	73
2	4	48
M-3	5	136
SH-50	4	24
1	4	30
2	nd	21
SH-53	4	13

MARKING	Mo	Cu
SH-55	3	24
6	3	20
7	2	20
8	4	41
59	3	32
60	3	23
1	2	30
2	nd	32
63	2	30
133	2	45
4	5	72
5	6	65
6	5	84
7	6	87
8	4	96
39	5	48
40	5	54
1	5	30
SH-142	9	28

REMARKS

nd= none detected

NORTH SIDE OF KLEANZA CREEK

SIDE OF KLEANZA CK

KENDAL CREEK

Vancouver Geochemical Laboratories Ltd.

1521 PEMBERTON AVENUE NORTH VANCOUVER, B.C. CANADA TELEPHONE 604-988-2172

COMPANY Hunna Mining Limited REPORT NO. 72-44-009 PAGE 4 OF 4

MARKING	Mo	Cu		
SH-143	6	34		
SH-144	4	47		
388N-126W	4	32		
28	2	31		
30	4	25		
2	4	20		
4	3	6		
6	4	40		
40	8	38		
388N-142W	10	22		

MARKING	Mo	Cu		

REMARKS

All samples are reported as parts per million unless specified otherwise. Values are believed to be correct to the best knowledge of the analyst based on the method and instruments used.

Vancouver Geochemical Laboratories Ltd.

1521 PEMBERTON AVENUE NORTH VANCOUVER, B.C., CANADA TELEPHONE 604-988-2172

GEOCHEMICAL ANALYTICAL REPORT

REPORT No. 72-44-008 DATE August 25, 1972

Job No. 72-221

SAMPLES SUBMITTED BY Bullis Engineering COMPANY Hanna Mining Limited

SHIPPED VIA delivered FROM

REPORT ON 71 samples for Mo,Cu
8 samples for ExCu,ExZn DATE SAMPLES ARRIVED August 21, 1972

* * *

COPIES OF THIS REPORT SENT TO: **TRANSMITTED BY:**

(1) Hanna Mining Limited — Mail
#506-1200 W. Pender Street
(2) Vancouver, B.C.

(3) Bullis Engineering Limited — Mail
#206-1318 56th Street Delta, B.C.

SAMPLES SIEVED OR GROUND TO -80 MESH WEIGHT USED 0.25 g for ExCu,ExZn
0.5g for Mo,Cu

FINAL VALUME 10 ml ALIQUOT USED n/a

* * *

METHOD OF ANALYSIS: Instrumental Atomic Absorption

EXTRACTION: ExCu,ExZn- Cold 0.5 N HCl leach for 4 hours

Mo,Cu - Hot $HClO_4$ & HNO_3 digestion

DETECTION: Techtron AA5 & AA1000

SAMPLES ASSIGNMENT: (a) PREPARED SAMPLES: filed

(b) REJECTS: discarded

* * *

ANALYST(S) W.L. , B.W. TYPIST dcw

SUPERVISING CHEMIST C.Chun CHECKED BY C. CHUN

COSTS:

SHIPPING CHARGE	$	---
SAMPLE PREPARATION	$	15.80
ANALYSIS	$	118.50
OTHER	$	---
TOTAL	$	134.30

Vancouver Geochemical Laboratories Ltd.

1521 PEMBERTON AVENUE NORTH VANCOUVER, B.C. CANADA TELEPHONE 604-988-2172

COMPANY Hanna Mining Limited REPORT No. 72-44-008 PAGE 2 OF 3

MARKING	Mo	Cu
LG-6+00	5	17
LG-8+00	6	38
LH-?+00	14	27
4	14	52
6	34	10
LH-8+00	4	21
LAW-0+00	25	10
?	50	10
4	53	25
6	32	18
LAW-8+00	72	28
LBW-0+00	22	14
?	16	15
4	54	17
6	66	38
LBW-8+00	23	16
LCW-0+00	12	7
?	3	8
4	10	6
LCW-6+00	34	25

MARKING	Mo	Cu	
LCW-8+00	50	18	
RS- 1	54	437	
2	55	362	
3	84	495	
RS- 4	52	347	
SA- 1	6	66	KENDAL
2	6	91	CREEK.
3	6	75	
4	16	52	
5	10	97	
6	4	62	
SA- 7	14	34	

REMARKS

Vancouver Geochemical Laboratories Ltd.

