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DOE-GROUP GEOCHEMICAL SURVEY

Victoria Mining Division

Reference Map 92C.070

<b>SUB-RECORDER RECEIVED</b>	
JUN 22 1990	
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VANCOUVER, B.C.	

Conducted for:  
Breakwater Resources Ltd.

By:  
A. J. Audet P.Eng.  
December 20th, 1990

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**20,875**

92C 9E

48° 40' NORTH

124° 07' WEST

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## DOE-GROUP SOIL GEOCHEMICAL SURVEY

### INTRODUCTION

The Doe Claims were staked in December of 1989 following the discovery of massive chalcopyrite-magnetite mineralization in a road cut. A sample taken from a section of semi-massive chalcopyrite returned an assay of 10% copper. The crudely banded texture seen in several of the specimen sawn for examination suggested a possible volcanogenic origin.

The showing is exposed over a length of more than two metres and has been traced under the road surface for an additional three metres by magnetometre measurements. It is difficult to determine if the showing is contained in bedrock; it may actually be a large piece of float in intimate contact with bedrock.

The work described herein was undertaken to evaluate the extent of copper mineralization by conducting a small-scale soil sampling programme over the target area.

### SCOPE OF WORK

A Geochemical soil sampling programme was undertaken to identify the trend of any mineralizing zone responsible for the copper-rich road-cut showing. The specific area of interest was restricted to the area bounded by Lens Creek to the East and the East boundary of the Helga 1 mineral claim to the West. A soil sampling grid consisting of eight lines oriented at 045 deg. Azimuth was measured and marked at a line spacing of 100 metres and a sampling interval of 25 metres. The line direction was selected to cross the local stratigraphic trend at right angles. Soil was sampled from the 'B' horizon at sites showing little or no surface disruption.

In addition to the specified area of interest, two lines were sampled on the hillside to the east of Lens Creek. This sampling was done along logging roads for the most part with the intent of producing a continuous profile across the East side of the valley. This work was interrupted when active logging resumed unexpectedly.

### LOCATION, TOPOGRAPHY AND ACCESS

The Doe Claim group is located in the Cowichan Lake area, about 17 kilometres to the South of Mesachie Lake. Main logging haul roads that extend between Port Renfrew and Cowichan Lake and the "Lens" Main haul road which cuts through the Doe Group provide year-round all vehicle access. Secondary forestry roads extend access to all sectors of the property.

Topography is rugged with elevations ranging between 200 and 800 metres. Mountain sides slope steeply and are deeply cut by canyon-like

416000

to Cowichan Lake

F.R.S. I

Doe Lake

Dimple Lake

5392000

HELGA I

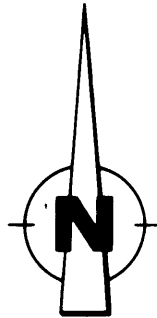
DOE I

DOE 2

COWICHAN LAKE LAND DISTRICT

MALAHAT LAND DISTRICT

0 500 1000 1500 2000m



**BREAKWATER RESOURCES LTD.**

**DOE GROUP  
CLAIM MAP**

**DRAWN A.J.A.**

**SCALE NOTED**

**DATE JAN 1991**

**FIGURE 1**

fault controlled streams. Lens Creek occupies a narrow valley located near the West claim boundary. This stream provides a reliable high quality water supply year-round.

Forest cover consisting of old-growth douglas fir, hemlock and spruce that has been completely harvested at lower elevations. About 50% of high elevation forest remains standing and is currently being logged. Regenerative growth consists of juvenile conifers. The remains of logging debris in combination with new growth makes access on foot difficult.

## OWNERSHIP

The Doe claims comprised of 24 units as listed below, are presently held by Breakwater Resources Ltd, with offices at Suite 900, 999 West Hastings St., Vancouver, B.C.

<u>Name</u>	<u>Unit</u>	<u>Record No.</u>	<u>Expiration Date</u>
Doe 1	16	2448	Dec. 10, 1992
Doe 2	8	2449	Dec. 9, 1992

## HISTORY

Assessment reports dating to the Early 1970's show that semi-massive tabular sulphide bodies located a short distance to the North West of the Doe claim group were examined briefly prior to a thorough evaluation by Westmin in 1977. Westmin's work was mainly confined to a small area of sulphide showing located to the North of Frost Lake.

The discovery of float strongly mineralized with chalcopyrite lead to the staking of the Helga 1 and FRS 1 claims in 1983. The Helga 1 claim lies adjacent to the Doe 1 claim on the West.

A soil geochemistry survey conducted on the Helga 1 claim shows weak linear copper anomalies located to the South of Frost Lake and extending South-Easterly to the common boundary. Preliminary geological mapping of the area failed to outline significant copper mineralization in bedrock.

## GEOLOGY

### Regional

Published Provincial geological maps show that the target area is underlain by a mixture of Karmutsen Volcanics with Quatsino and Parsons Bay Sediments that trends at 315 deg. Az. All three of these units appear to have been intruded by dioritic and granodioritic plutons. Little detailed stratigraphic or structural information is available for the area. Muller shows that many of the stratigraphic units as well as most intrusive bodies are fault bounded.

## Property Geology

No detailed study of the Doe Claim geology has been found in assessment records. From detailed mapping done by Garrett along the "Lens Main" road in 1987 and from casual observations made by the writer while sampling soil, the claims appear to be underlain entirely by mafic volcanics and fine grained diorite. No evidence of sedimentary or volcanoclastic units was seen in road cuts or natural outcroppings encountered.

## GEOCHEMISTRY

### Sampling Procedure

Soil sampling was conducted along compass lines measured by topofil. Lines were laid-out at approximately 045 deg Az. and the grid was arbitrarily defined as shown in figure 2. The theoretical line spacings of 100 metres was controlled by using the "Lens Main" road as a reference line. Where deviations from intended line positions and patterns was encountered, the correct line position is shown on plan. Samples were taken at 25 metre intervals.

In total, 4.5 km of soil sampling was completed and 181 samples were taken. As shown in figure 2, the main grid consists of eight lines numbered L10+000E to L10+700E inclusive. This grid covers the showing and the South-East extension of soil anomalies reported on the Helga 1 claim. Two additional reconnaissance lines shown as L11+400E and X1 were completed to test the Eastern slope of the valley. This work was interrupted by the resumption of timber harvesting in the area. Samples were taken from the 'B' horizon using a sampling mattock. Soil was placed in a Kraft bag marked with the station coordinates. Sample sites were marked with flagging tape.

Samples were submitted to Chemex Labs for analysis by I.C.P. for arsenic, copper, iron, lead, manganese, molybdenum, nickel, silver and zinc.

Three rock chip samples also submitted were analyzed for gold and a basemetal I.C.P. suite.

Analytical results are given in appendix 6. Copper values are plotted at a scale of 1:2500 in figure 2.

## STATISTICAL EVALUATION

Histograms for all elements found in measurable quantity were calculated for both the raw data and for natural logarithmic transforms (appendix 4). The lower limits of anomalous values was determined from these histograms by inspection. From this data base, the correlation

between elements was calculated for the entire data set and for only the anomalous portion of the population.(appendix 2) In addition, the number of anomalous elements present at each site was tabulated under the heading "score" and this value was used as a separate variable in the correlation analysis.

A summary of data is given in spreadsheet format in appendix 1 and the descriptive statistics for the complete data set is given in appendix 3.

## DISCUSSION OF RESULTS

### Cobalt

A threshold value of 18 ppm was determined from the natural log histogram. Good correlation is seen with both manganese and zinc in the subgroup of anomalous populations. The fair correlations observed between cobalt, iron and nickel in the general population does not exist in the anomalous group.

### Nickel

The histogram of natural logarithms shows only a subtle break to indicate a separate anomalous population with a threshold value of 21 ppm. It is seen from the table in appendix 2 that correlation between Ni, Co, Fe, and Mn is fair to good, however, in the anomalous population, no correlation exists with any element. There is however, a weak correlation with the "score" factor to be discussed further below.

### zinc

A clear break at 60ppm in the zinc histogram was accepted as the threshold of anomalous zinc. Good correlations are seen with Co, Fe, Mn and Ni in the general population however, anomalous zinc correlates with only cobalt and manganese.

### Iron

Iron shows no distinct anomalous population. A threshold value was selected on the basis of an obscure break in the histogram curve at a value of 5.2% Fe. No correlation exists between Iron and any other element tested in the anomalous population range nor is there any correlation with the "score" factor.

### Manganese

Manganese values were found to be highly skewed even under logarithmic transformation. A clear break in the histogram indicates 600 ppm to be the lower threshold of an anomalous population. Anomalous manganese correlates well with cobalt and zinc.

### Score

The "score" factor is a simple arithmetic tabulation of the number of anomalous elements recorded at each sample site. Appendix 6 shows bar graphs of each element as a function of "score". It is clearly seen from these that high metal values concentrate at sites that are anomalous in several elements. An inspection of the data spreadsheet in appendix 1 shows that elevated values show a strong spatial correlation or clustering that is better reflected by "score" than by individual correlation coefficients. The "score" values shown with the copper plot in figure 2 indicate well defined zones that extend beyond anomalous copper values.

### Topographic Effect

It is noteworthy that high metal values situated at the South ends of lines 10+300E to 10+600E correspond with steep terrain with extensive bedrock exposure. This zone of bluffs is slightly mineralized with narrow silica stringer. Observations made while sampling soil revealed no sulphide mineralization.

There is no obvious topographic feature that corresponds with weak copper anomalies found to the North of the "Lens Main" haul road. This zone, which incorporates the road-cut showing, is thickly vegetated and very little bedrock is exposed.

### East Soil Grid

Line 11+400E High copper values at the South end of the line correspond with very steep terrain and several narrow chalcopyrite rich quartz veins exposed in bed rock. No gold was detected in a single chip sample taken from one of the veins.

Line X1 No mineralization was noted in the continuous bedrock exposed in the road cut. Limonite staining was strong over the entire line but was clearly intensifying to the North.

### Showing Area

Soil samples taken near the highgrade copper occurrence show elevated copper values. It was noted that none of the anomalous sites could have been directly contaminated by the exposed showing.

A narrow band of anomalous copper values occurs to the north of the road on each of the lines. These may reflect the presence of a North trending mineralized zone but additional sampling would be needed to confirm this hypothesis. However, if such a zone were to exist, it would be unconformable with stratigraphic trends seen to the North-West and is therefore is not likely to indicate a volcanogenic exhalative deposit.



## CONCLUSIONS

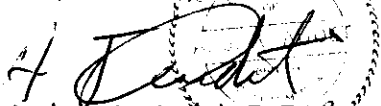
1/ The mineralized showing seen in the road cut coincides with a narrow band of elevated to anomalous copper values that shows a distinct northerly trend. No bedrock source to this anomaly was established.

2/ The above anomaly does not correspond with known stratigraphic trends and is therefore unlikely to reflect volcanogenic mineralization.

3/ Elevated copper values obtained on and near the bluffs above the road are probably related to weak hydrothermal mineralization.

4/ Elevated copper values seen at the North end of line 'X1' are unexplained and should be examined further.

Respectfully Submitted,

A handwritten signature in cursive script, appearing to read "A. Audet", is written over a circular, dotted stamp.

André J. Audet, P. Eng.  
December 20th, 1990

**APPENDIX 1**

Data Spreadsheet

BREAKWATER RESOURCES LTD.

GEOCHEMICAL ANALYSIS OF 180 SOIL SAMPLES TAKEN FROM THE DOE CLAIM-GROUP

Location: Lens Creek Area, Map 92C-070

Samples Were Taken in November 1990

COORDINATES	AS	AG	CO	CU	FE	MN	MO	NI	PB	ZN	LN-CO	LN-CU	LN-FE	LN-MN
BL10+425	1	0.5	10	34	3.92	260	1	14	2	58	2.3	3.53	1.37	5.56
BL10+450	1	0.5	17	104	5.62	430	1	27	0	56	2.83	4.64	1.73	6.06
BL10+525	3	0.5	18	657	4.28	670	0	18	0	54	2.89	6.49	1.45	6.51
BL10+550	1	0.5	6	34	3.61	235	0	7	0	46	1.79	3.53	1.28	5.46
BL10+575	1	0.5	14	99	5	550	0	15	0	104	2.64	4.6	1.61	6.31
BL10+625	2	0.5	16	81	5.36	450	0	30	0	82	2.77	4.39	1.68	6.11
BL10+650	2	0.5	11	64	4.97	270	1	15	0	60	2.4	4.16	1.6	5.6
BL10+675	1	0.5	11	49	5.01	310	1	17	0	60	2.4	3.89	1.61	5.74
L10+000 10+825N	2	0.5	7	161	5.44	220	0	11	2	48	1.95	5.08	1.69	5.39
L10+000 10+850N	2	0.5	7	105	4.07	230	0	15	6	48	1.95	4.65	1.4	5.44
L10+000 10+875N	2	0.5	9	93	4.71	275	0	15	4	64	2.2	4.53	1.55	5.62
L10+000 10+900N	3	0.5	9	28	4.58	420	0	14	6	52	2.2	3.33	1.52	6.04
L10+000 10+925N	1	0.5	8	76	4.61	300	0	12	2	52	2.08	4.33	1.53	5.7
L10+100 10+725N	1	0.5	6	38	4.05	210	0	10	2	40	1.79	3.64	1.4	5.35
L10+100 10+750N	1	0.5	9	90	4.46	240	0	17	0	48	2.2	4.5	1.5	5.48
L10+100 10+775N	1	0.5	3	24	4.14	165	0	6	0	38	1.1	3.18	1.42	5.11
L10+100 10+800N	1	0.5	8	87	4.38	270	0	16	4	44	2.08	4.47	1.48	5.6
L10+100 10+825N	1	0.5	11	107	3.71	500	0	22	0	50	2.4	4.67	1.31	6.21
L10+100 10+850N	8	0.5	4	63	4.42	255	0	8	0	42	1.39	4.14	1.49	5.54
L10+100 10+875N	2	0.5	5	52	4.78	205	0	12	0	40	1.61	3.95	1.56	5.32
L10+200 10+650N	0	0.5	21	125	5.34	705	0	76	2	86	3.04	4.83	1.68	6.56
L10+200 10+675N	1	0.5	39	93	5.67	775	0	118	4	58	3.66	4.53	1.74	6.65
L10+200 10+700N	2	0.5	9	38	4.79	405	0	15	0	48	2.2	3.64	1.57	6
L10+200 10+725N	2	0.5	7	49	3.14	310	0	12	0	36	1.95	3.89	1.14	5.74
L10+200 10+750N	0	0.5	5	33	3.65	210	0	12	4	50	1.61	3.5	1.29	5.35
L10+200 10+775N	1	0.5	7	53	4.47	285	0	15	0	44	1.95	3.97	1.5	5.65
L10+200 10+800N	1	0.5	7	85	4.68	240	0	11	0	42	1.95	4.44	1.54	5.48
L10+200 10+825N	2	0.5	5	34	4.37	170	0	10	2	38	1.61	3.53	1.47	5.14
L10+200 10+850N	1	0.5	9	98	4.73	310	0	20	0	54	2.2	4.58	1.55	5.74
L10+200 10+875N	1	0.5	8	79	4.45	425	0	14	0	48	2.08	4.37	1.49	6.05
L10+200 10+900N	1	0.5	10	44	4.33	360	0	21	4	52	2.3	3.78	1.47	5.89
L10+200 10+925N	1	0.5	17	212	5.06	520	0	37	0	66	2.83	5.36	1.62	6.25
L10+200 10+950N	1	0.5	7	48	5.63	235	0	16	2	52	1.95	3.87	1.73	5.46
L10+200 10+975N	1	0.5	7	24	6.16	345	0	18	4	48	1.95	3.18	1.82	5.84
L10+300 10+550N	1	0.5	6	17	4.68	850	0	7	8	40	1.79	2.83	1.54	6.75
L10+300 10+575N	1	0.5	12	47	4.88	835	0	19	0	50	2.48	3.85	1.59	6.73
L10+300 10+600N	1	0.5	17	21	5.4	1245	0	23	2	94	2.83	3.04	1.69	7.13
L10+300 10+625N	1	0.5	14	99	5.34	665	0	39	2	76	2.64	4.6	1.68	6.5
L10+300 10+650N	2	0.5	15	75	5.17	945	0	34	0	84	2.71	4.32	1.64	6.85
L10+300 10+675N	1	0.5	18	117	5.41	980	0	46	0	78	2.89	4.76	1.69	6.89
L10+300 10+700N	1	0.5	21	64	5.41	600	0	105	2	84	3.04	4.16	1.69	6.4
L10+300 10+725N	2	0.5	17	101	4.67	550	0	32	4	56	2.83	4.62	1.54	6.31
L10+300 10+725NM	1	0.5	6	55	4.59	275	0	19	4	56	1.79	4.01	1.52	5.62
L10+300 10+750N	2	0.5	6	12	4.42	240	0	15	6	40	1.79	2.48	1.49	5.48
L10+300 10+775N	1	0.5	7	52	5.79	245	0	16	2	42	1.95	3.95	1.76	5.5
L10+300 10+800N	2	0.5	3	20	4.47	150	0	6	8	40	1.1	3	1.5	5.01
L10+300 10+825N	1	0.5	8	62	4.47	350	0	11	6	48	2.08	4.13	1.5	5.86
L10+300 10+850N	1	0.5	7	31	5.17	440	0	11	4	56	1.95	3.43	1.64	6.09
L10+300 10+875N	1	0.5	10	103	5.2	375	0	16	6	66	2.3	4.63	1.65	5.93

BREAKWATER RESOURCES LTD.  
 GEOCHEMICAL ANALYSIS OF 180 SOIL SAMPLES TAKEN FROM THE DOE CLAIM-GROUP  
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 Samples Were Taken in November 1990

