

85-2172
85-1085-14698

ASSESSMENT REPORT
SOIL GEOCHEMISTRY ON THE BUCK CREEK PROJECT
BETH 9-14 CLAIMS
Latitude 54°18'North, Longitude 125°38'West
NTS 93L/7E

OWNER: POLO EXPLORCO LIMITED
#700-890 WEST PENDER STREET
VANCOUVER, B.C.
V6C 1K5

OPERATOR: BP MINERALS LIMITED
#700-890 WEST PENDER STREET
VANCOUVER, B.C.
V6C 1K5

FILMED

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

14,698

BPVR 85-34

PART
2 OF 5

C.M. Rebagliati
J.L. Gravel

December, 1985

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SUMMARY AND CONCLUSIONS

Two soil grids comprising 381 soil samples were established over two small intrusions similar to those exposed in the Bob Creek Canyon where anomalous concentrations base and precious metals are present.

Results indicate that no major concentration of base or precious metals are present within the grid areas surveyed.

RECOMMENDATIONS

No further exploration within the grid areas is warranted at this time.

INTRODUCTION

The discovery of placer gold in Bob Creek, circa, 1914, and the subsequent identification of the hydrothermally altered rocks within the Bob Creek Canyon is the likely source of the gold, has resulted in the assessment of the Buck Creek property by numerous exploration companies for a variety of metal deposit types.

This report will summarize the program of soil geochemistry carried out by BP-Selco at the Buck Creek property on the Beth 9-14 claims during the months of May to September, 1985.

LOCATION AND ACCESS

The Buck Creek property is located 11 km due south of Houston, B.C., near the junction of Bob and Buck Creek at latitude $54^{\circ}18'$ North and longitude $126^{\circ}38'$ West on NTS map 93L/7E (Figure 1).

Access to the property is via the all-weather Buck Flats road south from Houston a distance of 14 km and thence by range roads along Bob Creek.

Elevations vary from 830 metres to 1080 metres above sea level. Vegetation is mixed and consists of open forests spruce, pine and poplar as well as grassy open hilltops.

CLAIMS

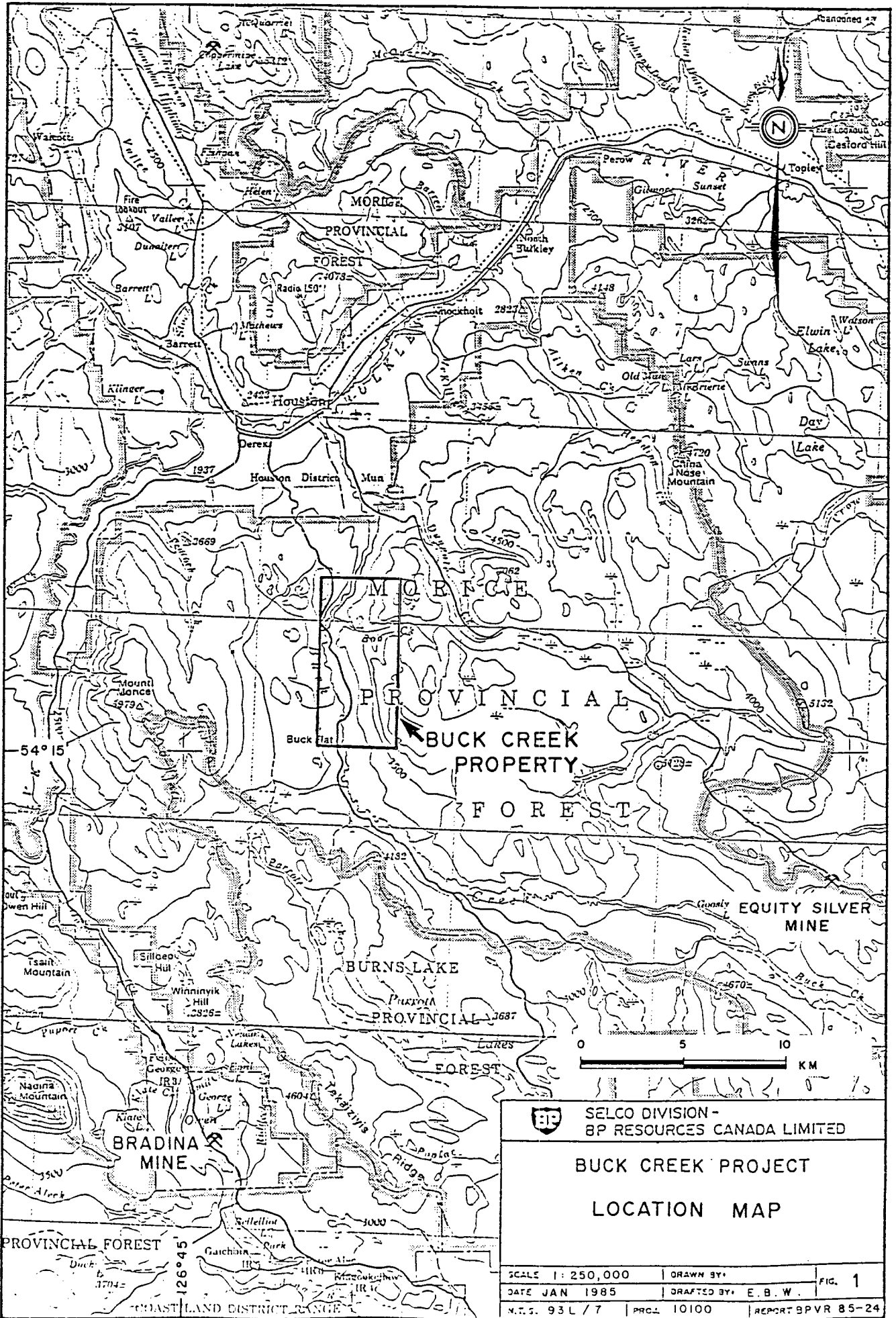
CLAIM NAME	# OF UNITS	RECORD #	ANNIVERSARY DATE
BETH 9	20	6833	January 25, 1986
BETH 10	20	6834	January 25, 1986
BETH 11	20	6835	January 25, 1986
BETH 12	20	6836	January 25, 1986
BETH 13	12	6837	January 25, 1986
BETH 14	12	6838	January 25, 1986


TOTAL 104 UNITS

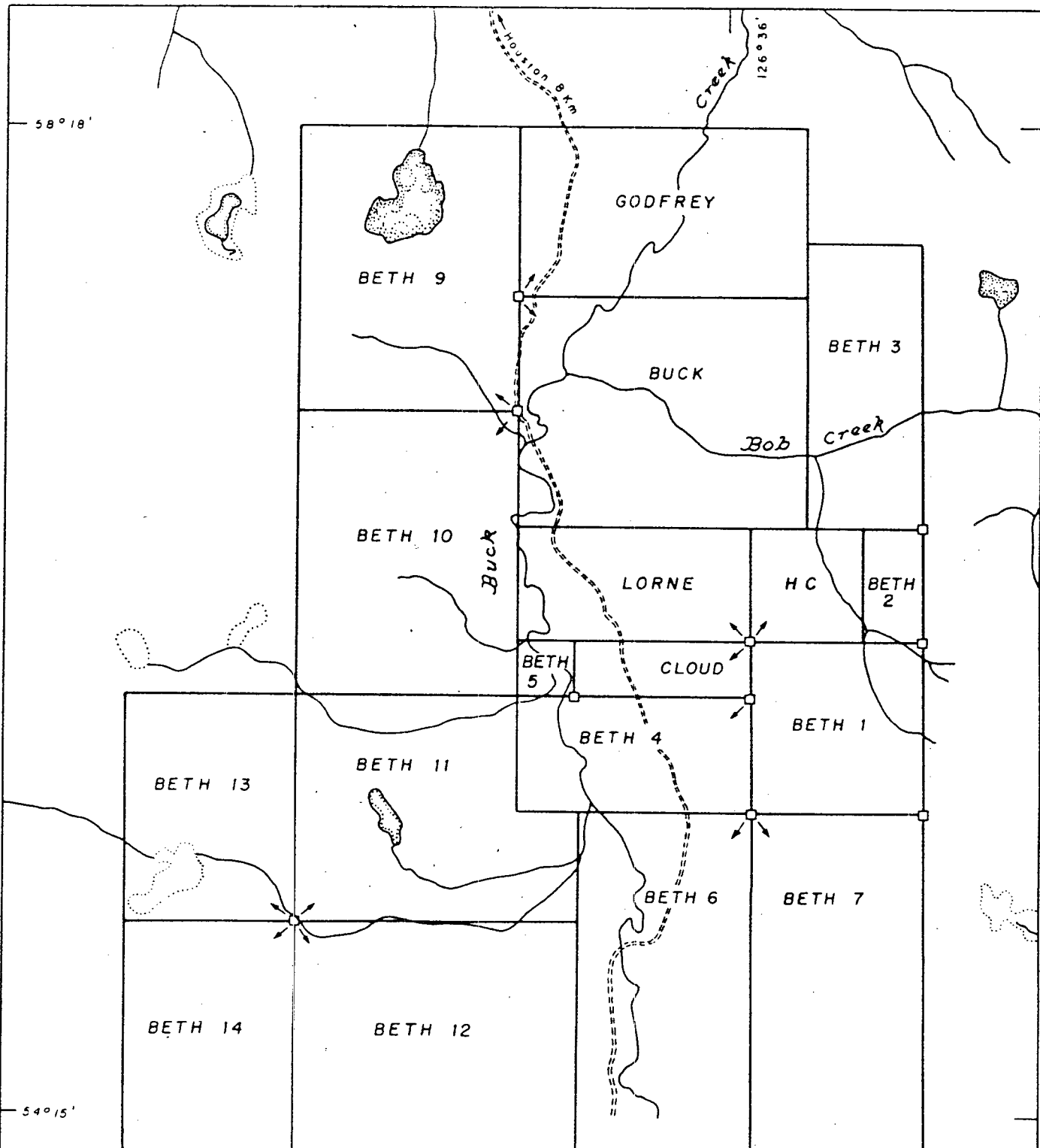
All claims are located on mapsheet 93L/7E (Figure 2).

SOIL GEOCHEMISTRY

A total of 381 soil samples were collected from the B soil horizon at depths ranging from 8-20 cm (Figure 3).



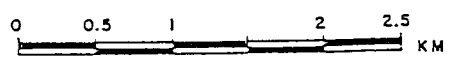
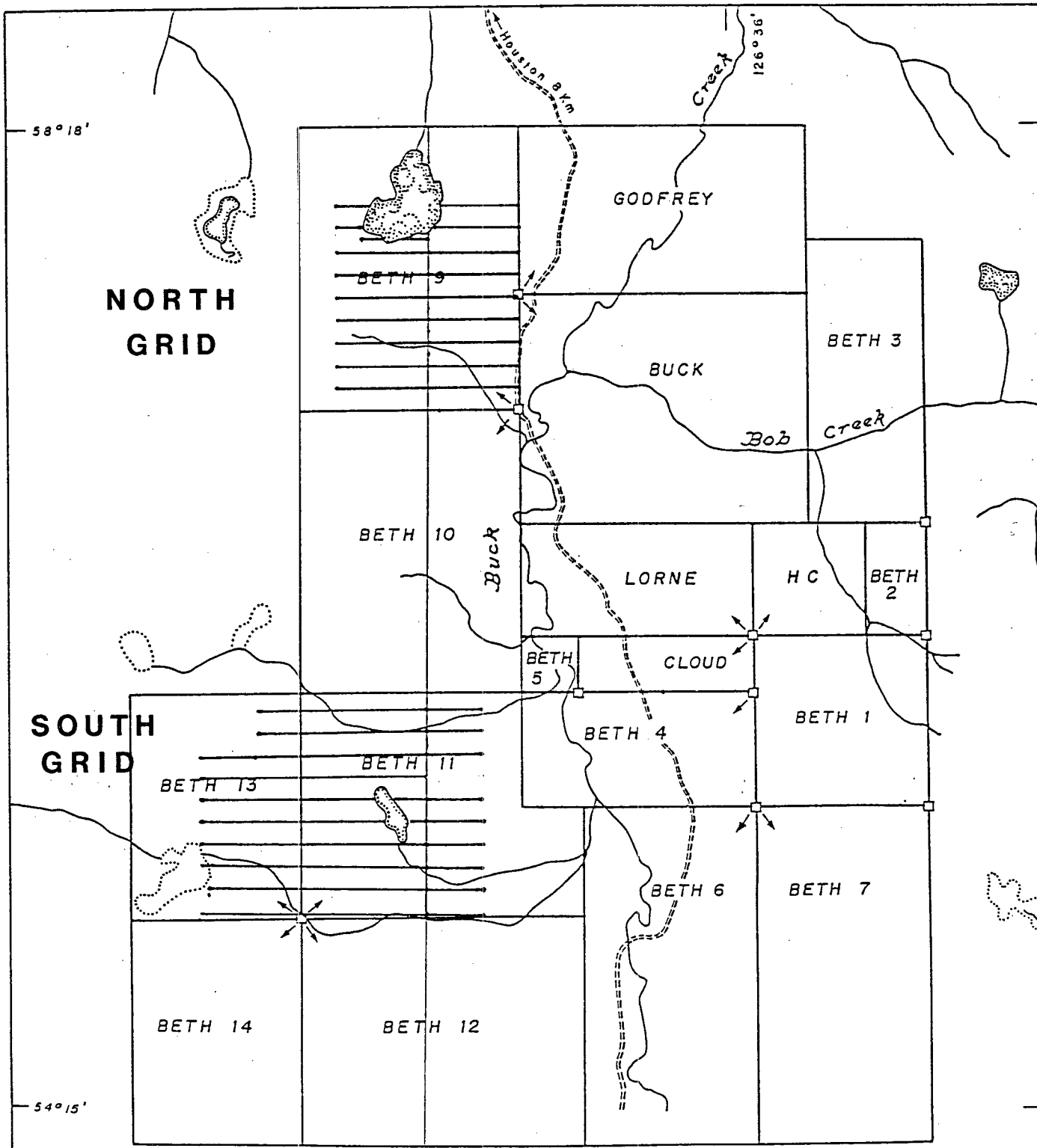
 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK PROJECT LOCATION MAP		
SCALE 1: 250,000	DRAWN BY:	FIG. 1
DATE JAN 1985	DRAFTED BY: E. B. W.	
N.T.S. 93 L / 7	PRCL 10100	REPORT 9PVR 85-24




BP SELCO DIVISION -
BP RESOURCES CANADA LIMITED

**BUCK CREEK PROJECT
CLAIM MAP**

SCALE	1:50,000	DRAWN BY:		FIG. 2
DATE	JAN 1985	DRAFTED BY:	E. B. W.	
M.T.S.	93 L/7E	PROJ.	10100	



 SELCO DIVISION - BP RESOURCES CANADA LIMITED	
BETH CLAIMS BUCK CREEK PROJECT SOIL GRIDS	
SCALE 1: 50,000	DRAWN BY:
DATE JAN 1985	DRAFTED BY: E. B. W.
N.T.S. 93 L / 7 E	PROJ. 10100
REPORT	FIG. 3

Results indicate that no major concentrations of precious or base metals are present within the area surveyed.

