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under Section 53(4) Yukon Quartz  
Mining Act.

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GOVERNMENT OF YUKON **Administrator**

CORANEX LIMITED

KLAZAN GROUP - GEOCHEMICAL REPORT

( Colin J. Campbell )

North Vancouver, B. C., April 3, 1967

GEOLOGICAL SURVEY

*[Signature]*  
JUN 30 1967

Resident Geologist  
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REGULATIONS OFFICE  
WHITEHORSE, Y.T.

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## SUMMARY

In 1965 a silt survey by a Coranex crew was successful in detecting three creeks anomalous in copper and T.H.M. A "bank" soil survey further outlined anomalous areas along the sides of Burgis Creek, however the source and significance of these anomalies was still unknown.

The detailed soil sampling of 1966 further outlined the anomalies and, along with soil profiles and pH measurements, led to an interpretation of the significance of the anomalies.

On the basis of this detailed survey and of the geological mapping, also done during the summer of 1966, it is recommended that further work include bulldozer stripping, trenching and mapping of the multimetals anomaly and also some trenching of the area near the T.H.M. anomaly.

## LOCATION

The Klazan Group is situated approximately 140 air miles northwest of Whitehorse in the Yukon Territory. It is at latitude 62° 23', longitude 137° 29'. A claim location map (Plate 1) is included in the text of this report.

## CLAIM OWNERSHIP

The Klazan Group (Klazan 1-48) are held by Coranex Limited. The geochemical survey on the Klazan Group was carried out by Coranex Limited.

## PERSONNEL

The geochemical survey was carried out by:

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- (ii) Kent Card -- student assistant  
c/o U.B.C. Dept. of Geology  
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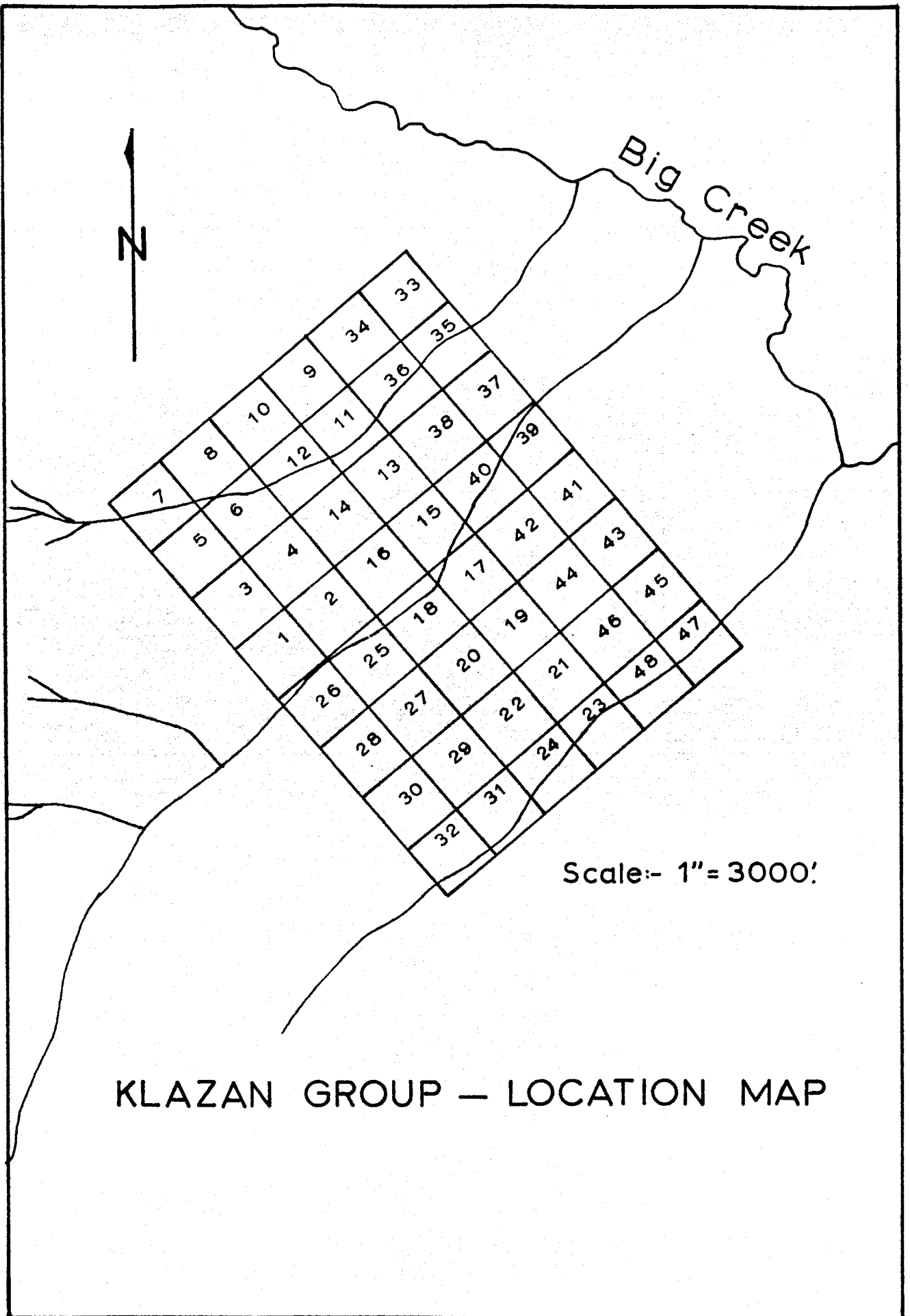
under the supervision of J. R. Woodcock, M.Sc., P.Eng.  
1521 Pemberton Avenue, North Vancouver, B. C.

## GEOMORPHOLOGY

On the Klazan Group the northwest slopes are typically covered by a layer of moss, two to ten inches of volcanic ash and below the ash by a normal soil horizon. The moss, being a good insulator, does not allow any melting of the permafrost during the summer.

The southeast slopes are dissimilar in that open grassy areas typically consist of soil mixed with volcanic ash and small blocks of bedrock or talus.

Part of the Klazan Group is covered by alluvium consisting of fine sand, gravel and rounded boulders of granite and syenite. Bostock (1936) notes that in recent times, Big Creek has downcut its bed from 200 to 500 feet. The alluvium may be part of a series of old beds of Big Creek or glacial outwash from a period of glaciation (Bostock, 1966).



**KLAZAN GROUP — LOCATION MAP**

## GEOCHEMISTRY

### INTRODUCTION

A preliminary soil survey was carried out by a Coranex crew in the summer of 1965. This preliminary "bank" or base-of-slope survey consisted of taking several hundred soil samples along lines sub-parallel to three creeks (Figure 5) which are anomalous in copper and T.H.M.

During July and August of 1966, as an essential follow-up to the earlier "bank" soil survey, a total of five hundred soil samples were taken to outline areas for trenching and detailed prospecting. It is these five hundred soil samples which are used as a basis for the geochemical survey now being applied as assessment work; however the results of the earlier survey are also included on the maps.

### SURVEY CONTROL, SAMPLING TECHNIQUES AND ANALYSES

#### Survey Control:

The "bank" survey was run on pace and compass lines with some air photo (1" = 3000') control points. Each sample site was marked by blazing a tree and marking the sample number in ink-pen. The sample interval was generally fifty feet.

The detailed survey was controlled by picket line grids which were tied into the picket lines shown in Figure 5.

#### Sampling Techniques:

In all cases where a B horizon was discernible the soil sample was taken from it; in most cases this sample consists only of the first mineral soil (which may or may not be the B horizon) below the ash and black muck layers.

#### Analyses:

The soil samples from the 1966 work were dried and sieved in the field. The -80 mesh fraction was tested in the field camp for cold extractable arsenic and total heavy metals. The samples were later analyzed for total copper and total molybdenum in the North Vancouver laboratory. For analytical methods see Appendix I.

It is noted that the earlier (1965) samples were analyzed in a field laboratory where digestion of the sample for total copper and total molybdenum was relatively incomplete resulting in relatively low values. This explains the obvious discrepancy in background values between analyses from the two different years (Figures 7 and 8).

### SOILS

#### Soil Types:

Several soil types are present in the area covered by the

## Klazan Group survey.

The northwest slopes generally have a typical podzol-type soil profile complicated only by the overlying ash layer and by the presence of permafrost (see Profile 3).

The steep southeast-facing slopes have a lithosol-type soil profile with a lack of definite soil horizons. Ash, soil and blocky talus form an undifferentiated mass. Figure 4 is in an area of this soil type and Profile 4 is a typical soil profile seen here.

The low poorly drained areas (e.g. Figure 3) have a hydromorphic-type soil profile i.e. gray clay layers interbedded with discontinuous seams of rusty soil. No B-type soil horizon can be distinguished.

### Soil Profiles:

Plate 2 and Plate 3 are soil profiles taken over three different areas on the Klazan Group.

Profile 1 is from the draw on the T.H.M. Anomaly (Figure 3). The soil profile is essentially an hydromorphic one; however the presence of a second layer of black muck in the bottom of the pit along with crude layers of sand and gravel indicate the draw originally served as a stream channel.

Profile 2 is from an area of rhyolite on the southeast bank of Foster Creek. A crude differentiation into an upper B and lower C horizon has taken place. However any metal enrichment present is in the upper part of the C horizon rather than the rustier B horizon. Broken bedrock was reached in the bottom of the trench.

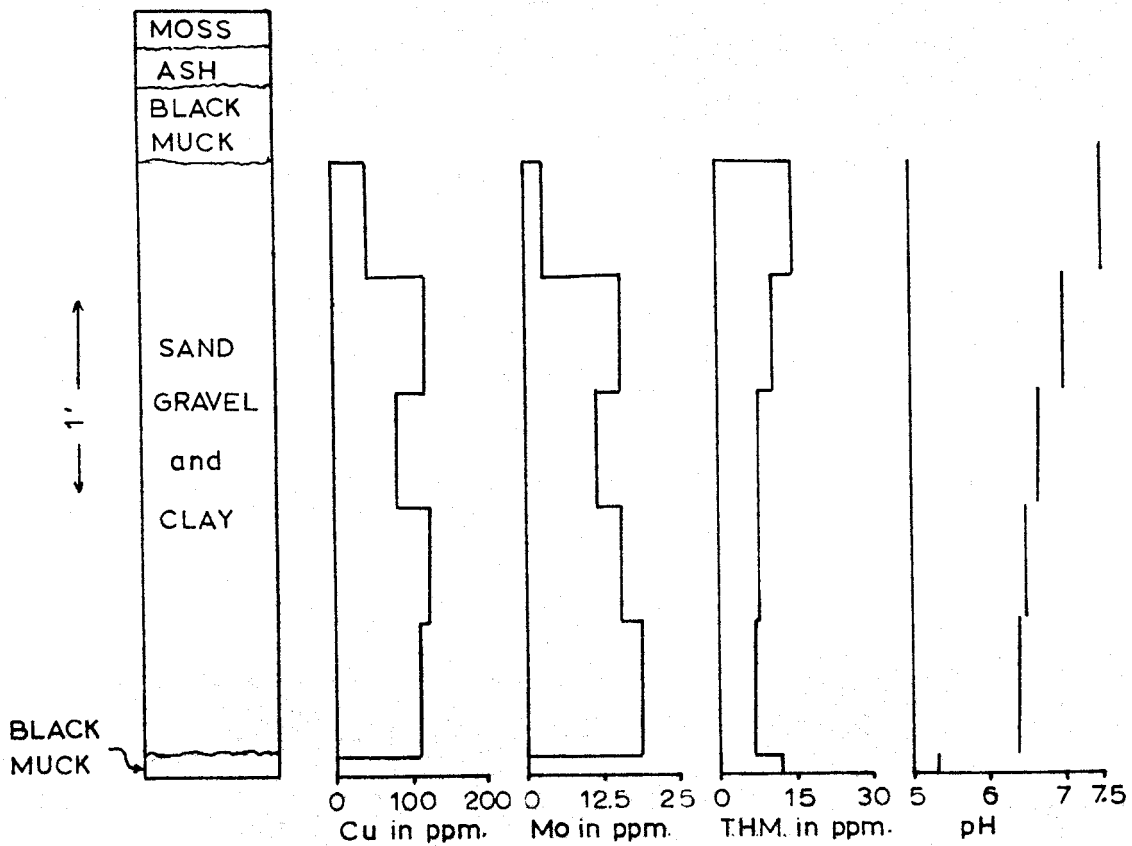
Profile 3 is from the T.H.M. Anomaly (Figure 3) but unlike Profile 1 is from a well drained area underlain by a coarsely porphyritic syenite. The B horizon is easily seen.