COORDINATES	AS	AG	CO	CU	FE	MN	MO	NI	PB	ZN	LN-CO	LN-CU	LN-FE	LN-MN
L10+300 10+900N	1	0.5	14	88	4.15	490	0	16	0	56	2.64	4.48	1.42	6.19
L10+300 10+950N	1	0.5	13	59	4.46	490	0	18	6	76	2.56	4.08	1.5	6.19
L10+400 10+400N	1	0.5	11	84	4.1	335	0	20	2	48	2.4	4.43	1.41	5.81
L10+400 10+425N	1	0.5	168	81	5.93	3690	0	29	10	134	5.12	4.39	1.78	8.21
L10+400 10+450N	1	0.5	21	67	4.99	980	0	20	6	106	3.04	4.2	1.61	6.89
L10+400 10+500N	2	0.5	25	70	6.17	1300	0	33	4	72	3.22	4.25	1.82	7.17
L10+400 10+525N	1	0.5	27	115	6.29	1620	0	29	8	74	3.3	4.74	1.84	7.39
L10+400 10+550N	2	0.5	27	137	6.83	1405	0	49	2	84	3.3	4.92	1.92	7.25
L10+400 10+575N	2	0.5	26	63	6.17	1455	0	26	4	74	3.26	4.14	1.82	7.28
L10+400 10+600N	1	0.5	23	183	4.81	760	0	50	2	62	3.14	5.21	1.57	6.63
L10+400 10+625N	1	0.5	16	59	4.47	525	0	56	0	56	2.77	4.08	1.5	6.26
L10+400 10+650N	1	0.5	11	21	4.42	420	0	27	2	48	2.4	3.04	1.49	6.04
L10+400 10+675N	30	0.5	16	44	4.03	700	0	38	0	56	2.77	3.78	1.39	6.55
L10+400 10+700N	1	0.5	4	25	4.42	170	0	8	0	34	1.39	3.22	1.49	5.14
L10+400 10+725N	1	0.5	7	75	4.46	275	0	13	0	46	1.95	4.32	1.5	5.62
L10+400 10+750N	1	0.5	13	100	4.77	450	0	24	0	62	2.56	4.61	1.56	6.11
L10+400 10+775N	2	0.5	10	116	6.21	355	0	13	0	58	2.3	4.75	1.83	5.87
L10+400 10+800N	0	0.5	4	12	3.99	250	0	5	2	38	1.39	2.48	1.38	5.52
L10+400 10+825N	0	0.5	4	17	5.11	240	0	8	8	40	1.39	2.83	1.63	5.48
L10+400 10+850N	1	0.5	6	25	4.68	265	0	8	6	50	1.79	3.22	1.54	5.58
L10+500 10+300N	0	0.5	5	35	4.44	215	0	13	2	50	1.61	3.56	1.49	5.37
L10+500 10+325N	0	0.5	15	73	9.2	430	0	16	6	56	2.71	4.29	2.22	6.06
L10+500 10+350N	0	0.5	21	67	5.61	615	0	21	4	96	3.04	4.2	1.72	6.42
L10+500 10+375N	0	0.5	3	19	4.06	230	0	5	4	44	1.1	2.94	1.4	5.44
L10+500 10+400N	0	0.5	5	51	5.09	400	0	10	2	54	1.61	3.93	1.63	5.99
L10+500 10+425N	0	0.5	26	100	7.01	1275	0	70	0	88	3.26	4.61	1.95	7.15
L10+500 10+450N	0	0.5	27	86	6.23	945	0	24	6	74	3.3	4.45	1.83	6.85
L10+500 10+475N	2	0.5	16	143	6.11	1595	0	25	4	56	2.77	4.96	1.81	7.37
L10+500 10+500N	1	0.5	16	80	5.65	1335	0	26	0	82	2.77	4.38	1.73	7.2
L10+500 10+525N	1	0.5	12	82	4.49	730	0	23	2	78	2.48	4.41	1.5	6.59
L10+500 10+550N	1	0.5	9	64	4.38	395	0	14	4	66	2.2	4.16	1.48	5.98
L10+500 10+575N	0	0.5	4	35	4.41	200	0	9	0	44	1.39	3.56	1.48	5.3
L10+500 10+600N	2	0.5	17	211	4.27	570	0	41	0	54	2.83	5.35	1.45	6.35
L10+500 10+600NS	1	0.5	9	52	4.81	350	0	23	0	60	2.2	3.95	1.57	5.86
L10+500 10+625N	2	0.5	11	99	5.08	335	0	25	2	62	2.4	4.6	1.63	5.81
L10+500 10+650N	1	0.5	4	34	3.2	165	0	9	8	36	1.39	3.53	1.16	5.11
L10+500 10+700N	2	0.5	8	58	5.07	250	0	20	2	46	2.08	4.06	1.62	5.52
L10+600 10+225N	0	0.5	6	46	5.98	565	0	7	6	52	1.79	3.83	1.79	6.34
L10+600 10+250N	0	0.5	4	29	4.15	195	0	7	4	38	1.39	3.37	1.42	5.27
L10+600 10+275N	0	0.5	80	126	5.58	1760	0	21	6	144	4.38	4.84	1.72	7.47
L10+600 10+300N	1	0.5	52	117	6.09	840	0	36	2	82	3.95	4.76	1.81	6.73
L10+600 10+325N	1	0.5	35	86	6.04	525	0	31	6	116	3.56	4.45	1.8	6.26
L10+600 10+350N	1	0.5	22	80	4.57	455	0	11	2	54	3.09	4.38	1.52	6.12
L10+600 10+375N	1	0.5	9	145	5.67	315	0	19	4	80	2.2	4.98	1.74	5.75
L10+600 10+400N	1	0.5	11	65	5.17	430	0	19	6	72	2.4	4.17	1.64	6.06
L10+600 10+425N	1	0.5	4	80	4.37	285	0	11	6	46	1.39	4.38	1.47	5.65
L10+600 10+450N	1	0.5	6	46	4.7	430	0	18	6	52	1.79	3.83	1.55	6.06
L10+600 10+475N	1	0.5	8	32	4.02	315	0	26	2	54	2.08	3.47	1.39	5.75
L10+600 10+500N	1	0.5	9	85	4.33	360	0	14	2	52	2.2	4.44	1.47	5.89

BREAKWATER RESOURCES LTD.

GEOCHEMICAL ANALYSIS OF 180 SOIL SAMPLES TAKEN FROM THE DOE CLAIM-GROUP

Location: Lens Creek Area, Map 92C-070

Samples Were Taken in November 1990

COORDINATES	AS	AG	CO	CU	FE	MN	MO	NI	PB	ZN	LN-CO	LN-CU	LN-FE	LN-MN
L10+600 10+525N	2	0.5	12	67	5.36	735	0	17	4	72	2.48	4.2	1.68	6.6
L10+600 10+550N	1	0.5	20	93	5.54	745	0	50	0	90	3	4.53	1.71	6.61
L10+600 10+575N	1	0.5	9	120	5.2	540	0	14	0	70	2.2	4.79	1.65	6.29
L10+600 10+600N	2	0.5	14	116	4.27	470	0	24	0	52	2.64	4.75	1.45	6.15
L10+600 10+625N	2	0.5	8	82	4.69	415	0	12	2	62	2.08	4.41	1.55	6.03
L10+600 10+650N	2	0.5	9	76	5.93	455	0	17	0	64	2.2	4.33	1.78	6.12
L10+600 10+675N	1	0.5	5	47	4.16	365	0	7	4	52	1.61	3.85	1.43	5.9
L10+600 10+700N	1	0.5	4	35	3.73	205	2	7	0	46	1.39	3.56	1.32	5.32
L10+675 10+600N	2	0.5	14	61	5.99	370	1	36	4	80	2.64	4.11	1.79	5.91
L10+700 10+000N	2	0.5	13	217	5.22	380	1	27	2	62	2.56	5.38	1.65	5.94
L10+700 10+025N	1	0.5	6	59	4.83	270	1	11	0	54	1.79	4.08	1.57	5.6
L10+700 10+050N	1	0.5	5	111	5.68	210	1	12	0	60	1.61	4.71	1.74	5.35
L10+700 10+075N	1	0.5	2	19	5.15	180	3	7	0	26	0.69	2.94	1.64	5.19
L10+700 10+100N	1	0.5	6	67	4.5	275	1	13	0	52	1.79	4.2	1.5	5.62
L10+700 10+125N	1	0.5	7	29	4.74	265	1	12	0	54	1.95	3.37	1.56	5.58
L10+700 10+150N	1	0.5	10	61	5.98	300	2	20	0	62	2.3	4.11	1.79	5.7
L10+700 10+175N	1	0.5	12	106	4.29	1080	1	16	0	66	2.48	4.66	1.46	6.98
L10+700 10+200N	1	0.5	9	75	4.51	715	1	12	4	66	2.2	4.32	1.51	6.57
L10+700 10+250N	1	0.5	7	91	4.7	320	1	16	0	46	1.95	4.51	1.55	5.71
L10+700 10+275N	1	0.5	9	136	5.04	320	0	19	0	58	2.2	4.91	1.62	5.77
L10+700 10+300N	1	0.5	7	42	4.63	380	0	11	0	68	1.95	3.74	1.53	5.94
L10+700 10+325N	1	0.5	4	34	4.66	215	0	11	0	50	1.39	3.53	1.54	5.37
L10+700 10+350N	1	0.5	2	22	3.07	310	0	7	0	42	0.69	3.09	1.12	5.74
L10+700 10+375N	2	0.5	12	119	4.77	340	1	22	0	58	2.48	4.78	1.56	5.83
L10+700 10+400N	2	0.5	10	275	5.67	400	0	23	4	60	2.3	5.62	1.74	5.99
L10+700 10+425N	1	0.5	4	101	5.9	335	0	11	0	46	1.39	4.62	1.77	5.81
L10+700 10+450N	1	0.5	7	192	5.81	465	0	17	0	78	1.95	5.26	1.76	6.14
L10+700 10+475N	1	0.5	4	23	4.56	560	0	7	8	50	1.39	3.14	1.52	6.33
L10+700 10+500N	1	0.5	9	105	4.14	1100	0	13	2	74	2.2	4.65	1.42	7
L10+700 10+525N	2	0.5	11	111	4.63	630	0	14	4	70	2.4	4.71	1.53	6.45
L10+700 10+550N	2	0.5	14	154	4.46	480	0	25	6	56	2.64	5.04	1.5	6.17
L10+700 10+575N	1	0.5	4	33	4.41	430	0	9	4	52	1.39	3.5	1.48	6.06
L10+700 10+600N	2	0.5	12	91	4.94	370	0	30	4	56	2.48	4.51	1.6	5.91
L11+400 10+025N	1	0.5	9	29	5.82	645	0	16	2	66	2.2	3.37	1.76	6.47
L11+400 10+050N	1	0.5	16	199	7.1	540	0	14	6	78	2.77	5.29	1.96	6.29
L11+400 10+075N	1	0.5	3	175	5.74	240	0	10	0	52	1.1	5.16	1.75	5.48
L11+400 10+100N	0	0.5	4	116	5.83	185	0	10	0	56	1.39	4.75	1.76	5.22
L11+400 10+125N	0	0.5	4	27	3.36	310	0	13	2	32	1.39	3.3	1.21	5.74
L11+400 10+150N	1	0.5	3	40	3.7	190	0	8	2	44	1.1	3.69	1.31	5.25
L11+400 10+175N	1	0.5	5	72	4.23	235	0	11	4	48	1.61	4.28	1.44	5.46
L11+400 10+200N	1	0.5	4	55	3.45	235	0	8	4	50	1.39	4.01	1.24	5.46
L11+400 10+225N	1	0.5	1	3	1.89	160	0	5	6	30	0	1.1	0.64	5.08
L11+400 10+250N	1	0.5	3	84	3.21	255	0	8	8	40	1.1	4.43	1.17	5.54
L11+400 10+275N	2	0.5	5	96	4.28	235	0	14	6	64	1.61	4.56	1.45	5.46
L11+400 10+300N	0	0.5	2	8	3.29	220	0	5	8	36	0.69	2.08	1.19	5.39
L11+400 10+325N	0	0.5	6	32	2.73	290	0	9	10	56	1.79	3.47	1	5.67
L11+400 10+350N	1	0.5	8	46	5.72	260	0	8	4	62	2.08	3.83	1.74	5.56
L11+400 10+375N	0	0.5	2	21	4.41	195	0	3	6	46	0.69	3.04	1.48	5.27
L11+400 10+425N	1	0.5	8	23	5	250	0	29	4	74	2.08	3.14	1.61	5.52

BREAKWATER RESOURCES LTD.

GEOCHEMICAL ANALYSIS OF 180 SOIL SAMPLES TAKEN FROM THE DOE CLAIM-GROUP

Location: Lens Creek Area, Map 92C-070

Samples Were Taken in November 1990

COORDINATES	AS	AG	CO	CU	FE	MN	MO	NI	PB	ZN	LN-CO	LN-CU	LN-FE	LN-MN
L11+400 10+450N	0	0.5	1	0	1.07	165	0	5	0	20	0	0	0.07	5.11
L11+400 10+475N	0	0.5	0	20	4.21	130	0	2	2	22	0	3	1.44	4.87
L11+400 10+500N	0	0.5	0	9	3.33	200	0	3	4	26	0	2.2	1.2	5.3
L11+400 10+525N	0	0.5	9	30	3.65	490	0	22	8	68	2.2	3.4	1.29	6.19
L11+400 10+550N	0	0.5	1	9	3.57	295	1	3	8	40	0	2.2	1.27	5.69
L11+400 10+575N	1	0.5	3	20	4.04	270	1	7	8	68	1.1	3	1.4	5.6
L11+400 10+600N	2	0.5	2	34	4.14	215	1	3	12	56	0.69	3.53	1.42	5.37
L11+400 10+625N	2	0.5	5	29	5.14	555	1	4	4	50	1.61	3.37	1.64	6.32
L11+400 10+650N	2	0.5	3	15	3.59	895	1	3	4	42	1.1	2.71	1.28	6.8
L11+400 10+675N	2	0.5	3	43	3.39	210	2	5	8	38	1.1	3.76	1.22	5.35
L11+400 10+700N	2	0.5	3	16	4.24	260	2	4	10	46	1.1	2.77	1.44	5.56
X1 0+00	2	0.5	4	23	3.44	170	0	8	8	42	1.39	3.14	1.24	5.14
X1 0+25	2	0.5	5	31	3.51	150	0	9	6	40	1.61	3.43	1.26	5.01
X1 0+50	1	0.5	6	25	4	150	0	9	4	44	1.79	3.22	1.39	5.01
X1 0+75	2	0.5	11	48	3.97	310	0	17	10	48	2.4	3.87	1.38	5.74
X1 1+00	1	0.5	6	50	4.14	185	0	10	0	42	1.79	3.91	1.42	5.22
X1 1+25	1	0.5	5	18	3.27	185	0	5	6	38	1.61	2.89	1.18	5.22
X1 1+50	2	0.5	6	46	4.9	325	0	10	6	48	1.79	3.83	1.59	5.78
X1 1+75	2	0.5	19	731	5.77	350	0	21	0	46	2.94	6.59	1.75	5.86
X1 2+00	2	0.5	7	64	4.11	210	0	11	4	34	1.95	4.16	1.41	5.35
X1 2+25	0	0.5	13	122	4.33	255	4	27	0	36	2.56	4.8	1.47	5.54
X1 2+50	1	0.5	13	131	4.61	260	0	19	0	40	2.56	4.88	1.53	5.56
X1 2+75	1	0.5	5	23	3.26	175	0	6	4	36	1.61	3.14	1.18	5.16
X1 3+00	1	0.5	6	37	3.72	190	0	8	4	38	1.79	3.61	1.31	5.25
X1 3+25	1	0.5	6	32	4.95	195	0	10	8	48	1.79	3.47	1.6	5.27
X1 3+50	3	0.5	22	59	6.27	375	0	34	4	42	3.09	4.08	1.84	5.93
X1 3+75	1	0.5	6	17	3.69	170	1	9	4	36	1.79	2.83	1.31	5.14
X1 4+00	3	0.5	13	50	5.13	320	4	16	2	42	2.56	3.91	1.64	5.77
X1 4+25	1	0.5	12	77	3.9	330	0	18	2	42	2.48	4.34	1.36	5.8
X1 4+50	1	0.5	8	162	4.37	305	0	14	6	48	2.08	5.09	1.47	5.72
X1 4+75	1	0.5	18	167	4.74	430	2	24	2	70	2.89	5.12	1.56	6.06
X1 5+00	1	0.5	9	400	4.42	305	3	13	6	62	2.2	5.99	1.49	5.72
X1 5+25	1	0.5	7	125	3.87	215	0	10	2	48	1.95	4.83	1.35	5.37

COORDINATES	LN-NI	LN-PB	LN-ZN	AN-CO	AN-CU	AN-FE	AN-MN	AN-NI	AN-PB	AN-ZN	AN-AS	SCORE
BL10+425	2.64	0.69	4.06	0	0	0	0	0	0	0	0	0
BL10+450	3.3	0	4.03	0	0	5.62	0	27	0	0	0	2
BL10+525	2.89	0	3.99	18	657	0	670	0	0	0	3	4
BL10+550	1.95	0	3.83	0	0	0	0	0	0	0	0	0
BL10+575	2.71	0	4.64	0	0	0	0	0	0	104	0	1
BL10+625	3.4	0	4.41	0	0	0	0	30	0	82	0	2
BL10+650	2.71	0	4.09	0	0	0	0	0	0	60	0	1
BL10+675	2.83	0	4.09	0	0	0	0	0	0	60	0	1
L10+000 10+825N	2.4	0.69	3.87	0	161	5.44	0	0	0	0	0	2
L10+000 10+850N	2.71	1.79	3.87	0	0	0	0	0	0	0	0	0
L10+000 10+875N	2.71	1.39	4.16	0	0	0	0	0	0	64	0	1
L10+000 10+900N	2.64	1.79	3.95	0	0	0	0	0	0	0	3	1
L10+000 10+925N	2.48	0.69	3.95	0	0	0	0	0	0	0	0	0
L10+100 10+725N	2.3	0.69	3.69	0	0	0	0	0	0	0	0	0
L10+100 10+750N	2.83	0	3.87	0	0	0	0	0	0	0	0	0
L10+100 10+775N	1.79	0	3.64	0	0	0	0	0	0	0	0	0
L10+100 10+800N	2.77	1.39	3.78	0	0	0	0	0	0	0	0	0
L10+100 10+825N	3.09	0	3.91	0	0	0	0	22	0	0	0	1
L10+100 10+850N	2.08	0	3.74	0	0	0	0	0	0	0	8	1
L10+100 10+875N	2.48	0	3.69	0	0	0	0	0	0	0	0	0
L10+200 10+650N	4.33	0.69	4.45	21	0	0	705	76	0	86	0	4
L10+200 10+675N	4.77	1.39	4.06	39	0	5.67	775	118	0	0	0	4
L10+200 10+700N	2.71	0	3.87	0	0	0	0	0	0	0	0	0
L10+200 10+725N	2.48	0	3.58	0	0	0	0	0	0	0	0	0
L10+200 10+750N	2.48	1.39	3.91	0	0	0	0	0	0	0	0	0
L10+200 10+775N	2.71	0	3.78	0	0	0	0	0	0	0	0	0
L10+200 10+800N	2.4	0	3.74	0	0	0	0	0	0	0	0	0
L10+200 10+825N	2.3	0.69	3.64	0	0	0	0	0	0	0	0	0
L10+200 10+850N	3	0	3.99	0	0	0	0	0	0	0	0	0
L10+200 10+875N	2.64	0	3.87	0	0	0	0	0	0	0	0	0
L10+200 10+900N	3.04	1.39	3.95	0	0	0	0	0	0	0	0	0
L10+200 10+925N	3.61	0	4.19	0	212	0	0	37	0	66	0	3
L10+200 10+950N	2.77	0.69	3.95	0	0	5.63	0	0	0	0	0	1
L10+200 10+975N	2.89	1.39	3.87	0	0	6.16	0	0	0	0	0	1
L10+300 10+550N	1.95	2.08	3.69	0	0	0	850	0	0	0	0	1
L10+300 10+575N	2.94	0	3.91	0	0	0	835	0	0	0	0	1
L10+300 10+600N	3.14	0.69	4.54	0	0	5.4	1245	23	0	94	0	4
L10+300 10+625N	3.66	0.69	4.33	0	0	0	665	39	0	76	0	3
L10+300 10+650N	3.53	0	4.43	0	0	0	945	34	0	84	0	3
L10+300 10+675N	3.83	0	4.36	18	0	5.41	980	46	0	78	0	5
L10+300 10+700N	4.65	0.69	4.43	21	0	5.41	0	105	0	84	0	4
L10+300 10+725N	3.47	1.39	4.03	0	0	0	0	32	0	0	0	1
L10+300 10+725HN	2.94	1.39	4.03	0	0	0	0	0	0	0	0	0
L10+300 10+750N	2.71	1.79	3.69	0	0	0	0	0	0	0	0	0
L10+300 10+775N	2.77	0.69	3.74	0	0	5.79	0	0	0	0	0	1
L10+300 10+800N	1.79	2.08	3.69	0	0	0	0	0	0	0	0	0
L10+300 10+825N	2.4	1.79	3.87	0	0	0	0	0	0	0	0	0
L10+300 10+850N	2.4	1.39	4.03	0	0	0	0	0	0	0	0	0
L10+300 10+875N	2.77	1.79	4.19	0	0	0	0	0	0	66	0	1