1521 PEMBERTON AVENUE NORTH VANCOUVER, B.C. CANADA TELEPHONE 604-988-2172

COMPANY Hanna Mining Limited REPORT No. 72-44-008 PAGE 3 OF 3

MARKING	ExCu	ExZn		
388N-126W	8	29		
28	10	5		
30	9	8		
32	6	10		
34	3	3		
36	7	7		
40	11	14		
388N-142W	18	9		

MARKING				

REMARKS

OUTLINE OF M.C.'s
K.D.L. 21-24, 26, 28, 30, 32

OUTLINE OF M.C.'s
K.D.L. #1-20

KDL 1
KDL 2
KDL 3
KDL 4
KDL 5
KDL 6
KDL 7
KDL 8
KDL 9
KDL 10
KDL 11
KDL 12
KDL 13
KDL 14
KDL 15
KDL 16
KDL 20
KDL 21
KDL 22
KDL 23
KDL 24
KDL 26
KDL 30
KDL 32

5/89
3579

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4075 MAP #2

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. R. ELLIS

CLAIMS LOCATION MAP

To accompany a report by A.R. Ellis, P.Eng. 3rd Nov. 1972

KEY MAP

1	3
	4

SCALE AND ELEVATION DATUM BASED ON LIMITED GROUND CONTROL RESULTING IN GOOD RELATIVE, BUT UNCERTAIN ABSOLUTE MAP ACCURACY

COMPILED FROM AERIAL PHOTOGRAPHY AT AN APPROXIMATE SCALE OF 1 INCH EQUALS 2640 FEET TAKEN IN 1968

THE HANNA MINING COMPANY

KLEANZA CREEK

PRELIMINARY RECONNAISSANCE TYPE MAPPING

Compiled by
McELHANNEY SURVEYING & ENGINEERING LTD.
1200 West Pender St. Vancouver, B.C.