Profile 4 is from near the Arsenic Anomaly (Figure 4). The area is underlain by crystal tuffs. It is noted here that a "normal" soil sample i.e. the type of sample which generally would have been taken by the samplers would not have been anomalous; however if the sample had been taken two feet deeper it would have been highly anomalous in molybdenum. It is believed that the variation here is the result of dilution by the ash rather than lack of enrichment by metal ions from the underlying rock.

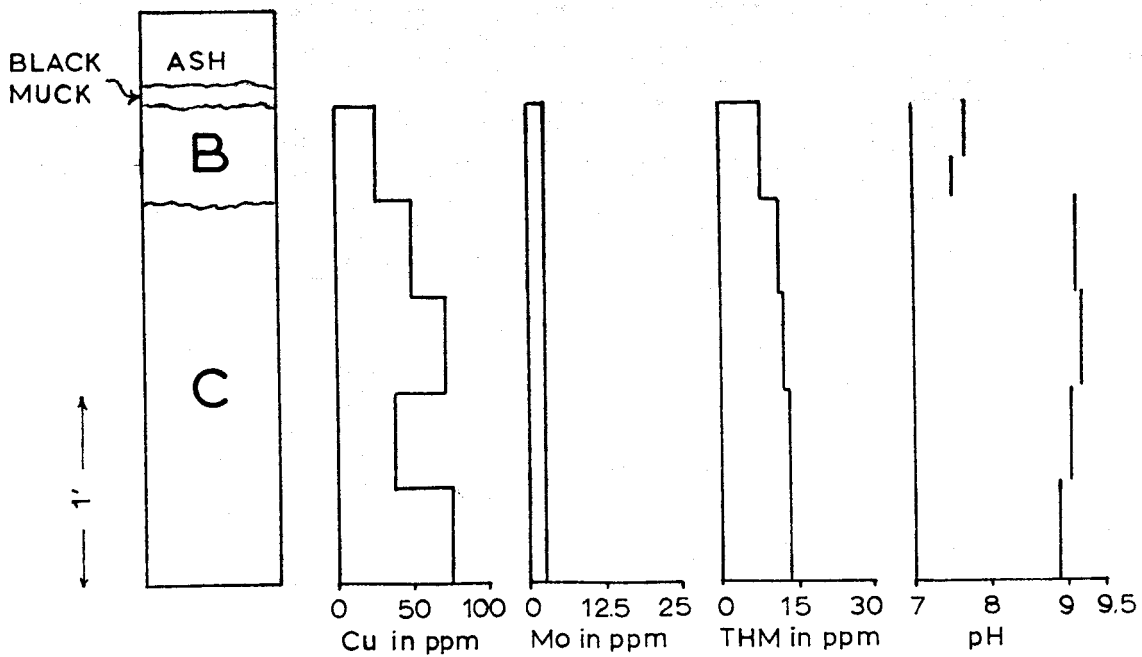
### Volcanic Ash:

The volcanic ash mentioned in connection with the geomorphology of the Klazan Group has been described by Dawson (1887-88) and Bostock (1936).

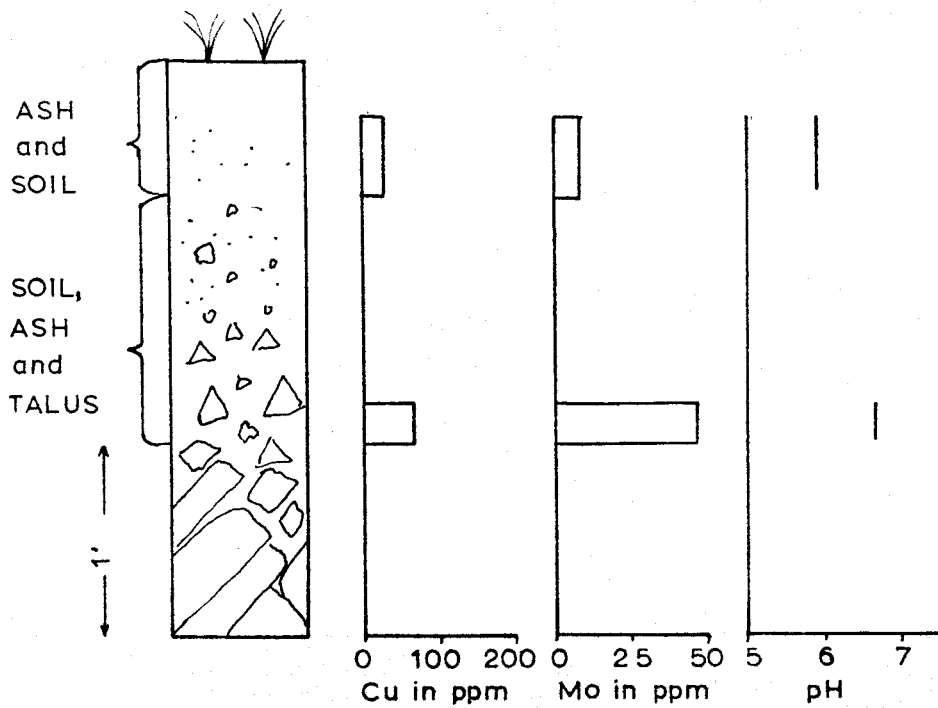
The following table gives the pH, and metals content of the ash. The three samples are from widely separated areas and are



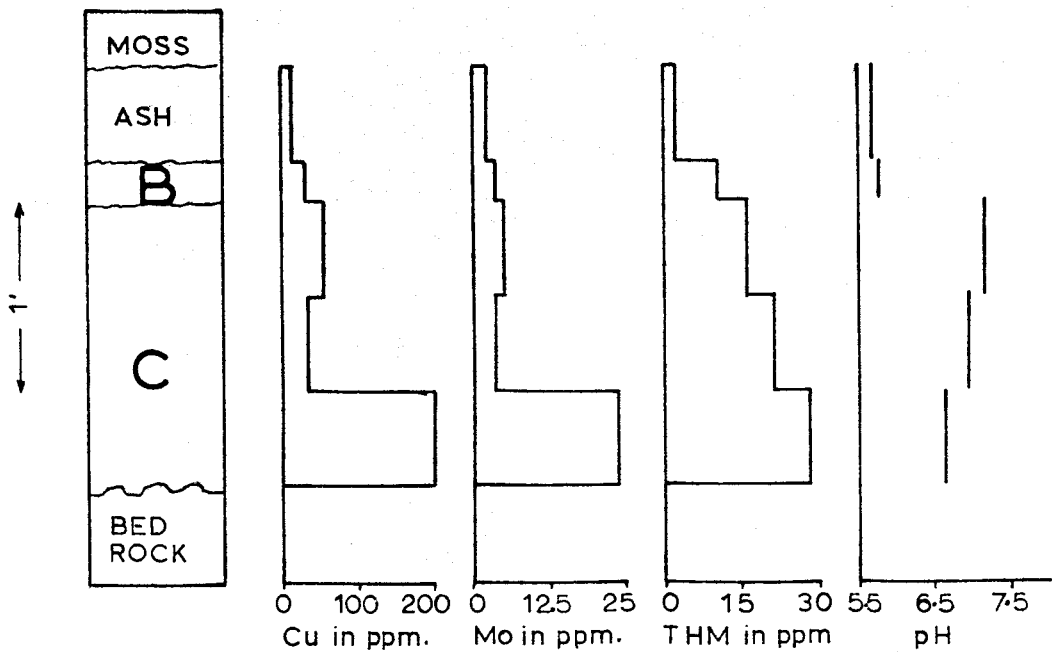
Profile 1: In draw on T.H.M. Anomaly



Profile 2: Over rhyolite on Foster Creek



Profile 4 : Over crystal tuff near Arsenic Anomaly



Profile 3 : Over syenite on T.H.M. Anomaly

thought to be representative of the volcanic ash on the Klazan Group:

SAMPLE NUMBER	pH	Mo(ppm)	T.H.M.(ppm)	As (ppm)	Cu(ppm)
		Hot ex.	Cold ex.	Cold ex.	Hot ex.
CCS 1473	5.5	2	N.A.	N.A.	4
CCS 1453	6.2	2	N.A.	N.A.	4
CCS 1129	5.7	2	3.5	0	6

The ash has been found to contain a small amount of carbonate (effervesces with 10% H Cl).

It is obvious that in a soil-ash mixture the ash has a tendency to dilute the metal content of the sample. The presence of carbonate may also affect the pH and hence the metal content; however it does not seem to have given the ash an alkaline pH as might be expected.

#### pH VARIATIONS ON THE KLAZAN GROUP

Hansauld (1965, 1966) indicates Eh and pH have important effects on the oxidation and dispersion of various metals.

The following data is given since it is thought to have a definite application to the interpretation of copper and molybdenum anomalies on the Klazan Group.

All pH measurements were made on a "slurry" of soil and water in a ratio of approximately 1:1 with a pH meter.

Nine soil samples from the two gossan areas had an average pH of 5.4 with a range of 5.1 to 5.7. Seven of these samples are from the Multimetals Anomaly (Figure 1). The average Mo content is 136 ppm, average Cu content is 179 ppm.

Six soil samples from the Arsenic Anomaly (Figure 4) had an average pH of 6.0 with a range of 5.5 to 6.3.

The variation of pH with depth is shown in Plate 2 and Plate 3. Profile 1 is from a draw on the T.H.M. Anomaly (Figure 3) and is different in that the pH decreases with depth from 7.0 to 5.3 whereas in Profile 2 and Profile 3 the pH is highest in the upper twelve inches of the C horizon and decreases both upwards and downwards. The exceptionally high pH in Profile 2 (up to 9.2) is not easily explained since the profile seems normal in all other respects; however carbonate veins were found in the rhyolite nearby.

#### DESCRIPTION OF ANOMALIES

The four main anomalous areas discovered in the 1965 "bank" survey were each covered by a grid of detailed sampling in 1966. For ease of

reference and description, the anomalous areas have each been given a name:

- (1) the "Multimetals Anomaly" shown on figures 1a, 1b, 1c, 1d
- (2) the "Copper—T.H.M. Anomaly" shown on figures 2a, 2b, 2c, 2d
- (3) the "T.H.M. Anomaly" shown on figures 3a, 3b, 3c, 3d
- (4) the "Arsenic Anomaly" shown on figures 4a, 4b, 4c, 4d

Figure 5 shows the relative positions of the four anomalous areas (Figure 1 to Figure 4) on the Klazan Group.

The anomalous areas will each be described separately and the follow-up trenching and assay results will be included under these descriptions.

#### Multimetals Anomaly (Figure 1)

The Multimetals Anomaly is in an area of small gossans caused by weathering and oxidation of pyrite in rhyolitic rocks. These gossans crop out in a steep bank which was cut quite recently by Burgis Creek. An old stream channel is still present at the base of the bank. Topographic lows perpendicular to the bank (small gullies) reflect sheared zones. Through these depressions drainage from the east towards Burgis Creek takes place.

As the name indicates the area is anomalous in several metals including arsenic, molybdenum, copper and zinc (T.H.M.).

The samples of the two most northwesterly lines are from the gossan areas of rusty (jarosite and goethite) soil and blocky talus. There are no recognizable soil horizons here. The samples from the line to the southeast are of the B horizon typical of the soil profile of the areas on the northwest slopes covered by permafrost.

The Multimetals Anomaly was trenched to bedrock in two areas. A quartz breccia and a quartz-barite breccia were found. Gold assays from the area varied from a trace to .02 ounces per ton. Except for some malachite-coated float near the top of one trench, no copper mineralization was seen.

The geochemical maps show:

#### Molybdenum (Figure 1b):

The soils are anomalous (18 to 590 ppm molybdenum) over an area (25' by 150') bounded by the valley floor to the northwest and permafrost soil horizons to the southeast.

#### Copper (Figure 1c):

Soils from an area 50' by 150' are strongly anomalous in copper (up to 450 ppm). The copper anomaly unlike the molybdenum, arsenic and T.H.M. extends to the southeast.

A topographic low to the east which intersects the valley bank at the copper anomaly controls drainage in the

area. This area is covered by alluvial gravels of unknown depth.

T.H.M. (Figure 1d)

The T.H.M. anomaly is small, less than 25' by 100', and weak (11 to 29 ppm). Minor (much less than 1%) sphalerite was found as disseminated grains in bedrock near here.

### Copper - T.H.M. Anomaly (Figure 2)

The Copper-T.H.M. Anomaly is in essentially the same geological and topographical setting as the Multimetals Anomaly. However the soils are not anomalous in molybdenum and arsenic. No trenching was done on the Copper - T.H.M. Anomaly.

The geochemical maps show:

Arsenic (Figure 2a)

The samples are not anomalous in arsenic (maximum value is 1 ppm).

Molybdenum (Figure 2b)

The samples are not anomalous in molybdenum. (maximum value is 7 ppm).