COORDINATES	LN-WI	LN-PB	LN-ZN	AN-CO	AN-CU	AN-FE	AN-MN	AN-NI	AN-PB	AN-ZN	AN-AS	SCORE
L10+600 10+525N	2.83	1.39	4.28	0	0	0	735	0	0	72	0	2
L10+600 10+550N	3.91	0	4.5	20	0	5.54	745	50	0	90	0	5
L10+600 10+575N	2.64	0	4.25	0	0	0	0	0	0	70	0	1
L10+600 10+600N	3.18	0	3.95	0	0	0	0	24	0	0	0	1
L10+600 10+625N	2.48	0.69	4.13	0	0	0	0	0	0	62	0	1
L10+600 10+650N	2.83	0	4.16	0	0	5.93	0	0	0	64	0	2
L10+600 10+675N	1.95	1.39	3.95	0	0	0	0	0	0	0	0	0
L10+600 10+700N	1.95	0	3.83	0	0	0	0	0	0	0	0	0
L10+675 10+600N	3.58	1.39	4.38	0	0	5.99	0	36	0	80	0	3
L10+700 10+000N	3.3	0.69	4.13	0	217	0	0	27	0	62	0	3
L10+700 10+025N	2.4	0	3.99	0	0	0	0	0	0	0	0	0
L10+700 10+050N	2.48	0	4.09	0	0	5.68	0	0	0	60	0	2
L10+700 10+075N	1.95	0	3.26	0	0	0	0	0	0	0	0	0
L10+700 10+100N	2.56	0	3.95	0	0	0	0	0	0	0	0	0
L10+700 10+125N	2.48	0	3.99	0	0	0	0	0	0	0	0	0
L10+700 10+150N	3	0	4.13	0	0	5.98	0	0	0	62	0	2
L10+700 10+175N	2.77	0	4.19	0	0	0	1080	0	0	66	0	2
L10+700 10+200N	2.48	1.39	4.19	0	0	0	715	0	0	66	0	2
L10+700 10+250K	2.77	0	3.83	0	0	0	0	0	0	0	0	0
L10+700 10+275N	2.94	0	4.06	0	0	0	0	0	0	0	0	0
L10+700 10+300N	2.4	0	4.22	0	0	0	0	0	0	68	0	1
L10+700 10+325N	2.4	0	3.91	0	0	0	0	0	0	0	0	0
L10+700 10+350N	1.95	0	3.74	0	0	0	0	0	0	0	0	0
L10+700 10+375N	3.09	0	4.06	0	0	0	0	22	0	0	0	1
L10+700 10+400N	3.14	1.39	4.09	0	275	5.67	0	23	0	60	0	4
L10+700 10+425N	2.4	0	3.83	0	0	5.9	0	0	0	0	0	1
L10+700 10+450N	2.83	0	4.36	0	192	5.81	0	0	0	78	0	3
L10+700 10+475N	1.95	2.08	3.91	0	0	0	0	0	0	0	0	0
L10+700 10+500N	2.56	0.69	4.3	0	0	0	1100	0	0	74	0	2
L10+700 10+525N	2.64	1.39	4.25	0	0	0	630	0	0	70	0	2
L10+700 10+550N	3.22	1.79	4.03	0	154	0	0	25	0	0	0	2
L10+700 10+575N	2.2	1.39	3.95	0	0	0	0	0	0	0	0	0
L10+700 10+600N	3.4	1.39	4.03	0	0	0	0	30	0	0	0	1
L11+400 10+025N	2.77	0.69	4.19	0	0	5.82	645	0	0	66	0	3
L11+400 10+050N	2.64	1.79	4.36	0	199	7.1	0	0	0	78	0	3
L11+400 10+075N	2.3	0	3.95	0	175	5.74	0	0	0	0	0	2
L11+400 10+100N	2.3	0	4.03	0	0	5.83	0	0	0	0	0	1
L11+400 10+125N	2.56	0.69	3.47	0	0	0	0	0	0	0	0	0
L11+400 10+150N	2.08	0.69	3.78	0	0	0	0	0	0	0	0	0
L11+400 10+175N	2.4	1.39	3.87	0	0	0	0	0	0	0	0	0
L11+400 10+200N	2.08	1.39	3.91	0	0	0	0	0	0	0	0	0
L11+400 10+225N	1.61	1.79	3.4	0	0	0	0	0	0	0	0	0
L11+400 10+250N	2.08	2.08	3.69	0	0	0	0	0	0	0	0	0
L11+400 10+275N	2.64	1.79	4.16	0	0	0	0	0	0	64	0	1
L11+400 10+300N	1.61	2.08	3.58	0	0	0	0	0	0	0	0	0
L11+400 10+325N	2.2	2.3	4.03	0	0	0	0	0	0	0	0	0
L11+400 10+350N	2.08	1.39	4.13	0	0	5.72	0	0	0	62	0	2
L11+400 10+375N	1.1	1.79	3.83	0	0	0	0	0	0	0	0	0
L11+400 10+425N	3.37	1.39	4.3	0	0	0	0	29	0	74	0	2



**APPENDIX 2**

**Table of Correlation Coefficients**

DOE CLAIM-GROUP, SOIL ANALYSIS

\*\*\* CORRELATION MATRIX OF ANOMALOUS SAMPLES \*\*\*

18 AN-CO	1.00000								
19 AN-CU	-0.44672	1.00000							
20 AN-FE	-0.07527	-0.11717	1.00000						
21 AN-MN	<u>0.88823</u>	-1.00000	0.14386	1.00000					
22 AN-NI	-0.16282	-0.13185	-0.09566	-0.28553	1.00000				
23 AN-PB	0.00000	0.00000	0.00000	0.00000	0.00000	1.00000			
24 AN-ZN	<u>0.69763</u>	-0.46349	-0.08520	<u>0.63676</u>	0.18285	0.00000	1.00000		
25 AN-AS	0.00000	0.00000	0.00000	1.00000	1.00000	0.00000	0.00000	1.00000	
26 SCORE	0.23721	0.22966	-0.06642	<u>0.39393</u>	<u>0.31287</u>	0.00000	<u>0.44680</u>	0.06310	1.00000
	18 AN-CO	19 AN-CU	20 AN-FE	21 AN-MN	22 AN-NI	23 AN-PB	24 AN-ZN	25 AN-AS	26 SCORE

DOE CLAIM-GROUP, SOIL ANALYSIS

\*\*\* CORRELATION MATRIX FOR ALL ELEMENTS AND CASES \*\*\*

(NUMBER OF VALID CASES APPEARS UNDER COEFFICIENT)

1 AS	1.00000									
2 AG	0.00000	1.00000								
3 CO	0.01817	0.00000	1.00000							
4 CU	0.04230	0.00000	0.18057	1.00000						
5 FE	-0.02780	0.00000	<u>0.35986</u>	0.25700	1.00000					
6 MN	0.04497	0.00000	<u>0.82030</u>	0.13675	<u>0.40577</u>	1.00000				
7 MO	-0.00390	0.00000	-0.06699	0.04149	-0.03408	-0.11548	1.00000			
8 NI	0.09508	0.00000	<u>0.40359</u>	0.20731	<u>0.39260</u>	<u>0.38799</u>	-0.09072	1.00000		
9 PB	-0.09423	0.00000	0.10820	-0.20250	-0.09282	0.09280	-0.04680	-0.18799	1.00000	
10 ZN	-0.01849	0.00000	<u>0.65769</u>	0.19420	<u>0.53155</u>	<u>0.68298</u>	-0.11313	<u>0.45507</u>	0.03697	1.00000
	1 AS	2 AG	3 CO	4 CU	5 FE	6 MN	7 MO	8 NI	9 PB	10 ZN

**APPENDIX 3**

**Summary of Descriptive Statistics**

## DOE CLAIM-GROUP; SOIL ANALYSIS

## SUMMARY OF STATISTICAL PARAMETERS

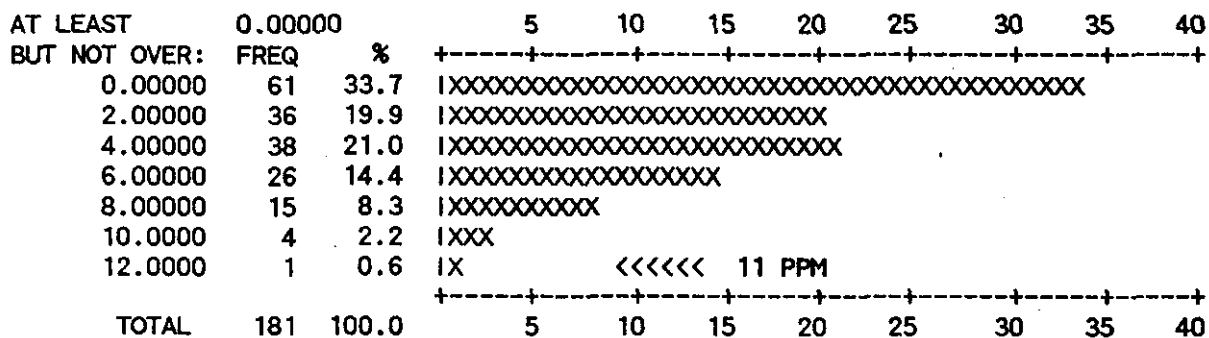
VARIABLE	VALID CASES	NUMBER MISSING	% MISSING	MEAN	STD.DEV	VARIANCE	STD ERROR OF MEAN	COEFF OF VARIATION	MINIMUM
1 AS	181	0	0.0	1.34254	2.3030	5.30424	0.171188	171.547	0.00000
2 AG	181	0	0.0	0.500000	0.0000	0.00000	0.00000	0.00000	0.500000
3 CO	181	0	0.0	11.1602	14.748	217.524	1.09626	132.154	0.00000
4 CU	181	0	0.0	79.1105	84.351	7115.14	6.26978	106.625	0.00000
5 FE	181	0	0.0	4.71674	0.95937	0.920402	0.0713098	20.3398	1.07000
6 MN	181	0	0.0	451.519	391.89	153583	29.1295	86.7952	130.000
7 MO	181	0	0.0	0.243094	0.66376	0.440577	0.0493369	273.047	0.00000
8 NI	181	0	0.0	18.1105	15.301	234.143	1.13737	84.4910	2.00000
9 PB	181	0	0.0	3.04972	2.8949	8.38085	0.215181	94.9256	0.00000
10 ZN	181	0	0.0	56.1657	18.296	334.750	1.35994	32.5753	20.0000
11 LN-CO	181	0	0.0	2.08249	0.77435	0.599622	0.0575572	37.1840	0.00000
12 LN-CU	180	1	0.6	4.05824	0.79776	0.636432	0.0594620	19.6580	1.09861
13 LN-FE	181	0	0.0	1.52836	0.22503	0.0506419	0.0167269	14.7242	0.0676586
14 LN-MN	181	0	0.0	5.90429	0.59102	0.349313	0.0439307	10.0101	4.86753
15 LN-NI	181	0	0.0	2.65789	0.68078	0.463465	0.0506022	25.6137	0.693147
16 LN-PB	120	61	33.7	1.39254	0.52929	0.280153	0.0483178	38.0092	0.693147
17 LN-ZN	181	0	0.0	3.98147	0.30332	0.0920032	0.0225456	7.61830	2.99573
18 AN-CO	181	0	0.0	4.28729	15.969	255.028	1.18701	372.487	0.00000
19 AN-CU	181	0	0.0	22.6298	90.977	8276.92	6.76231	402.025	0.00000
20 AN-FE	181	0	0.0	1.35939	2.5372	6.43746	0.188590	186.643	0.00000
21 AN-MN	181	0	0.0	194.586	478.21	228690	35.5455	245.761	0.00000
22 AN-NI	181	0	0.0	9.24309	18.829	354.563	1.39961	203.718	0.00000
23 AN-PB	181	0	0.0	0.0662983	0.89195	0.795580	0.0662983	1345.36	0.00000
24 AN-ZN	181	0	0.0	25.2155	37.201	1383.98	2.76520	147.536	0.00000
25 AN-AS	181	0	0.0	0.276243	2.3406	5.47882	0.173982	847.329	0.00000
26 SCORE	181	0	0.0	1.46961	1.8515	3.42824	0.137625	125.989	0.00000

	MAXIMUM	RANGE	TOTAL	MEDIAN	MODE	SKEWNESS	KURTOSIS
1 AS	30.0000	30.0000	243.000	1.00000	1.00000	10.8507	134.333
2 AG	0.500000	0.00000	90.5000	0.500000	.500000	0.00000	0.00000
3 CO	168.000	168.000	2020.00	8.00000	4.00000	7.45305	74.6071
4 CU	731.000	731.000	14319.0	63.0000	34.0000	4.79390	33.8381
5 FE	9.20000	8.13000	853.730	4.63000	4.42000	0.323147	5.87279
6 MN	3690.00	3560.00	81725.0	325.000	310.000	4.07587	28.7410
7 MO	4.00000	4.00000	44.0000	0.00000	0.00000	3.45883	16.3671
8 NI	118.000	116.000	3278.00	14.0000	11.0000	3.33268	18.6566
9 PB	12.0000	12.0000	552.000	2.00000	0.00000	0.644744	2.55149
10 ZN	144.000	124.000	10166.0	52.0000	48.0000	1.53189	7.14213
11 LN-CO	5.12396	5.12396	376.931	2.07944	1.38629	0.0618565	4.49389
12 LN-CU	6.59441	5.49580	730.482	4.14313	3.52636	-0.183161	4.00133
13 LN-FE	2.21920	2.15154	276.632	1.53256	1.48614	-1.73221	12.9173
14 LN-MN	8.21338	3.34585	1068.68	5.78383	5.73657	0.916561	3.77949
15 LN-NI	4.77068	4.07754	481.077	2.63906	2.39790	0.0526207	3.59368
16 LN-PB	2.48491	1.79176	167.105	1.38629	1.38629	0.0843450	1.81181
17 LN-ZN	4.96981	1.97408	720.646	3.95124	3.87120	0.163238	4.01785
18 AN-CO	168.000	168.000	776.000	0.00000	0.00000	6.98226	65.3688
19 AN-CU	731.000	731.000	4096.00	0.00000	0.00000	5.38655	36.4144
20 AN-FE	9.20000	9.20000	246.050	0.00000	0.00000	1.36935	3.02056
21 AN-MN	3690.00	3690.00	35220.0	0.00000	0.00000	3.37473	19.0393
22 AN-NI	118.000	118.000	1673.00	0.00000	0.00000	2.71705	12.4780
23 AN-PB	12.0000	12.0000	12.0000	0.00000	0.00000	13.3419	179.006
24 AN-ZN	144.000	144.000	4564.00	0.00000	0.00000	0.988168	2.54017
25 AN-AS	30.0000	30.0000	50.0000	0.00000	0.00000	11.6417	145.973
26 SCORE	6.00000	6.00000	266.000	1.00000	0.00000	1.14348	3.14298

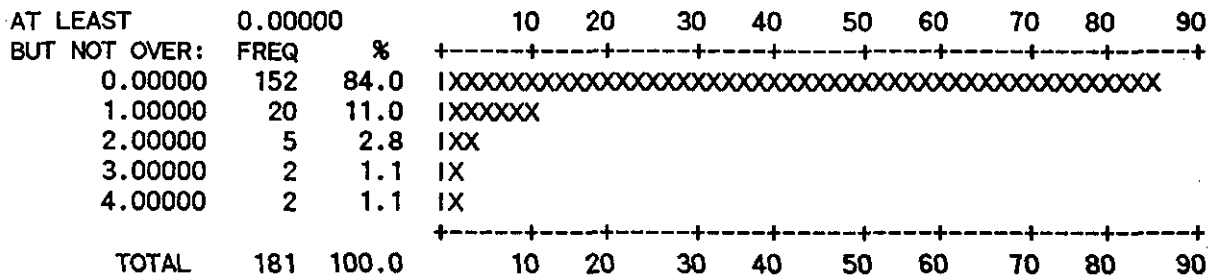
## APPENDIX 4

Histograms Showing Population Distribution

DOE CLAIM-GROUP; SOIL SURVEY, NOVEMBER 1990, BY ICP  
 HISTOGRAM OF LEAD VALUES IN SOIL



DOE CLAIM-GROUP; SOIL SURVEY, NOVEMBER 1990, BY ICP  
 HISTOGRAM OF MOLYBDENUM VALUES IN SOIL





DOE CLAIM-GROUP; SOIL SURVEY, NOVEMBER 1990, BY ICP  
 HISTOGRAM OF ZINC VALUES IN SOIL

AT LEAST BUT NOT OVER:	20.0000 FREQ	%	1	2	3	4	5	6	7	8	9	10
20.0000	1	0.6	XXX									
22.0000	1	0.6	XXX									
26.0000	2	1.1	XXXXXX									
30.0000	1	0.6	XXX									
32.0000	1	0.6	XXX									
34.0000	2	1.1	XXXXXX									
36.0000	6	3.3	XXXXXXXXXXXXXXXXXXXX									
38.0000	7	3.9	XXXXXXXXXXXXXXXXXXXX									
40.0000	10	5.5	XX									
42.0000	10	5.5	XX									
44.0000	6	3.3	XXXXXXXXXXXXXXXXXXXX									
46.0000	10	5.5	XX									
48.0000	15	8.3	XX									
50.0000	9	5.0	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX									
52.0000	13	7.2	XX									
54.0000	8	4.4	XXXXXXXXXXXXXXXXXXXXXXXXXXXX									
56.0000	14	7.7	XX									
58.0000	5	2.8	XXXXXXXXXXXX									
60.0000	5	2.8	XXXXXXXXXXXX									
62.0000	8	4.4	XXXXXXXXXXXXXXXXXXXXXXXXXXXX									
64.0000	3	1.7	XXXXXXX									
66.0000	6	3.3	XXXXXXXXXXXXXXXXXXXX									
68.0000	3	1.7	XXXXXXX									
70.0000	3	1.7	XXXXXXX									
72.0000	3	1.7	XXXXXXX									
74.0000	5	2.8	XXXXXXXXXXXXXXXXXXXX									
76.0000	2	1.1	XXXXXX									
78.0000	4	2.2	XXXXXXXXXXXX									
80.0000	2	1.1	XXXXXX									
82.0000	3	1.7	XXXXXXX									
84.0000	3	1.7	XXXXXXX									
86.0000	1	0.6	XXX									
88.0000	1	0.6	XXX									
90.0000	1	0.6	XXX									
94.0000	1	0.6	XXX									
96.0000	1	0.6	XXX									
104.000	1	0.6	XXX									
106.000	1	0.6	XXX									
116.000	1	0.6	XXX									
134.000	1	0.6	XXX									
144.000	1	0.6	XXX									
TOTAL	181	100.0										

<<<<<<< 60 PPM

DOE CLAIM-GROUP; SOIL SURVEY, NOVEMBER 1990, BY ICP  
 HISTOGRAM OF NATURAL LOGARITHMS OF ZINC VALUES IN SOIL

AT LEAST BUT NOT OVER:	2.99573 FREQ	%	1	2	3	4	5	6	7	8	9	10
2.99573	1	0.6	I	X	X							
3.09104	1	0.6	I	X	X							
3.25810	2	1.2	I	X	X	X	X	X	X			
3.40120	1	0.6	I	X	X							
3.46574	1	0.6	I	X	X							
3.52636	2	1.2	I	X	X	X	X	X	X			
3.58352	6	3.5	I	X	X	X	X	X	X	X	X	X
3.63759	7	4.0	I	X	X	X	X	X	X	X	X	X
3.68888	10	5.8	I	X	X	X	X	X	X	X	X	X
3.73767	10	5.8	I	X	X	X	X	X	X	X	X	X
3.78419	6	3.5	I	X	X	X	X	X	X	X	X	X
3.82864	9	5.2	I	X	X	X	X	X	X	X	X	X
3.87120	15	8.7	I	X	X	X	X	X	X	X	X	X
3.91202	9	5.2	I	X	X	X	X	X	X	X	X	X
3.95124	13	7.5	I	X	X	X	X	X	X	X	X	X
3.98898	7	4.0	I	X	X	X	X	X	X	X	X	X
4.02535	13	7.5	I	X	X	X	X	X	X	X	X	X
4.06044	4	2.3	I	X	X	X	X					
4.09434	3	1.7	I	X	X	X						
4.12713	8	4.6	I	X	X	X	X	X	X	X	X	X
4.15888	3	1.7	I	X	X	X						
4.18965	6	3.5	I	X	X	X	X	X	X	X	X	X
4.21951	3	1.7	I	X	X	X						
4.24850	3	1.7	I	X	X	X						
4.27667	3	1.7	I	X	X	X						
4.30407	5	2.9	I	X	X	X	X	X				
4.33073	2	1.2	I	X	X	X						
4.35671	4	2.3	I	X	X	X	X					
4.38203	2	1.2	I	X	X	X						
4.40672	2	1.2	I	X	X	X						
4.43082	3	1.7	I	X	X	X						
4.45435	1	0.6	I	X	X							
4.47734	1	0.6	I	X	X							
4.49981	1	0.6	I	X	X							
4.54329	1	0.6	I	X	X							
4.56435	1	0.6	I	X	X							
4.66344	1	0.6	I	X	X							
4.75359	1	0.6	I	X	X							
4.89784	1	0.6	I	X	X							
4.96981	1	0.6	I	X	X							
TOTAL	173	100.0										