A memorandum by J. Gravel discussing the results more fully and containing metal plots are appended.

APPENDIX 1

SOIL GEOCHEMISTRY RESULTS - By John Gravel

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- FIGURE 2A BUCK CREEK WEST - NORTH GRID
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- FIGURE 2C BUCK CREEK WEST - NORTH GRID
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- FIGURE 2D BUCK CREEK WEST - NORTH GRID
SOIL GEOCHEMICAL SURVEY - COPPER
- FIGURE 2E BUCK CREEK WEST - NORTH GRID
SOIL GEOCHEMICAL SURVEY - LEAD
- FIGURE 2F BUCK CREEK WEST - NORTH GRID
SOIL GEOCHEMICAL SURVEY - ZINC
- FIGURE 2G BUCK CREEK WEST - NORTH GRID
SOIL GEOCHEMICAL SURVEY - MANGANESE
- FIGURE 2H BUCK CREEK WEST - NORTH GRID
SOIL GEOCHEMICAL SURVEY - IRON
- FIGURE 2I BUCK CREEK WEST - NORTH GRID
SOIL GEOCHEMICAL SURVEY - BARIUM
- FIGURE 2J BUCK CREEK WEST - NORTH GRID
SOIL GEOCHEMICAL SURVEY - ANTIMONY
- FIGURE 2K BUCK CREEK WEST - NORTH GRID
SOIL GEOCHEMICAL SURVEY - MOLYBDENUM
- FIGURE 2L BUCK CREEK WEST - NORTH GRID
SOIL GEOCHEMICAL SURVEY - NICKEL
- FIGURE 2M BUCK CREEK WEST - NORTH GRID
SOIL GEOCHEMICAL SURVEY - COBALT
- FIGURE 3A BUCK CREEK WEST - SOUTH GRID
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SOIL GEOCHEMICAL SURVEY - LEAD
- FIGURE 3F BUCK CREEK WEST - SOUTH GRID
SOIL GEOCHEMICAL SURVEY - ZINC
- FIGURE 3G BUCK CREEK WEST - SOUTH GRID
SOIL GEOCHEMICAL SURVEY - MANGANESE
- FIGURE 3H BUCK CREEK WEST - SOUTH GRID
SOIL GEOCHEMICAL SURVEY - IRON
- FIGURE 3I BUCK CREEK WEST - SOUTH GRID
SOIL GEOCHEMICAL SURVEY - BARIUM
- FIGURE 3J BUCK CREEK WEST - SOUTH GRID
SOIL GEOCHEMICAL SURVEY - ANTIMONY
- FIGURE 3K BUCK CREEK WEST - SOUTH GRID
SOIL GEOCHEMICAL SURVEY - MOLYBDENUM
- FIGURE 3L BUCK CREEK WEST - SOUTH GRID
SOIL GEOCHEMICAL SURVEY - NICKEL
- FIGURE 3M BUCK CREEK WEST - SOUTH GRID
SOIL GEOCHEMICAL SURVEY - COBALT

SUBJECT: BUCK CREEK PROJECT, BETH 9 & 11
SOIL SAMPLING PROGRAMS

DATE: August 28, 1985

FROM: J. Gravel

TO: M. Rebagliati,
S. Hoffman

cc: I. Trinder

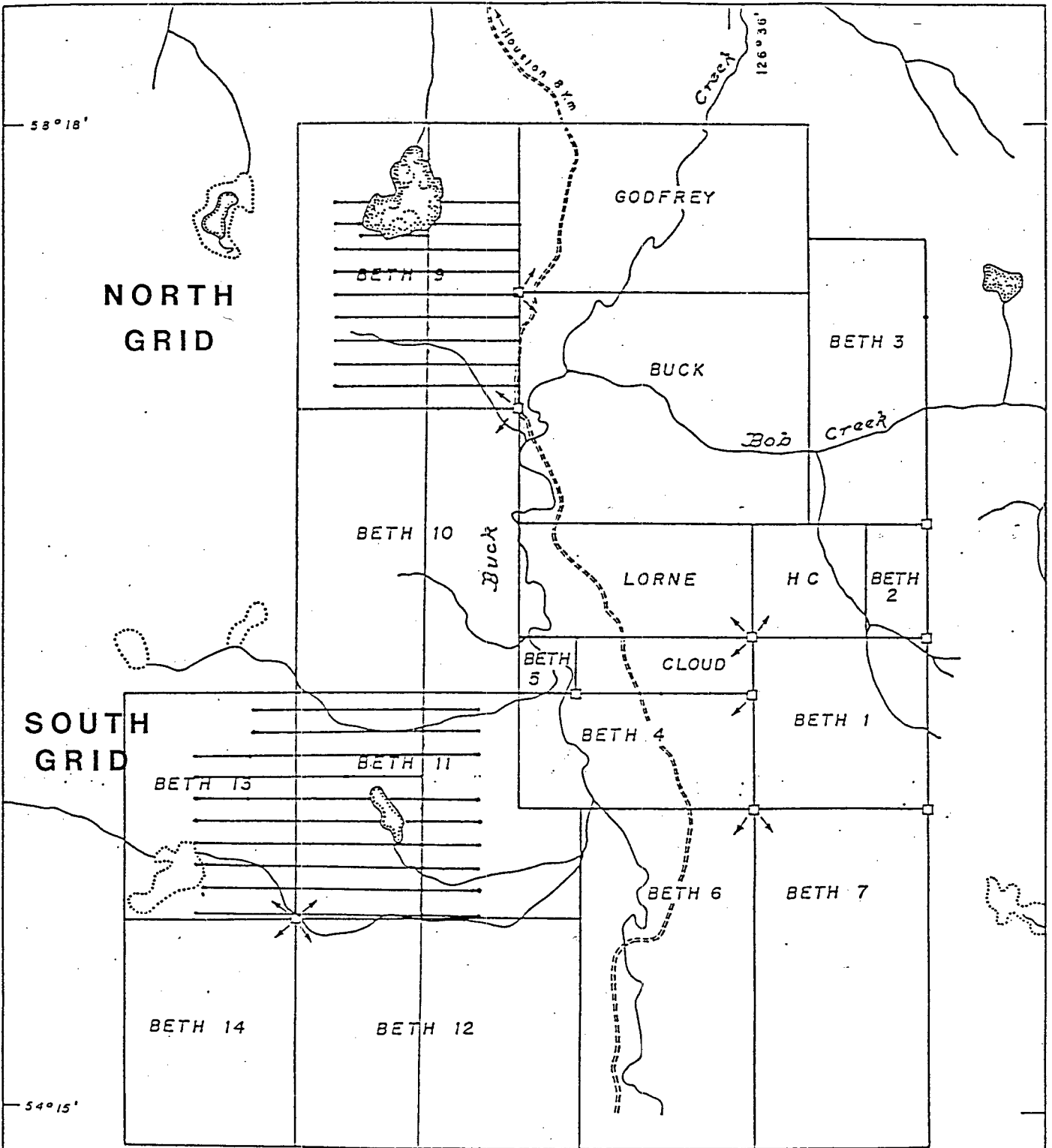
A geochemical soil survey was conducted over the Beth 9, 11 and 13 claims (Fig. 1) from August 5th to August 9th. A total of 381 soils were collected in 17 man days over the two grids using a 100 metre and 200 metre sample density. Each grid tests a small quartz feldspar intrusion of similar age and geology to the Buck Creek QFP intrusions. Previous surveys indicated an anomalous Hg level in the northern intrusion and elevated Pb, Zn, and Cd in the southern intrusion. Samples were shipped to Acme Labs for ICP and Au analysis on August 14th. Results have been received and plotted.

Samples collected over the QFP zone in the northern grid give consistently enhanced Zn levels (200 ppm to 1700 ppm). Arsenic exhibits similar enrichment with an average value of 20 ppm and an isolated high of 221 ppm. Copper, lead, nickel, cobalt, iron and manganese are weakly anomalous. Gold averages less than 10 ppb except for an isolated high of 105 ppb.

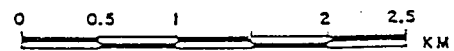
Samples collected over the intrusion on the southern grid have lower trace element concentrations than the surrounding outwash except for a minor Au, As, Pb anomaly in the northwest grid corner. The gold anomaly consists of a single point measuring 170 ppb surrounded by values of 8 ppb or less. Arsenic attains a peak value of 132 ppm in a region averaging 10 to 20 ppm. Lead is locally anomalous exhibiting a maximum concentration of 45 ppm.


A finer density grid is recommended for the northern intrusion, no further work is warranted over the southern intrusion.

JG/wt



BL



 SELCO DIVISION - BP RESOURCES CANADA LIMITED	
BETH CLAIMS BUCK CREEK PROJECT SOIL GRIDS	
SCALE 1:50,000	DRAWN BY:
DATE JAN 1985	DRAFTED BY: E.B.W.
FIG. 1	

652500

6022500

6020000

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- +501582
- +501575
- +501576
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- +502146
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- +505010
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- +505014
- +505015
- +505016
- +505017
- +505018
- +505019
- +505020
- +505021
- +505022
- +505023
- +505024
- +505025
- +505026

NORTH GRID
SAMPLE NUMBERS

652500

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NORTH GRID



6022500

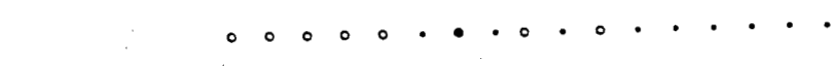
+

- BL 100E

L120N -



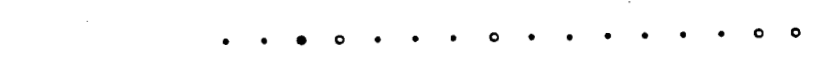
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L112N -



L108N -



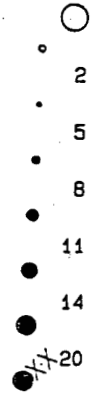
L104N -



92E -


BL 100E -

108E -



6020000



 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey GOLD (ppb)		
SCALE 1:20000	DRAWN BY:	FIG. 2A
DATE Aug/85	DRAFTED BY: j.g.	
N.T.S. 93L/7	PROJ. 554	REPORT

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NORTH GRID



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L120N -

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L116N -

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L112N -

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o o o o o o o o o o o o o o o o

L108N -

o o o o o o o o o o o o o o o o

o o o o o o o o o o o o o o o o

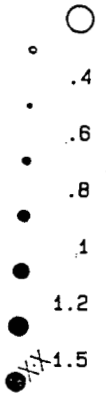
L104N -

o o o o o o o o o o o o o o o o

92E -


BL 100E -

108E -



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 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey SILVER (ppm)		
SCALE 1:20000	DRAWN BY:	FIG. 2B
DATE Aug/85	DRAFTED BY: j.g.	
N.T.S. 93L/7	PROJ. 554	REPORT

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AS

NORTH GRID



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+

- BL 100E

L120N -

L116N -

L112N -

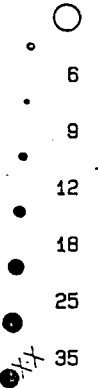
L108N -

L104N -

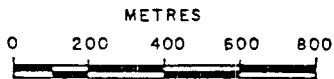
92E -


BL 100E -

108E -



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 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey ARSENIC (ppm)		
SCALE 1:20000	DRAWN BY:	FIG. 2C
DATE Aug/85	DRAFTED BY: j.g.	
N.T.S. 93L/7	PRGL 554	REPORT