Copper (Figure 2c)

Five samples were slightly anomalous in copper (28 to 37 ppm). The sample sites roughly coincide with low draws which drain the same area as mentioned in respect to Figure 1c.

T.H.M. (Figure 2d)

Three samples from the northwest line plus one from the southeast line were anomalous in T.H.M. (18 to 20 ppm).

### T.H.M. Anomaly (Figure 3)

The area covered by Figure 3 was sampled in detail because of anomalous results in copper and T.H.M. in the bank survey.

A north-south trending draw cuts the central part of the grid. The soil here is typically a hydromorphic soil i.e. no true soil horizons are present due to permafrost and lack of drainage.

Trenching of the draw, in which the most highly anomalous T.H.M. values occur, reveals the draw has been filled by stream gravels and sand below which another layer of black muck occurs (Profile I).

The area to the southeast of the draw is underlain by syenite. A podzol-type soil profile has developed (Profile 3).

The geochemical maps show:

Arsenic (Figure 3a)

None of the soil samples are anomalous in arsenic.

#### Molybdenum (Figure 3b)

Several of the samples are slightly anomalous in molybdenum (26 to 32 ppm). Conditions in the draw together with pH measurements on samples from it indicate a slightly acid environment (average pH = 6.5).

#### Copper (Figure 3c)

Thirteen of the samples are highly anomalous in copper (greater than 100 ppm). These highly anomalous samples generally follow the draw i.e. run in a north-south direction. However several of the anomalous samples are from above weathered syenite. No copper mineralization was found in the syenite.

#### T.H.M. (Figure 3d)

The samples anomalous in T.H.M. (16 to 36 ppm) again follow the north-south trending draw.

#### Arsenic Anomaly (Figure 4)

The survey covered by Figure 4 was run because of anomalous arsenic results in the original bank soil survey. The sample grid is on a steep hillside which is covered by blocky talus and soil mixed with volcanic ash. No soil horizons could be distinguished. No permafrost was present. The term lithosol could be applied as the soil type (Profile 4).

The presence of talus on this steep slope indicates a mechanical downslope movement of the anomaly.

The geochemical maps show:

#### Arsenic (Figure 4a)

The slightly anomalous samples (6 to 30 ppm arsenic) indicate two trends, one a north-south the other an east-west.

A trench was put down uphill from the most highly anomalous samples (up to 35 ppm arsenic) in the west corner of the grid. Only minor pyrite mineralization and very low gold values were found.

#### Molybdenum (Figure 4b)

None of the samples from the survey grid are anomalous in molybdenum.

#### Copper (Figure 4c)

The survey results indicate a large area (150' x 300') slightly anomalous in copper (26 to 50 ppm) and a smaller area (25' by 50') anomalous in copper (51 to 100 ppm). The smaller anomalous area is in the same location as the highly anomalous arsenic samples were in Figure 4a.

#### T.H.M. (Figure 4d)

Many of the samples are slightly anomalous in T.H.M. (16 to 30 ppm). No lead-zinc mineralization was found.

## CONCLUSIONS

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The Multimetals Anomaly (Figure I) has several causes:

- (a) The obvious source of the zinc ions is the disseminated sphalerite found in surrounding bedrock areas.
- (b) The arsenic values, not so easily explained, could result from trace amounts of arsenic associated with pyrite (no arsenopyrite was found). The arsenic seems too widely distributed to be associated with the few large quartz veins and low gold values.
- (c) The presence of several samples highly anomalous in molybdenum in this area without related extensive molybdenite mineralization may be due to the slightly acid pH of the soil in this area. Hansauld (1966) has shown how several anomalous areas are caused by an acid condition of the soil, whereas other areas underlain by identical source rock are not anomalous due to the alkaline nature of the soils.
- (d) The copper anomaly may be the most significant anomaly within the area covered by Figure I. It is thought to be a lateral hydromorphic (seepage) anomaly caused by ground water movements from the area to the east of the survey grid. The fact that this anomaly has not been detected by the three south-east lines of the original bank survey is thought due to the presence of an unknown thickness of frozen alluvial fill in this area.

The entire anomaly may have been missed if it were not for the gossan area which supplied the abundant iron in the form of goethite and jarosite which allowed precipitation of copper and molybdenum as insoluble hydroxides. The arsenic may also occur associated with the limonitic material.

The Copper - T.H.M. Anomaly (Figure 2) is thought to have the same sources as the copper and zinc (T.H.M.) in the Multimetals Anomaly of Figure I.

### T.H.M. Anomaly (Figure 3)

The copper and T.H.M. anomalies are both thought to be the result of precipitation of copper and zinc ions by organic matter in a small draw or drainage area. This draw is sharply outlined by the T.H.M. results in Figure 3d. The copper anomaly however does extend to the southwest over an area of syenite. The syenite is thought to be the source of the copper ion concentration here; the soil profile (Profile 3) supports this supposition (note the concentration of copper near bedrock). However no copper mineralization was found in the syenite during trenching.

### Arsenic Anomaly (Figure 4)

The arsenic and superimposed copper anomaly may both be due

to the originally higher pyrite content of the underlying source rock (which results in an area anomalous in iron hydroxides). The two trends outlined by slightly anomalous samples may be due to small faults; however these faults are not reflected in the topography.

The arsenic - copper anomaly has been trenched and the rock analyzed for gold with negative results.

#### RECOMMENDATIONS

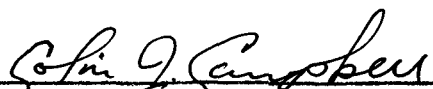
Further examination of the area east of the Multimetals Anomaly (Figure 1) is necessary. There is a strong lateral hydromorphic (seepage) anomaly here associated with a zone of shearing. Although no economic mineralization has been found within the exposed portion of the shear zone it should be examined. Any follow-up work done here would also be a check on the Copper - T.H.M. Anomaly (Figure 2) which is thought to have the same source as the Multimetals Anomaly.

Geochemistry would seem to be of little further use in outlining drilling targets since several lines have been run to the east with negative results. Because of the unknown depth of alluvium, which has likely remained frozen since being deposited, a normal soil profile and hence an anomaly could not develop over any mineralization.

Geophysical methods, although considered, seem to be of doubtful use. Since disseminated pyrite is common in the area an induced polarization anomaly due to it would dwarf an anomaly due to other disseminated sulphides. Electromagnetic methods could detect massive galena veins, however none have been found on the property and their size is unknown and their commercial value dubious.

Trenching with a bulldozer would allow maximum exposure of bed-rock in the area. This could be followed by further mapping and by some effective geochemical work and thus enable a geologist to recommend drill targets or abandonment of the project.

Since this is essentially a gold - silver region, the possibility of the Mount Nansen type of deposit should not be overlooked. If a bulldozer is taken to the property, then the rim of the drainage basin in which the T.H.M. Anomaly is situated should be carefully examined and the source of the zinc and copper ions determined. The area near the most southwesterly copper anomaly (Figure 3c) should be further trenched and some fresh rock samples analyzed to check if it is the source of the copper anomaly.

  
Colin J. Campbell, B.Sc.

  
J. R. Woodcock, P.Eng.

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- Dawson, G. M. - "Report on an Exploration in the Yukon District, N.W.T., and Adjacent Northern Portion of British Columbia, 1887"; Geol. Surv., Canada, Ann. Rept. 1887-88, pt. B, pp. 40-43.
- Hansauld, J. A. (March 1966) - The Canadian Mining and Metallurgical Bulletin for March 1966, Montreal, Canada (pp. 315-322).
- Hansauld, J. A. (December 1966) - Mining Engineering, December 1966, (pp. 73-77).

ANALYTICAL METHOD USED IN GEOCHEMICAL ANALYSIS FOR ACID SOLUBLE  
MOLYBDENUM

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METHOD

- (1) DIGESTION
  - (a) 0.25 gram of -80 mesh sample
  - (b) Perchloric acid digestion in sand bath
  
- (2) Molybdenum Analysis:
  - (a) Ammonium thiocyanate solution to complex ions.
  - (b) Stannous chloride solution for reducing.
  - (c) Iso-propyl ether for extraction.
  - (d) A Bausch & Lomb spectronic 20 colourimeter for reading molybdenum concentration.

REFERENCES

- (1) SANDELL: Colourimetric Metal Analyses - 3rd. ed.
  
- (2) FEIGL: Spot tests in inorganic analysis.
  
- (3) WARD ET AL: Analytical methods used in geochemical exploration by U. S. Geological Survey Bulletin 1152.
  
- (4) Methods of geochemical determination from Applied Geochemical Laboratory, Imperial College of Science & Technology, London, S. W. 7, England.

ANALYTICAL METHODS USED IN GEOCHEMICAL ANALYSIS FOR ACID  
SOLUBLE COPPER

---

METHOD

(1) DIGESTION

- (a) 0.25 gram of -80 mesh sample
- (b) Perchloric acid digestion in sand bath

(2) Copper Analysis

- (a) Buffer solution at pH 6.5

Reagents: Sodium acetate  
Sodium tartrate  
Hydroxylamine hydrochloride

- (b) 2, 2' - biquinoline in iso-amyl alcohol
- (c) A Fisher Electrophotometer II for reading copper concentration.

REFERENCES

- (1) SANDELL: Colourimetric Metal Analyses - 3rd. ed.
  - (2) FEIGL: Spot tests in inorganic analysis.
  - (3) WARD ET AL: Analytical methods used in geochemical exploration by the U. S. Geological Survey. Bulletin 1152.
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ANALYTICAL METHODS USED IN GEOCHEMICAL ANALYSIS FOR ACID  
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  - (2) FEIGL: Spot tests in inorganic analysis.
  - (3) WARD ET AL: Analytical methods used in geochemical exploration by the U. S. Geological Survey. Bulletin 1152.
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ANALYTICAL METHODS USED IN GEOCHEMICAL ANALYSIS FOR COLD EXTRACTABLE "Total Heavy Metals" IN SILT AND SOIL.

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METHOD

- (1) 0.50 gram dried -80 mesh sample
- (2) Buffer solution at pH 8.5  
Reagents: Ammonium citrate  
Hydroxylamine hydrochloride  
Ammonium hydroxide
- (3) Dithizone-benzene solution at 0.001% W/V concentration
- (4) The concentration of metals is estimated by using the following formula:

$$\frac{1}{\text{Wt. of sample}} \times \frac{\text{ml. of dithizone to reach the end point}}{\text{ml. of buffer}} = \text{Parts per million (ppm)}$$

REFERENCES

- (1) A. Y. SMITH: Field and laboratory methods used by the Geological Survey of Canada in geochemical surveys  
No. 5  
Cold Extractable "Heavy Metal" in soil and alluvium  
Paper 63-49
- (2) Methods of geochemical determinations from Applied Geochemical Laboratory, Imperial College of Science & Technology, London, S. W. 7, England.

ANALYTICAL METHOD USED IN GEOCHEMICAL ANALYSIS FOR COLD AND ACID-  
EXTRACTABLE ARSENIC

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Preparation of Reagents

Mercuric chloride is a poison and this preparation should be done under a hood or out of doors.

- (1). Mercuric Chloride solution - dissolve 25 grams of mercuric chloride in 100 ml of warm (not hot) ethyl alcohol. Store in a tightly capped tinted glass bottle.
- (2). Soak the arsenic strip-sheets in mercuric chloride solution (in the covered glass tray) for one hour. Remove the paper, holding it horizontal in air until the mercuric chloride crystals begin to form in the center of the sheet. Put the sheet to one side and allow to dry completely. Vigorously brush away the excess mercuric chloride with a test tube brush. Prepare fresh paper each week.

Lead Acetate in glass wool

Dissolve 15 g of lead acetate tri-hydrate in 100 ml of H<sub>2</sub>O containing 1 ml of glacial acetic acid. Saturate glass wool in this solution and then allow the glass wool to dry. Pack this glass wool loosely in the sulfur trap of the Gutzeit apparatus (see sketch) and replace it when the lower half has become discolored (black or dark brown).

Stannous Chloride Solution

Dissolve 10 grams SnCl<sub>2</sub>·2H<sub>2</sub>O in 100 ml of concentrated HCl. Just before use (each day) add 200 ml metal free water carefully and place solution in the automatic pipette. Set the automatic pipette to deliver 5 ml.

Standards

Standard (100 ug/ml As) arsenic solution - dissolve 42 mg. of sodium arsenate in water, add 0.1 ml conc. HCl and dilute to 100 ml with water. This solution is stable. Standards of 1, 3, 5, and 10 ppm should be run. This is equivalent to 0.5, 1.5, 2.5, and 5 ug respectively if a 1/2 gram sample is used.