<<<<<< 60 PPM

DOE CLAIM-GROUP; SOIL SURVEY, NOVEMBER 1990, BY ICP  
 HISTOGRAM OF MANGANESE VALUES IN SOIL

AT LEAST	130.000		5	10	15	20	25	30
BUT NOT OVER:	FREQ	%	+-----+-----+-----+-----+-----+					
201.200	24	13.3	XXXXXXXXXXXXXXXXXXXXXXXXXXXX					
272.400	43	23.8	XX					
343.600	29	16.0	XXXXXXXXXXXXXXXXXXXXXXXXXXXX					
414.800	18	9.9	XXXXXXXXXXXXXXXXXXXX					
486.000	18	9.9	XXXXXXXXXXXXXXXXXXXX					
557.200	12	6.6	XXXXXXXXXXXX					
628.400	5	2.8	XXXXX		<<<<<<< 600 PPM			
699.600	4	2.2	XXXX					
770.800	7	3.9	XXXXXX					
842.000	3	1.7	XXX					
913.200	2	1.1	XX					
984.400	4	2.2	XXXX					
1055.60	0	00.0						
1126.80	2	1.1	XX					
1198.00	0	00.0						
1269.20	1	0.6	X					
1340.40	3	1.7	XXX					
1411.60	1	0.6	X					
1482.80	1	0.6	X					
1554.00	0	00.0						
1625.20	2	1.1	XX					
1696.40	0	00.0						
1767.60	1	0.6	X					
1838.80	0	00.0						
1910.00	0	00.0						
1981.20	0	00.0						
2052.40	0	00.0						
2123.60	0	00.0						
2194.80	0	00.0						
2266.00	0	00.0						
2337.20	0	00.0						
2408.40	0	00.0						
2479.60	0	00.0						
2550.80	0	00.0						
2622.00	0	00.0						
2693.20	0	00.0						
2764.40	0	00.0						
2835.60	0	00.0						
2906.80	0	00.0						
2978.00	0	00.0						
3049.20	0	00.0						
3120.40	0	00.0						
3191.60	0	00.0						
3262.80	0	00.0						
3334.00	0	00.0						
3476.40	0	00.0						
3547.60	0	00.0						
3618.80	0	00.0						
3690.00	1	0.6	X					
TOTAL	181	100.0	+-----+-----+-----+-----+-----+					

DOE CLAIM-GROUP; SOIL SURVEY, NOVEMBER 1990, BY ICP  
 HISTOGRAM OF NATURAL LOGARITHMS OF MANGANESE VALUES IN SOIL

AT LEAST	4.86753		1	2	3	4	5	6	7	8	9	10
BUT NOT OVER:	FREQ	%	+-----+-----+-----+-----+-----+-----+-----+-----+									
4.93445	1	0.6	I	X	X							
5.00137	0	00.0	I									
5.06829	3	1.7	I	X	X	X						
5.13520	4	2.3	I	X	X	X	X					
5.20212	6	3.5	I	X	X	X	X	X	X			
5.26904	5	2.9	I	X	X	X	X	X				
5.33595	7	4.0	I	X	X	X	X	X	X	X		
5.40287	12	6.9	I	X	X	X	X	X	X	X	X	X
5.46979	6	3.5	I	X	X	X	X	X				
5.53670	9	5.2	I	X	X	X	X	X	X	X		
5.60362	11	6.4	I	X	X	X	X	X	X	X	X	
5.67054	7	4.0	I	X	X	X	X	X	X			
5.73745	10	5.8	I	X	X	X	X	X	X	X	X	
5.80437	7	4.0	I	X	X	X	X	X	X			
5.87129	8	4.6	I	X	X	X	X	X	X	X		
5.93821	8	4.6	I	X	X	X	X	X	X	X		
6.00512	6	3.5	I	X	X	X	X	X				
6.07204	9	5.2	I	X	X	X	X	X	X	X		
6.13896	4	2.3	I	X	X	X						
6.20587	6	3.5	I	X	X	X	X	X				
6.27279	4	2.3	I	X	X	X						
6.33971	6	3.5	I	X	X	X	X	X				
6.40662	2	1.2	I	X	X							
6.47354	3	1.7	I	X	X	X						
6.54046	1	0.6	I	X								
6.60738	5	2.9	I	X	X	X	X	X				
6.67429	3	1.7	I	X	X	X						
6.74121	2	1.2	I	X	X							
6.80813	2	1.2	I	X	X							
6.87504	2	1.2	I	X	X							
6.94196	2	1.2	I	X	X							
7.00888	2	1.2	I	X	X							
7.07579	0	00.0	I									
7.14271	1	0.6	I	X								
7.20963	3	1.7	I	X	X	X						
7.27654	1	0.6	I	X								
7.34346	1	0.6	I	X								
7.41038	2	1.2	I	X	X							
7.47730	1	0.6	I	X								
7.54421	0	00.0	I									
7.61113	0	00.0	I									
7.67805	0	00.0	I									
7.74496	0	00.0	I									
7.81188	0	00.0	I									
7.87880	0	00.0	I									
7.94571	0	00.0	I									
8.01263	0	00.0	I									
8.07955	0	00.0	I									
8.14646	0	00.0	I									
8.21338	1	0.6	I	X								

<<<<<< 600 PPM

DOE CLAIM-GROUP; SOIL SURVEY, NOVEMBER 1990, BY ICP  
 HISTOGRAM OF COPPER VALUES IN SOIL

AT LEAST	0.00000		5	10	15	20
BUT NOT OVER:	FREQ	%	+-----+-----+-----+-----+			
14.6200	7	3.9	XXXXXXXXXX			
29.2400	30	16.6	XX			
43.8600	23	12.7	XX			
58.4800	23	12.7	XX			
73.1000	21	11.6	XX			
87.7200	21	11.6	XX			
102.340	16	8.8	XX			
116.960	12	6.6	XX			
131.580	9	5.0	XXXXXXXXXXXXXXXXXXXX			
146.200	4	2.2	XXXXXX			
160.820	1	0.6	X			
175.440	4	2.2	XXXXXX			
190.060	1	0.6	X			
204.680	2	1.1	XX			
219.300	3	1.7	XXX			
233.920	0	00.0				
248.540	0	00.0				
263.160	0	00.0				
277.780	1	0.6	X			
292.400	0	00.0				
307.020	0	00.0				
321.640	0	00.0				
336.260	0	00.0				
350.880	0	00.0				
365.500	0	00.0				
380.120	0	00.0				
394.740	0	00.0				
409.360	1	0.6	X			
423.980	0	00.0				
438.600	0	00.0				
453.220	0	00.0				
467.840	0	00.0				
482.460	0	00.0				
497.080	0	00.0				
511.700	0	00.0				
526.320	0	00.0				
540.940	0	00.0				
555.560	0	00.0				
570.180	0	00.0				
584.800	0	00.0				
599.420	0	00.0				
614.040	0	00.0				
628.660	0	00.0				
643.280	0	00.0				
657.900	1	0.6	X			
672.520	0	00.0				
701.760	0	00.0				
716.380	0	00.0				
731.000	1	0.6	X			
TOTAL	181	100.0	+-----+-----+-----+-----+			

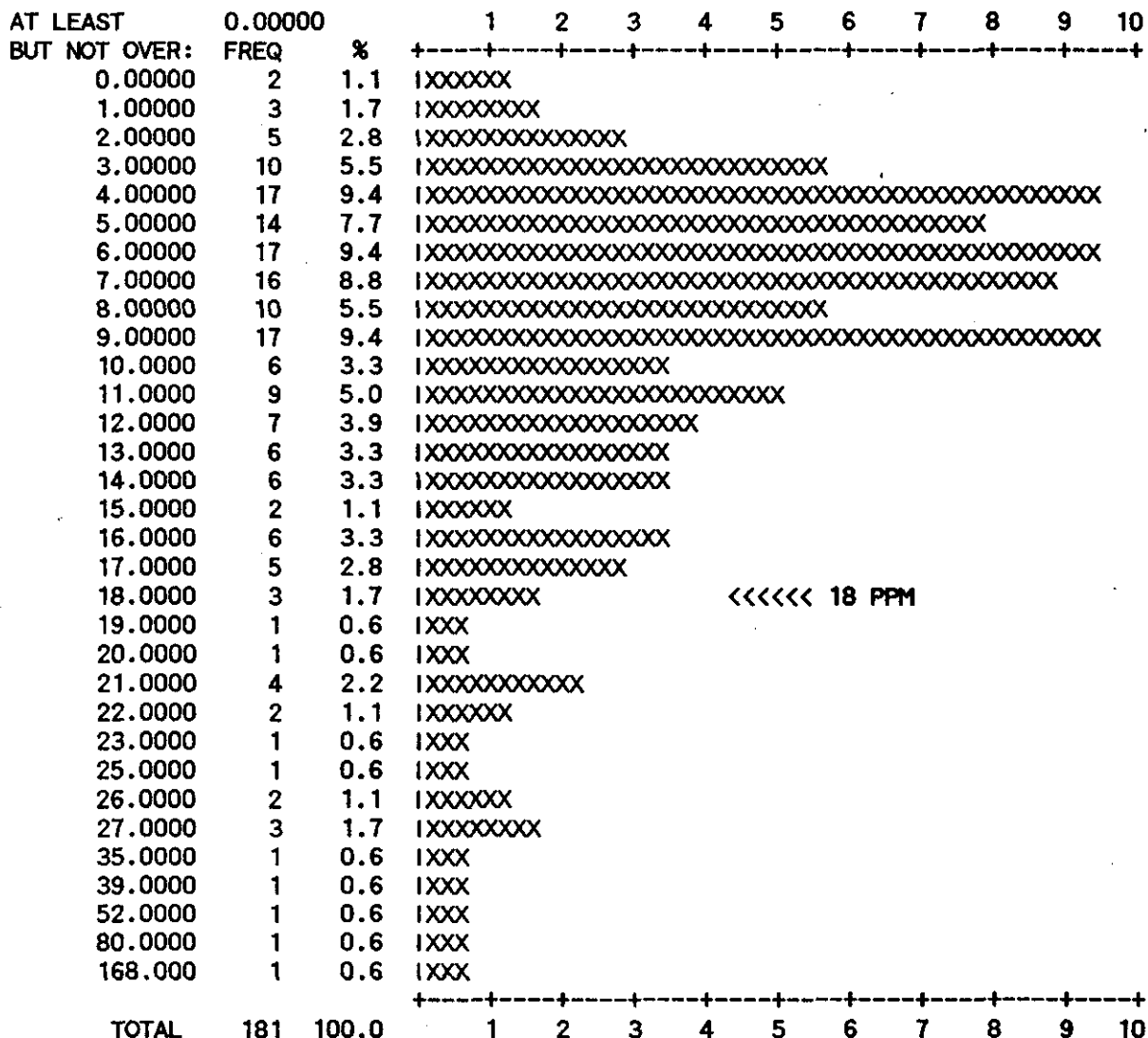
<<<<<< 145 PPM

DOE CLAIM-GROUP; SOIL SURVEY, NOVEMBER 1990, BY ICP  
 HISTOGRAM OF NATURAL LOGARITHMS OF COPPER VALUES IN SOIL

AT LEAST	1.09861		1	2	3	4	5	6	7	8	9	10
BUT NOT OVER:	FREQ	%	+-----+-----+-----+-----+-----+-----+-----+-----+									
1.20853	1	0.6	XXX									
1.31844	0	00.0										
1.42836	0	00.0										
1.53828	0	00.0										
1.64819	0	00.0										
1.75811	0	00.0										
1.86802	0	00.0										
1.97794	0	00.0										
2.08786	1	0.6	XXX									
2.19777	2	1.1	XXXXXX									
2.30769	0	00.0										
2.41760	0	00.0										
2.52752	2	1.1	XXXXXX									
2.63744	0	00.0										
2.74735	1	0.6	XXX									
2.85727	4	2.2	XXXXXXXXXXXX									
2.96718	3	1.7	XXXXXXXX									
3.07710	6	3.3	XXXXXXXXXXXXXXXXXXXX									
3.18702	7	3.9	XXXXXXXXXXXXXXXXXXXXXXXX									
3.29693	4	2.2	XXXXXXXXXXXX									
3.40685	6	3.3	XXXXXXXXXXXXXXXXXXXX									
3.51676	7	3.9	XXXXXXXXXXXXXXXXXXXXXXXX									
3.62668	10	5.6	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX									
3.73660	3	1.7	XXXXXXXX									
3.84651	8	4.4	XXXXXXXXXXXXXXXXXXXXXXXXXXXX									
3.95643	12	6.7	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX									
4.06634	5	2.8	XXXXXXXXXXXX									
4.17626	14	7.8	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX									
4.28618	6	3.3	XXXXXXXXXXXXXXXXXXXX									
4.39609	13	7.2	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX									
4.50601	11	6.1	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX									
4.61593	14	7.8	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX									
4.72584	8	4.4	XXXXXXXXXXXXXXXXXXXX									
4.83576	11	6.1	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX									
4.94567	4	2.2	XXXXXXXXXXXX									
5.05559	3	1.7	XXXXXXXX									
5.16551	4	2.2	XXXXXXXXXXXX									
5.27542	2	1.1	XXXXXX									
5.38534	4	2.2	XXXXXXXXXXXX									
5.49525	0	00.0										
5.60517	0	00.0										
5.71509	1	0.6	XXX									
5.82500	0	00.0										
5.93492	0	00.0										
6.04483	1	0.6	XXX									
6.15475	0	00.0										
6.26467	0	00.0										
6.48450	0	00.0										
6.59441	2	1.1	XXXXXX									
TOTAL	180	100.0	+-----+-----+-----+-----+-----+-----+-----+-----+									

<<<<<< 145 PPM

DOE CLAIM-GROUP; SOIL SURVEY, NOVEMBER 1990, BY ICP  
 HISTOGRAM OF COBALT VALUES IN SOIL







DOE CLAIM-GROUP; SOIL SURVEY, NOVEMBER 1990, BY ICP  
 HISTOGRAM OF IRON VALUES IN SOIL

AT LEAST BUT NOT OVER:	1.07000			5	10	15	20
FREQ	%						
1.23260	1	0.6	IX				
1.39520	0	00.0	I				
1.55780	0	00.0	I				
1.72040	0	00.0	I				
1.88300	0	00.0	I				
2.04560	1	0.6	IX				
2.20820	0	00.0	I				
2.37080	0	00.0	I				
2.53340	0	00.0	I				
2.69600	0	00.0	I				
2.85860	1	0.6	IX				
3.02120	0	00.0	I				
3.18380	2	1.1	IXXX				
3.34640	6	3.3	IXXXXXXXXX				
3.50900	4	2.2	IXXXXXXX				
3.67160	6	3.3	IXXXXXXXXX				
3.83420	5	2.8	IXXXXXXX				
3.99680	5	2.8	IXXXXXXX				
4.15940	15	8.3	IXXXXXXXXXXXXXXXXXXXXXXXXXXXXX				
4.32200	9	5.0	IXXXXXXXXXXXXX				
4.48460	26	14.4	IXXX				
4.64720	11	6.1	IXXXXXXXXXXXXXXXXXXXXX				
4.80980	16	8.8	IXXXXXXXXXXXXXXXXXXXXXXXXXXXXX				
4.97240	8	4.4	IXXXXXXXXXXXXX				
5.13500	11	6.1	IXXXXXXXXXXXXXXXXXXXXX				
5.29760	9	5.0	IXXXXXXXXXXXXX				
5.46020	8	4.4	IXXXXXXXXXXXXX				
5.62280	4	2.2	IXXXXXXX				
5.78540	9	5.0	IXXXXXXXXXXXXX				
5.94800	7	3.9	IXXXXXXXXXXXXX				
6.11060	6	3.3	IXXXXXXX				
6.27320	6	3.3	IXXXXXXX				
6.43580	1	0.6	IX				
6.59840	0	00.0	I				
6.76100	0	00.0	I				
6.92360	1	0.6	IX				
7.08620	1	0.6	IX				
7.24880	1	0.6	IX				
7.41140	0	00.0	I				
7.57400	0	00.0	I				
7.73660	0	00.0	I				
7.89920	0	00.0	I				
8.06180	0	00.0	I				
8.22440	0	00.0	I				
8.38700	0	00.0	I				
8.54960	0	00.0	I				
8.71220	0	00.0	I				
8.87480	0	00.0	I				
9.03740	0	00.0	I				
9.20000	1	0.6	IX				
TOTAL	181	100.0					

<<<<<<< 5.2 %

DOE CLAIM-GROUP; SOIL SURVEY, NOVEMBER 1990, BY ICP  
 HISTOGRAM OF NATURAL LOGARITHMS OF IRON VALUES IN SOIL  
 AT LEAST 0.0676586

BUT NOT OVER:	FREQ	%	
0.110690	1	0.6	IX
0.153720	0	00.0	
0.196751	0	00.0	
0.239782	0	00.0	
0.282813	0	00.0	
0.325844	0	00.0	
0.368875	0	00.0	
0.411906	0	00.0	
0.454937	0	00.0	
0.497968	0	00.0	
0.540999	0	00.0	
0.584029	0	00.0	
0.627060	0	00.0	
0.670091	1	0.6	IX
0.713122	0	00.0	
0.756153	0	00.0	
0.799184	0	00.0	
0.842215	0	00.0	
0.885246	0	00.0	
0.928277	0	00.0	
0.971307	0	00.0	
1.01434	1	0.6	IX
1.05737	0	00.0	
1.10040	0	00.0	
1.14343	1	0.6	IX
1.18646	5	2.8	IXXXXXXX
1.22949	4	2.2	IXXXXXXX
1.27252	3	1.7	IXXXX
1.31555	8	4.4	IXXXXXXXXXXX
1.35859	2	1.1	IXXX
1.40162	10	5.6	IXXXXXXXXXXXXXXX
1.44465	13	7.2	IXXXXXXXXXXXXXXXXXXX
1.48768	21	11.7	IXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1.53071	19	10.6	IXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1.57374	20	11.1	IXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1.61677	10	5.6	IXXXXXXXXXXXXXXX
1.65980	16	8.9	IXXXXXXXXXXXXXXXXXXXXXXXXXXXXX <<<<< 5.20 %
1.70283	8	4.4	IXXXXXXXXXXXXX
1.74586	11	6.1	IXXXXXXXXXXXXXXXXXXX
1.78889	11	6.1	IXXXXXXXXXXXXXXXXXXX
1.83193	9	5.0	IXXXXXXXXXXXXXXX
1.87496	2	1.1	IXXX
1.91799	0	00.0	
1.96102	3	1.7	IXXXX
2.00405	0	00.0	
2.04708	0	00.0	
2.09011	0	00.0	
2.13314	0	00.0	
2.21920	1	0.6	IX
TOTAL	180	100.0	

DOE CLAIM-GROUP; SOIL SURVEY, NOVEMBER 1990, BY ICP  
 HISTOGRAM OF NATURAL LOGARITHMS OF NICKEL VALUES IN SOIL

AT LEAST	0.693147		1	2	3	4	5	6	7	8	9	10
BUT NOT OVER:	FREQ	%	+-----+-----+-----+-----+-----+-----+-----+-----+-----+									
0.693147	1	0.6	IXXX									
1.09861	5	2.9	XXXXXXXXXXXXXXXXXX									
1.38629	2	1.2	XXXXXX									
1.60944	7	4.0	XXXXXXXXXXXXXXXXXXXX									
1.79176	3	1.7	XXXXXXX									
1.94591	9	5.2	XXXXXXXXXXXXXXXXXXXXXXXXXXXX									
2.07944	10	5.8	XXXXXXXXXXXXXXXXXXXXXXXXXXXX									
2.19722	7	4.0	XXXXXXXXXXXXXXXXXXXX									
2.30259	10	5.8	XXXXXXXXXXXXXXXXXXXXXXXXXXXX									
2.39790	12	6.9	XXXXXXXXXXXXXXXXXXXXXXXXXXXX									
2.48491	8	4.6	XXXXXXXXXXXXXXXXXXXX									
2.56495	7	4.0	XXXXXXXXXXXXXXXXXXXX									
2.63906	9	5.2	XXXXXXXXXXXXXXXXXXXXXXXXXXXX									
2.70805	5	2.9	XXXXXXXXXXXX									
2.77259	10	5.8	XXXXXXXXXXXXXXXXXXXXXXXXXXXX									
2.83321	5	2.9	XXXXXXXXXXXX									
2.89037	4	2.3	XXXXXXXXXXXX									
2.94444	6	3.5	XXXXXXXXXXXXXXXXXXXX									
2.99573	5	2.9	XXXXXXXXXXXX									
3.04452	4	2.3	XXXXXXXXXXXX									
3.09104	3	1.7	XXXXXXX									
3.13549	4	2.3	XXXXXXXXXXXX									
3.17805	4	2.3	XXXXXXXXXXXX									
3.21888	3	1.7	XXXXXXX									
3.25810	3	1.7	XXXXXXX									
3.29584	3	1.7	XXXXXXX									
3.36730	3	1.7	XXXXXXX									
3.40120	1	0.6	IXXX									
3.43399	1	0.6	IXXX									
3.46574	1	0.6	IXXX									
3.49651	1	0.6	IXXX									
3.52636	2	1.2	XXXXXX									
3.58352	2	1.2	XXXXXX									
3.61092	1	0.6	IXXX									
3.63759	1	0.6	IXXX									
3.66356	1	0.6	IXXX									
3.71357	1	0.6	IXXX									
3.82864	1	0.6	IXXX									
3.89182	1	0.6	IXXX									
3.91202	2	1.2	XXXXXX									
4.02535	1	0.6	IXXX									
4.24850	1	0.6	IXXX									
4.33073	1	0.6	IXXX									
4.65396	1	0.6	IXXX									
4.77068	1	0.6	IXXX									
TOTAL	173	100.0	+-----+-----+-----+-----+-----+-----+-----+-----+-----+									
			1	2	3	4	5	6	7	8	9	10