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- BL 100E

L120N -

L116N -

L112N -

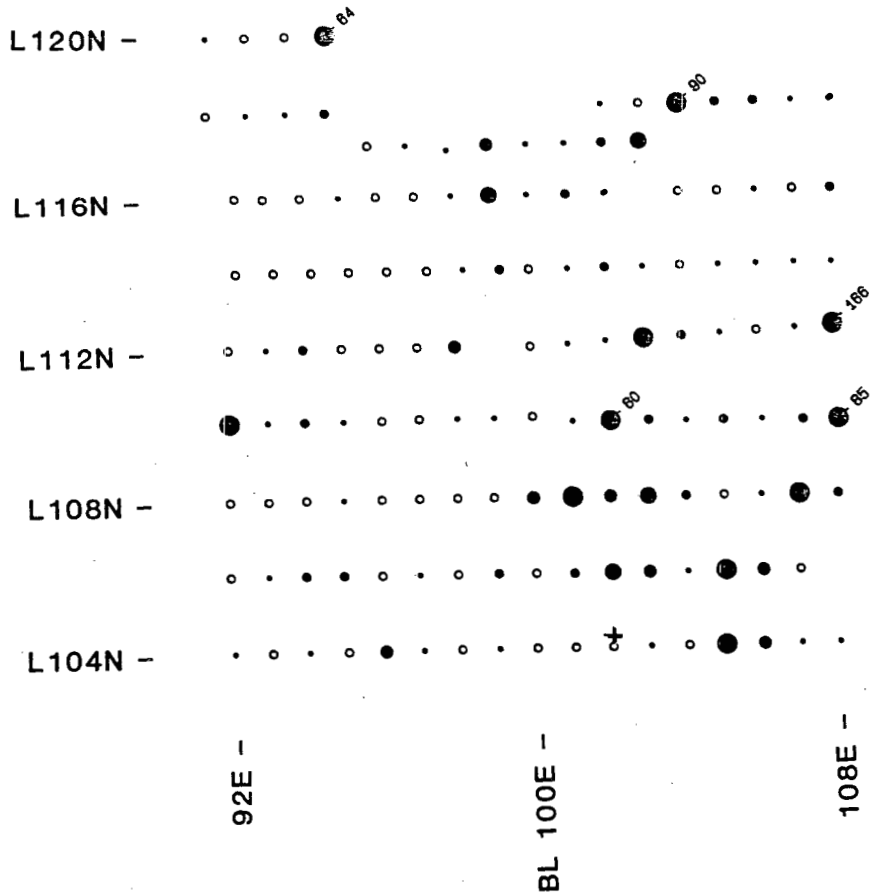
L108N -

L104N -

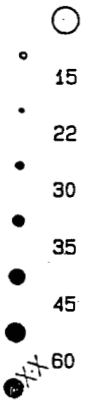
92E -


BL 100E -

108E -



6020000



 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey COPPER (ppm)		
SCALE 1:20 000	DRAWN BY:	FIG. 2D
DATE Aug/85	DRAFTED BY: J.g.	
N.T.S. 93L/7	PROJ. 554	REPORT

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PB

NORTH GRID



6022500

- BL 100E

L120N -

L116N -

L112N -

L108N -

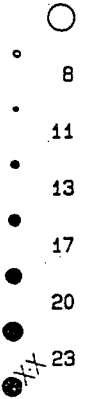
L104N -


92E -

BL 100E -

108E -

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 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey LEAD (ppm)		
SCALE 1:20000	DRAWN BY:	FIG. 2E
DATE Aug/85	DRAFTED BY: j.g.	
R.T.S. 93L/7	PROJ. 554	REPORT

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NORTH GRID



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- BL 100E

L120N -

L116N -

L112N -

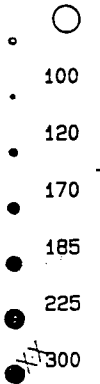
L108N -

L104N -

92E -


BL 100E -

108E -



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 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey ZINC (ppm)		
SCALE 1:20000	DRAWN BY:	FIG. 2F
DATE Aug/85	DRAFTED BY: j.g.	
N.T.S. 93L/7	PROJ. 554	REPORT

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MN

NORTH GRID



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+

- BL 100E

L120N -

L116N -

L112N -

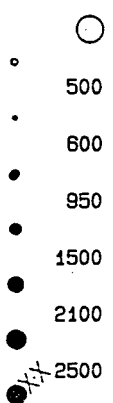
L108N -

L104N -

92E -


BL 100E -

108E -



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 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey MANGANESE (ppm)		
SCALE 1:20000	DRAWN BY:	FIG. 2G
DATE Aug / 85	DRAFTED BY: J.g.	
N.T.S. 93L/7	PROJ. 554	REPORT

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NORTH GRID



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- BL 100E

L120N -

L116N -

L112N -

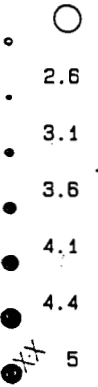
L108N -

L104N -

92E -


BL 100E -

108E -



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 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey IRON (%)		
SCALE 1:20000	DRAWN BY:	FIG. 2H
DATE Aug/85	DRAFTED BY: J.G.	
N.T.S. 93L/7	PROJ. 554	REPORT

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NORTH GRID



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- BL 100E

L120N -

L116N -

L112N -

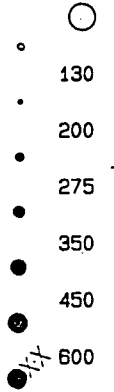
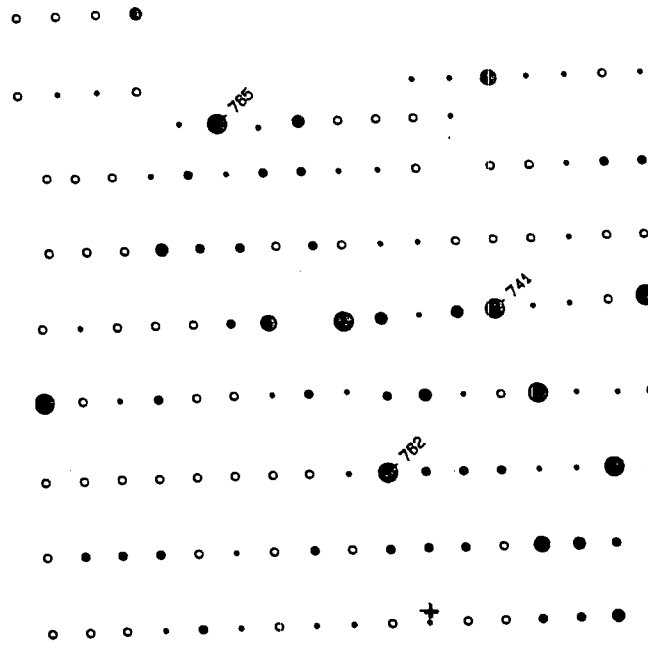
L108N -

L104N -

92E -


BL 100E -

108E -



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 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey BARIUM (ppm)		
SCALE 1:20000	DRAWN BY:	FIG. 2I
DATE Aug/85	DRAFTED BY: j.g.	
N.T.S. 93L/7	PROJ. 554	REPORT

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NORTH GRID



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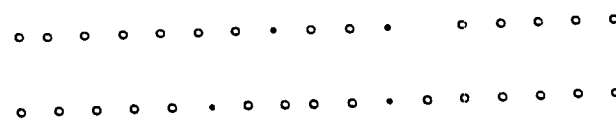
+

- BL 100E

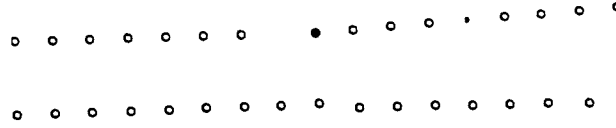
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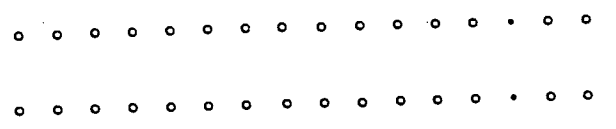
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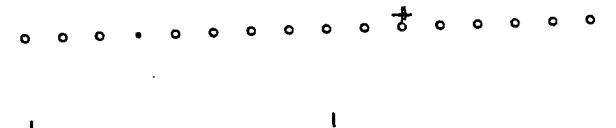
L112N -



L108N -



L104N -

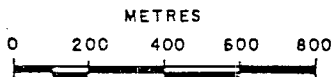
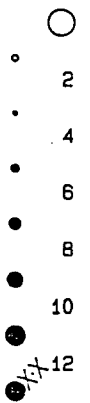



92E -

BL 100E -

108E -

6020000



 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey ANTIMONY (ppm)		
SCALE 1:20000	DRAWN BY:	FIG. 2J
DATE Aug/85	DRAFTED BY: j.g.	
K.T.S. 93L/7	PROJ. 554	REPORT

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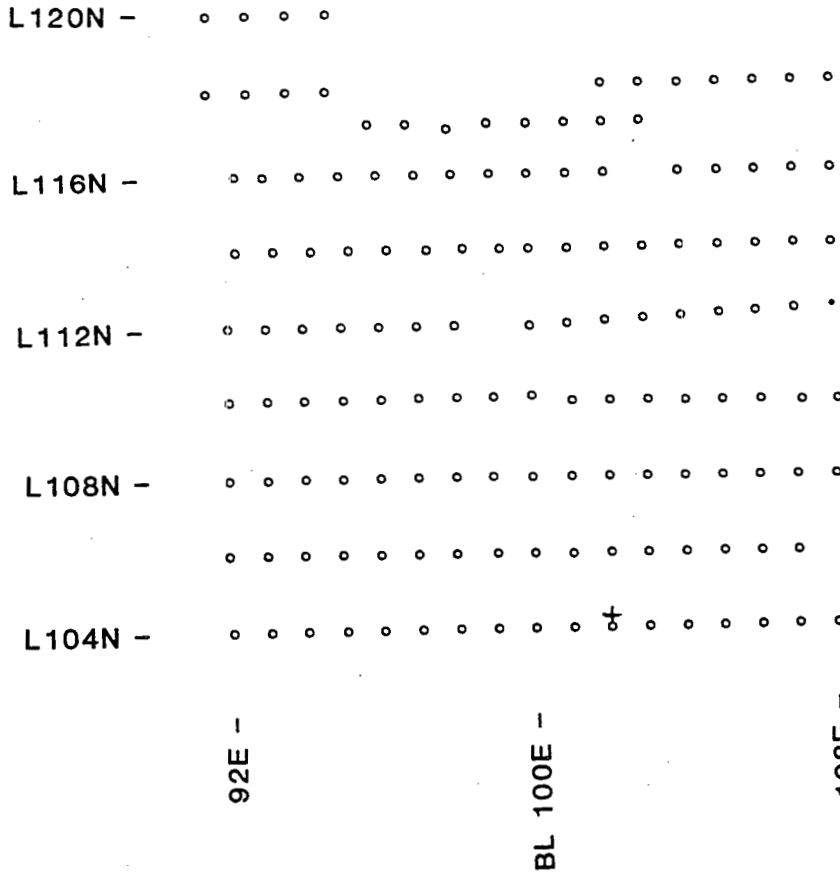
NORTH GRID



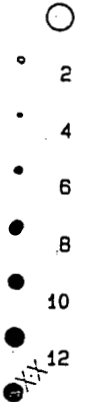
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 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey MOLYBDENUM (ppm)		
SCALE 1:20000	DRAWN BY:	FIG. 2K
DATE Aug/85	DRAFTED BY: j.g.	
N.T.S. 93L/7	PROJ. 554	REPORT

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NORTH GRID



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- BL 100E

L120N -

L116N -

L112N -

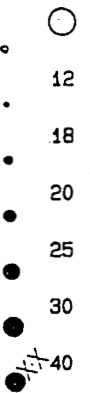
L108N -

L104N -

92E -


BL 100E -

108E -



6020000



 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey NICKEL (ppm)		
SCALE 1:20000	DRAWN BY:	FIG. 2L
DATE Aug/85	DRAFTED BY: j.g.	
N.T.S. 93L/7	PROJ. 554	REPORT

652500

CO

NORTH GRID



6022500

+

- BL 100E

L120N -

L116N -

L112N -

L108N -

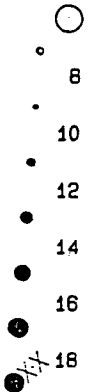
L104N -


92E -

BL 100E -

108E -

6020000



 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey COBALT (ppm)		
SCALE 1:20000	DRAWN BY:	FIG. 2M
DATE Aug/85	DRAFTED BY: j.g.	
N.T.S. 93L/7	PROJ. 554	REPORT

6017500

6015000

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SOUTH GRID
SAMPLE NUMBERS

652500

AU SOUTH GRID



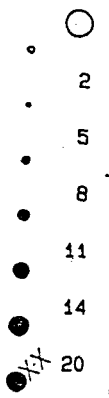
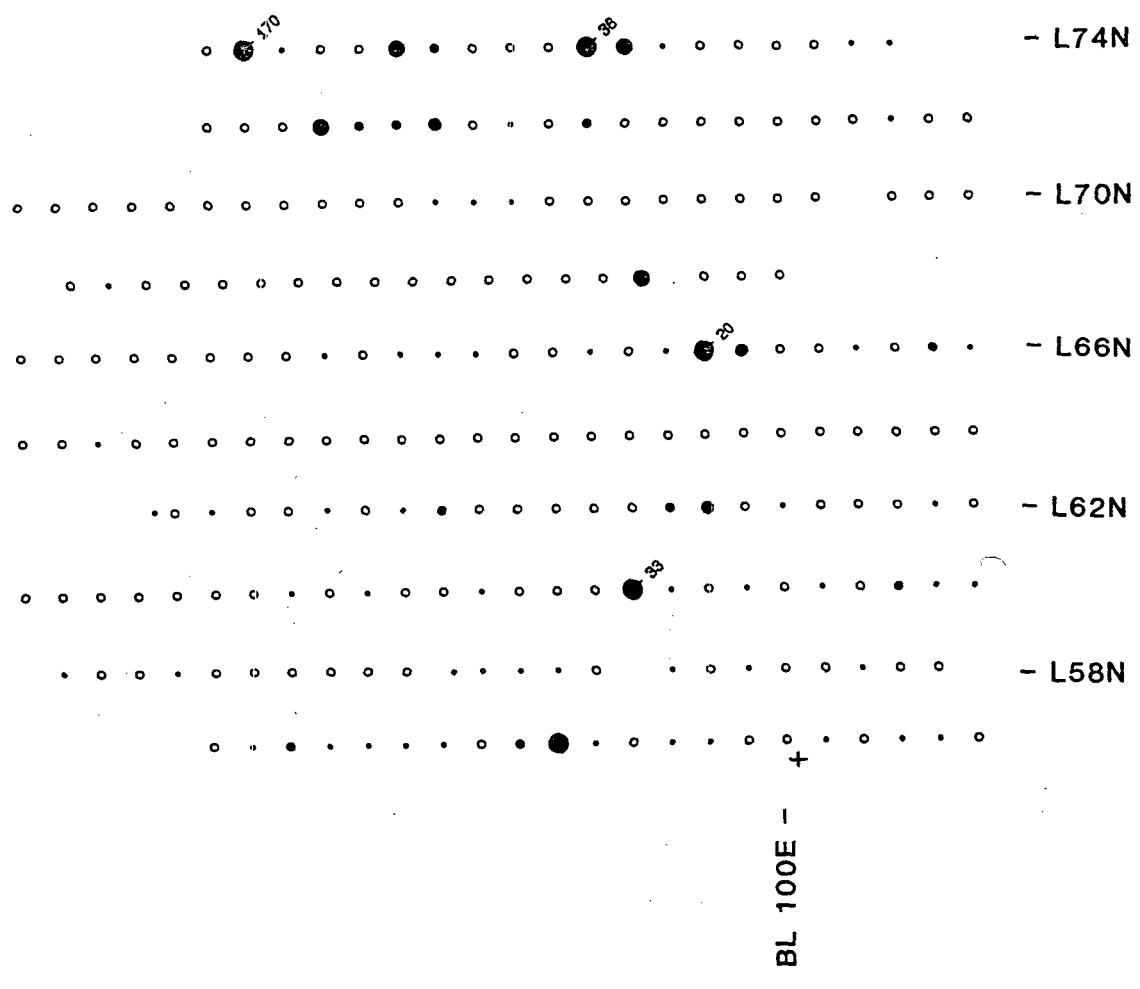
6017500