Procedure

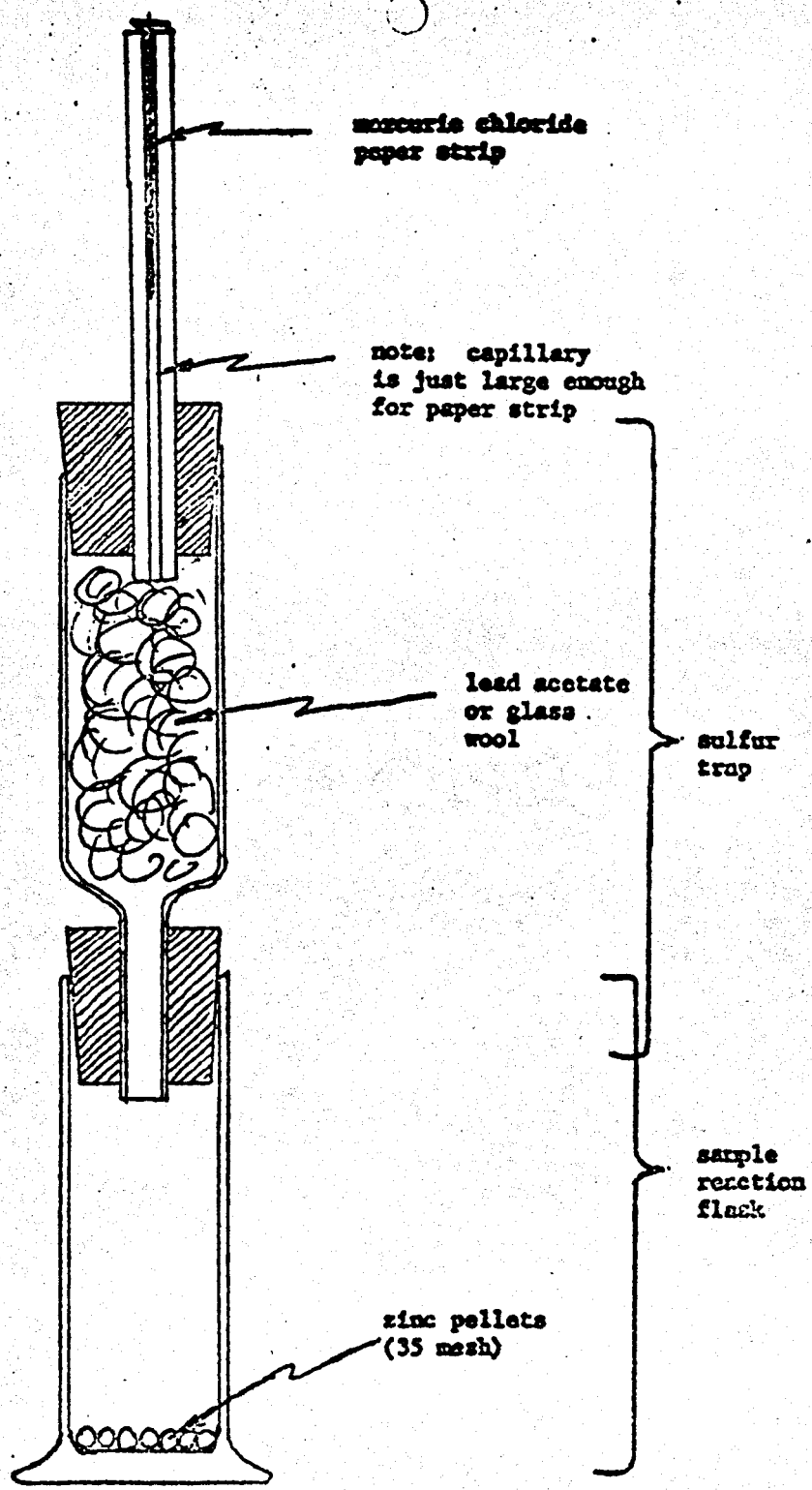
1. Prepare the Gutzeit apparatus as shown in the sketch except that the sulfur trap should not be attached to the reaction flask.
  - (a) The mercuric chloride sheet is to be cut in half across the strips and the cut end of one strip inserted into each capillary tip - the torn end is then bent to hold the paper in place.
  - (b) Zinc pellets are to just cover the bottom of the reaction flask.

Procedure cont'd

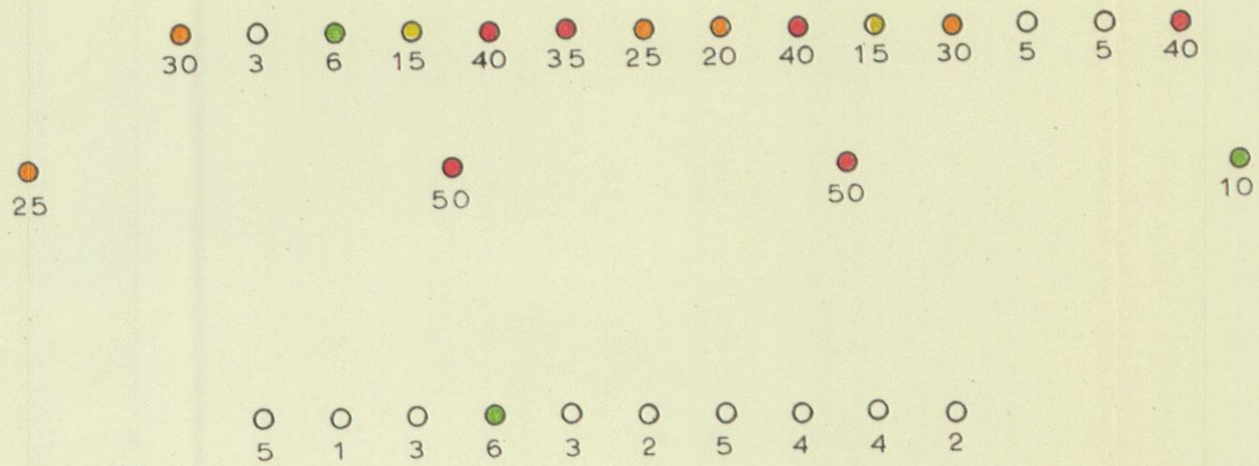
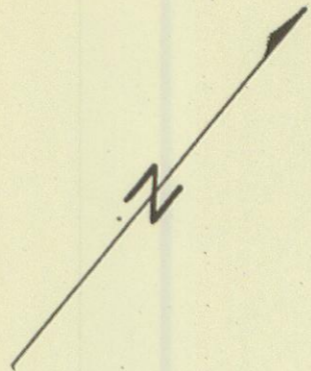
2. Sieve samples to -80 mesh and measure approximately 1/2 gram into reaction flask with a volumetric scoop.
3. Add 5 ml of the stannous chloride solution and quickly seal the reaction flask.
4. Compare the mercuric chloride strips with the standards after one hour of reaction - the best comparison is for the length of the reaction zone - permanent standards may be prepared by sealing the standard strips inside of cellophane tape and keeping them in the dark when not in use.
5. The zinc pellets may be recovered and used again as no arsenic contamination is developed.
6. The reaction flasks are ready for re-use after simple rinsing. The rest of the apparatus is ready to go unless the sample has bubbled into the sulfur trap.
7. Production is 100 to 150 determinations per man per eight-hour shift.

REFERENCES:

Applied Geochemistry Laboratory  
University of California  
Berkeley 4, California, U. S. A.



MODIFIED GUTZEIT APPARATUS



**CORANEX LIMITED  
KLAZAN GROUP**

**COLD EXTRACTABLE ARSENIC  
IN SOILS**

0 - 5 ppm	○
6 - 10 ppm	●
11 - 15 ppm	●
16 - 30 ppm	●
31 - 50 ppm	●
> 50 ppm	●

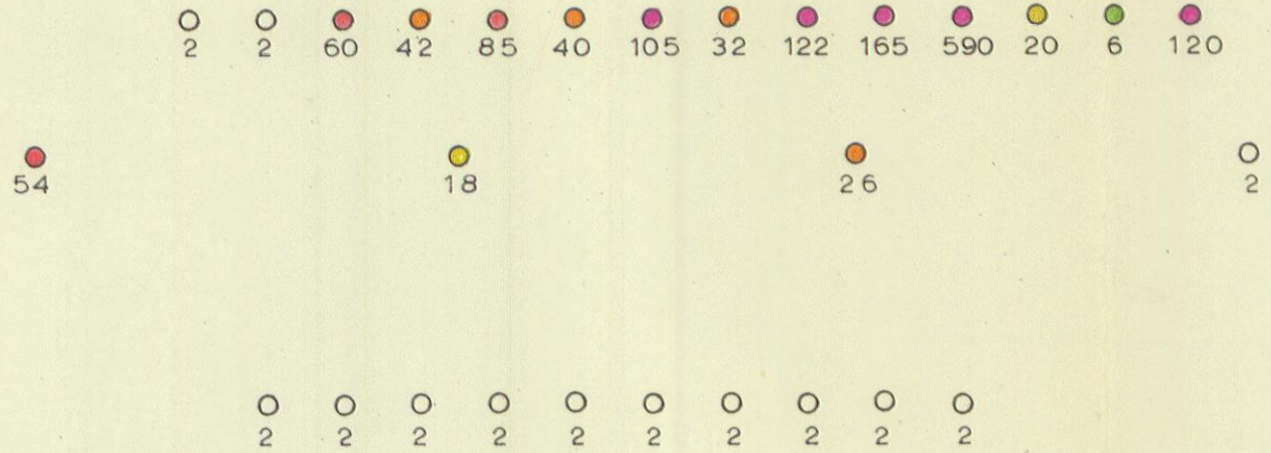
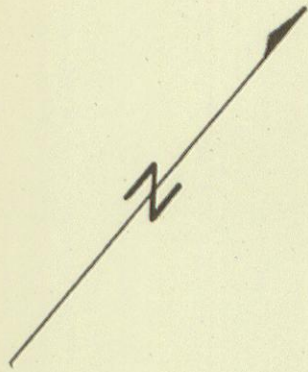
Analyzed by:- C.Chun.

Drawn by :- C.Campbell.

Date :- March 1, 1967.

Scale:- 1" = 25'.

Figure 1.a



**CORANEX LIMITED  
KLAZAN GROUP**

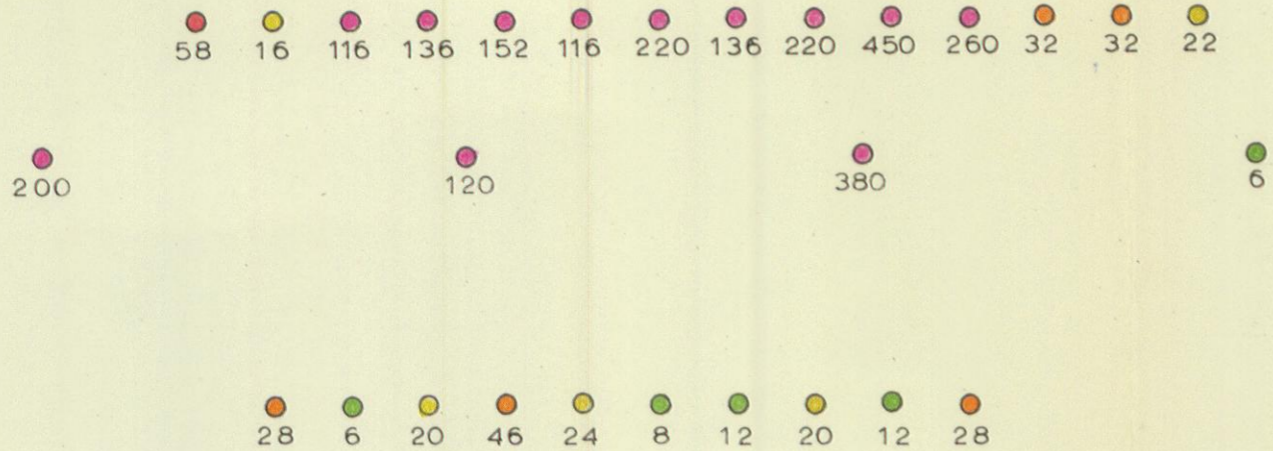
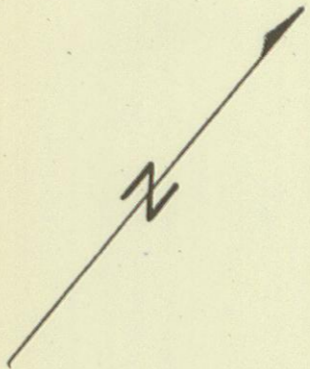
**TOTAL MOLYBDENUM IN SOILS**

- 0 - 5 ppm      ○
- 6 - 12 ppm    ●
- 13 - 25 ppm   ●
- 26 - 50 ppm   ●
- 51 - 100 ppm ●
- >100 ppm     ●

Analyzed by :- C.Chun.  
Drawn by    :- C.Campbell.  
Date        :- March 1, 1967.