<<<<<< 21 PPM

DOE CLAIM-GROUP; SOIL SURVEY, NOVEMBER 1990, BY ICP  
 HISTOGRAM OF NICKEL VALUES IN SOIL

AT LEAST BUT NOT OVER:	FREQ	%	0	1	2	3	4	5	6	7	8	9	10
2.0000	1	0.6	XXX										
3.0000	5	2.8	XXXXXXXXXXXXXXXXXX										
4.0000	2	1.1	XXXXXX										
5.0000	7	3.9	XXXXXXXXXXXXXXXXXXXX										
6.0000	3	1.7	XXXXXXX										
7.0000	10	5.5	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX										
8.0000	10	5.5	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX										
9.0000	7	3.9	XXXXXXXXXXXXXXXXXXXX										
10.0000	10	5.5	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX										
11.0000	12	6.6	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX										
12.0000	8	4.4	XXXXXXXXXXXXXXXXXXXX										
13.0000	7	3.9	XXXXXXXXXXXXXXXXXXXX										
14.0000	10	5.5	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX										
15.0000	7	3.9	XXXXXXXXXXXXXXXXXXXX										
16.0000	10	5.5	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX										
17.0000	6	3.3	XXXXXXXXXXXXXXXXXXXX										
18.0000	5	2.8	XXXXXXXXXXXXXXXXXXXX										
19.0000	6	3.3	XXXXXXXXXXXXXXXXXXXX										
20.0000	5	2.8	XXXXXXXXXXXXXXXXXXXX										
21.0000	4	2.2	XXXXXXXXXXXX										
22.0000	3	1.7	XXXXXXX										
23.0000	4	2.2	XXXXXXXXXXXX										
24.0000	4	2.2	XXXXXXXXXXXX										
25.0000	3	1.7	XXXXXXX										
26.0000	3	1.7	XXXXXXX										
27.0000	4	2.2	XXXXXXXXXXXX										
29.0000	3	1.7	XXXXXXX										
30.0000	2	1.1	XXXXXX										
31.0000	1	0.6	XXX										
32.0000	1	0.6	XXX										
33.0000	1	0.6	XXX										
34.0000	2	1.1	XXXXXX										
36.0000	2	1.1	XXXXXX										
37.0000	1	0.6	XXX										
38.0000	1	0.6	XXX										
39.0000	1	0.6	XXX										
41.0000	1	0.6	XXX										
46.0000	1	0.6	XXX										
49.0000	1	0.6	XXX										
50.0000	2	1.1	XXXXXX										
56.0000	1	0.6	XXX										
70.0000	1	0.6	XXX										
76.0000	1	0.6	XXX										
105.000	1	0.6	XXX										
118.000	1	0.6	XXX										
TOTAL	181	100.0											