- 85E

- BL 100E +

- 105E

6015000



 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey GOLD (ppb)		
SCALE 1:20000	DRAWN BY:	FIG. 3A
DATE Aug/85	DRAFTED BY: j.g.	
N.T.S. 93L/7	PROJ 554	REPORT

652500

AG SOUTH GRID



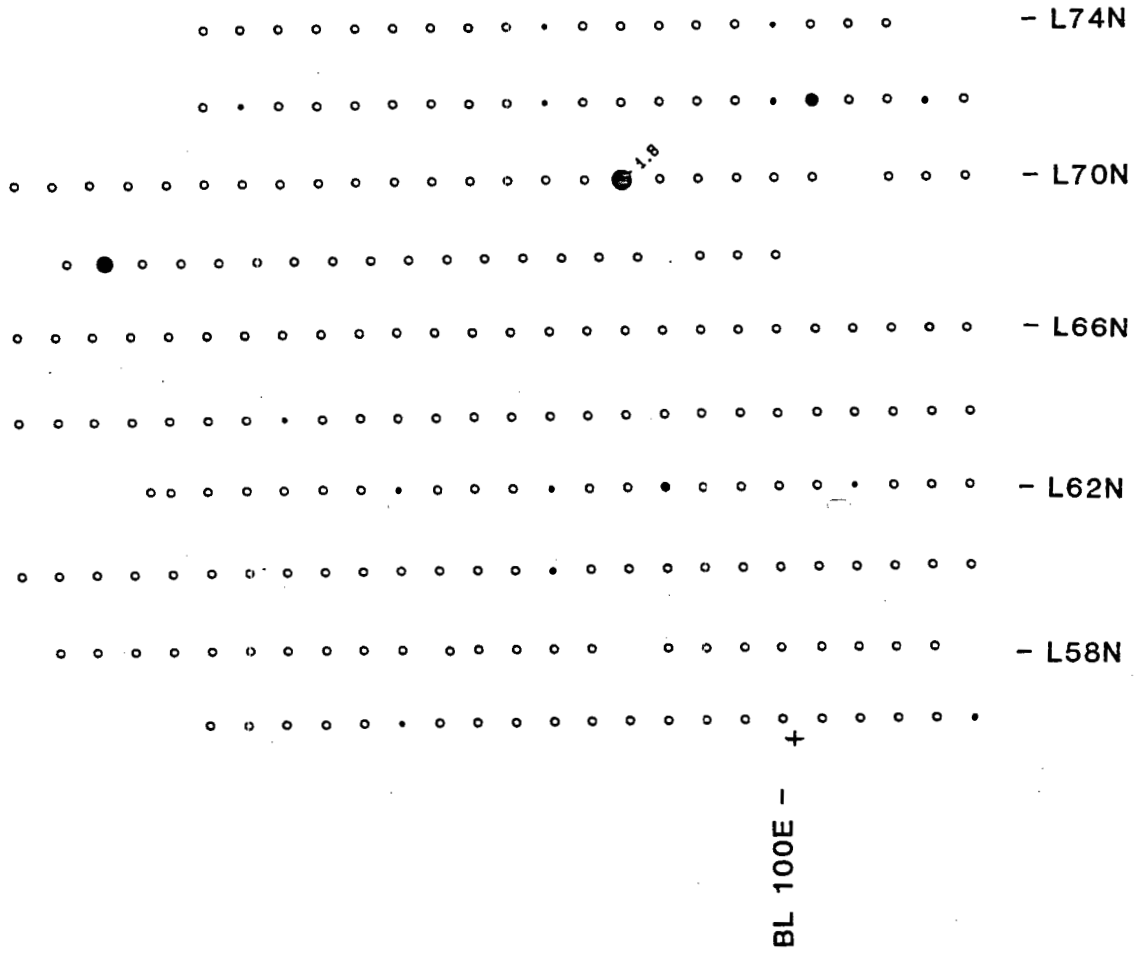
6017500


- 85E

- BL 100E +

- 105E

6015000



 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey SILVER (ppm)		
SCALE 1:20000	DRAWN BY:	FIG. 3B
DATE Aug/85	DRAFTED BY: j.g.	
N.T.S. 93L/7	PROJ. 554	REPORT

10

652500

AS SOUTH GRID



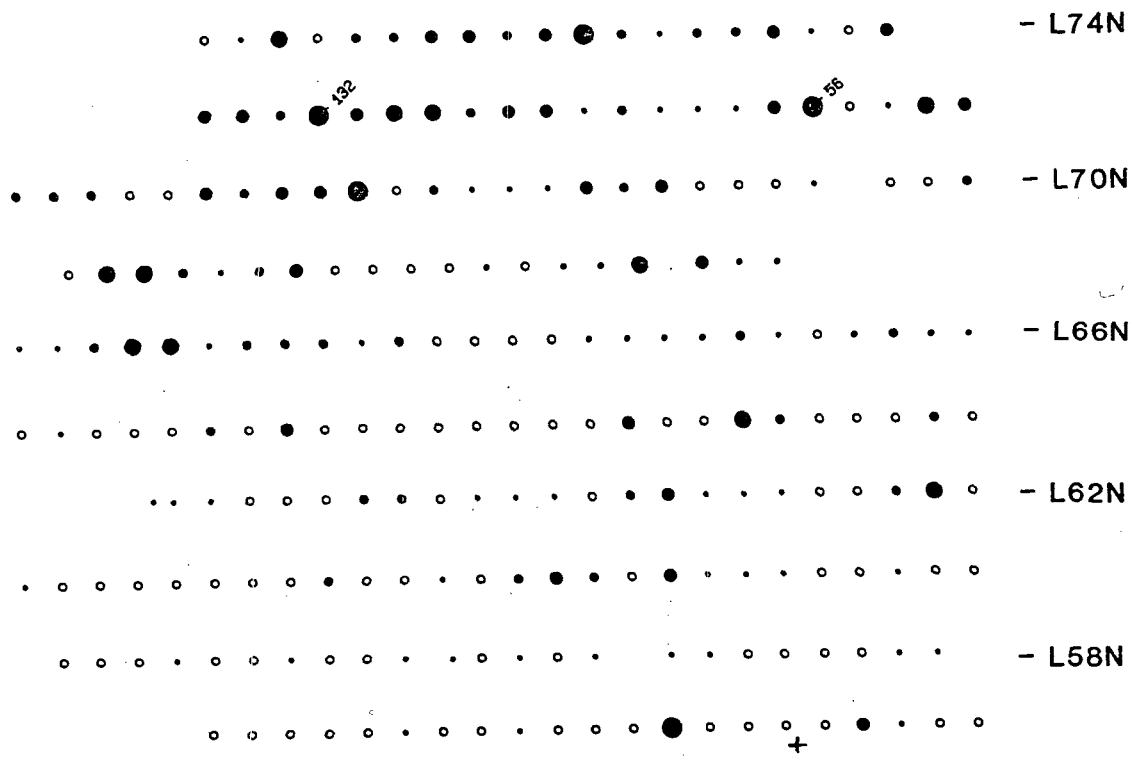
6017500

- 85E

- BL 100E +

- 105E

6015000



BL 100E -

- L74N

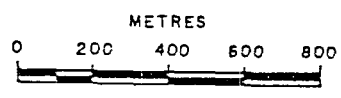
- L70N


- L66N

- L62N

- L58N

- 6
- 9
- 12
- 18
- 25
- 35



 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey ARSENIC (ppm)		
SCALE 1:20000	DRAWN BY:	FIG. 3C
DATE Aug/85	DRAFTED BY: j.g.	
N.T.S. 93L/7	PROJ. 554	REPORT