Scale:- 1" = 25'.

Figure 1.b



**CORANEX LIMITED  
KLAZAN GROUP**

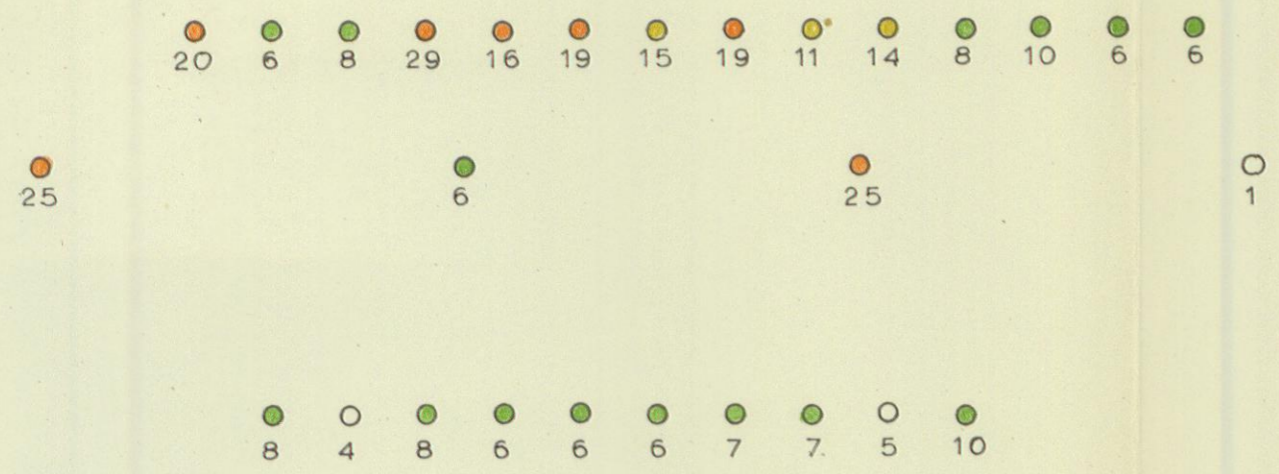
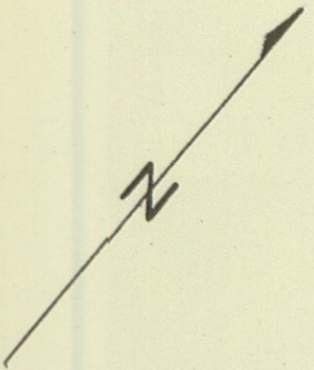
**TOTAL COPPER IN SOILS**

0 - 5 ppm	○
6 - 12 ppm	●
13 - 25 ppm	●
26 - 50 ppm	●
51 - 100 ppm	●
>100 ppm	●

Analyzed by:- C.Chun.  
Drawn by :- C.Campbell.  
Date :- March 1, 1967.

Scale:- 1" = 25'.

Figure 1.c



**CORANEX LIMITED  
KLAZAN GROUP**

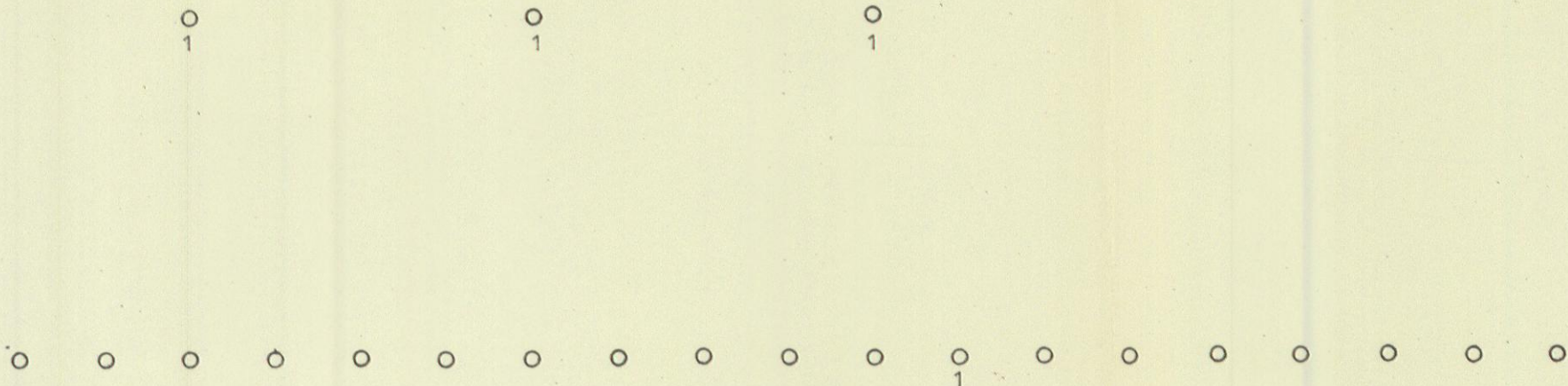
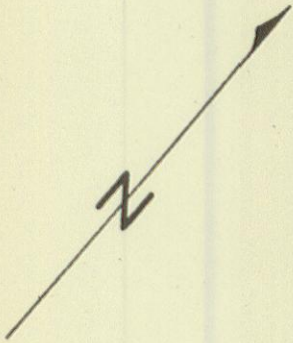
**COLD EXTRACTABLE TOTAL  
HEAVY METALS IN SOILS**

- 0 - 5ppm      ○
- 6 - 10ppm    ●
- 11 - 15ppm   ●
- 16 - 30ppm   ●
- 31 - 50ppm   ●
- > 50ppm     ●

Analyzed by:- C. Chun.  
Drawn by :- C. Campbell.  
Date :- March 1, 1967.

Scale:- 1" = 25'.

Figure 1.d



**CORANEX LIMITED  
KLAZAN GROUP**

**COLD EXTRACTABLE ARSENIC  
IN SOILS**

0 - 5 ppm	○
6 - 10 ppm	●
11 - 15 ppm	●
16 - 30 ppm	●
31 - 50 ppm	●
> 50 ppm	●

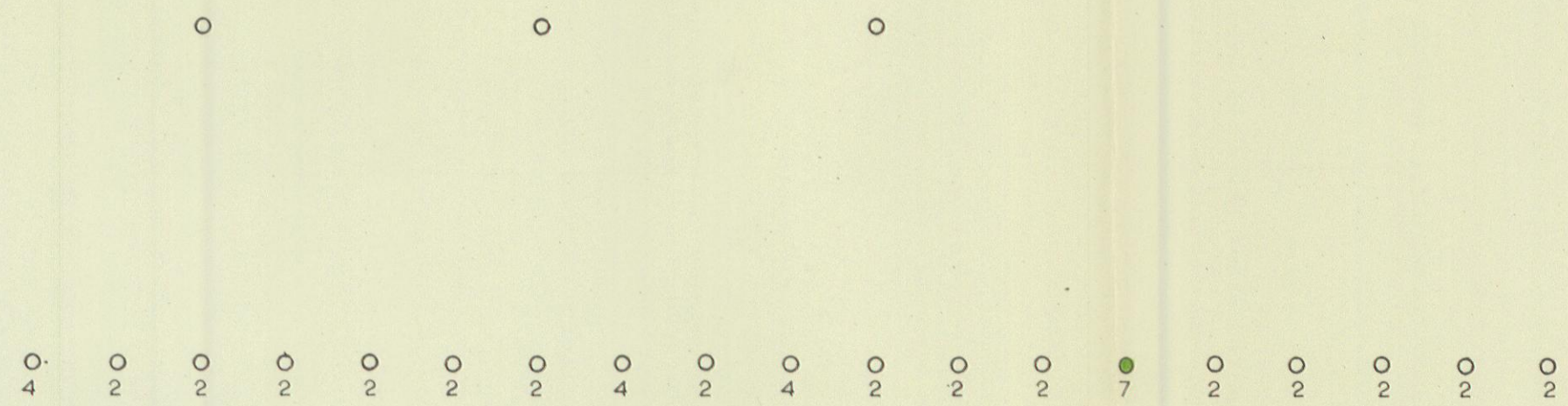
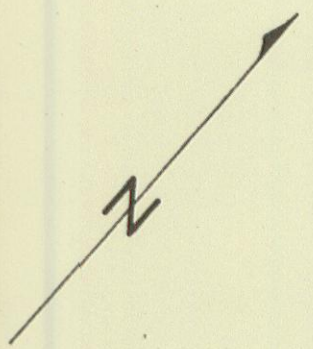
Analyzed by :- C.Chun.

Drawn by :- C.Campbell.

Date :- March 1, 1967.

Scale:- 1" = 25'

Figure 2.a



**CORANEX LIMITED  
KLAZAN GROUP**

---

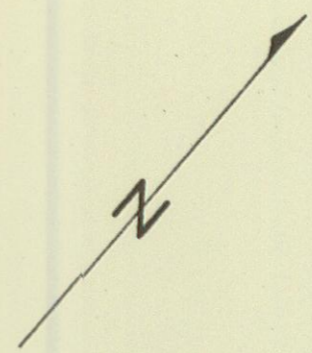
**TOTAL MOLYBDENUM IN SOILS**

0 - 5 ppm	○
6 - 12 ppm	●
13 - 25 ppm	●
26 - 50 ppm	●
51 - 100 ppm	●
>100 ppm	●

Analyzed by :- C.Chun.  
Drawn by :- C.Campbell.  
Date :- March 1, 1967.

Scale:- 1" = 25'

Figure 2.b



0  
4

0  
4

0  
4



Scale:- 1" = 25'

### CORANEX LIMITED KLAZAN GROUP

#### TOTAL COPPER IN SOILS

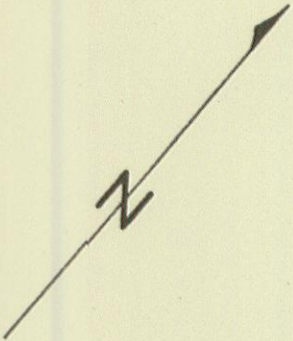
0 - 5 ppm	○
6 - 12 ppm	●
13 - 25 ppm	◐
26 - 50 ppm	●
51 - 100 ppm	●
>100 ppm	●

Analyzed by:- C.Chun.

Drawn by :- C.Campbell.

Date :- March 1, 1967.

Figure 2c



**CORANEX LIMITED  
KLAZAN GROUP**

**COLD EXTRACTABLE TOTAL  
HEAVY METALS IN SOILS**

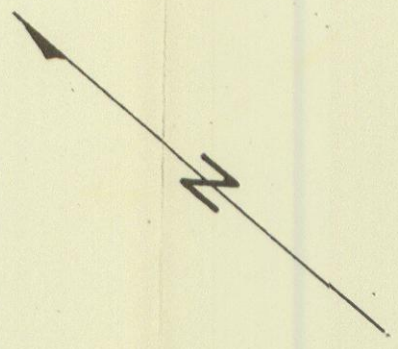
0 - 5ppm	○
6 - 10ppm	●
11 - 15ppm	●
16 - 30ppm	●
31 - 50ppm	●
> 50ppm	●

Analyzed by:- C.Chun.  
Drawn by :- C.Campbell.  
Date :- March 1,1967.

Scale:- 1" = 25'

Figure 2d





**CORANEX LIMITED  
KLAZAN GROUP**

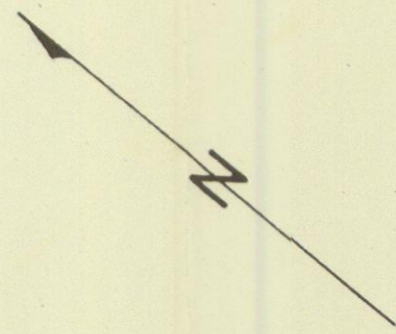
**TOTAL MOLYBDENUM IN SOILS**

- 0 - 5 ppm      ○
- 6 - 12 ppm    ●
- 13 - 25 ppm   ●
- 26 - 50 ppm   ●
- 51 - 100 ppm ●
- >100 ppm    ●

Analyzed by :- C.Chun.  
 Drawn by :- C.Campbell.  
 Date :- March 1, 1967.