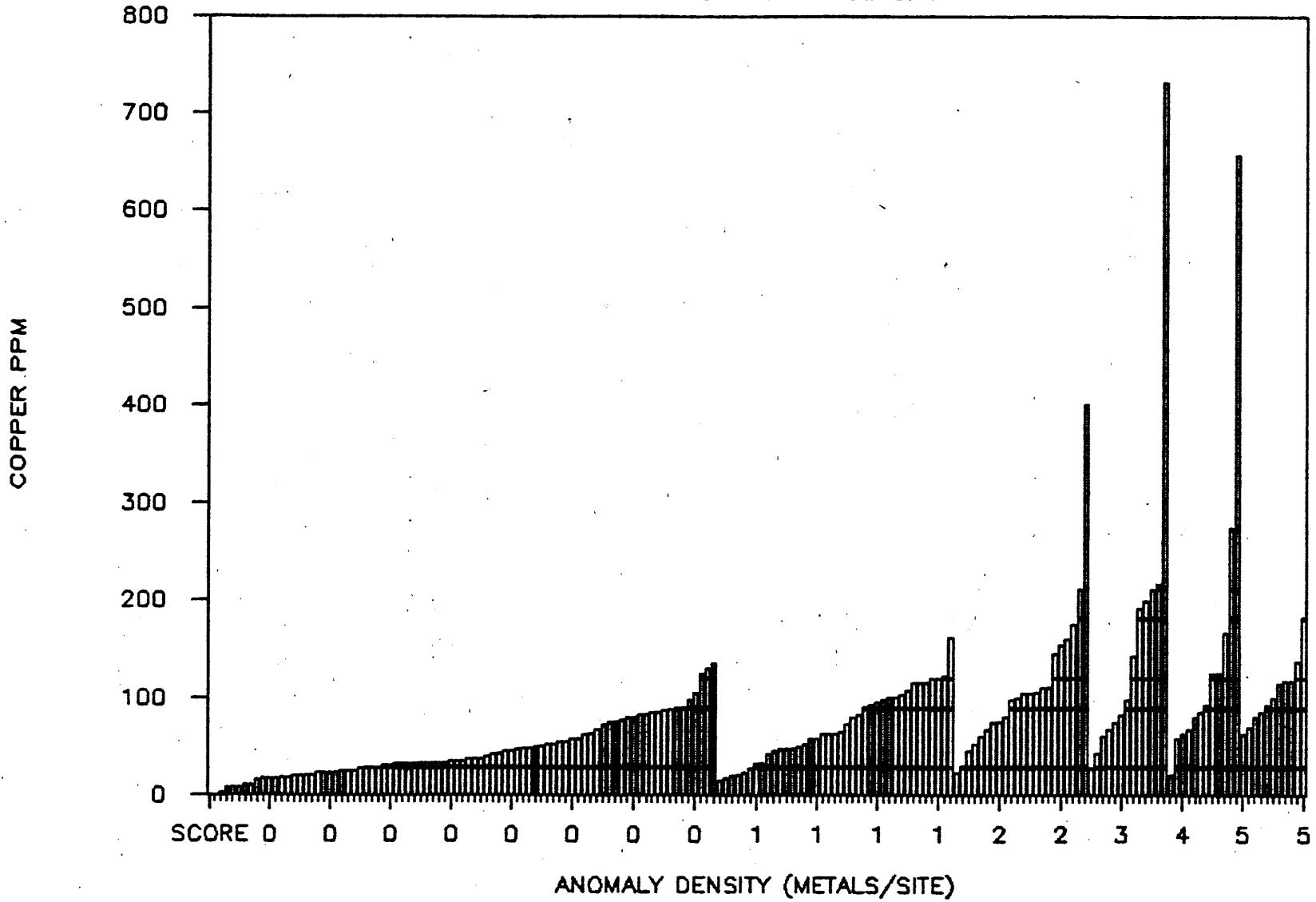
<<<<<<< 21 PPM

## APPENDIX 5

Anomaly Density Bar Graphs

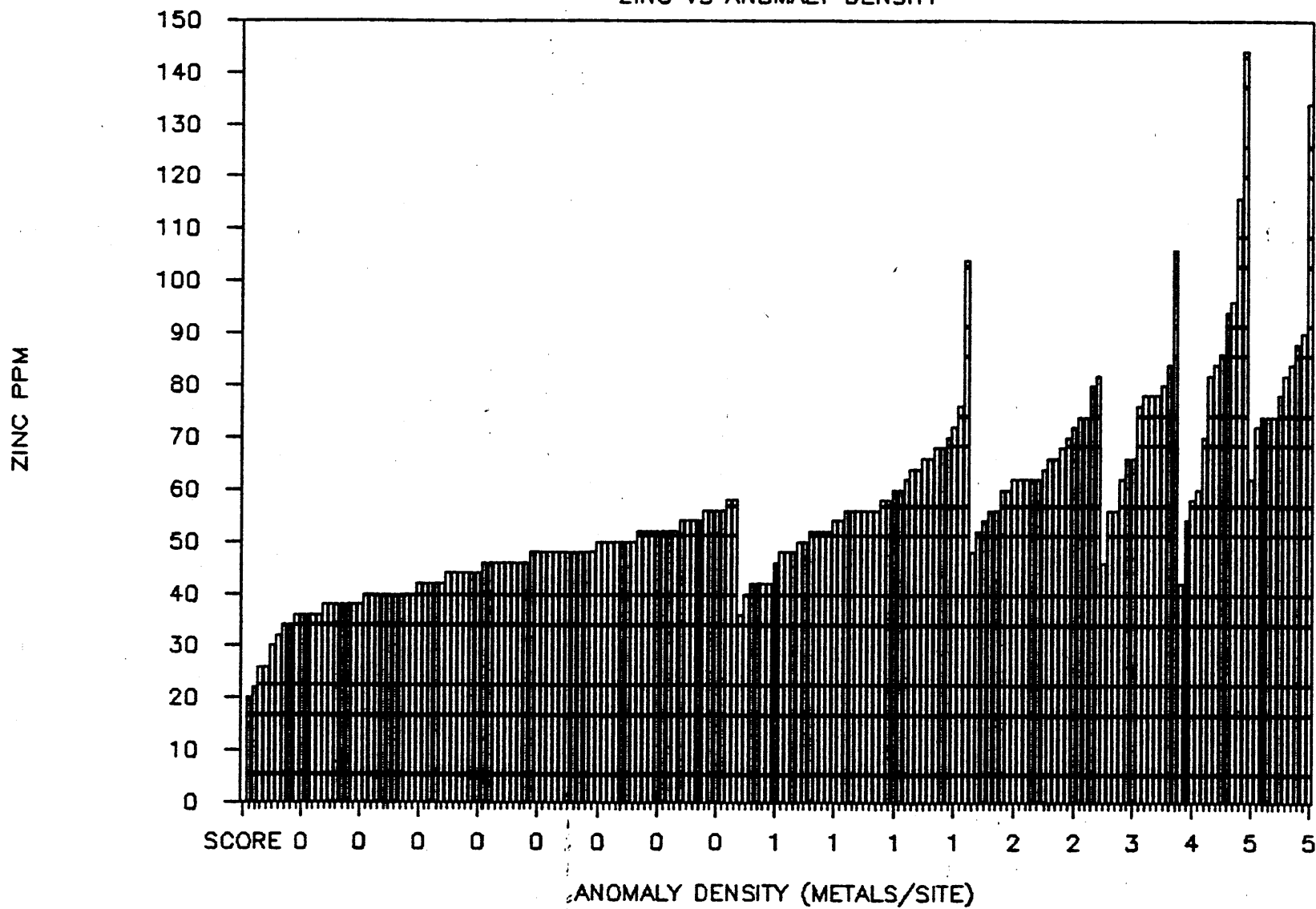
# DOE CLAIM-GROUP; SOIL ANALYSIS

## COPPER VS ANOMALY DENSITY



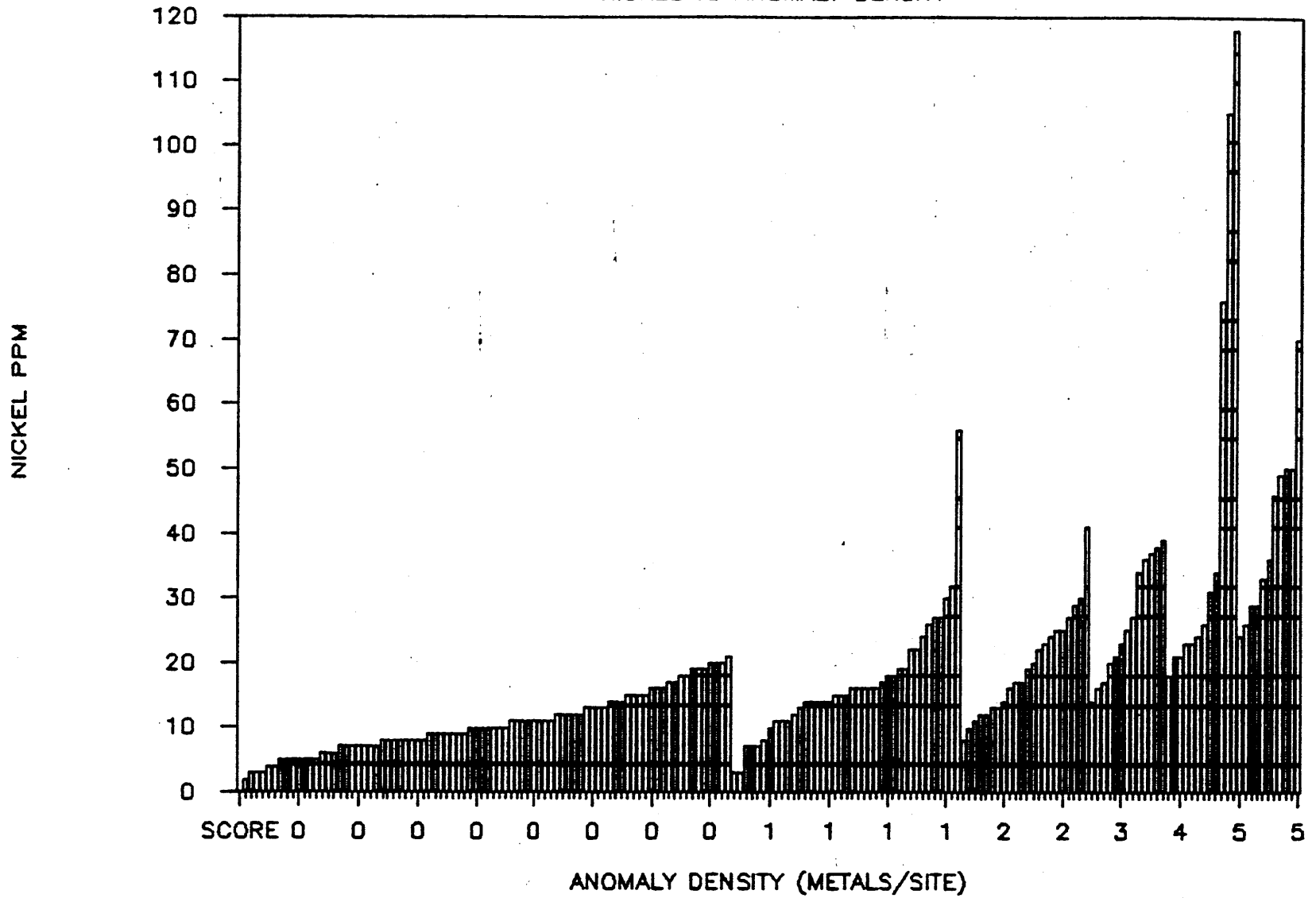
# DOE CLAIM-GROUP; SOIL ANALYSIS

## ZINC VS ANOMALY DENSITY



# DOE CLAIM-GROUP; SOIL ANALYSIS

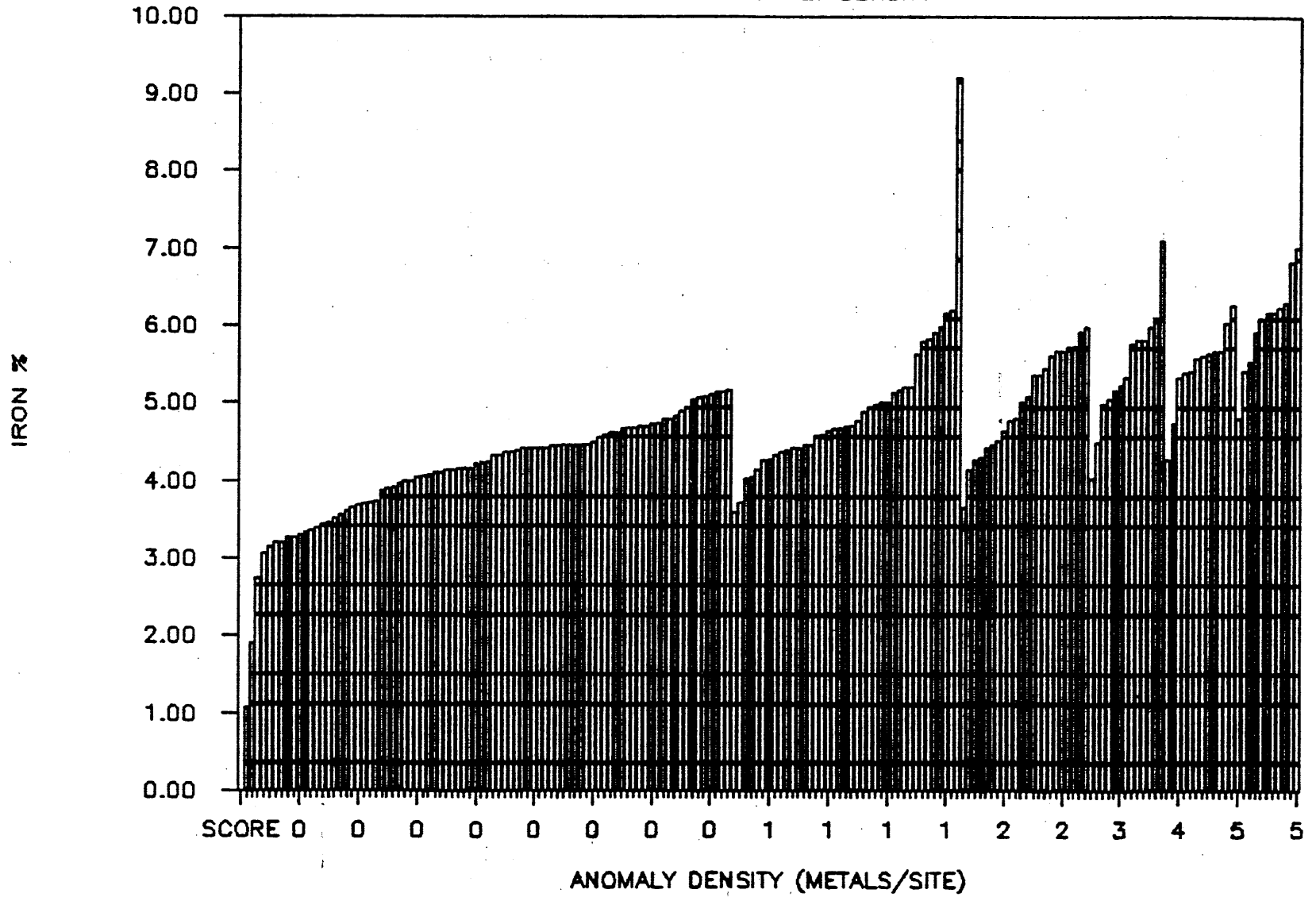
## NICKEL VS ANOMALY DENSITY





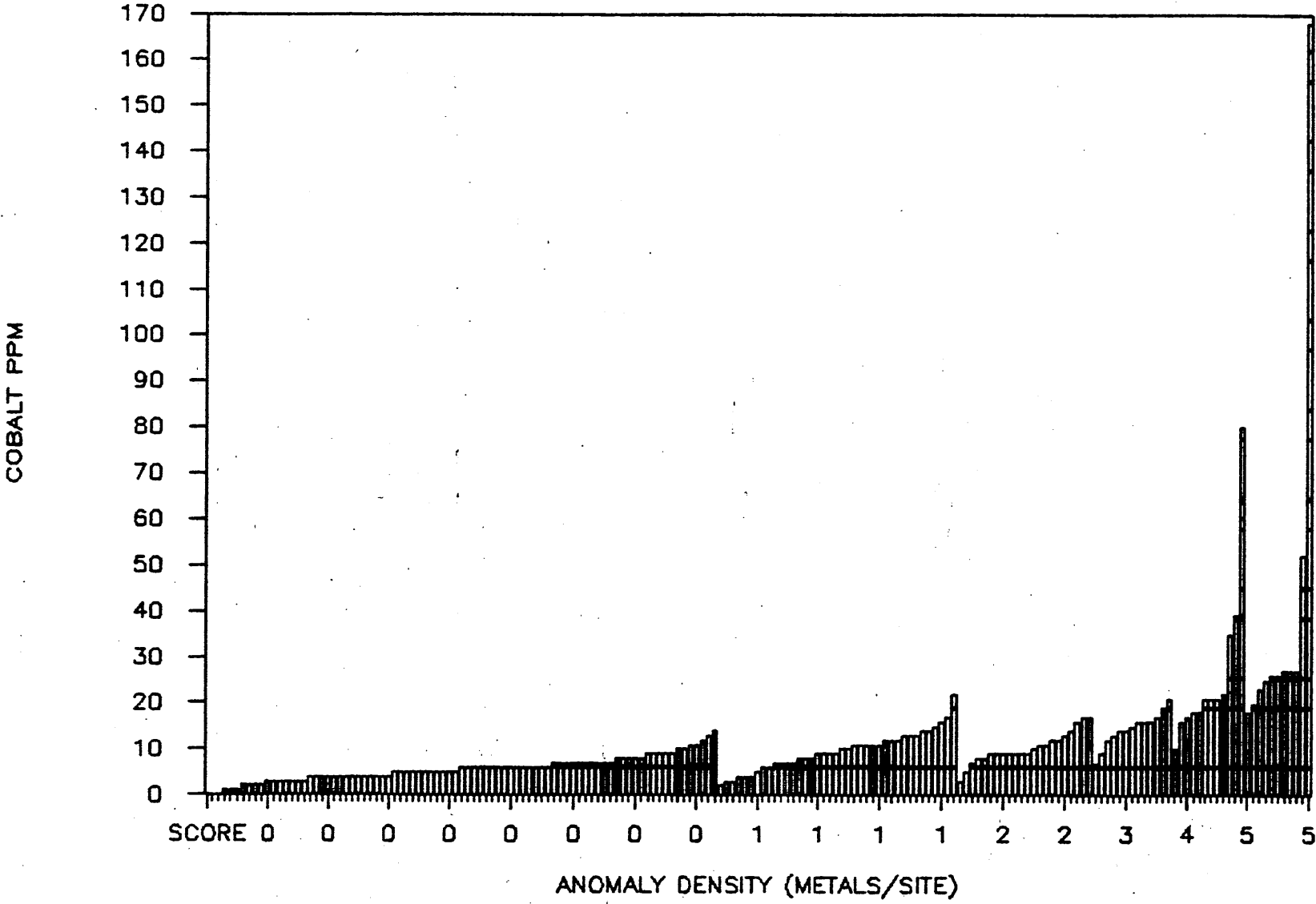
# DOE CLAIM-GROUP; SOIL ANALYSIS

## IRON VS ANOMALY DENSITY



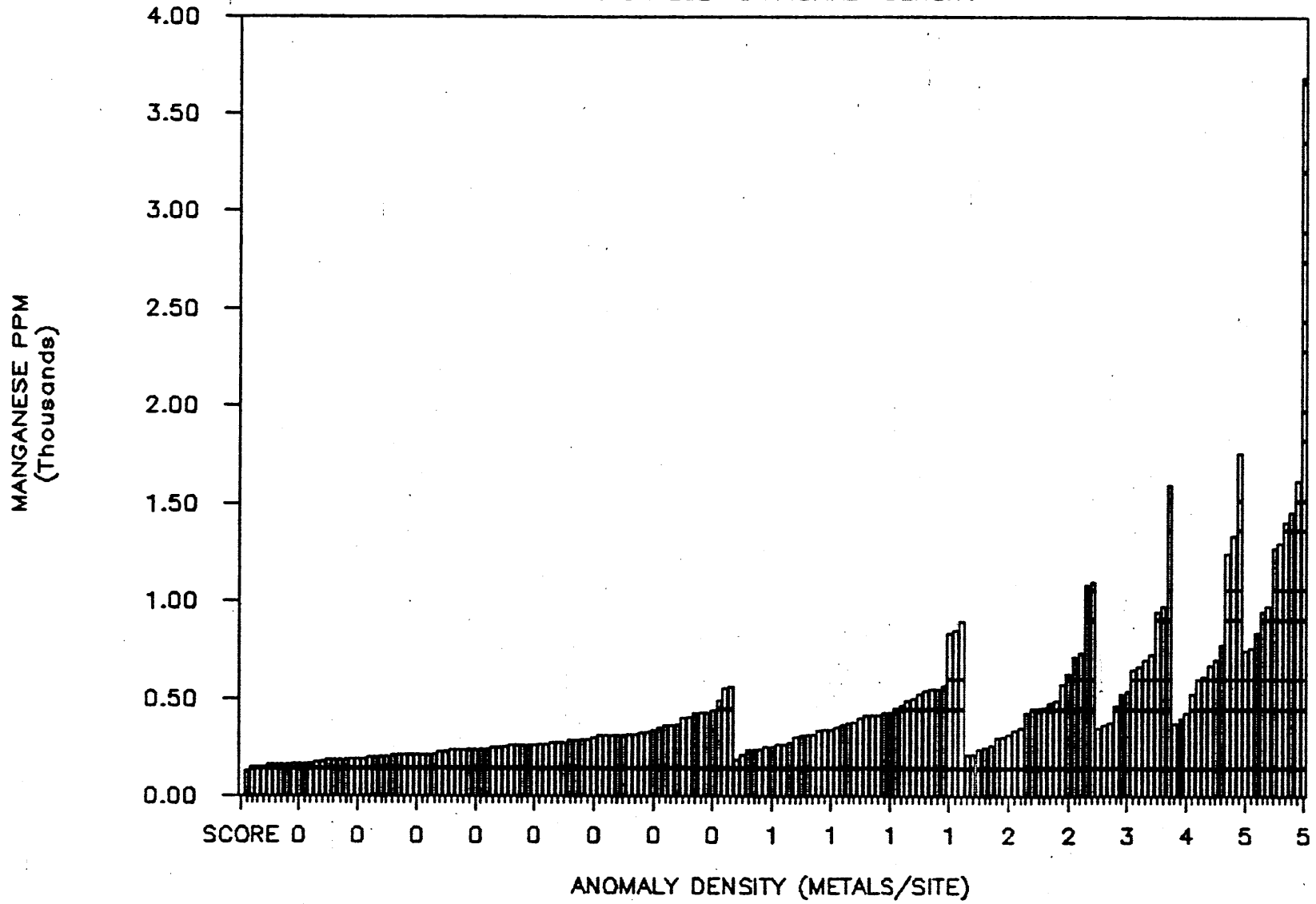
# DOE CLAIM-GROUP; SOIL ANALYSIS

## COBALT VS ANOMALY DENSITY



# DOE CLAIM-GROUP; SOIL ANALYSIS

## MANGANESE VS ANOMALY DENSITY

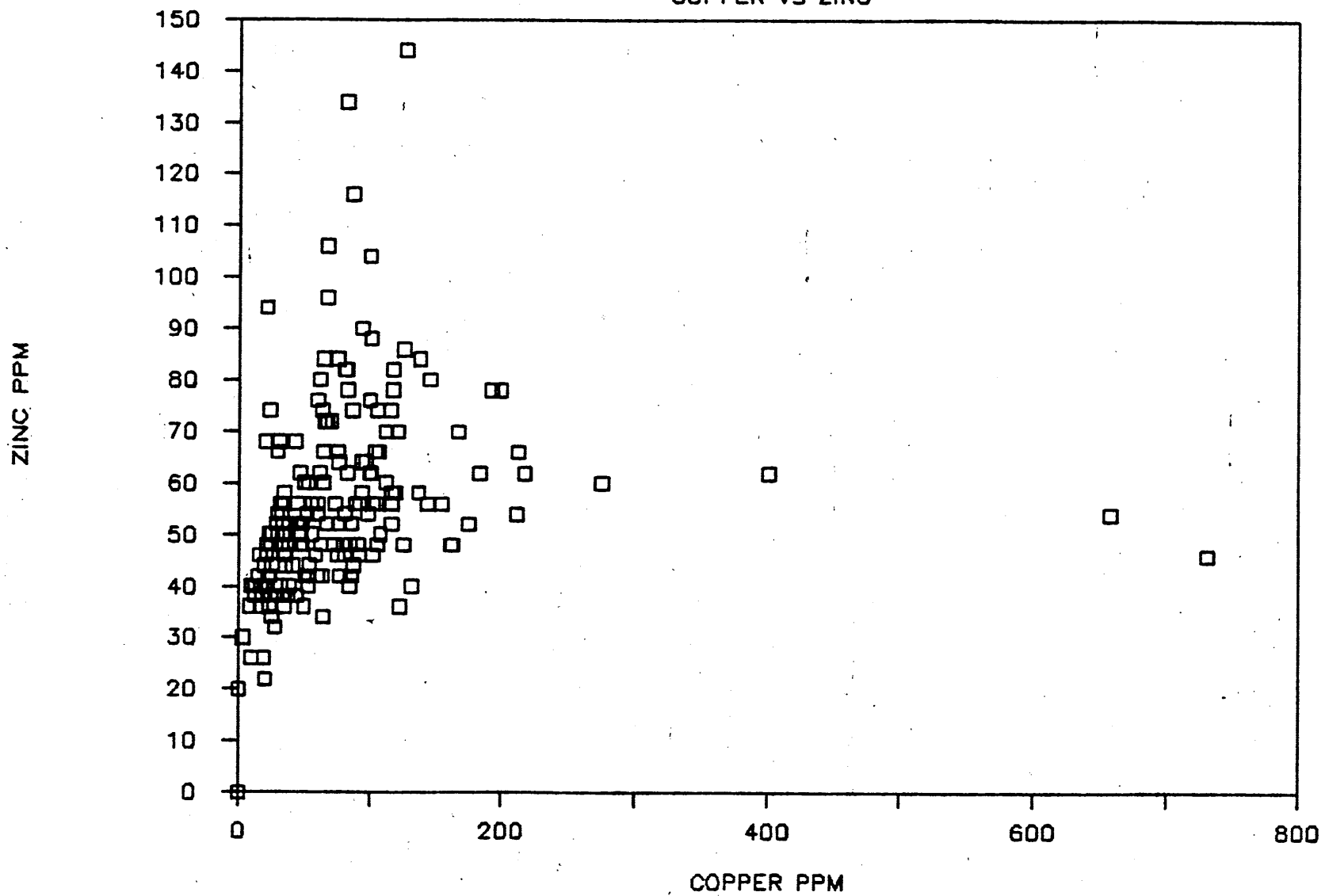


**APPENDIX 6**

**Scatter Plots of Selected Data**

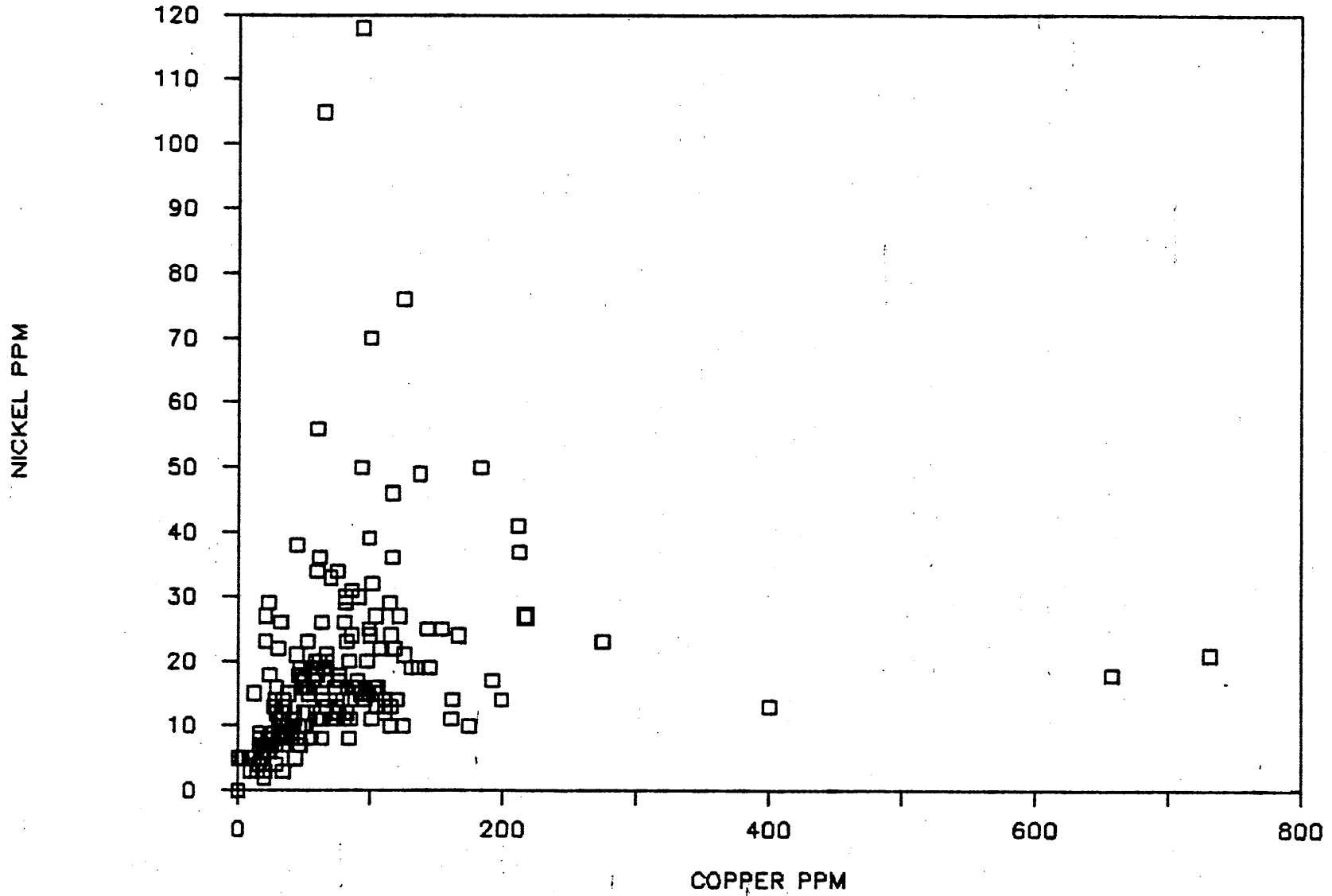
# DOE CLAIM-GROUP; SOIL ANALYSIS

## COPPER VS ZINC



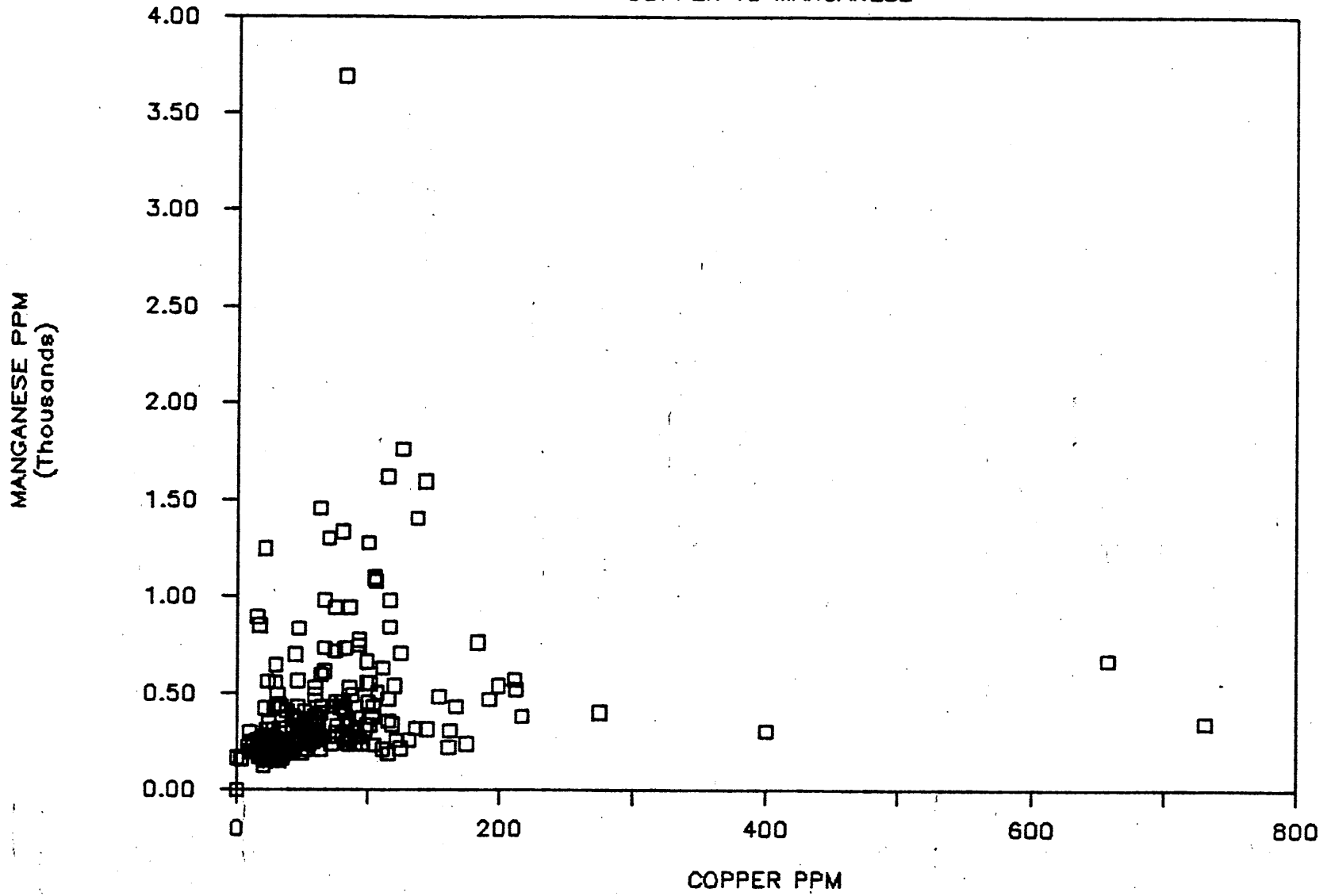
# DOE CLAIM-GROUP; SOIL ANALYSIS

## COPPER VS NICKEL



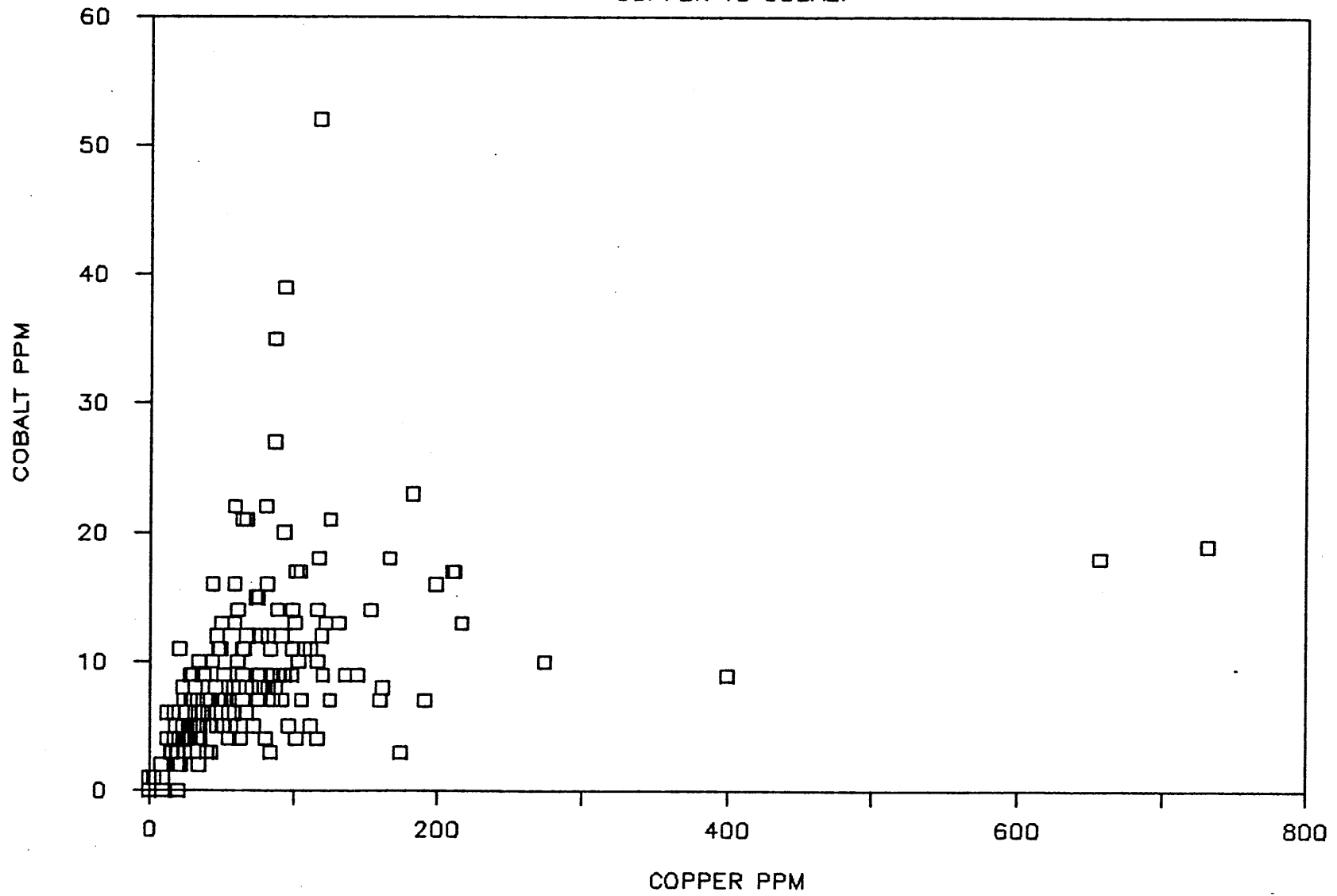
# DOE CLAIM-GROUP; SOIL ANALYSIS

## COPPER VS MANGANESE



# DOE CLAIM-GROUP; SOIL ANALYSIS

## COPPER VS COBALT





**APPENDIX 7**

**Certificates of Analysis**



# Chemex Labs Ltd.

Analytical Chemists \* Geochemists \* Registered Assayers  
212 Brooksbank Ave., North Vancouver  
British Columbia, Canada V7J 2C1  
PHONE: 604-984-0221