0

652500

CU SOUTH GRID



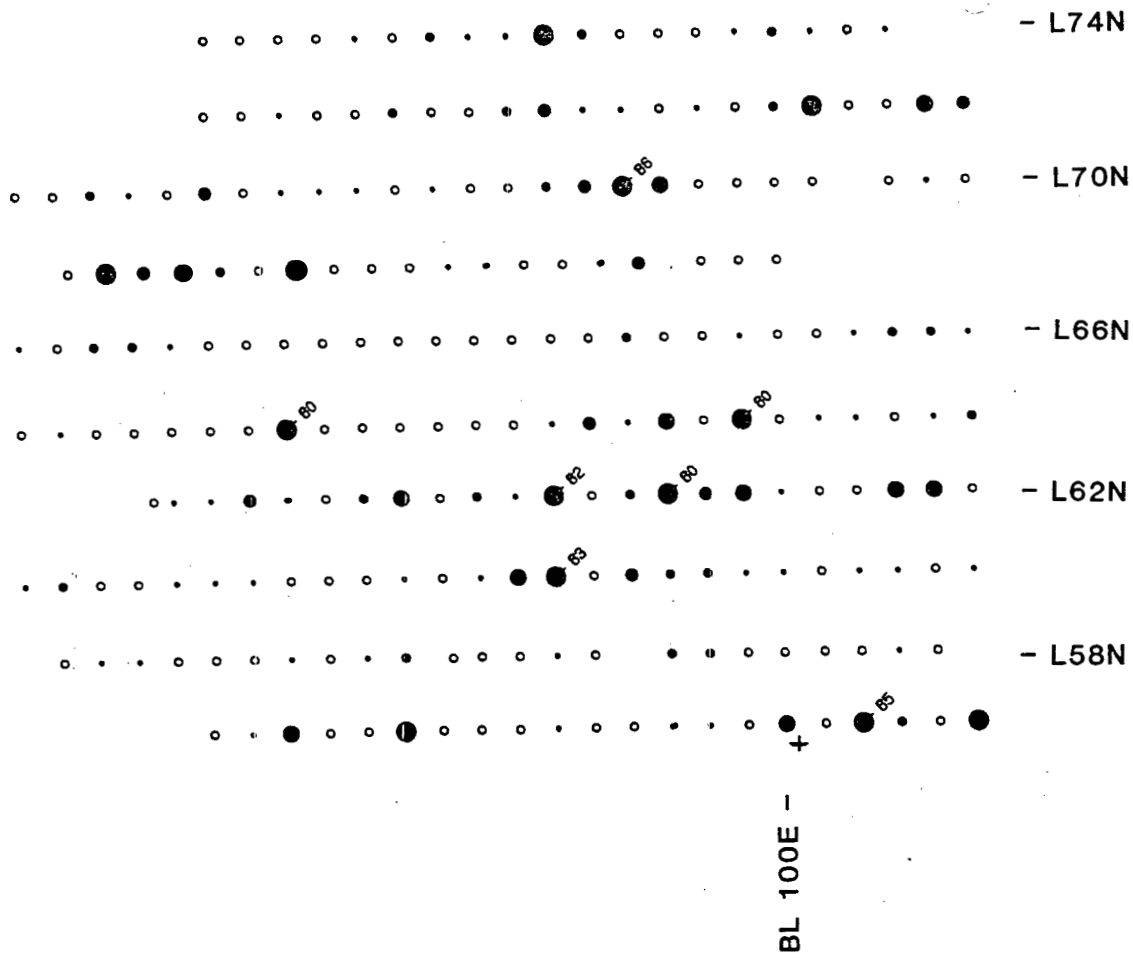
6017500

- 85E

- BL 100E +

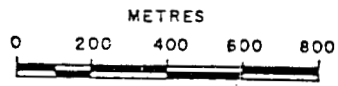
- 105E


6015000

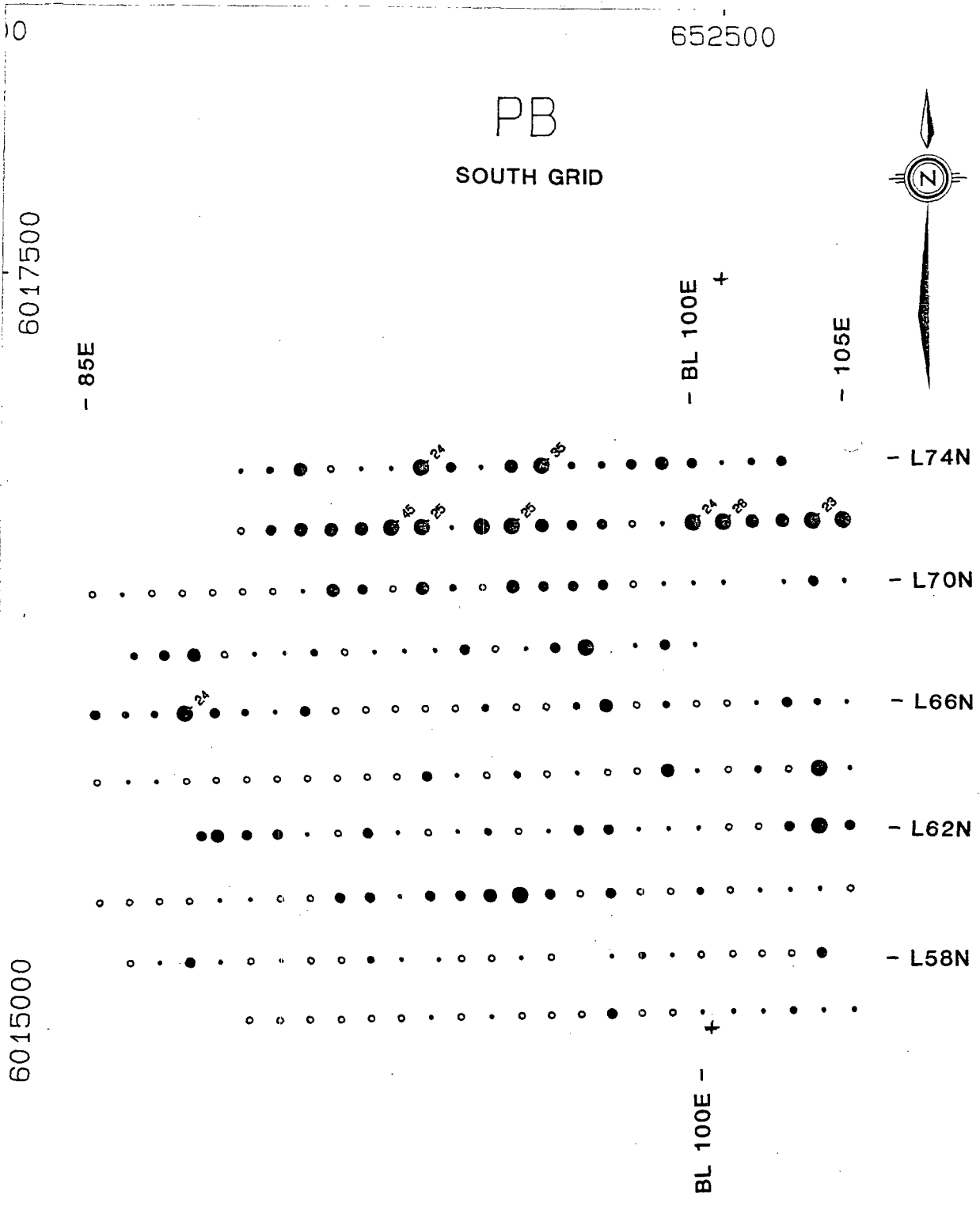



○ 15
● 22
● 30
● 35
● 45
● 60

BL 100E - +



 SELCO DIVISION -- BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey COPPER (ppm)		
SCALE 1:20000	DRAWN BY:	FIG. 3D
DATE Aug/85	DRAFTED BY: j.g.	
R.T.S. 93L/7	PROJ. 554	REPORT



 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey LEAD (ppm)		
SCALE 1:20000	DRAWN BY:	FIG. 3E
DATE Aug/85	DRAFTED BY: j.g.	
N.T.S. 93L/7	PROJ. 554	REPORT

0

652500

ZN SOUTH GRID

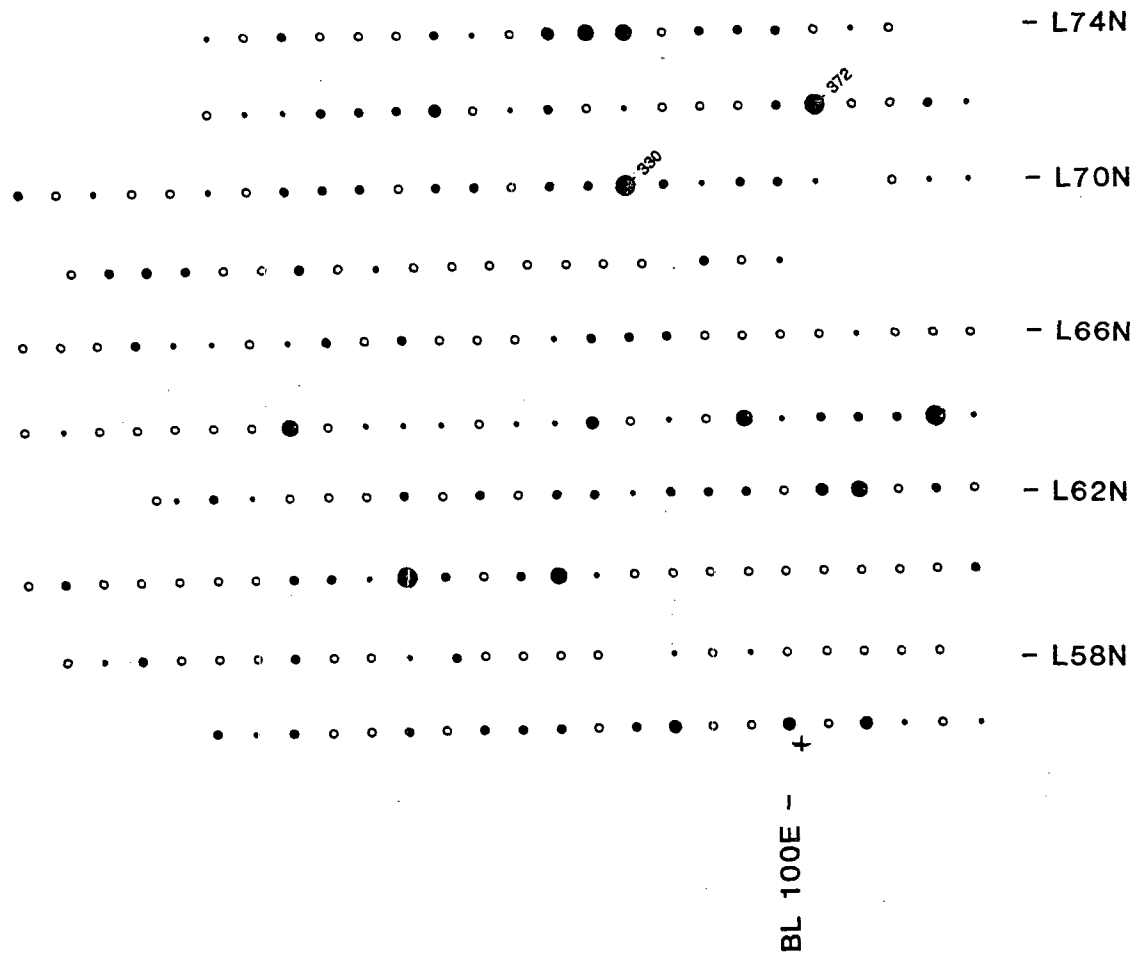


6017500

- 85E

- BL 100E +


- 105E



6015000

BL 100E - +



 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project -B.C. Soil Geochemical Survey ZINC (ppm)		
SCALE 1:20000	DRAWN BY:	FIG. 3F
DATE Aug/85	DRAFTED BY: J.G.	
N.T.S. 93L/7	PROJ. 554	REPORT

60

652500

MN SOUTH GRID



6017500

- 85E

- BL 100E #

- 105E

- L74N

- L70N

- L66N

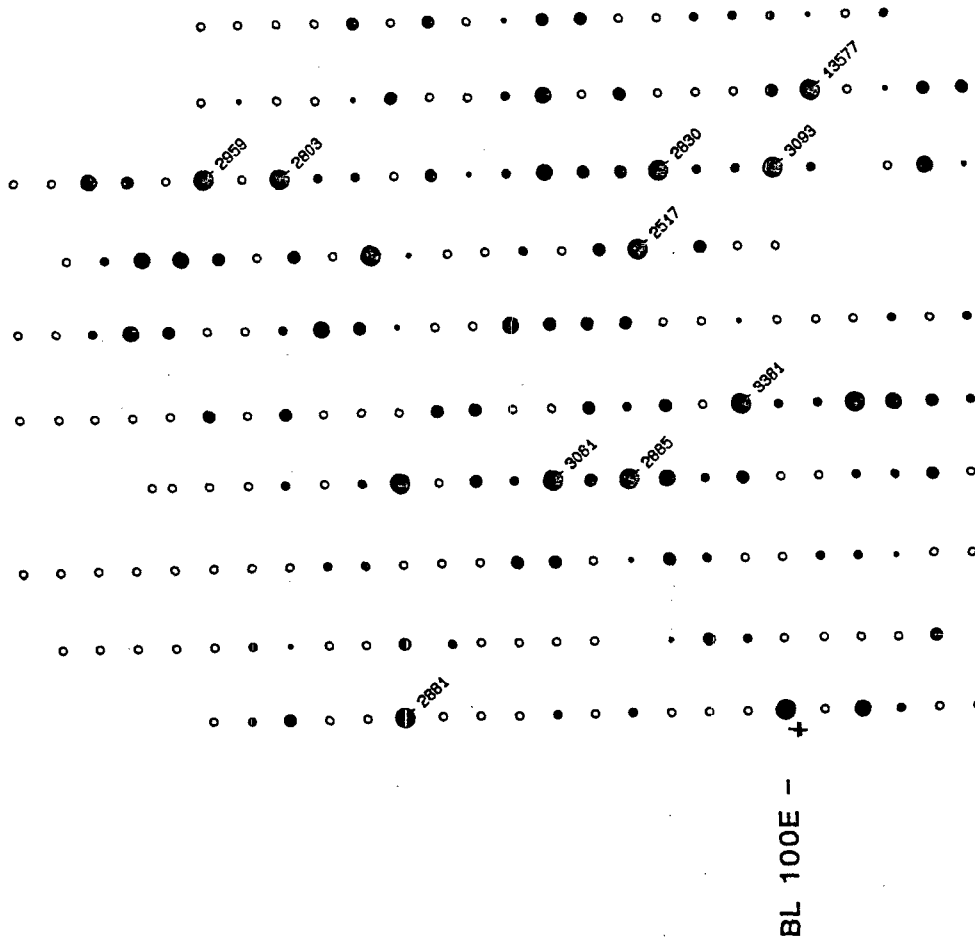
- L62N


- L58N

6015000

BL 100E -

500
600
950
1500
2100
2500



 SELCO DIVISION - BP RESOURCES CANADA LIMITED			
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey MANGANESE (ppm)			
SCALE	1:20000	DRAWN BY:	PK. 3G
DATE	Aug/85	DRAFTED BY:	
N.T.S.	93L/7	PROJ.	554
		REPORT	

0

652500

FE SOUTH GRID



6017500

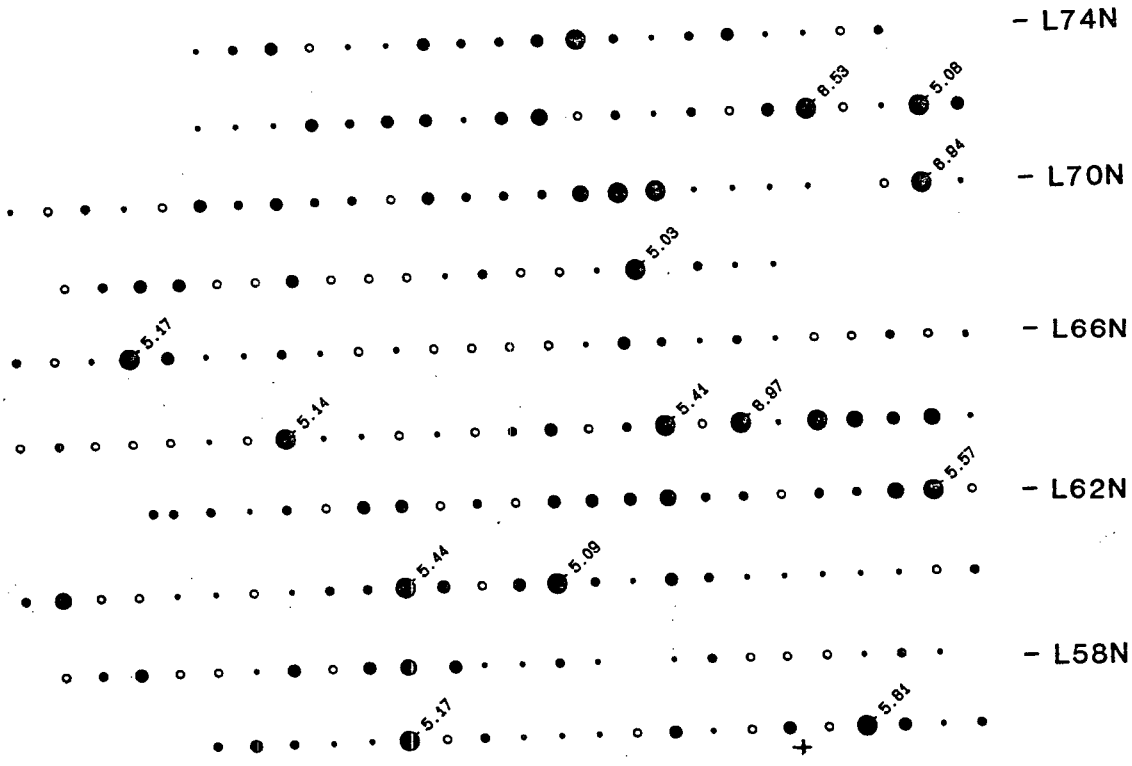
- 85E

- BL 100E +

- 105E

6015000

BL 100E -



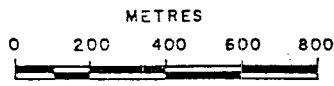
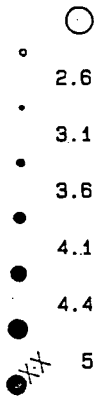
- L74N