Scale:- 1" = 50'

Figure 3b



**CORANEX LIMITED  
KLAZAN GROUP**

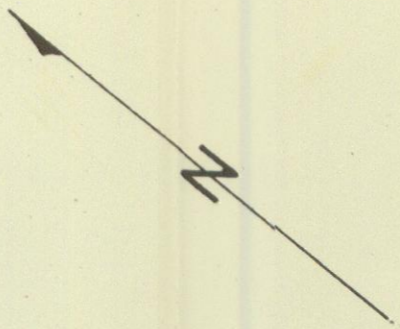
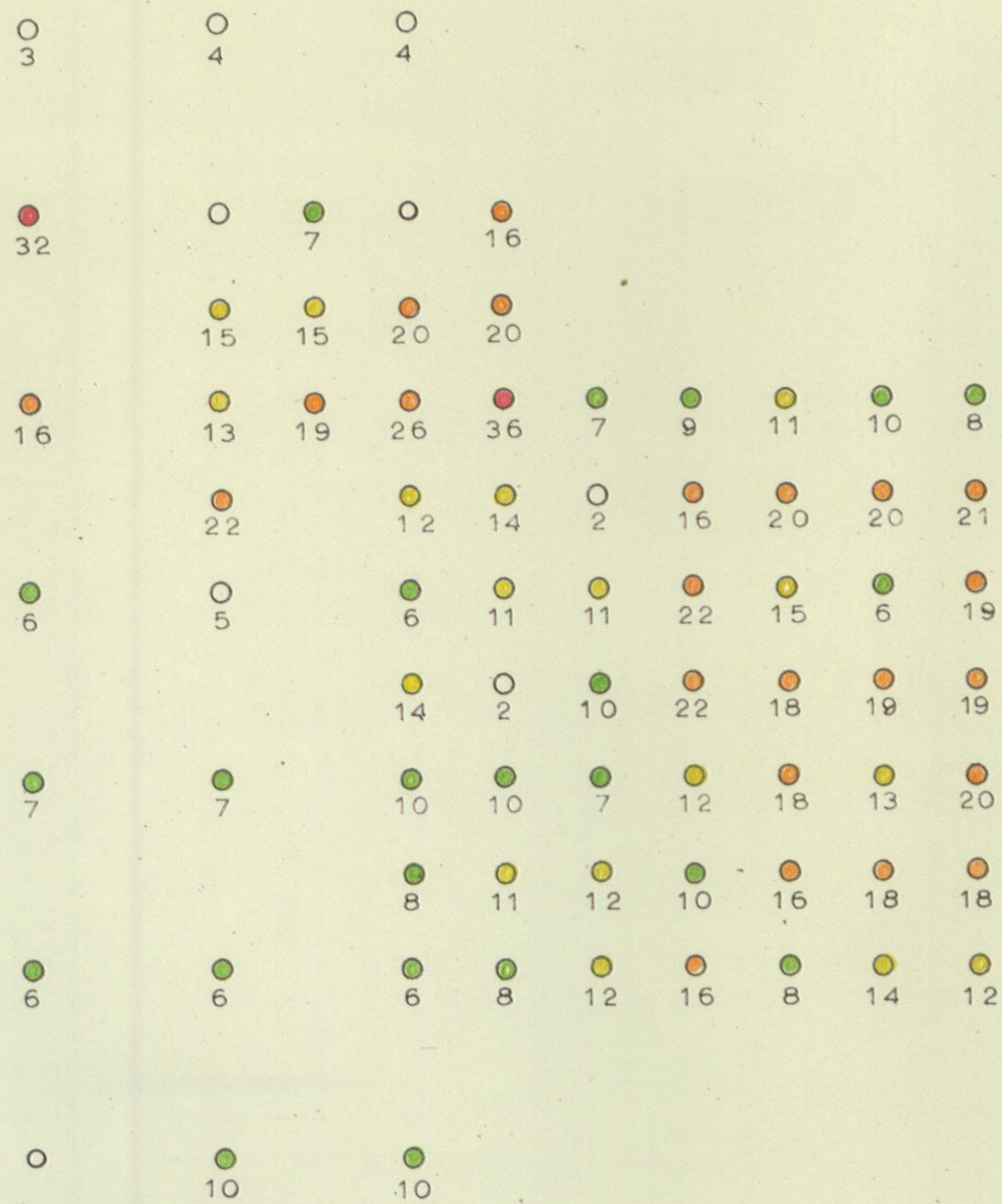
**TOTAL COPPER IN SOILS**

- 0 - 5 ppm      ○
- 6 - 12 ppm    ●
- 13 - 25 ppm   ●
- 26 - 50 ppm   ●
- 51 - 100 ppm ●
- >100 ppm     ●

Analyzed by:- C.Chun.  
 Drawn by :- C.Campbell.  
 Date :- March 1, 1967.

Scale:- 1" = 50'

Figure 3c



## CORANEX LIMITED KLAZAN GROUP

### COLD EXTRACTABLE TOTAL HEAVY METALS IN SOILS

- 0 - 5ppm           ○
- 6 - 10ppm       ●
- 11 - 15ppm      ●
- 16 - 30ppm     ●
- 31 - 50ppm     ●
- > 50ppm       ●

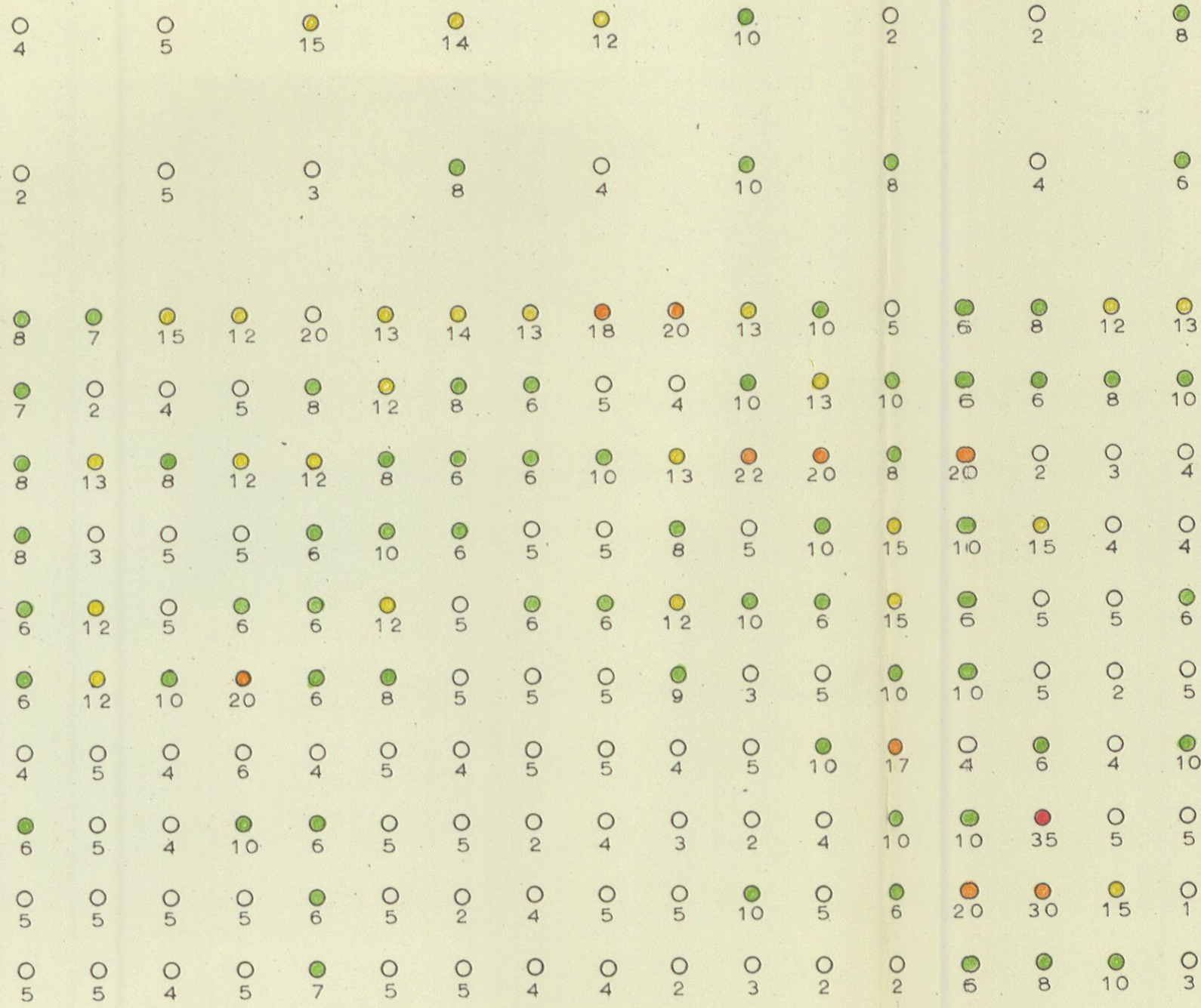
Analyzed by:- C. Chun.

Drawn by :- C. Campbell.

Date :- March 1, 1967.

Scale:- 1" = 50'

Figure 3.d



Scale:- 1" = 50'

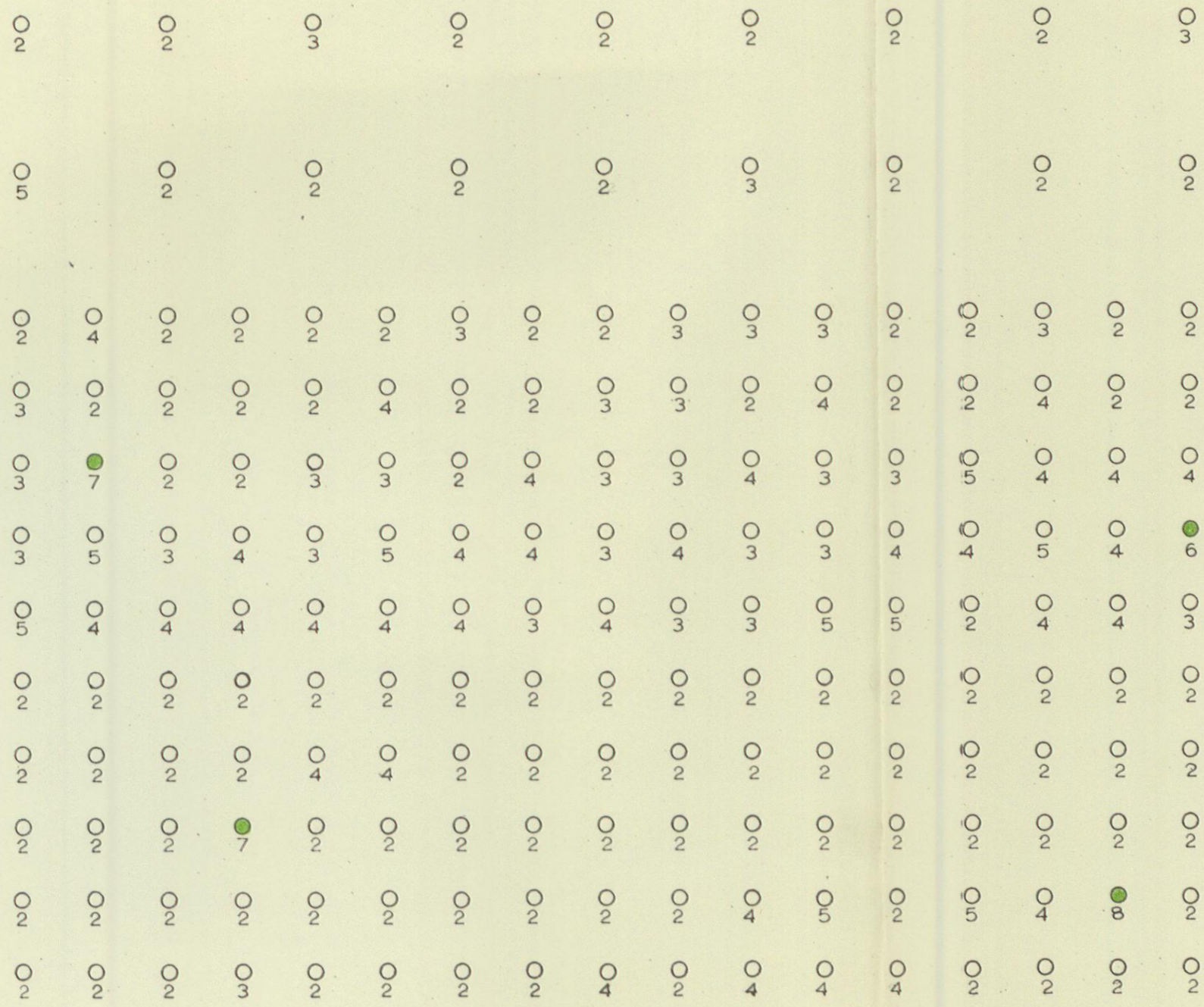
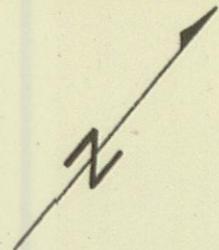
## CORANEX LIMITED KLAZAN GROUP

### COLD EXTRACTABLE ARSENIC IN SOILS

- 0 - 5 ppm      ○
- 6 - 10 ppm    ●
- 11 - 15 ppm   ●
- 16 - 30 ppm   ●
- 31 - 50 ppm   ●
- > 50 ppm     ●

Analyzed by:- C.Chun.  
 Drawn by :- C.Campbell.  
 Date :- March 1, 1967.