To: AUDET, ANDRE

\*

1936 WILLEMAR AVE.  
COURTENAY, BC  
V9N 3M6

INVOICE NUMBER

I 9 0 2 7 1 2 7

## BILLING INFORMATION

Date: 4-DEC-90  
Project: LEACH RIVER  
P.O. No.:  
Account: IAB

Comments:

Billing: For analysis performed on  
Certificate I9027127

Terms: Payment due on receipt of invoice  
1.5% per month (18% per annum)  
charged on overdue accounts

Please Remit Payments to:

**CHEMEX LABS LTD.**  
212 Brooksbank Ave.,  
North Vancouver, B.C.  
Canada V7J-2C1

CHEMEX CODE	ANALYSIS DESCRIPTION	SAMPLES ANALYSED	UNIT PRICE	AMOUNT
G24	- G-24 24 EL. ICP	1	11.00	11.00
Sample preparation and other charges.				
201	- -80 mesh sieve	1	1.00	1.00
Total Cost \$				12.00
<b>TOTAL PAYABLE (CDN) \$</b>				<b>12.00</b>



# Chemex Labs Ltd.

Analytical Chemists \* Geochemists \* Registered Assayers  
 212 Brooksbank Ave., North Vancouver  
 British Columbia, Canada V7J 2C1  
 PHONE: 604-984-0221

To: AUDET, ANDRE

1936 WILLEMAR AVE.  
 COURTENAY, BC  
 V9N 3M6

A9027127

Comments:

**CERTIFICATE**                      **A9027127**

AUDET, ANDRE

Project: LEACH RIVER  
 P.O. #:

Samples submitted to our lab in Vancouver, BC.  
 This report was printed on 4-DEC-90.

SAMPLE PREPARATION		
CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION
201	1	Dry, sieve to -80 mesh
232	1	PERCHLORIC-NITRIC-HYDROFLUORIC D

ANALYTICAL PROCEDURES					
CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION	METHOD	DETECTION LIMIT	UPPER LIMIT
578	1	Ag ppm: 24 element, rock & core	AAS	0.5	200
573	1	Al %: 24 element, rock & core	ICP-AES	0.01	25.0
565	1	Ba ppm: 24 element, rock & core	ICP-AES	10	10000
575	1	Be ppm: 24 element, rock & core	ICP-AES	0.5	10000
561	1	Bi ppm: 24 element, rock & core	ICP-AES	2	10000
576	1	Ca %: 24 element, rock & core	ICP-AES	0.01	25.0
562	1	Cd ppm: 24 element, rock & core	ICP-AES	0.5	10000
563	1	Co ppm: 24 element, rock & core	ICP-AES	1	10000
569	1	Cr ppm: 24 element, rock & core	ICP-AES	1	10000
577	1	Cu ppm: 24 element, rock & core	ICP-AES	1	10000
566	1	Fe %: 24 element, rock & core	ICP-AES	0.01	25.0
584	1	K %: 24 element, rock & core	ICP-AES	0.01	20.0
570	1	Mg %: 24 element, rock & core	ICP-AES	0.01	20.0
568	1	Mn ppm: 24 element, rock & core	ICP-AES	5	10000
554	1	Mo ppm: 24 element, rock & core	ICP-AES	1	10000
583	1	Na %: 24 element, rock & core	ICP-AES	0.01	5.00
564	1	Ni ppm: 24 element, rock & core	ICP-AES	1	10000
559	1	P ppm: 24 element, rock & core	ICP-AES	10	10000
560	1	Pb ppm: 24 element, rock & core	ICP-AES	2	10000
582	1	Sr ppm: 24 element, rock & core	ICP-AES	1	10000
579	1	Ti %: 24 element, rock & core	ICP-AES	0.01	10.00
572	1	V ppm: 24 element, rock & core	ICP-AES	1	10000
556	1	W ppm: 24 element, rock & core	ICP-AES	10	10000
558	1	Zn ppm: 24 element, rock & core	ICP-AES	2	10000



# Chemex Labs Ltd.

Analytical Chemists \* Geochemists \* Registered Assayers  
212 Brooksbank Ave., North Vancouver  
British Columbia, Canada V7J 2C1  
PHONE: 604-984-0221

To: AUDET, ANDRE

1936 WILLEMAR AVE.  
COURTENAY, BC  
V9N 3M6

Project : LEACH RIVER  
Comments:

Page Number : 1-A  
Total Pages : 1  
Invoice Date : 4-DEC-90  
Invoice No. : I-9027127  
P.O. Number :

## CERTIFICATE OF ANALYSIS

A9027127

SAMPLE DESCRIPTION	PREP CODE	Ag ppm AAS	Al % (ICP)	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Ca % (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	K % (ICP)	Mg % (ICP)	Mn ppm (ICP)
10+000 @ RD	201 232	< 0.5	8.50	370	< 0.5	< 2	2.69	< 0.5	18	87	86	5.52	0.63	1.95	850

CERTIFICATION:

*B. Coughlin*



# Chemex Labs Ltd.

Analytical Chemists \* Geochemists \* Registered Assayers  
212 Brooksbank Ave., North Vancouver  
British Columbia, Canada V7J 2C1  
PHONE: 604-984-0221

To: AUDET, ANDRE

1936 WILLEMAR AVE.  
COURTENAY, BC  
V9N 3M6

Project: LEACH RIVER  
Comments:

Page Number: 1-B  
Total Pages: 1  
Invoice Date: 4-DEC-90  
Invoice No.: I-9027127  
P.O. Number:

## CERTIFICATE OF ANALYSIS A9027127

SAMPLE DESCRIPTION	PREP CODE	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm (ICP)	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)				
10+000 @ RD	201 232	3	2.09	41	600	< 2	314	0.58	206	< 10	72				

CERTIFICATION: B. Coughlin



# Chemex Labs Ltd.

Analytical Chemists \* Geochemists \* Registered Assayers  
212 Brooksbank Ave., North Vancouver  
British Columbia, Canada V7J 2C1  
PHONE: 604-984-0221

To: AUDET, ANDRE

\*

1936 WILLEMAR AVE.  
COURTENAY, BC  
V9N 3M6

INVOICE NUMBER

I 9 0 2 7 1 2 5

## BILLING INFORMATION

Date: 30-NOV-90  
Project: LEACH RIVER  
P.O. No.:  
Account: IAB

Comments:

Billing: For analysis performed on  
Certificate I9027125

Terms: Payment due on receipt of invoice  
1.5% per month (18% per annum)  
charged on overdue accounts

Please Remit Payments to:

**CHEMEX LABS LTD.**  
212 Brooksbank Ave.,  
North Vancouver, B.C.  
Canada V7J-2C1

CHEMEX CODE	ANALYSIS DESCRIPTION	SAMPLES ANALYSED	UNIT PRICE	AMOUNT
100	- Au ppb FA+AA			
G7	- TR-7 AU RELATED	3	19.00	57.00
Sample preparation and other charges.				
205	- Geochem - RING	3	1.75	5.25
294	- Crush and split	3	2.25	6.75
			Total Cost \$	69.00
			<b>TOTAL PAYABLE (CDN) \$</b>	<b>69.00</b>



# Chemex Labs Ltd.

Analytical Chemists \* Geochemists \* Registered Assayers  
212 Brooksbank Ave., North Vancouver  
British Columbia, Canada V7J 2C1  
PHONE: 604-984-0221

To: AUDET, ANDRE  
1936 WILLEMAR AVE.  
COURTENAY, BC  
V9N 3M6

A9027125

Comments:

CERTIFICATE

A9027125

AUDET, ANDRE

Project: LEACH RIVER  
P.O. #:

Samples submitted to our lab in Vancouver, BC.  
This report was printed on 30-NOV-90.

## SAMPLE PREPARATION

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION
205	3	Geochem ring to approx 150 mesh
294	3	Crush and split (0-10 pounds)
238	3	NITRIC-AQUA REGIA DIGESTION
287	3	Special dig'n with organic ext'n

## ANALYTICAL PROCEDURES

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION	METHOD	DETECTION LIMIT	UPPER LIMIT
100	3	Au ppb: Fuse 10 g sample	FA-AAS	5	10000
6	3	Ag ppm: HNO3-aqua regia digest	AAS-BKGD CORR	0.2	100.0
13	3	As ppm: HNO3-aqua regia digest	AAS-HYDRIDE/EDL	1	10000
2	3	Cu ppm: HNO3-aqua regia digest	AAS	1	10000
3	3	Mo ppm: HNO3-aqua regia digest	AAS	1	1000
4	3	Pb ppm: HNO3-aqua regia digest	AAS-BKGD CORR	1	10000
22	3	Sb ppm: HCL-KClO3 digest, extrac	AAS-BKGD CORR	0.2	1000
5	3	Zn ppm: HNO3-aqua regia digest	AAS	1	10000



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V9N 3M6

Project : LEACH RIVER  
Comments:

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Invoice No. : I-9027125  
P.O. Number :

## CERTIFICATE OF ANALYSIS A9027125

SAMPLE DESCRIPTION	PREP CODE	Au ppb FA+AA	Ag ppm Aqua R	As ppm	Cu ppm	Mo ppm	Pb ppm	Sb ppm	Zn ppm		
1165	205 294	< 5	< 0.2	1	230	1	6	1.0	44		
1166	205 294	< 5	0.8	5	1500	< 1	3	0.4	40		
1167	205 294	< 5	0.2	1	1750	1	2	< 0.2	12		

CERTIFICATION: Hart Bickler





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1936 WILLEMAR AVE.  
COURTENAY, BC  
V9N 3M6

INVOICE NUMBER

I 9 0 2 7 1 2 6

## BILLING INFORMATION

Date: 28-NOV-90  
Project: LEACH RIVER  
P.O. No.:  
Account: IAB

Comments:

Billing: For analysis performed on  
Certificate I9027126

Terms: Payment due on receipt of invoice  
1.5% per month (18% per annum)  
charged on overdue accounts

Please Remit Payments to:

**CHEMEX LABS LTD.**  
212 Brooksbank Ave.,  
North Vancouver, B.C.  
Canada V7J-2C1

CHEMEX CODE	ANALYSIS DESCRIPTION	SAMPLES ANALYSED	UNIT PRICE	AMOUNT
G110	- TRACE-10 PACKAGE	173	8.00	1384.00
Sample preparation and other charges.				
201	- -80 mesh sieve	154	1.00	154.00
203	- -35 mesh sieve	19	0.75	14.25
205	- Geochem - RING	19	1.75	33.25
Total Cost \$				1585.50
<b>TOTAL PAYABLE (CDN) \$</b>				<b>1585.50</b>



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A9027126

Comments:

<b>CERTIFICATE</b>	<b>A9027126</b>
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AUDET, ANDRE

Project: LEACH RIVER  
 P.O. #:

Samples submitted to our lab in Vancouver, BC.  
 This report was printed on 28-NOV-90.

SAMPLE PREPARATION		
CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION
201	154	Dry, sieve to -80 mesh
203	19	Dry, sieve to -35 mesh
205	19	Geochem ring to approx 150 mesh
238	173	NITRIC-AQUA REGIA DIGESTION

ANALYTICAL PROCEDURES					
CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION	METHOD	DETECTION LIMIT	UPPER LIMIT
13	173	As ppm: HNO <sub>3</sub> -aqua regia digest	AAS-HYDRIDE/EDL	1	10000
1005	173	Ag ppm: 9 element, soil and rock	ICP-AES	0.5	200
1929	173	Co ppm: 9 element, soil & rock	ICP-AES	1	10000
1931	173	Cu ppm: 9 element, soil & rock	ICP-AES	1	10000
1932	173	Fe %: 9 element, soil & rock	ICP-AES	0.01	15.00
1937	173	Mn ppm: 9 element, soil & rock	ICP-AES	5	10000
1938	173	Mo ppm: 9 element, soil & rock	ICP-AES	1	10000
1940	173	Ni ppm: 9 element, soil & rock	ICP-AES	1	10000
1004	173	Pb ppm: 9 element, soil and rock	ICP-AES	5	10000
1950	173	Zn ppm: 9 element, soil & rock	ICP-AES	2	10000



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## CERTIFICATE OF ANALYSIS A9027126

SAMPLE DESCRIPTION	PREP CODE	As ppm	Ag ppm	Co ppm	Cu ppm	Fe %	Mn ppm	Mo ppm	Ni ppm	Pb ppm	Zn ppm
X1 0+00	201 238	2	< 0.5	4	23	3.44	170	< 1	8	8	42
X1 0+25	201 238	2	< 0.5	5	31	3.51	150	< 1	9	6	40
X1 0+50	201 238	1	< 0.5	6	25	4.00	150	< 1	9	4	44
X1 0+75	201 238	2	< 0.5	11	48	3.97	310	< 1	17	10	48
X1 1+00	201 238	1	< 0.5	6	50	4.14	185	< 1	10	< 2	42
X1 1+25	201 238	1	< 0.5	5	18	3.27	185	< 1	5	6	38
X1 1+50	201 238	2	< 0.5	6	46	4.90	325	< 1	10	6	48
X1 1+75	201 238	2	< 0.5	19	731	5.77	350	< 1	21	< 2	46
X1 2+00	201 238	2	< 0.5	7	64	4.11	210	< 1	11	4	34
X1 2+25	201 238	< 1	< 0.5	13	122	4.33	255	4	27	< 2	36
X1 2+50	201 238	1	< 0.5	13	131	4.61	260	< 1	19	< 2	40
X1 2+75	201 238	1	< 0.5	5	23	3.26	175	< 1	6	4	36
X1 3+00	201 238	1	< 0.5	6	37	3.72	190	< 1	8	4	38
X1 3+25	201 238	1	< 0.5	6	32	4.95	195	< 1	10	8	48
X1 3+50	201 238	3	< 0.5	22	59	6.27	375	< 1	34	4	42
X1 3+75	201 238	1	< 0.5	6	17	3.69	170	1	9	4	36
X1 4+00	201 238	3	< 0.5	13	50	5.13	320	4	16	2	42
X1 4+25	201 238	1	< 0.5	12	77	3.90	330	< 1	18	2	42
X1 4+50	201 238	1	< 0.5	8	162	4.37	305	< 1	14	6	48
X1 4+75	201 238	1	< 0.5	18	167	4.74	430	2	24	2	70
X1 5+00	201 238	1	< 0.5	9	400	4.42	305	3	13	6	62
X1 5+25	201 238	1	< 0.5	7	125	3.87	215	< 1	10	2	48
L10+000 10+825N	201 238	2	< 0.5	7	161	5.44	220	< 1	11	2	48
L10+000 10+850N	201 238	2	< 0.5	7	105	4.07	230	< 1	15	6	48
L10+000 10+875N	201 238	2	< 0.5	9	93	4.71	275	< 1	15	4	64
L10+000 10+900N	203 205	3	< 0.5	9	28	4.58	420	< 1	14	6	52
L10+000 10+925N	201 238	1	< 0.5	8	76	4.61	300	< 1	12	2	52
L10+000 10+950N	201 238	1	< 0.5	5	56	5.17	215	< 1	10	6	52
L10+100 10+725N	201 238	1	< 0.5	6	38	4.05	210	< 1	10	2	40
L10+100 10+750N	203 205	1	< 0.5	9	90	4.46	240	< 1	17	< 2	48
L10+100 10+775N	201 238	1	< 0.5	3	24	4.14	165	< 1	6	< 2	38
L10+100 10+800N	201 238	1	< 0.5	8	87	4.38	270	< 1	16	4	44
L10+100 10+825N	203 205	1	< 0.5	11	107	3.71	500	< 1	22	< 2	50
L10+100 10+850N	201 238	8	< 0.5	4	63	4.42	255	< 1	8	< 2	42
L10+100 10+875N	201 238	2	< 0.5	5	52	4.78	205	< 1	12	< 2	40
L10+200 10+650N	203 205	< 1	< 0.5	21	125	5.34	705	< 1	76	2	86
L10+200 10+675N	201 238	1	< 0.5	39	93	5.67	775	< 1	118	4	58
L10+200 10+700N	201 238	2	< 0.5	9	38	4.79	405	< 1	15	< 2	48
L10+200 10+725N	201 238	2	< 0.5	7	49	3.14	310	< 1	12	< 2	36
L10+200 10+750N	201 238	< 1	< 0.5	5	33	3.65	210	< 1	12	4	50

CERTIFICATION: B. Cough



# Chemex Labs Ltd.

Analytical Chemists \* Geochemists \* Registered Assayers  
 212 Brooksbank Ave., North Vancouver  
 British Columbia, Canada V7J 2C1  
 PHONE: 604-984-0221

To: AUDET, ANDRE

1936 WILLEMAR AVE.  
 COURTENAY, BC  
 V9N 3M6

Project : LEACH RIVER  
 Comments:

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 Total Pages : 5  
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 Invoice No. : I-9027126  
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## CERTIFICATE OF ANALYSIS A9027126