- L70N

- L66N

- L62N

- L58N



 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey IRON (%)		
SCALE 1:20000	DRAWN BY:	FIG. 3H
DATE Aug/85	DRAFTED BY: J.G.	
N.T.S. 93L/7	PROJ. 554	REPORT

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652500

BA SOUTH GRID



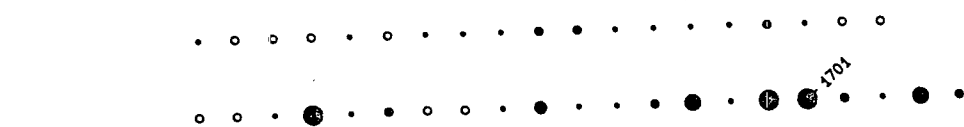
6017500

- 85E

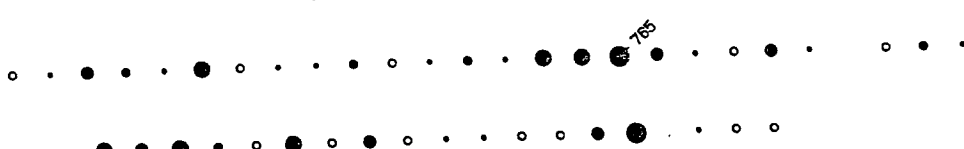
- BL 100E +

- 105E

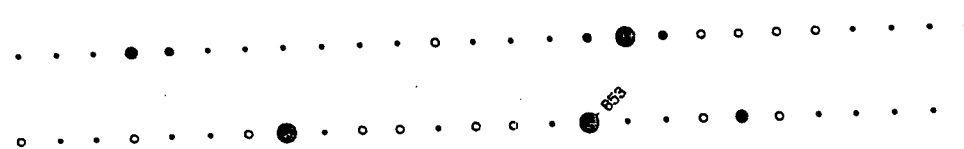
- L74N



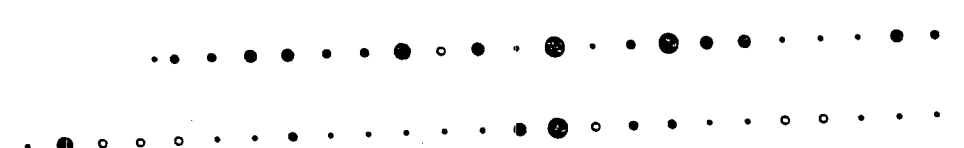
- L70N



- L66N



- L62N

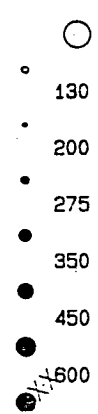



- L58N

6015000

644

BL 100E -



 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey BARIUM (ppm)		
SCALE 1:20000	DRAWN BY:	FIG. 3I
DATE Aug/85	DRAFTED BY: j.g.	
N.T.S. 93L/7	PROJ. 554	REPORT

0

652500

SB SOUTH GRID

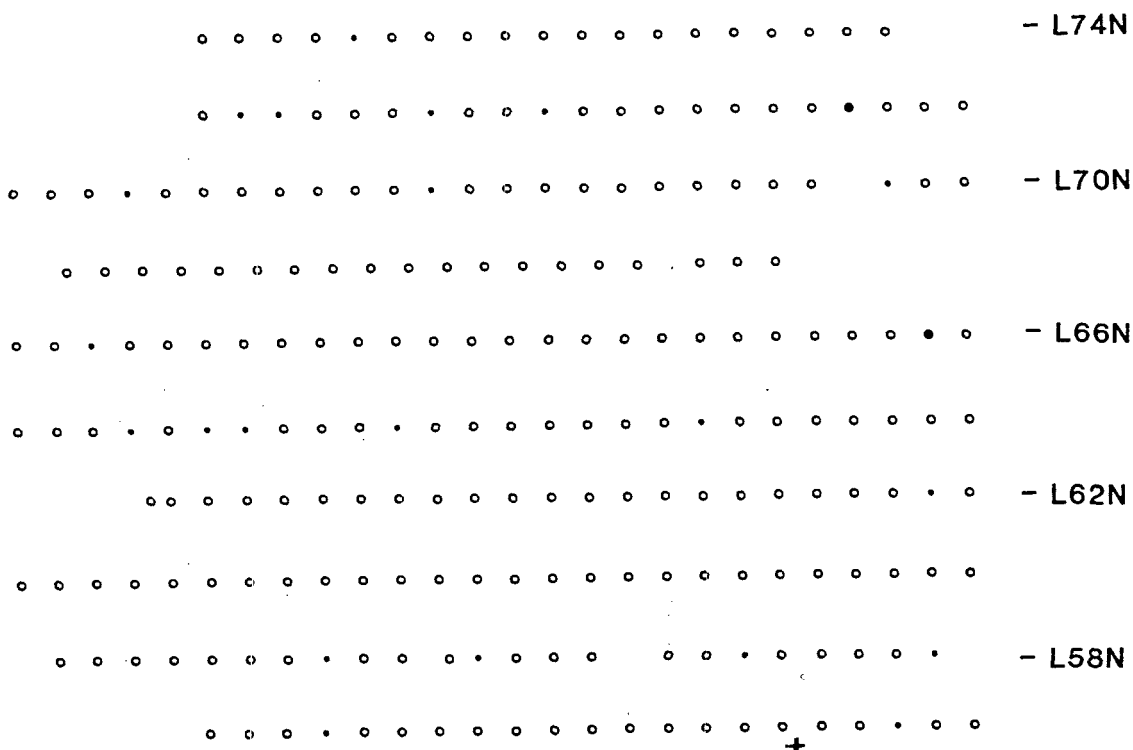


6017500

- 85E

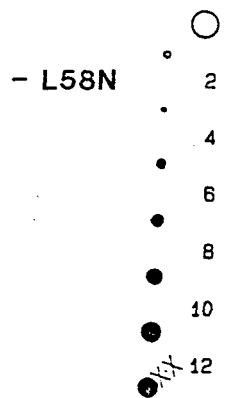
- BL 100E +


- 105E



6015000

BL 100E - +



 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey ANTIMONY (ppm)		
SCALE 1:20000	DRAWN BY:	FIG. 3J
DATE Aug/85	DRAFTED BY: j.g.	
N.T.S. 93L/7	PROJ. 554	REPORT

652500

MO SOUTH GRID



6017500

- 85E

- BL 100E +

- 105E

- L74N

- L70N

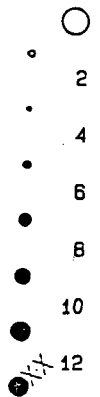
- L66N


- L62N

- L58N

6015000

BL 100E -



 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey MOLYBDENUM (ppm)		
SCALE 1:20000	DRAWN BY:	FIG. 3K
DATE Aug/85	DRAFTED BY: j.g.	
N.T.S. 93L/7	PROJ. 554	REPORT

0

652500

NI SOUTH GRID



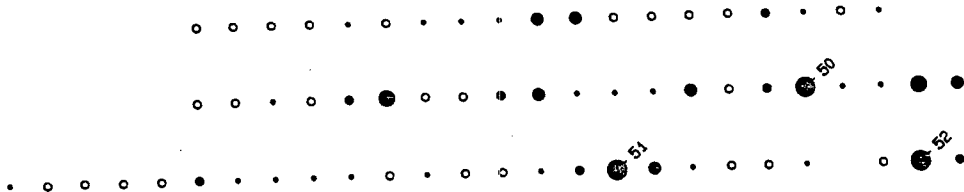
6017500

- 85E

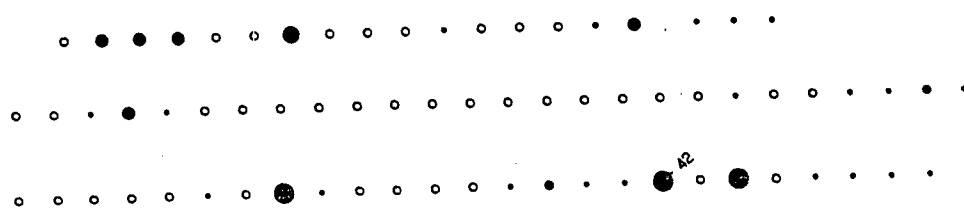
- BL 100E +

- 105E

- L74N

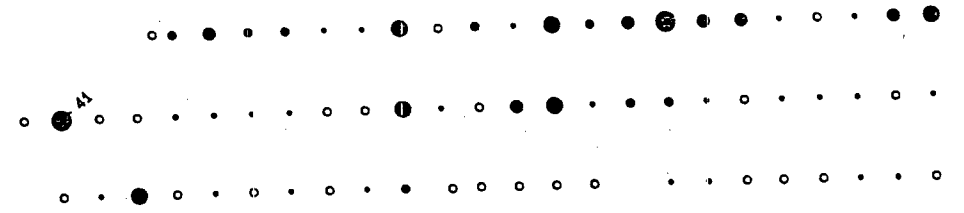


- L70N



- L66N

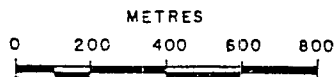
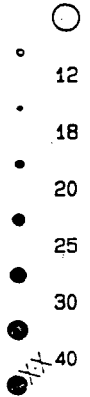
- L62N




- L58N

6015000

BL 100E -



 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey NICKEL - (ppm)		
SCALE 1:20000	DRAWN BY:	FIG. 3L
DATE Aug/85	DRAFTED BY: J.L.G.	
N.T.S. 93L/7	PROJ. 554	REPORT

652500

CO SOUTH GRID



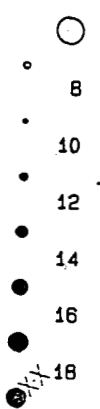
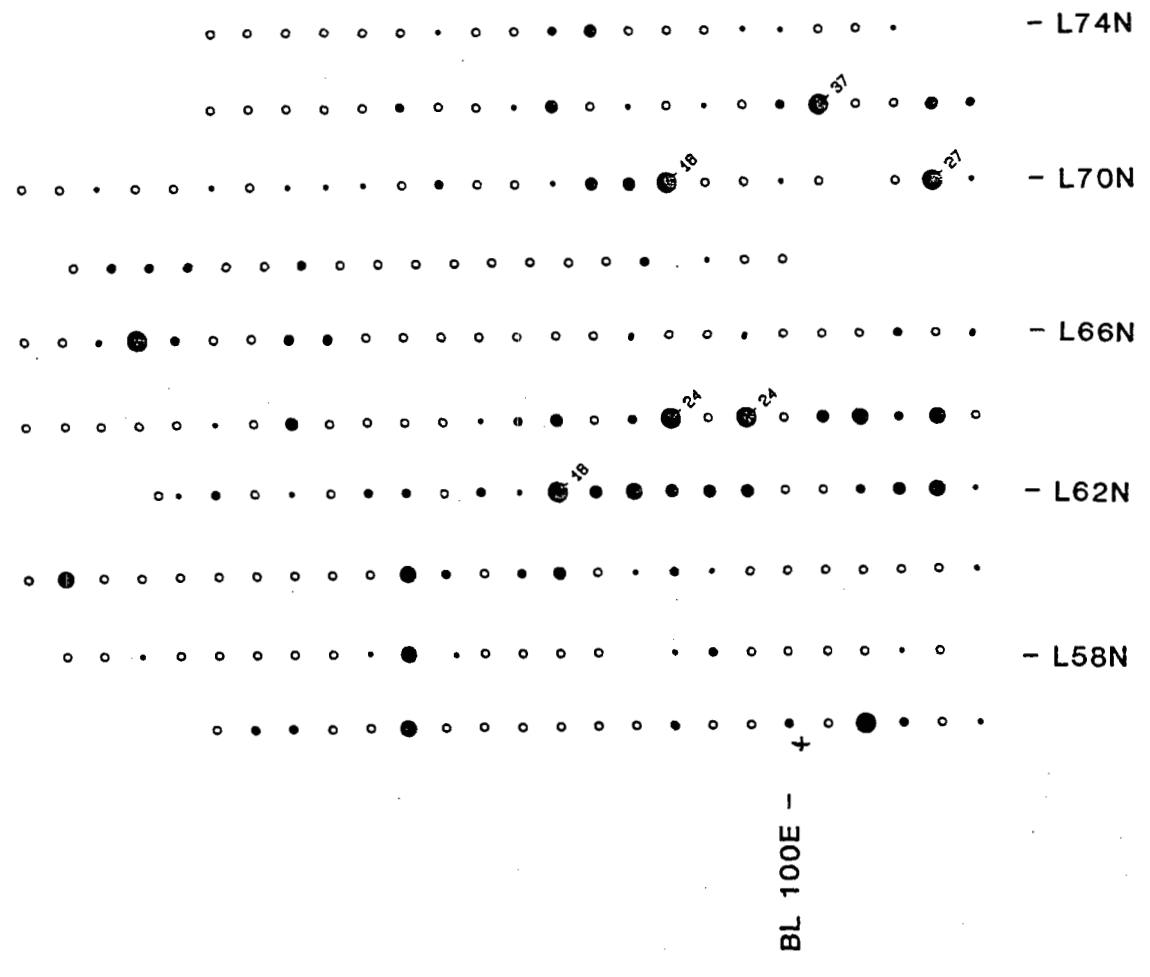
6017500


- 85E

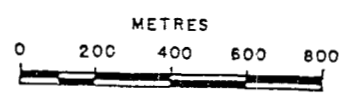
- BL 100E +

- 105E

6015000



 SELCO DIVISION - BP RESOURCES CANADA LIMITED		
BUCK CREEK - WEST GRID Buck Creek Project - B.C. Soil Geochemical Survey COBALT (ppm)		
SCALE 1:20000	DRAWN BY:	FIG. 3M
DATE Aug/85	DRAFTED BY: J.G.	
N.T.S. 93L/7	PROJ. 554	REPORT



APPENDIX II
Geochemical Preparation
and
Analytical Procedures



ACME ANALYTICAL LABORATORIES LTD.