Figure 4a



**CORANEX LIMITED  
KLAZAN GROUP**

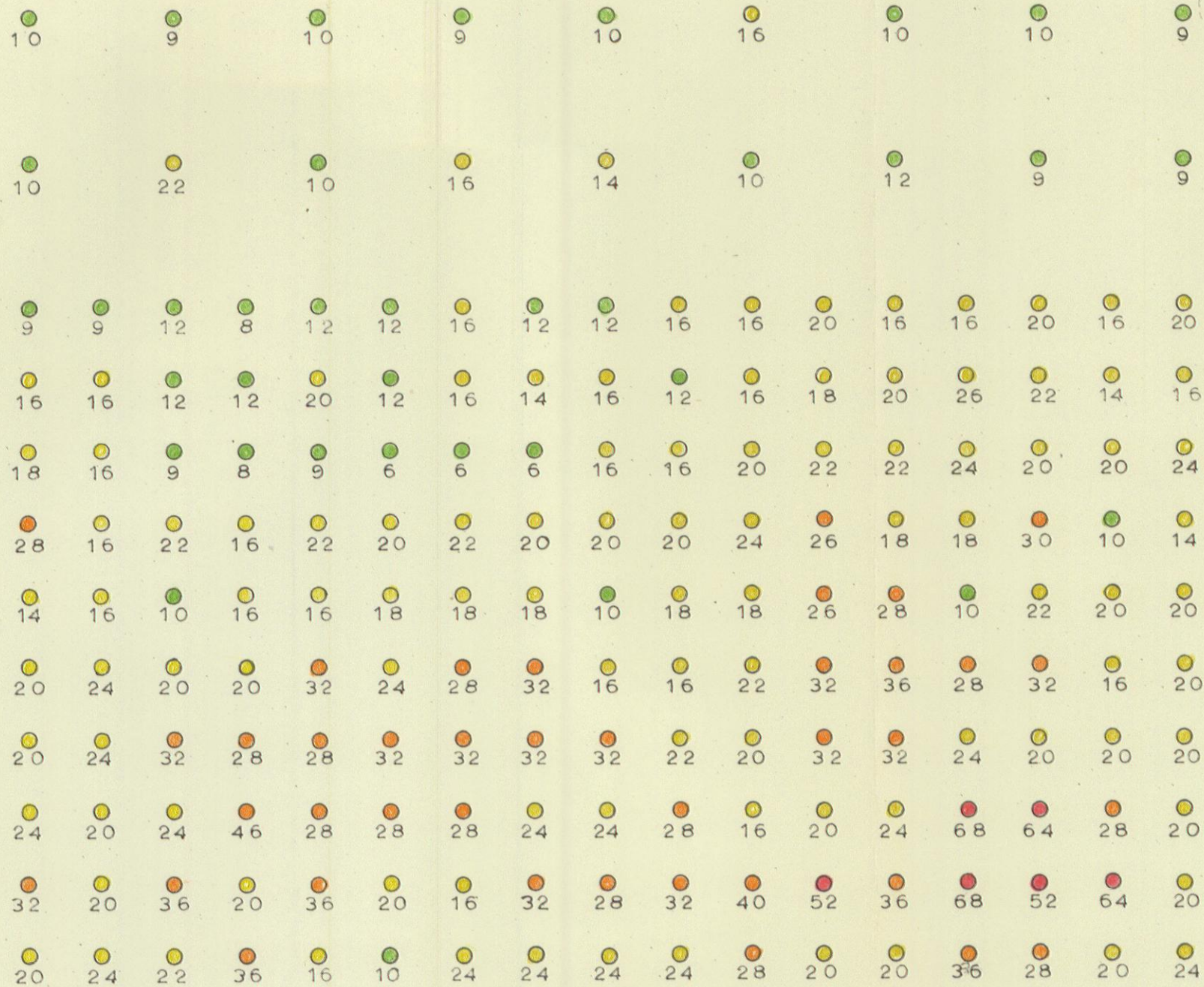
**TOTAL MOLYBDENUM IN SOILS**

- 0 - 5 ppm      ○
- 6 - 12 ppm    ●
- 13 - 25 ppm   ●
- 26 - 50 ppm   ●
- 51 - 100 ppm ●
- >100 ppm     ●

Analyzed by :- C.Chun.  
 Drawn by :- C.Campbell.  
 Date :- March 1, 1967.

Scale:- 1" = 50'

Figure 4b



Scale:- 1" = 50'

### CORANEX LIMITED KLAZAN GROUP

#### TOTAL COPPER IN SOILS

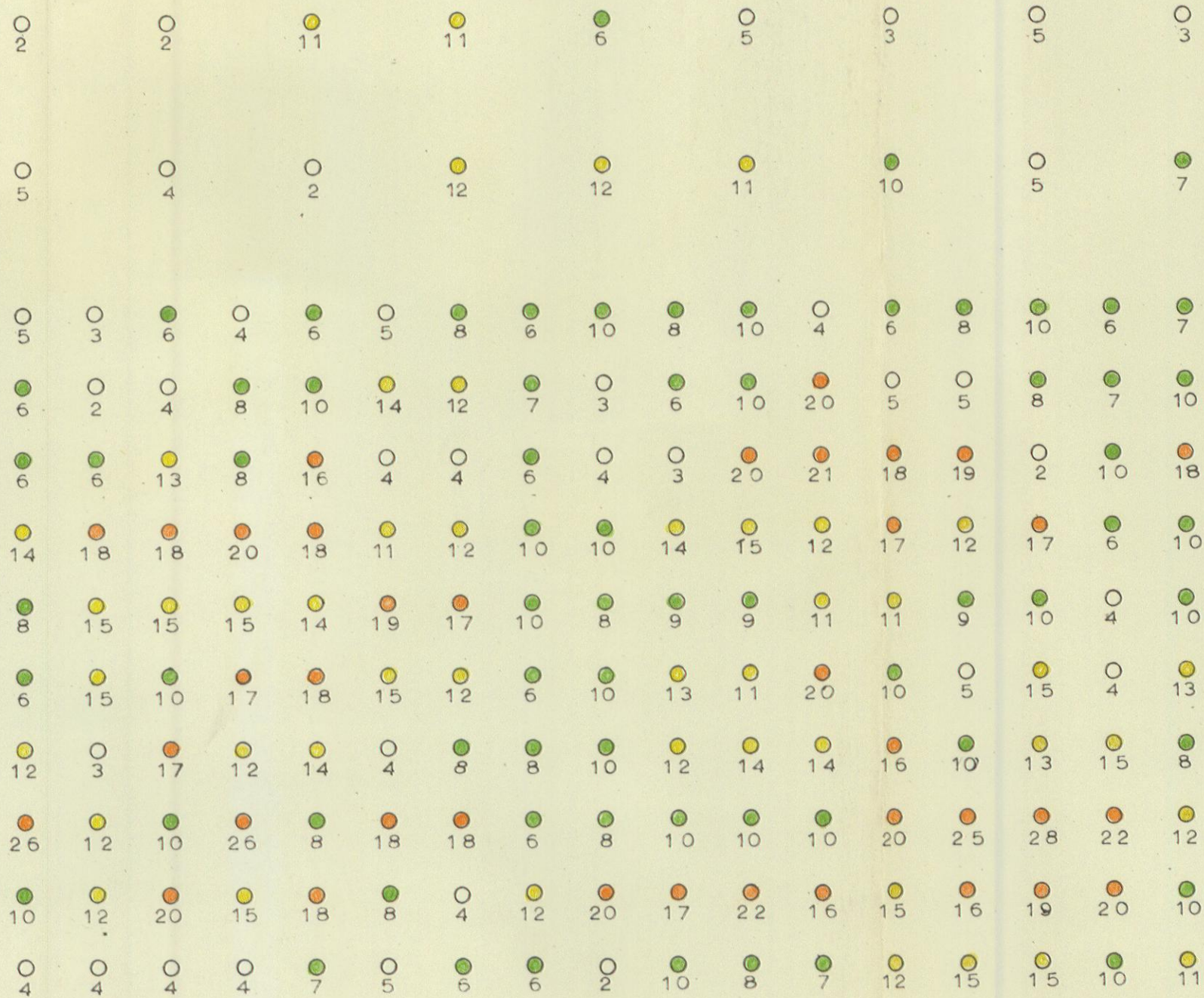
- 0 - 5 ppm ○
- 6 - 12 ppm ●
- 13 - 25 ppm ●
- 26 - 50 ppm ●
- 51 - 100 ppm ●
- >100 ppm ●

Analyzed by:- C.Chun.

Drawn by :- C.Campbell.

Date :- March 1, 1967.

Figure 4c



Scale:- 1" = 50'

**CORANEX LIMITED  
KLAZAN GROUP**

**COLD EXTRACTABLE TOTAL  
HEAVY METALS IN SOILS**

0 - 5ppm	○
6 - 10ppm	●
11 - 15 ppm	●
16 - 30 ppm	●
31 - 50 ppm	●
> 50 ppm	●

Analyzed by:- C. Chun.  
 Drawn by :- C. Campbell.  
 Date :- March 1, 1967.