SCALE	CONTOUR INTERVAL	DATE	JOB NO.	SHEET NO.
1" to 400'	25'	JUNE 16, 1972	05700R-0	2 of 4

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4275 MAP #4

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. R. GULLIS

KEY MAP

2	3
1	4

THE HANNA MINING COMPANY
KLEANZA CREEK
PRELIMINARY RECONNAISSANCE TYPE MAPPING

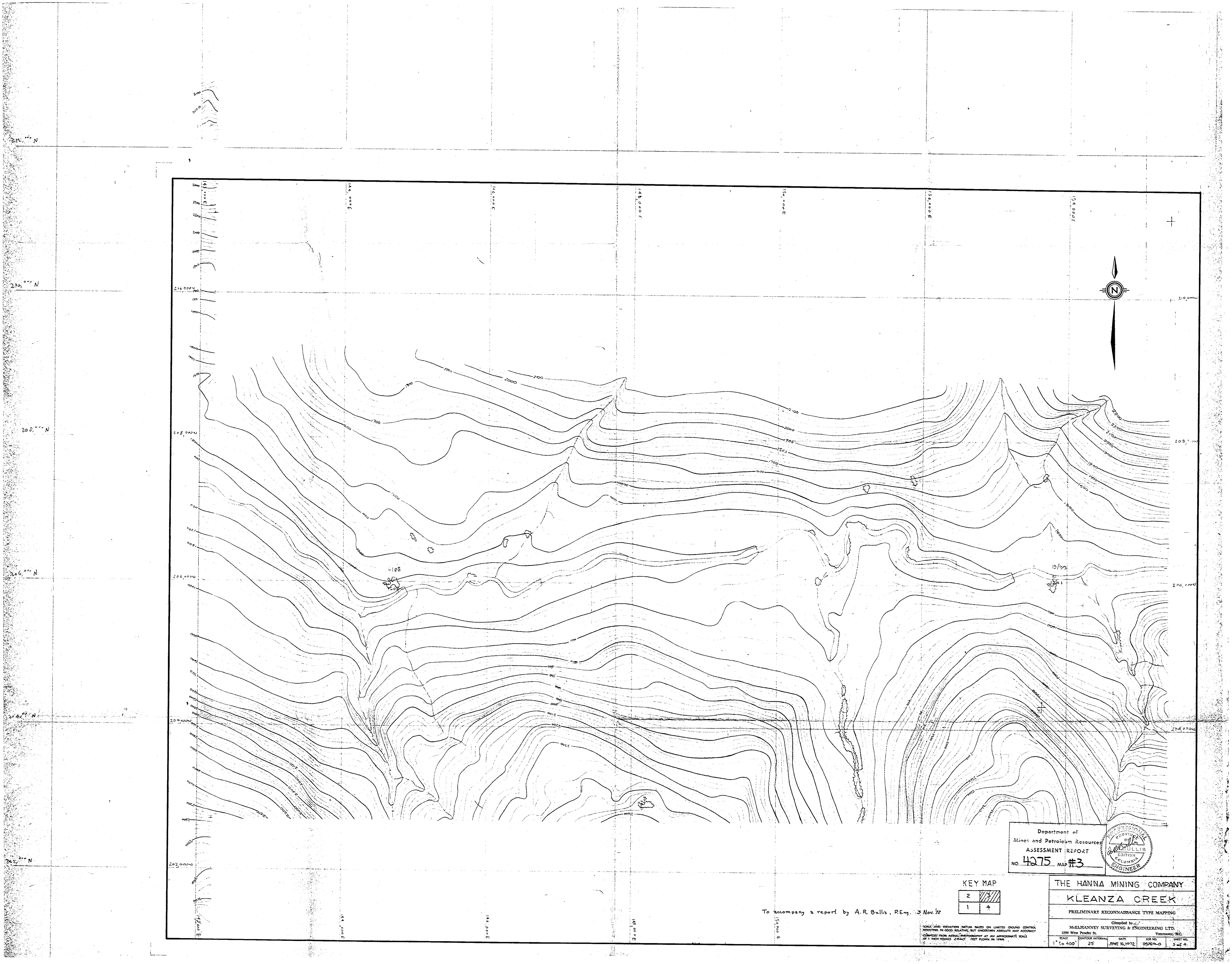
Compiled by
McELHANNEY SURVEYING & ENGINEERING LTD.
1200 West Pender St. Vancouver, B.C.