Assaying & Trace Analysis

852 E. Hastings St., Vancouver, B.C. V6A 1R6

Telephone : 253 - 3153

GEOCHEMICAL LABORATORY METHODOLOGY - 1984Sample Preparation

1. Soil samples are dried at 60°C and sieved to -80 mesh.
2. Rock samples are pulverized to -100 mesh.

Geochemical Analysis (AA and ICP)

0.5 gram samples are digested in hot dilute aqua regia in a boiling water bath and diluted to 10 ml with demineralized water. Extracted metals are determined by :

A. Atomic Absorption (AA)

Ag*, Bi*, Cd*, Co, Cu, Fe, Ga, In, Mn, Mo, Ni, Pb, Sb*, Tl, V, Zn
(* denotes with background correction.)

B. Inductively Coupled Argon Plasma (ICP)

Ag, Al, As, Au, B, Ba, Bi, Ca, Cd, Co, Cu, Cr, Fe, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Sr, Th, Ti, U, V, W, Zn.

Geochemical Analysis for Au*

10.0 gram samples that have been ignited overnight at 600°C are digested with hot dilute aqua regia, and the clear solution obtained is extracted with Methyl Isobutyl Ketone.

Au is determined in the MIBK extract by Atomic Absorption using background correction (Detection Limit = 5 ppb direct AA and 1 ppb graphite AA.)

Geochemical Analysis for Au**, Pd, Pt, Rh

10.0 - 30.0 gram samples are subjected to Fire Assay preconcentration techniques to produce silver beads.

The silver beads are dissolved and Au, Pd, Pt and Rh are determined in the solution by graphite furnace Atomic Absorption.

Geochemical Analysis for As

0.5 gram samples are digested with hot dilute aqua regia and diluted to 10 ml. As is determined in the solution by Graphite Furnace Atomic Absorption (AA) or by Inductively Coupled Argon Plasma (ICP).

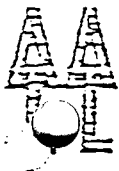
Geochemical Analysis for Barium

0.1 gram samples are digested with hot NaOH and EDTA solution, and diluted to 10 ml.

Ba is determined in the solution by Atomic Absorption or ICP.

Geochemical Analysis for Tungsten

1.0 gram samples are fused with KCl, KNO₃ and Na₂CO₃ Flux in a test tube, and the fusions are leached with 20 ml water. W in the solution determined by ICP with a detection of 1 ppm.



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Geochemical Analysis for Uranium

0.5 gram samples are digested with hot aqua regia and diluted to 10 ml.

Aliquots of the acid extract are solvent extracted using a salting agent and aliquots of the solvent extract are fused with NaF, K_2CO_3 and Na_2CO_3 flux in a platinum dish.

The fluorescence of the pellet is determined on the Jarrel Ash Fluorometer.

Geochemical Analysis for Fluorine

0.25 gram samples are fused with sodium hydroxide and leached with 10 ml water. The solution is neutralized, buffered, adjusted to pH 7.8 and diluted to 100 ml.

Fluorine is determined by Specific Ion Electrode using an Orion Model 404 meter.

Geochemical Analysis for Tin

1.0 gram samples are fused with ammonium iodide in a test tube. The sublimed iodine is leached with dilute hydrochloric acid.

The solution is extracted with MIBK and tin is determined in the extract by Atomic Absorption.

Geochemical Analysis for Chromium

0.1 gram samples are fused with Na_2O_2 . The melt is leached with HCl and analysed by AA or ICP.

Geochemical Analysis for Hg

0.5 gram samples is digested with aqua regia and diluted with 20% HCl.

Hg in the solution is determined by cold vapour AA using a F & J Scientific Hg assembly. An aliquot of the extract is added to a stannous chloride / hydrochloric acid solution. The reduced Hg is swept out of the solution and passed into the Hg cell where it is measured by AA.

Geochemical Analysis for Ga & Ge

0.5 gram samples are digested with hot aqua regia with HF in pressure bombs.

Ga and Ge in the solution are determined by graphite furnace AA.

Geochemical Analysis for Tl (Thallium)

0.5 gram samples are digested with 1:1 HNO_3 . Tl is determined in the extract by graphite AA.

Geochemical Analysis for Te (Tellurium)

0.5 gram samples are digested with hot aqua regia. The Te extracted in MIBK is analysed by AA graphite furnace.

APPENDIX III
List of Analytical Data

GENERAL

- 1-2 SAMPLE TYPE
10. Stream sediment
 11. Stream water
 12. Drainage ditch sediment
 18. Heavy mineral concentrate
 20. Seepage (spring) sediment
 21. Seepage (spring) water
 30. Lake sediment - Lake center
 31. Lake water
 32. Lake sediment-near shore
 40. 80q-upper 100 cm
 41. 80q-stagnant water
 42. 80q-below 100 cm
 43. 80q-organic material at mineral horizon interface
 44. 80q-mineral horizon
 50. Soil-top of the B horizon (or top of the C horizon if B horizon absent)

- 1-2 SAMPLE TYPE Cont.
51. Soil-occur horizons (organic-rich samples or when 2 samples taken at same hole)
 52. Frost boil or seepage boil
 54. Groundwater sample
 55. Deep overburden sample
 58. Heavy mineral concentrate
 60. Talus fines
 63. Talus blocks-hand sample
 64. Talus blocks-chips
 68. Heavy mineral concentrate
 70. Biogeochemical sample
 75. Radon
 80. Bedrock hand specimen
 81. Bedrock chips - hand sample
 82. Float hand specimen
 83. Float chips - hand sample
 84. Drill core specimens

- 1-2 SAMPLE TYPE Cont.
85. Channel sample/split core
 86. Drill chips
 87. Drill sludge
 88. Heavy mineral concentrate
 89. High grade sample
 - *90. Special sample-specify
 99. Standard sample
- *Clearly label if high grade.
- Special Note
For Kaypunchers benefit, P's should be crossed P and O's (letter) should be slashed @
- 3-4 YEAR
- 5-7 PROJECT NUMBER

- 8 PROJECT IDENTIFICATION
- Blank-recognition
A.B.C. etc. - properties, anomalies. (List 6)
- 9 DUPLICATE SAMPLES
- Label duplicates as 1,2, etc. (collect 1 duplicate pair in 30)
- 10-12 SAMPLER IDENTIFICATION
(10-11) (List 7)
- 13-15 SAMPLE NUMBER
(13-15)
- 19-24 EAST COORDINATE
- 25-31 NORTH COORDINATE
- 34-38 NTS MAP SHEET NUMBER
- Example: record 92P/3 as 92P3

- LIST 1
- INTRUSIVE ROCKS
- 1- QUARTZ RICH
 - 1- Granite
 - 2- Quartz Monzonite
 - 1- Granodiorite
 - 4- Quartz diorite
 - 1- DIFERENTIAL
 - 1- Syenite
 - 2- Monzonite
 - 1- Diorite
 - 4- Gabbro
 - 3- FELDSPATHOID RICH
 - 1- Nepheline Syenite
 - 2- Nepheline Monzonite
 - 10- ULTRABASIC
 - 50- CARBONATITES
 - 6- SPECIAL TYPES
 - 1- Pegmatite
 - 2- Aplite
 - 3- Lamprophyre
 - 4- Trap
 - 5- Felsite
 - 6- Intrusion Breccia
 - 7- Diabase

STREAM SEDIMENTS

- 40 SAMPLE ENVIRONMENT
1. Side of creek
 4. Middle of stream
 9. Composite across stream
- A. Soil
- 41 WATER TURBIDITY
- Blank-clear
1. Murky (report findings in note section)
- 42 PRECIPITATE
- Blank-none
1. Record colour (report presence of precipitate in immediate vicinity in stream bed. If heavy precipitate, sample separately as sample type 90)
- 43 OVERBURDEN TRANSPORT
- L. Local M. Mixed local
E. Extensive & extensive
U. Unknown
- 45 OVERBURDEN ORIGIN
1. Till-angular boulders
 2. Outwash-sandy, rounded boulders
 3. Lake sediment-sand/silt
 4. Alluvium-stream deposit
 5. Peat-bog
 6. Colluvium*

- 45 OVERBURDEN ORIGIN Cont.
7. Lake sediment-clay
 8. Talus
 9. Residual *use only if C. Boulder field* former origin cannot be identified
 10. Soil*
- 46 BEDROCK
- M. Mineralized
P. Present within 100m upslope
D. Present within 100m down-slope
- B. Underlies sample site
G. Gossan
F. Fe surface stains
R. Radioactivity
- 47-48 PH
- 49 SAMPLE TEXTURE
0. Organic-decomposed
 1. Clay
 2. Silt and fine sand
 3. Sand
 4. Gravel
 6. Cemented
 7. Precipitate
 8. Twigs or undecomposed organic matter
- 50-52 AVERAGE WIDTH OF STREAM-M
- Decimal point in col 51 (or col 52 if stream > 10m wide)

- 53-55 AVERAGE DEPTH OF STREAM-M
- 56 STREAM VELOCITY
1. Dry
 2. Stagnant
 3. Slow
 4. Moderate
 5. Fast
 6. Turbulent
- 57 INDICATE AS TRIBUTARY
- R. Stream enters on the right looking down main stream
L. Stream enters on left looking down main stream
- 58-60 LOCAL BEDROCK COMPOSITION
- Estimate-use Lists 1-4
- 61-64 COLOUR
- Munsell notation or abbreviation
- 67 CONTAMINATION
- Blank - none L - logging
C - culvert M - mine
F - farming R - road
G - garbage T - trench
H - house @ - other - spec.
I - industry

- 68 ORGANIC FRACTION *(Complete where sediment composition is unusual)
2. Large amount of undecomposed leaves, twigs, etc.
 4. Large amount of well-decomposed vegetation
 5. Moss
 7. Sediment grains coated in organic matter
 8. Lake sediment ooze.
- 69 MINERAL FRACTION *(Complete where composition is unusual)
3. Notable content of mafic minerals, resistates
 4. Very high content of mafics, resistates
- 71 SCINTILLOMETER NUMBER
- 72-75 GAMMA COUNT AT SAMPLE DEPTH
- (make note if landscape is affecting gamma count)
- 76 ROCK
- *Star if bedrock is influencing scint count
- 77-78 APPROXIMATE SLOPE ANGLE
- 79-80 APPROXIMATE SLOPE DIRECTION

- LIST 2
- VOLCANIC ROCKS
- 0- UNDIFFERENTIATED
 - 1- BASALT
 - 2- ANDESITE
 - 3- DACITE
 - 4- RHYOLITE
 - 5- QUARTZ LATITE
 - 6- LATITE
 - 7- TRACHYTE
 - 8- PHONOITE
 - 9- NEPHELINE LATITE
 - 1- Fine grained flows
 - 2- Pyroclastic flows
 - 3- Crystal tuffs
 - 4- Ash tuffs
 - 5- Lapilli tuffs
 - 6- Agglomerate
 - 7- Lapilli breccia
 - 8- Block breccia
 - 9- Turbidite
- LIST 3
- SEDIMENTARY ROCKS
- 1- ARENACEOUS
 - 2- Siltstone
 - 3- Mudstone
 - 4- Gypsaren
 - 5- Sandstone
 - 6- Quartzite
 - 6- Conglomerate
 - 2- ARGILLACEOUS
 - 1- Shale
 - 2- Argillite
 - 3- CALCAREOUS
 - 1- Limestone
 - 2- Dolomite
 - 4- CHEMICAL PRECIPITATE
 - 1- Chert
 - 2- Marble
 - 3- Iron formation
- LIST 4
- METAMORPHIC ROCKS
- 10- FINE GRAINED CONTACT
 - 2- PHANERITIC
 - 1- Meta quartzite
 - 2- Marble
 - 1- Soapstone
 - 4- Hornfels
 - 5- Serpentine
 - 6- Skarn
 - 7- Amphibolite
 - 8- Eclogite
 - 3- MECHANICAL
 - 1- Mylonite
 - 2- Flaser
 - 3- Augen
 - 4- Ultramylonite
 - 10- SLATE
 - 50- PHYLLITE
 - 60- SCHIST
 - 7- GNEISS
 - 8- MICHAELITE*
 - 1- Granite
 - 2- Monzonite
 - 3- Granodiorite
 - 4- Conglomerate
 - 5- Sandstone
 - 6- Augen
 - 7- Granulite
 - 8- Quartz diorite
 - 9- Diorite
 - 0- Amphibolite

SOILS

- 40 SITE TOPOGRAPHY
1. Hill top
 2. Gentle slope
 3. Steep slope > 20°
 4. Base of slope
 5. Valley floor
 6. Depression
 7. Level
 8. Rolling
 9. Bog
- 41 SAMPLE ENVIRONMENT
1. Tundra-hummocky
 2. Tundra-dry
 3. Tundra-swampy
 4. Grassland, meadows
 5. Peat mounds
 6. Bog in depression
 7. Forest-coniferous
 8. Forest-deciduous
 9. Forest-mixed
 - A. Alder or willows
 - B. Cultivated land
 - C. Desert, semi-arid
 - D. Barren
 - E. Talus fan
 - F. Bank soil-stream
 - G. Bank soil-lake
 - H. Road cut
- 42 SITE DRAINAGE
1. Dry
 2. Moist
 3. Wet
 4. Saturated
- 43 OVERBURDEN TRANSPORT
- L. Local
E. Extensive
U. Unknown
M. Mixed
- 44 WATER MOVEMENT
5. Seepage