Figure 4d



Figure 5

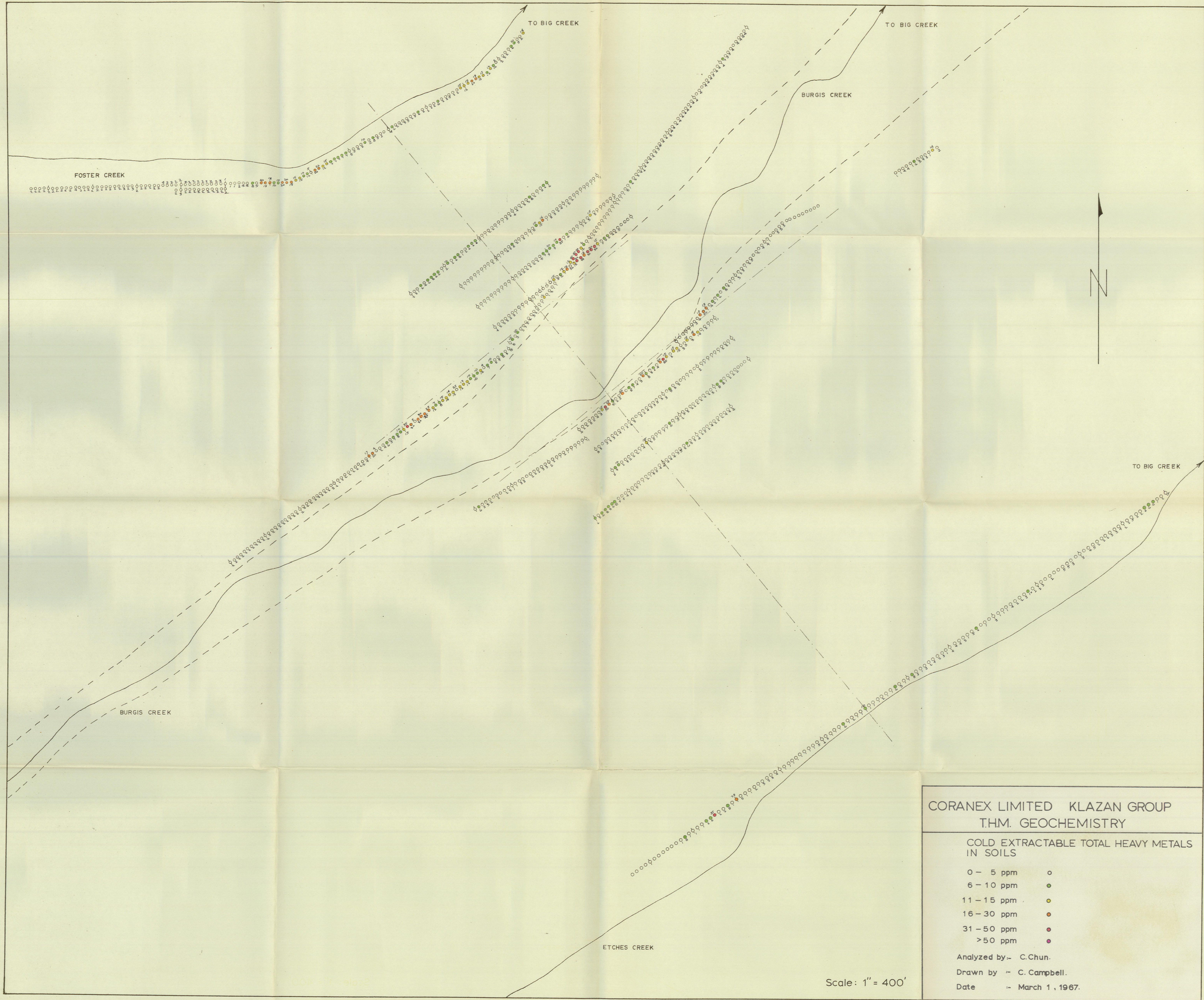


Figure 6

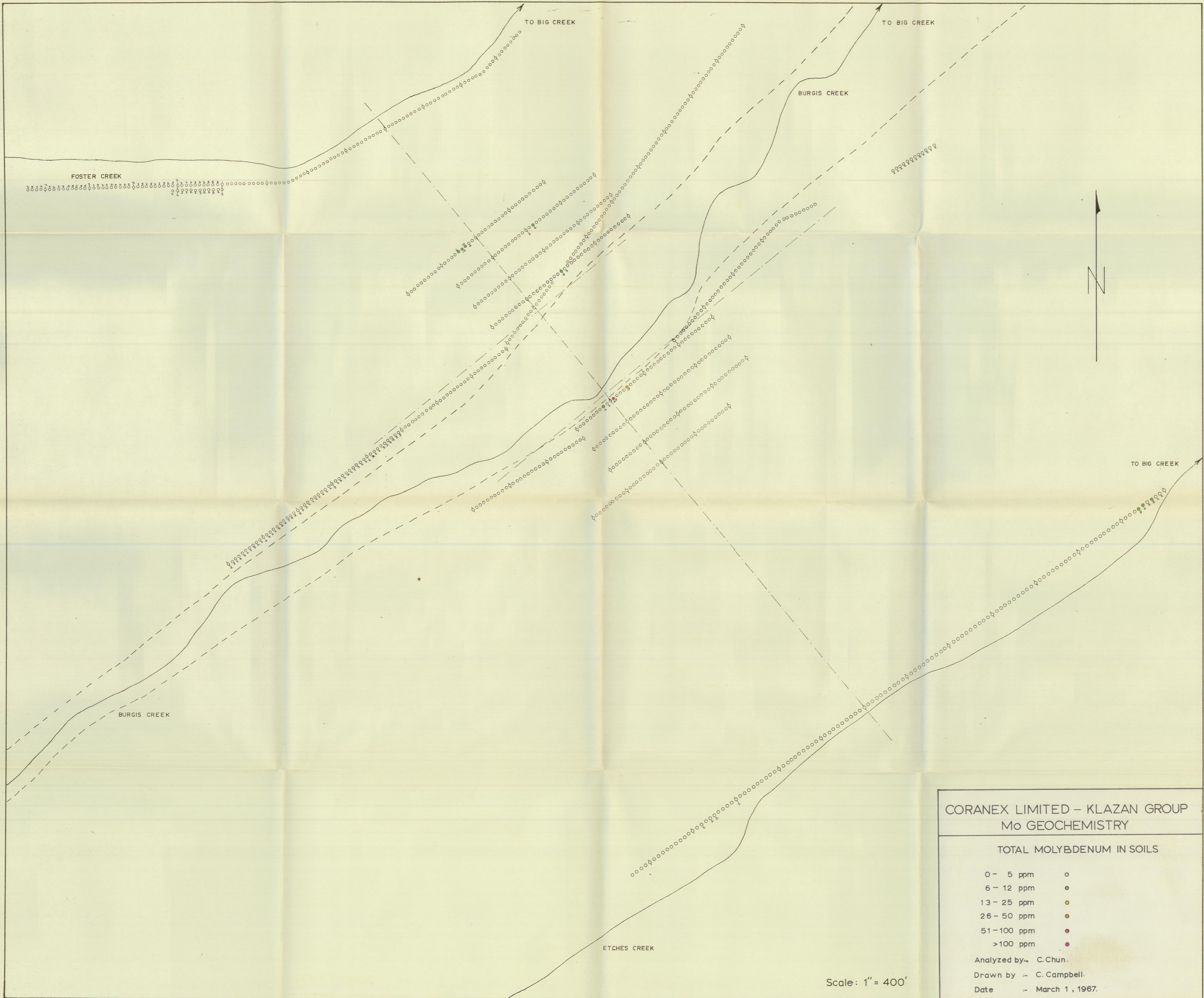
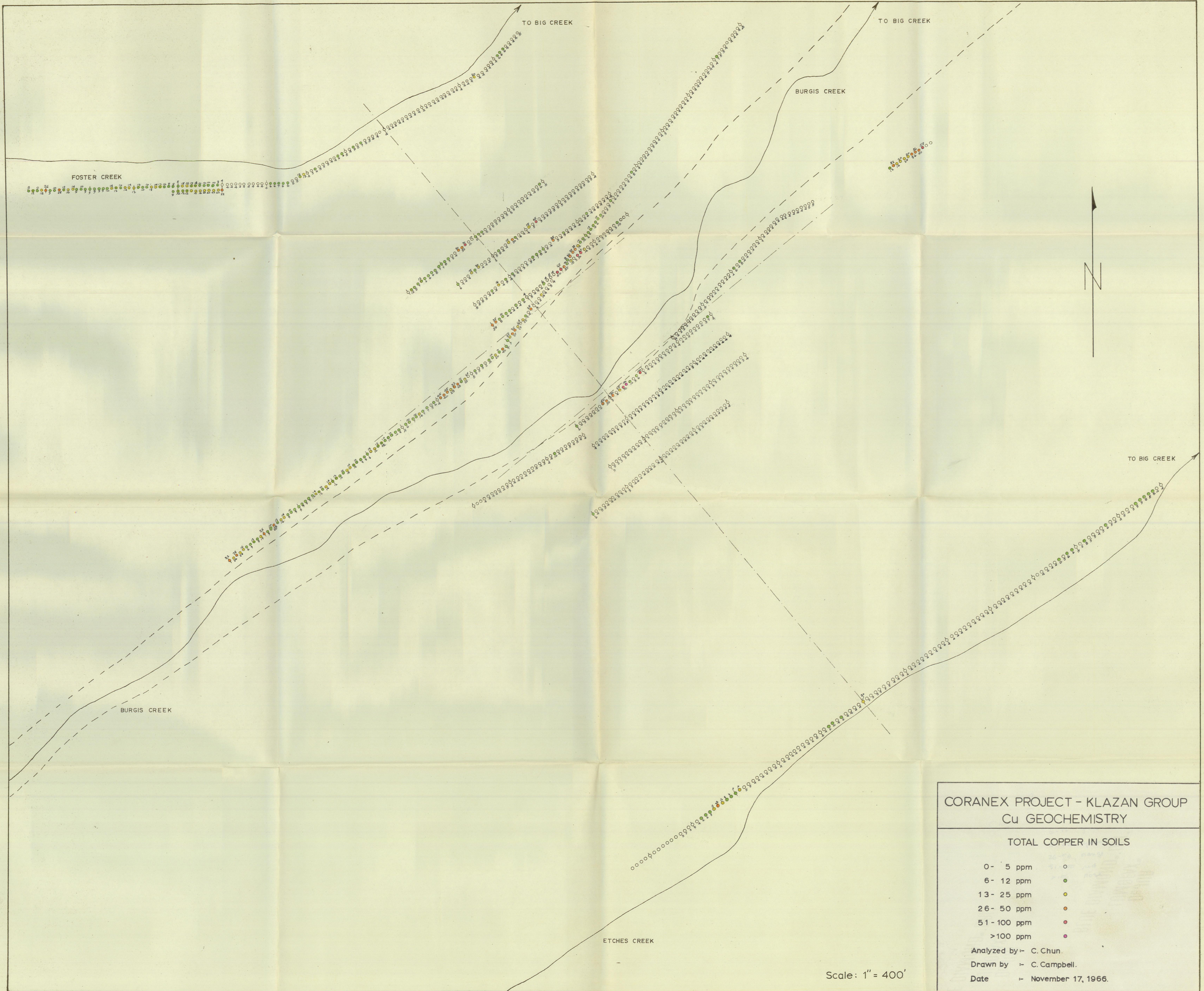


Figure 7



**CORANEX PROJECT - KLAZAN GROUP**  
**Cu GEOCHEMISTRY**

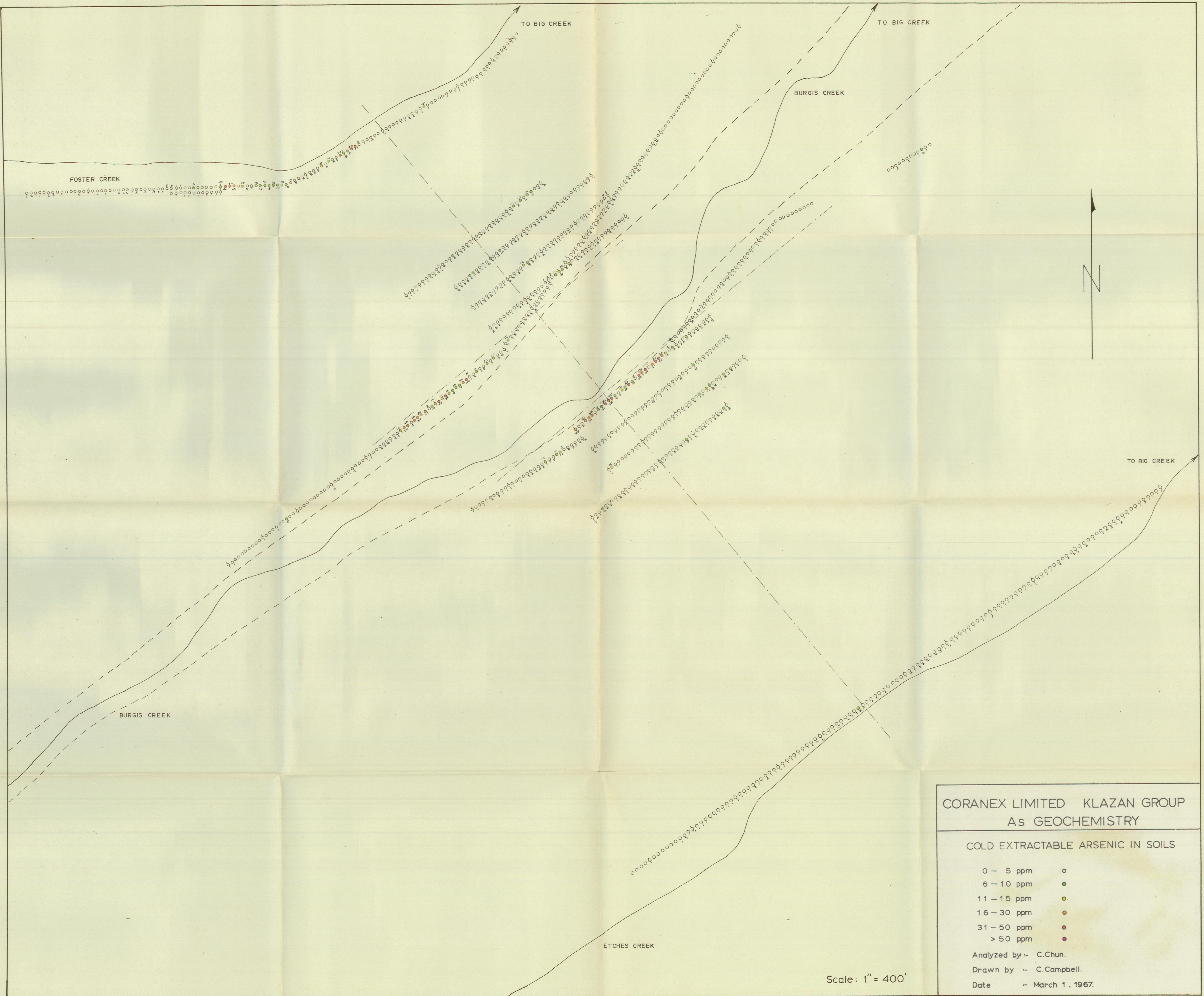
TOTAL COPPER IN SOILS

0 - 5 ppm	○
6 - 12 ppm	●
13 - 25 ppm	●
26 - 50 ppm	●
51 - 100 ppm	●
>100 ppm	●

Analyzed by - C. Chun.  
 Drawn by - C. Campbell.  
 Date - November 17, 1966.

Scale: 1" = 400'

Figure 8



**CORANEX LIMITED KLAZAN GROUP**  
**As GEOCHEMISTRY**

**COLD EXTRACTABLE ARSENIC IN SOILS**

0 - 5 ppm	○
6 - 10 ppm	●
11 - 15 ppm	●
16 - 30 ppm	●
31 - 50 ppm	●
> 50 ppm	●

Analyzed by - C.Chun.  
 Drawn by - C.Campbell.  
 Date - March 1, 1967.

Figure 9