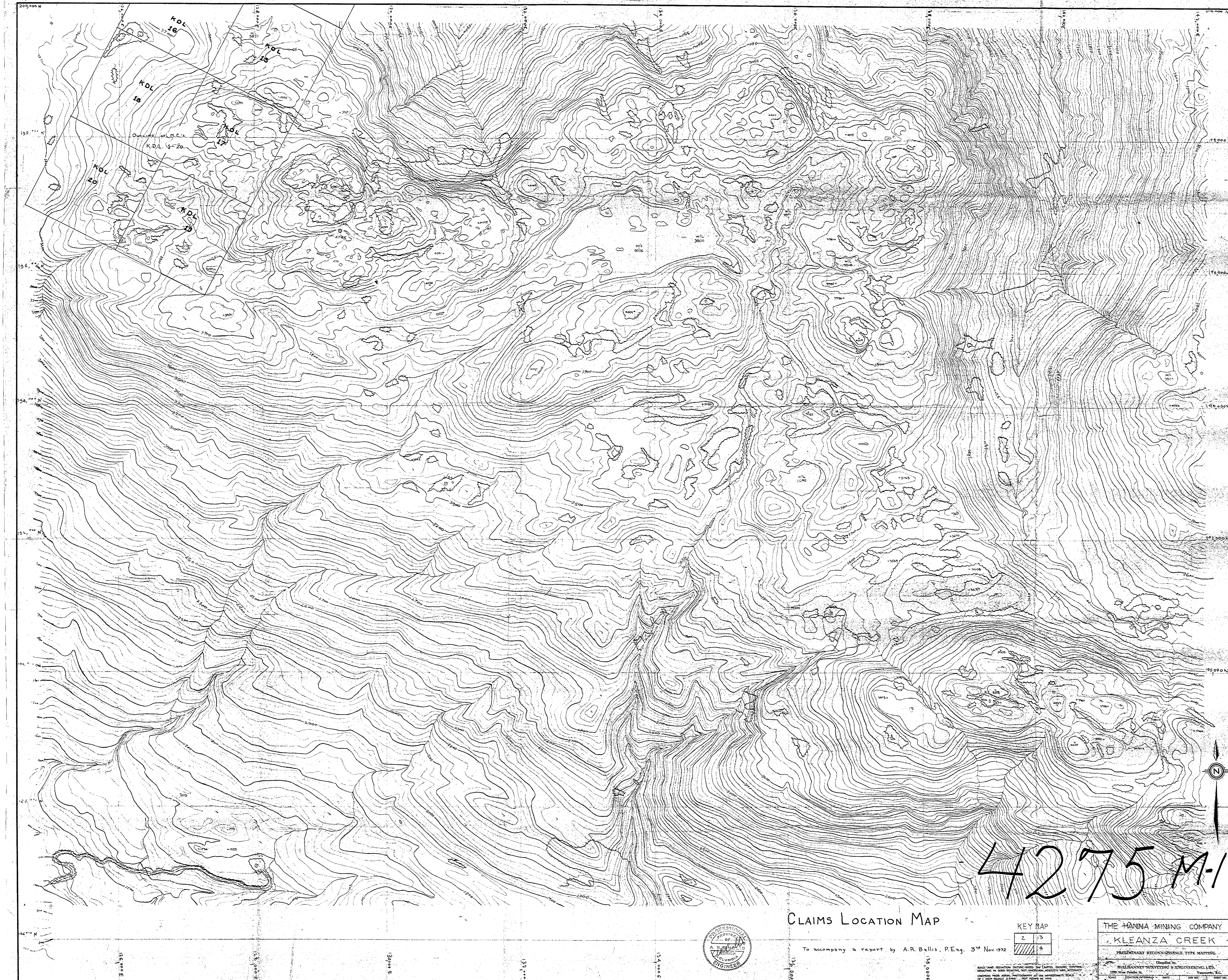
SCALE	CONTOUR INTERVAL	DATE	JOB NO.	SHEET NO.
1" = 400'	25'	JUNE 19, 1972	05784-0	4 OF 4

SCALE AND ELEVATION DATUM BASED ON LIMITED GROUND CONTROL & REVISIONS TO GIVE RELATIVE BUT UNCERTAIN ABSOLUTE MAP ACCURACY

COMPILED FROM AERIAL PHOTOGRAPHY AT AN APPROXIMATE SCALE 1 INCH EQUALS 2640 FEET FLOWN IN 1968

To accompany a report by A.R. Gullis, P.Eng. 3 Nov '72


Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4275 MAP #3
PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. R. BULLIS
To accompany a report by A.R. Bullis, P.Eng. 3 Nov. '72
KEY MAP
2 3
1 4
SCALE AND ELEVATION DATUM BASED ON LIMITED GROUND CONTROL RESULTING IN GOOD RELATIVE, BUT UNCERTAIN ABSOLUTE MAP ACCURACY
COMPILED FROM AERIAL PHOTOGRAPHY AT AN APPROXIMATE SCALE OF 1 INCH EQUALS 2640 FEET FLOWN IN 1968
THE HANNA MINING COMPANY
KLEANZA CREEK
PRELIMINARY RECONNAISSANCE TYPE MAPPING
Compiled by
McELHANNEY SURVEYING & ENGINEERING LTD.
1200 West Pender St. Vancouver, B.C.
SCALE 1" to 400'
CONTOUR INTERVAL 25'
DATE JUNE 16, 1972
JOB NO. 05769-0
SHEET NO. 3 of 4



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4275 MAP #1