- 45 OVERBURDEN ORIGIN
1. Till-angular boulders
 2. Outwash-sandy, rounded boulders
 3. Lake sediment-sand/silt
 4. Alluvium-stream deposit
 5. Peat-bog
 6. Colluvium
 7. Lake sediment-clay
 8. Talus
 9. Residual
 - A. Frost boils*
 - B. Seepage boils*
 - C. Boulder field*
 - D. Gravel*
- * Use only if former origin cannot be identified.
- 46 BEDROCK
- M. Mineralized
P. Present within 100m upslope
D. Present within 100m down-slope
- B. Underlies sample site
G. Gossan
F. Fe surface stains
R. Radioactivity
- 47-48 PH
- 49 SAMPLE TEXTURE
0. Organic muck
 1. Fibrous, peaty organic matter
 2. Very sandy
 3. Sandy
 4. Sand-silt
 5. Sand-silt-clay
 6. Silt
 7. Silt-clay
 8. Clay
 9. Gravel
- 50-51 THICKNESS OF SOIL SAMPLE INTERVAL-M
- 52-54 BOTTOM OF SOIL SAMPLE INTERVAL-M

- 55-56 SOIL HORIZON
- LH. Leaf, humus layer, undecomposed vegetation lying on the ground surface (do not sample)
- AM. Dark grey to black, organic rich mineral horizon usually no deeper than 15cm from the surface (do not sample)
- AE. Grey to white (occasionally brown) leached mineral horizon near ground surface, usually sandy; accompanied by BF or BT horizon at depth (do not sample)
- BH. Black, organic-rich mineral horizon at depths greater than 15cm (do not sample)
- BF. Red-brown, iron-rich horizon
- BT. Brown, clay-rich horizon
- BG. Horizon which is water-saturated most of the year, identified by red brown mottles
- BM. Brown horizon which is only slightly different in appearance from underlying parent material
- Cl, C2, C3, etc. Parent material for soil
- CA. White calcium carbonate precipitate in C horizon
- 01, 02, 03, etc. Bog sample at various depths
- TF. Talus fines
- 57 SOIL TYPE
- C. Chernozem-prairie soil usually under grassland or meadow, thick AM > 10cm, CA horizon at depth
- S. Solonchak-saline soil, high content of NaCl

- 57 SOIL TYPE Cont.
- L. Luvisol-BT horizon diagnostic
- P. Podzol-BF horizon diagnostic
- B. Brunisol-BM horizon is only B horizon of profile
- R. Regosol-little or no soil development, no B soil horizon, only LH (may be) and C horizon
- G. Clayey-BG horizon diagnostic
0. Organic soil-bog vegetation-no mineral matter
- 58-60 LOCAL BEDROCK COMPOSITION
- Estimate-use Lists 1-4
- 61-66 COLOUR
- Munsell notation or abbreviation
- 67 CONTAMINATION
- Blank - none L - logging
C - culvert M - mine
F - farming R - road
G - garbage T - trench
H - house @ - other - spec.
I - industry
- 60-69 COARSE FRAGMENTS
- 70 SHAPE OF COARSE FRAGMENTS
- A. Angular
 - R. Rounded
 - S. Subrounded
 - M. Mixed above types
- 71 SCINTILLOMETER NUMBER
- 72-75 GAMMA COUNT AT SAMPLE SITE
- Scint reading at ground level over hole
- 76 ROCK
- *Star if bedrock is influencing scint counts
- 77-78 APPROXIMATE SLOPE ANGLE
- 79-80 APPROXIMATE SLOPE DIRECTION

LAKE SEDIMENTS

- 40 TOPOGRAPHY-SETTING OF LAKE ON LANDSCAPE
1. Clifftop basin
 2. Gentle slope
 3. Steep slope > 20°
 4. Footslope
 5. Valley floor
 - 6.
 7. Level
 8. Rolling
 9. Major bog
- 41 DRAINAGE BASIN ENVIRONMENT
1. Tundra-arctic
 2. Tundra-alpine
 3. Grassland, pasture, meadows
 4. Bog, swamp
 5. Forest-coniferous
 6. Forest-deciduous
 7. Forest-mixed
 8. Cultivated land
 9. Semi arid to desert
- 42 LAKE TYPE
- L - Oligotrophic
E - Eutrophic
D - Dystrophic
- Other - specify
- 43 OVERBURDEN TRANSPORT
- L. Local E. Extensive-thin
T. Extensive-thick
- 44 WATERSHED AREA
1. Low 0-1 km²
 2. Moderate 1-1 km²
 3. Relatively large 1-10 km²
 4. Very large > 10 km²
- 45 PREDOMINANT GLACIAL OVERBURDEN
1. Till
 2. Outwash sand
 3. Lacustrine sand
 4. Alluvium
 5. Peat
 6. Colluvium
 7. Lacustrine clay
 8. Talus
 9. Residual
 0. Unknown
- 46 FISHING RATE
1. None
 2. Low
 3. Moderate
 4. High
- 47-48 PH
- 49 TEXTURE
1. Nearshore sands/gravels
 2. Deltaic sands/gravels
 3. Woody
 4. Well decomposed vegetation (bog)
 5. Algae
 6. Ooze
 7. Clay
 8. Silt/sand
 9. Pre-lake deposits
- 50-52 MAXIMUM LAKE LENGTH IN METRES - 10
- 53-55 MAXIMUM LAKE WIDTH IN METRES - 10
- 56-57 LAKE DEPTH AT POINT OF SAMPLING - METRES
- 58-60 LOCAL BEDROCK COMPOSITION-PRIMARY UNIT
- Estimate - use lists 1-4
- 61-66 COLOUR
- Munsell notation or abbreviation
- 67 CONTAMINATION
- Blank - none L - Logging
C - culvert M - mine
F - farming R - road
G - garbage T - trench
H - house # - other - spec.
I - industry
- 68 LAKEHORE CHARACTER
- R. Boggy
S. Sandy
K. Rocky
M. Mixed boggy and sandy/rocky
- 69 NUMBER OF MAJOR INFLOW STREAMS
- Blank - none
1. 1
 2. 2
 3. 3
 4. 4-10
 5. > 10
- 70 PROXIMITY OF SAMPLE SITE TO MAJOR INFLOW STREAMS
1. 0-50m
 2. 51-100m
 3. 101-250m
 4. 251-500m
 5. > 500m
- 71 SAMPLE HOMOGENEITY
- H. Homogenous
L. Layered
T. Turbidite
#. Other - specify
- 72 SEDIMENT CONSISTENCY
- S. Soupy
F. Firm
#. Other
- 73 ISLANDS
- Blank-none
1. Low density
 2. Moderate density
 3. High density
- 74 PRECIPITATE
- F. Fe oxides-red brown
M. Mn oxides-black
C. Calcium-carbonate -white
#. Other - specify
- 75 FEATURE
1. Fe concretions
 2. Mn concretions
 3. Fe-Mn concretions
 4. Shell fragments
 5. Other - specify
- 76 SEDIMENT OCCUR
- Blank-none
N. Hydrogen sulphide
F. Flaky
#. Other - specify
- 78-80 LOCAL BEDROCK COMPOSITION
- Secondary Unit
Estimate-use lists 1-4
- INFORMATION RECORDED ON SITE
□ INFORMATION NOTED ON SITE IF UNUSUAL

ROCK CHIP SAMPLES

- 32 SELECTIVE LITHOCHEMICAL SAMPLE
- Blank - representative sample
- A. Altered zone - specify alteration minerals in col 77-80
 - C. Carbonate vein
 - G. Gossan zone
 - I. Iron stained (rusty) zone
 - M. Mineralized zone
 - Q. Quartz vein
 - R. Radioactive zone
 - S. Shear zone
 - #. Other - specify
- 40 OUTCROP TOPOGRAPHY
1. Rugged ridge
 2. Recessive ridge
 3. Steep slope (> 20°)
 4. Shallow slope
 5. Cirque headwall
 6. Cirque floor
 7. Valley floor
 8. Flat land
 9. Creek-channel
 - A. Nickpoint
 - #. Other
- 41 OUTCROP EXPOSURE
1. Continuous-well
 2. Continuous-poor
 3. Intermittent-well
 4. Intermittent-poor
 5. Isolated-well
 6. Isolated-poor
 7. Flacc
 - 8.
- 43 WEATHERING
1. Frost heaved
 2. Mechanical-plants
 3. Sheeting(exfoliation)
 4. Chemical disintegration
 5. Mechanical disintegration (grus)
 6. Leached
 - #. Other
- 44 CHEMICAL WEATHERING
1. Fresh
 2. Normal
 3. Weathered
 4. Decomposed
- 45 SURFACE COATING OR STAINS
1. Gossan-mineralized
 2. Gossan-barren
 3. Primary ore minerals
 4. Secondary ore minerals
 5. Iron and manganese
 6. Iron
 7. Manganese
 8. Calcium carbonate
 9. Malachite/azurite
 - #. Other
- 46-48 WEATHERED SURFACE COLOUR
- L-light M-medium D-dark
- BR - Orange BR - Brown
RE - Red BK - Black
YE - Yellow GY - Grey
PI - Pink WH - White
BL - Blue RB - Red Brown
PU - Purple PB - Orange Brown
GR - Green
- 49 TEXTURE #1
- A - Aphanitic
F - fine grained
M - medium grained
C - coarse grained
E - equigranular
P - porphyritic
V - vesicular
B - brecciated
S - massive
G - glassy
- 50 TEXTURE #2
- Use same coding as for col. 49
- 51 FRACTURE INTENSITY
1. Massive
 2. Widely spaced
 3. Moderately spaced
 4. Closely spaced
 5. Shattered
- 52 VEINING INTENSITY
1. Massive
 2. Widely spaced
 3. Moderately spaced
 4. Closely spaced
 5. Very closely spaced
- 54-56 FRESH SURFACE COLOUR
- Use same codes as for columns 47-49
- 57 FORMATION NAME
- Use a list describing local lithological units
- 58-62 LOCAL BEDROCK COMPOSITION
- Use list 1-4 detailed on the rock coding form
- 64-65 ORE ELEMENT #1
- Use chemical element symbol
- 66-67 ORE ELEMENT #2
- Use chemical element symbol
- 68-69 ORE ELEMENT #3
- Use chemical element symbol
- 70-71 ORE ELEMENT #4
- Use chemical element symbol
- 72 PROMINENT OUTCROP FEATURE #1
1. Bedding
 2. Banding
 3. Foliation
 4. Shearing
 5. Faulting
 6. Veining
 7. Diking
 8. Contact zone
 9. Alteration
 - A. Crossbedding
 - B. Fold axis
 - C. Greenschist meta
 - D. Amphibolite meta
 - E. Contact meta
- 73 PROMINENT OUTCROP FEATURE #2
- Use same codings as for col 73
- 74 PROMINENT OUTCROP FEATURE #3
- Use same coding as for col 73
- 75 PROMINENT OUTCROP FEATURE #4
- Use same coding as for col 73
- 77 ALTERATION MINERAL #1
- A. Albite/anorthite
 - B. Secondary biotite
 - C. Carbonate
 - E. Epidote
 - G. Gypsum/anhydrite
 - I. Illite
 - K. Kaolinite
 - L. Chlorite
 - M. monomillonite
 - P. Potash feldspar
 - Q. Quartz/silica
 - S. Sericite
 - T. Tourmaline
 - Z. Zeolites
 - #. Other-specify in notes
- 78 ALTERATION MINERAL #2
- Use list for col 77
- 79 ALTERATION MINERAL #3
- Use list for col 77
- 80 ALTERATION MINERAL #4
- Use list for col 77

APPENDIX IV

Method of Histogram Interpretation

Rules for choice of size coding or contouring intervals

- (1) Examine both arithmetic and logarithmic histograms for each type of survey data. Choose the histogram which most closely approximates a normal (or lognormal) distribution. If there are several populations exhibited on the histogram, subjectively divide the data into a series of normal or lognormal distributions. Avoid interpreting histograms which are strongly skewed. Portions of the arithmetic or logarithmic histograms may be chosen for data interpretation over specific metal concentration intervals, if this allows for the best portrayal of the data in graphical form.
- (2) Choose, as two of the coding intervals, points which represent between 90% and 95%, and 95% and 97.5% of the data, two different numbers. These choices highlight 1 in 10 and 1 in 20 samples which are considered slightly anomalous and definitely anomalous, respectively. These limits are optimistic in that the two categories are defined to be anomalous regardless of the distribution of values on the remainder of the histogram. A rigorous statistical approach would suggest that only the 97.5% value be considered the anomaly threshold.
- (3) Divide the remaining portion of the histogram into recognizable populations. The dividing point of each of these populations is chosen as a coding interval. Minimums caused by the failure of a laboratory to record specific concentration values are ignored. These artificial breaks in the histogram can be recognized by scanning the laboratory reports.
- (4) For each population, choose one or two numbers which correspond to the 90% and 95% cumulative frequencies for that population (1 in 10 and 1 in 20 samples for that population respectively). These will also be used to represent anomalous conditions for each population.
- (5) A maximum of six numbers can be chosen to plot symbol maps. This number is dictated by the ability to present data in graphical form with sufficiently different symbol sizes to be easily distinguishable, particularly if maps are to be reduced. The seven defined concentration classes are normally sufficient to represent geochemical data on a map. More intervals can be chosen if data are to be contoured. Avoid choosing arithmetic intervals without considering rules (1) and (4).
- (6) Maps plotted using the preceding instructions might result in two areas being distinguished from each other by a relatively uniform density of symbol sizes, yet only poor contrast anomalies are indicated. Differences between the two areas, A and B, might be due to underlying geology, overburden character, soils etc. Whatever the cause, the data are not well displayed. If the underlying control distinguishing A and B can be recognized, the data must be divided and re-interpreted following steps (1) to

(5). Two sets of maps can be drawn, or both sets of interpreted data can be plotted on a single map. For such superimposed geochemical maps the symbol sizes lose their absolute meaning but assume a more important stance, that of reflecting anomalous conditions regardless of the underlying control. To illustrate, consider the case where A and B are areas underlain by very different geology. Anomalous conditions for low background rock types might be concentrations which are much lower than average values for the high background rock types. Nevertheless, anomalies defined in each area are to be considered significant. Reliance on absolute concentrations can be misleading in such cases.