SAMPLE DESCRIPTION	PREP CODE	As ppm	Ag ppm	Co ppm	Cu ppm	Fe %	Mn ppm	Mo ppm	Ni ppm	Pb ppm	Zn ppm
L10+200 10+775N	201 238	1	< 0.5	7	53	4.47	285	< 1	15	< 2	44
L10+200 10+800N	201 238	1	< 0.5	7	85	4.68	240	< 1	11	< 2	42
L10+200 10+825N	201 238	2	< 0.5	5	34	4.37	170	< 1	10	< 2	38
L10+200 10+850N	201 238	1	< 0.5	9	98	4.73	310	< 1	20	< 2	54
L10+200 10+875N	201 238	1	< 0.5	8	79	4.45	425	< 1	14	< 2	48
L10+200 10+900N	203 205	1	< 0.5	10	44	4.33	360	< 1	21	< 4	52
L10+200 10+925N	203 205	1	< 0.5	17	212	5.06	520	< 1	37	< 2	66
L10+200 10+950N	201 238	1	< 0.5	7	48	5.63	235	< 1	16	< 2	52
L10+200 10+975N	203 205	1	< 0.5	7	24	6.16	345	< 1	18	< 4	48
L10+300 10+550N	201 238	1	< 0.5	6	17	4.68	850	< 1	7	< 8	40
L10+300 10+575N	201 238	1	< 0.5	12	47	4.88	835	< 1	19	< 2	50
L10+300 10+600N	203 205	1	< 0.5	17	21	5.40	1245	< 1	23	< 2	94
L10+300 10+625N	203 205	1	< 0.5	14	99	5.34	665	< 1	39	< 2	76
L10+300 10+650N	203 205	2	< 0.5	15	75	5.17	945	< 1	34	< 2	84
L10+300 10+675N	201 238	1	< 0.5	18	117	5.41	980	< 1	46	< 2	78
L10+300 10+700N	203 205	1	< 0.5	21	64	5.41	600	< 1	105	< 2	84
L10+300 10+725N	201 238	2	< 0.5	17	101	4.67	550	< 1	32	< 4	56
L10+300 10+725NN	201 238	1	< 0.5	6	55	4.59	275	< 1	19	< 4	56
L10+300 10+750N	201 238	2	< 0.5	6	12	4.42	240	< 1	15	< 6	40
L10+300 10+775N	201 238	1	< 0.5	7	52	5.79	245	< 1	16	< 2	42
L10+300 10+800N	201 238	2	< 0.5	3	20	4.47	150	< 1	6	< 8	40
L10+300 10+825N	201 238	1	< 0.5	8	62	4.47	350	< 1	11	< 6	48
L10+300 10+850N	201 238	1	< 0.5	7	31	5.17	440	< 1	11	< 4	56
L10+300 10+875N	201 238	1	< 0.5	10	103	5.20	375	< 1	16	< 6	66
L10+300 10+900N	203 205	1	< 0.5	14	88	4.15	490	< 1	16	< 2	56
L10+300 10+950N	203 205	1	< 0.5	13	59	4.46	490	< 1	18	< 6	76
L10+400 10+400N	201 238	1	< 0.5	11	84	4.10	335	< 1	20	< 2	48
L10+400 10+425N	201 238	1	< 0.5	168	81	5.93	3690	< 1	29	< 10	134
L10+400 10+450N	203 205	1	< 0.5	21	67	4.99	980	< 1	20	< 6	106
L10+400 10+500N	201 238	2	< 0.5	25	70	6.17	1300	< 1	33	< 4	72
L10+400 10+525N	203 205	1	< 0.5	27	115	6.29	1620	< 1	29	< 8	74
L10+400 10+550N	201 238	2	< 0.5	27	137	6.83	1405	< 1	49	< 2	84
L10+400 10+575N	203 205	2	< 0.5	26	63	6.17	1455	< 1	26	< 4	74
L10+400 10+600N	201 238	1	< 0.5	23	183	4.81	760	< 1	50	< 2	62
L10+400 10+625N	201 238	1	< 0.5	16	59	4.47	525	< 1	56	< 2	56
L10+400 10+650N	203 205	1	< 0.5	11	21	4.42	420	< 1	27	< 2	48
L10+400 10+675N	203 205	30	< 0.5	16	44	4.03	700	< 1	38	< 2	56
L10+400 10+700N	201 238	1	< 0.5	4	25	4.42	170	< 1	8	< 2	34
L10+400 10+725N	201 238	1	< 0.5	7	75	4.46	275	< 1	13	< 2	46
L10+400 10+750N	203 205	1	< 0.5	13	100	4.77	450	< 1	24	< 2	62

CERTIFICATION: B. Coughlin



# Chemex Labs Ltd.

Analytical Chemists \* Geochemists \* Registered Assayers  
 212 Brooksbank Ave., North Vancouver  
 British Columbia, Canada V7J 2C1  
 PHONE: 604-984-0221

To: AUDET, ANDRE

1936 WILLEMAR AVE.  
 COURTENAY, BC  
 V9N 3M6

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 Invoice No. : I-9027126  
 P.O. Number :

Project : LEACH RIVER  
 Comments :

## CERTIFICATE OF ANALYSIS A9027126

SAMPLE DESCRIPTION	PREP CODE	As ppm	Ag ppm	Co ppm	Cu ppm	Fe %	Mn ppm	Mo ppm	Ni ppm	Pb ppm	Zn ppm
L10+400 10+775N	201 238	< 2	< 0.5	10	116	6.21	355	< 1	13	< 2	58
L10+400 10+800N	201 238	< 1	< 0.5	4	12	3.99	250	< 1	5	2	38
L10+400 10+825N	201 238	< 1	< 0.5	4	17	5.11	240	< 1	8	8	40
L10+400 10+850N	201 238	< 1	< 0.5	6	25	4.68	265	< 1	8	6	50
L10+500 10+300N	201 238	< 1	< 0.5	5	35	4.44	215	< 1	13	2	50
L10+500 10+325N	201 238	< 1	< 0.5	15	73	9.20	430	< 1	16	8	56
L10+500 10+350N	201 238	< 1	< 0.5	21	67	5.61	615	< 1	21	4	96
L10+500 10+375N	201 238	< 1	< 0.5	3	19	4.06	230	< 1	5	4	44
L10+500 10+400N	201 238	< 1	< 0.5	5	51	5.09	400	< 1	10	2	54
L10+500 10+425N	201 238	< 1	< 0.5	26	100	7.01	1275	< 1	70	< 2	88
L10+500 10+450N	201 238	< 1	< 0.5	27	86	6.23	945	< 1	24	6	74
L10+500 10+475N	201 238	2	< 0.5	16	143	6.11	1595	< 1	25	4	56
L10+500 10+500N	201 238	1	< 0.5	16	80	5.65	1335	< 1	26	< 2	82
L10+500 10+525N	201 238	1	< 0.5	12	82	4.49	730	< 1	23	2	78
L10+500 10+550N	201 238	1	< 0.5	9	64	4.38	395	< 1	14	4	66
L10+500 10+575N	201 238	< 1	< 0.5	4	35	4.41	200	< 1	9	< 2	44
L10+500 10+600NN	201 238	2	< 0.5	17	211	4.27	570	< 1	41	< 2	54
L10+500 10+600NS	201 238	1	< 0.5	9	52	4.81	350	< 1	23	< 2	60
L10+500 10+625N	201 238	2	< 0.5	11	99	5.08	335	< 1	25	2	62
L10+500 10+650N	201 238	1	< 0.5	4	34	3.20	165	< 1	9	8	36
L10+500 10+700N	201 238	< 2	< 0.5	8	58	5.07	250	< 1	20	2	46
L10+600 10+225N	201 238	< 1	< 0.5	6	46	5.98	565	< 1	7	6	52
L10+600 10+250N	201 238	< 1	< 0.5	4	29	4.15	195	< 1	7	4	38
L10+600 10+275N	201 238	< 1	< 0.5	80	126	5.58	1760	< 1	21	6	144
L10+600 10+300N	201 238	1	< 0.5	52	117	6.09	840	< 1	36	2	82
L10+600 10+325N	201 238	1	< 0.5	35	86	6.04	525	< 1	31	6	116
L10+600 10+350N	201 238	1	< 0.5	22	80	4.57	455	< 1	11	2	54
L10+600 10+375N	201 238	1	< 0.5	9	145	5.67	315	< 1	19	4	80
L10+600 10+400N	201 238	1	< 0.5	11	65	5.17	430	< 1	19	6	72
L10+600 10+425N	201 238	1	< 0.5	4	80	4.37	285	< 1	11	6	46
L10+600 10+450N	201 238	1	< 0.5	6	46	4.70	430	< 1	18	6	52
L10+600 10+475N	201 238	1	< 0.5	8	32	4.02	315	< 1	26	2	54
L10+600 10+500N	201 238	1	< 0.5	9	85	4.33	360	< 1	14	2	52
L10+600 10+525N	201 238	2	< 0.5	12	67	5.36	735	< 1	17	4	72
L10+600 10+550N	201 238	1	< 0.5	20	93	5.54	745	< 1	50	< 2	90
L10+600 10+575N	201 238	1	< 0.5	9	120	5.20	540	< 1	14	< 2	70
L10+600 10+600N	201 238	2	< 0.5	14	116	4.27	470	< 1	24	< 2	52
L10+600 10+625N	201 238	2	< 0.5	8	82	4.69	415	< 1	12	< 2	62
L10+600 10+650N	201 238	2	< 0.5	9	76	5.93	455	< 1	17	< 2	64
L10+600 10+675N	201 238	1	< 0.5	5	47	4.16	365	< 1	7	4	52

CERTIFICATION: \_\_\_\_\_

*B. Coughlin*



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## CERTIFICATE OF ANALYSIS A9027126

SAMPLE DESCRIPTION	PREP CODE	As ppm	Ag ppm	Co ppm	Cu ppm	Fe %	Mn ppm	Mo ppm	Ni ppm	Pb ppm	Zn ppm
L10+600 10+700N	201 238	1	< 0.5	4	35	3.73	205	2	7	< 2	46
L10+675 10+600N	201 238	2	< 0.5	14	61	5.99	370	1	36	4	80
L10+700 10+000N	201 238	2	< 0.5	13	217	5.22	380	1	27	2	62
L10+700 10+025N	201 238	1	< 0.5	6	59	4.83	270	1	11	< 2	54
L10+700 10+050N	201 238	1	< 0.5	5	111	5.68	210	1	12	< 2	60
L10+700 10+075N	201 238	1	< 0.5	2	19	5.15	180	3	7	< 2	26
L10+700 10+100N	201 238	1	< 0.5	6	67	4.50	275	1	13	< 2	52
L10+700 10+125N	201 238	1	< 0.5	7	29	4.74	265	1	12	< 2	54
L10+700 10+150N	201 238	1	< 0.5	10	61	5.98	300	2	20	< 2	62
L10+700 10+175N	201 238	1	< 0.5	12	106	4.29	1080	1	16	< 2	66
L10+700 10+200N	201 238	1	< 0.5	9	75	4.51	715	1	12	4	66
L10+700 10+250N	201 238	1	< 0.5	7	91	4.70	320	1	16	< 2	46
L10+700 10+275N	201 238	1	< 0.5	9	136	5.04	320	< 1	19	< 2	58
L10+700 10+300N	201 238	1	< 0.5	7	42	4.63	380	< 1	11	< 2	68
L10+700 10+325N	201 238	1	< 0.5	4	34	4.66	215	< 1	11	< 2	50
L10+700 10+350N	201 238	1	< 0.5	2	22	3.07	310	< 1	7	< 2	42
L10+700 10+375N	201 238	2	< 0.5	12	119	4.77	340	1	22	< 2	58
L10+700 10+400N	201 238	2	< 0.5	10	275	5.67	400	< 1	23	4	60
L10+700 10+425N	201 238	1	< 0.5	4	101	5.90	335	< 1	11	< 2	46
L10+700 10+450N	201 238	1	< 0.5	7	192	5.81	465	< 1	17	< 2	78
L10+700 10+475N	201 238	1	< 0.5	4	23	4.56	560	< 1	7	8	50
L10+700 10+500N	201 238	1	< 0.5	9	105	4.14	1100	< 1	13	2	74
L10+700 10+525N	201 238	2	< 0.5	11	111	4.63	630	< 1	14	4	70
L10+700 10+550N	201 238	2	< 0.5	14	154	4.46	480	< 1	25	6	56
L10+700 10+575N	201 238	1	< 0.5	4	33	4.41	430	< 1	9	4	52
L10+700 10+600N	201 238	2	< 0.5	12	91	4.94	370	< 1	30	4	56
L11+400 10+025N	201 238	1	< 0.5	9	29	5.82	645	< 1	16	2	66
L11+400 10+050N	201 238	1	< 0.5	16	199	7.10	540	< 1	14	6	78
L11+400 10+075N	201 238	1	< 0.5	3	175	5.74	240	< 1	10	< 2	52
L11+400 10+100N	201 238	< 1	< 0.5	4	116	5.83	185	< 1	10	< 2	56
L11+400 10+125N	201 238	< 1	< 0.5	4	27	3.36	310	< 1	13	2	32
L11+400 10+150N	201 238	1	< 0.5	3	40	3.70	190	< 1	8	2	44
L11+400 10+175N	201 238	1	< 0.5	5	72	4.23	235	< 1	11	4	48
L11+400 10+200N	201 238	1	< 0.5	4	55	3.45	235	< 1	8	4	50
L11+400 10+225N	201 238	1	< 0.5	1	3	1.89	160	< 1	5	6	30
L11+400 10+250N	201 238	1	< 0.5	3	84	3.21	255	< 1	8	8	40
L11+400 10+275N	201 238	2	< 0.5	5	96	4.28	235	< 1	14	6	64
L11+400 10+300N	201 238	< 1	< 0.5	2	8	3.29	220	< 1	5	8	36
L11+400 10+325N	201 238	< 1	< 0.5	6	32	2.73	290	< 1	9	10	56
L11+400 10+350N	201 238	1	< 0.5	8	46	5.72	260	< 1	8	4	62

CERTIFICATION:

*B. Coughlin*



# Chemex Labs Ltd.

Analytical Chemists \* Geochemists \* Registered Assayers  
212 Brooksbank Ave., North Vancouver  
British Columbia, Canada V7J 2C1  
PHONE: 604-984-0221

To: AUDET, ANDRE

1936 WILLEMAR AVE.  
COURTENAY, BC  
V9N 3M6

Project : LEACH RIVER  
Comments:

Page Number : 5  
Total Pages : 5  
Invoice Date: 28-NOV-90  
Invoice No. : I-9027126  
P.O. Number :

## CERTIFICATE OF ANALYSIS

A9027126

SAMPLE DESCRIPTION	PREP CODE	As ppm	Ag ppm	Co ppm	Cu ppm	Fe %	Mn ppm	Mo ppm	Ni ppm	Pb ppm	Zn ppm
L11+400 10+375N	201 238	< 1	< 0.5	2	21	4.41	195	< 1	3	6	46
L11+400 10+425N	201 238	< 1	< 0.5	8	23	5.00	250	< 1	29	4	74
L11+400 10+450N	201 238	< 1	< 0.5	1	< 1	1.07	165	< 1	5	< 2	20
L11+400 10+475N	201 238	< 1	< 0.5	< 1	20	4.21	130	< 1	2	2	22
L11+400 10+500N	201 238	< 1	< 0.5	< 1	9	3.33	200	< 1	3	4	26
L11+400 10+525N	201 238	< 1	< 0.5	9	30	3.65	490	< 1	22	8	68
L11+400 10+550N	201 238	< 1	< 0.5	1	9	3.57	295	1	3	8	40
L11+400 10+575N	201 238	1	< 0.5	3	20	4.04	270	1	7	8	68
L11+400 10+600N	201 238	2	< 0.5	2	34	4.14	215	1	3	12	56
L11+400 10+625N	201 238	2	< 0.5	5	29	5.14	555	1	4	4	50
L11+400 10+650N	201 238	2	< 0.5	3	15	3.59	895	1	3	4	42
L11+400 10+675N	201 238	2	< 0.5	3	43	3.39	210	2	5	8	38
L11+400 10+700N	201 238	2	< 0.5	3	16	4.24	260	2	4	10	46

CERTIFICATION:

*B. Coughlin*



# Chemex Labs Ltd.

Analytical Chemists \* Geochemists \* Registered Assayers  
212 Brooksbank Ave., North Vancouver  
British Columbia, Canada V7J 2C1  
PHONE: 604-984-0221

To: AUDET, ANDRE

\*

1936 WILLEMAR AVE.  
COURTENAY, BC  
V9N 3M6

INVOICE NUMBER

I 9 0 2 7 3 4 6

## BILLING INFORMATION

Date: 6-DEC-90  
Project: LEACH  
P.O. No.:  
Account: IAB

Comments:

Billing: For analysis performed on  
Certificate I9027346

Terms: Payment due on receipt of invoice  
1.5% per month (18% per annum)  
charged on overdue accounts

Please Remit Payments to:

**CHEMEX LABS LTD.**  
212 Brooksbank Ave.,  
North Vancouver, B.C.  
Canada V7J-2C1

CHEMEX CODE	ANALYSIS DESCRIPTION	SAMPLES ANALYSED	UNIT PRICE	AMOUNT
G110	- TRACE-10 PACKAGE	8	8.00	64.00
	Sample preparation and other charges.			
201	- -80 mesh sieve	8	1.00	8.00
			Total Cost \$	72.00
			<b>TOTAL PAYABLE (CDN) \$</b>	<b>72.00</b>





# Chemex Labs Ltd.

Analytical Chemists \* Geochemists \* Registered Assayers  
212 Brooksbank Ave., North Vancouver  
British Columbia, Canada V7J 2C1  
PHONE: 604-984-0221

To: AUDET, ANDRE

1936 WILLEMAR AVE.  
COURTENAY, BC  
V9N 3M6

A9027346

Comments:

CERTIFICATE

A9027346

AUDET, ANDRE

Project: LEACH  
P.O. #:

Samples submitted to our lab in Vancouver, BC.  
This report was printed on 6-DEC-90.

## SAMPLE PREPARATION

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION
201	8	Dry, sieve to -80 mesh
238	8	NITRIC-AQUA REGIA DIGESTION

## ANALYTICAL PROCEDURES

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION	METHOD	DETECTION LIMIT	UPPER LIMIT
13	8	As ppm: HNO3-aqua regia digest	AAS-HYDRIDE/EDL	1	10000
1005	8	Ag ppm: 9 element, soil and rock	ICP-AES	0.5	200
1929	8	Co ppm: 9 element, soil & rock	ICP-AES	1	10000
1931	8	Cu ppm: 9 element, soil & rock	ICP-AES	1	10000
1932	8	Fe %: 9 element, soil & rock	ICP-AES	0.01	15.00
1937	8	Mn ppm: 9 element, soil & rock	ICP-AES	5	10000
1938	8	Mo ppm: 9 element, soil & rock	ICP-AES	1	10000
1940	8	Ni ppm: 9 element, soil & rock	ICP-AES	1	10000
1004	8	Pb ppm: 9 element, soil and rock	ICP-AES	5	10000
1950	8	Zn ppm: 9 element, soil & rock	ICP-AES	2	10000



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1936 WILLEMAR AVE.  
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Page Number : 1  
Total Pages : 1  
Invoice Date: 6-DEC-90  
Invoice No. : I-9027346  
P.O. Number :

Project : LEACH  
Comments:

## CERTIFICATE OF ANALYSIS A9027346

SAMPLE DESCRIPTION	PREP CODE		As ppm	Ag ppm	Co ppm	Cu ppm	Fe %	Mn ppm	Mo ppm	Ni ppm	Pb ppm	Zn ppm
BL10+425	201	238	1	< 0.5	10	34	3.92	260	1	14	< 2	58
BL10+450	201	238	1	< 0.5	17	104	5.62	430	1	27	< 2	56
BL10+525	201	238	3	< 0.5	18	657	4.28	670	< 1	18	< 2	54
BL10+550	201	238	1	< 0.5	6	34	3.61	235	< 1	7	< 2	46
BL10+575	201	238	1	< 0.5	14	99	5.00	550	< 1	15	< 2	104
BL10+625	201	238	2	< 0.5	16	81	5.36	450	< 1	30	< 2	82
BL10+650	201	238	2	< 0.5	11	64	4.97	270	1	15	< 2	60
BL10+675	201	238	1	< 0.5	11	49	5.01	310	1	17	< 2	60

CERTIFICATION:

*B. Coughlin*

**CERTIFICATE**

I, Andre J. Audet, of the Township of Courtenay, Province of British Columbia, hereby certify as follows:

I am a geological engineer residing at 1936 Willemer Avenue, Courtenay, British Columbia.

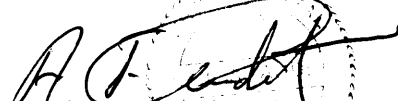
I am a member in good standing of the Association of Professional Engineers of British Columbia.

I am a graduate of the University of British Columbia, Faculty of Applied Science, and I have practiced my profession continuously since 1972.

Information given in this report was drawn from both published and unpublished material relating to the area and from field observations.

I have no direct interest in Breakwater Resources Ltd. nor do I expect to receive any such interest.

Dated at Courtenay, B.C., this the 20th day of December 1990.

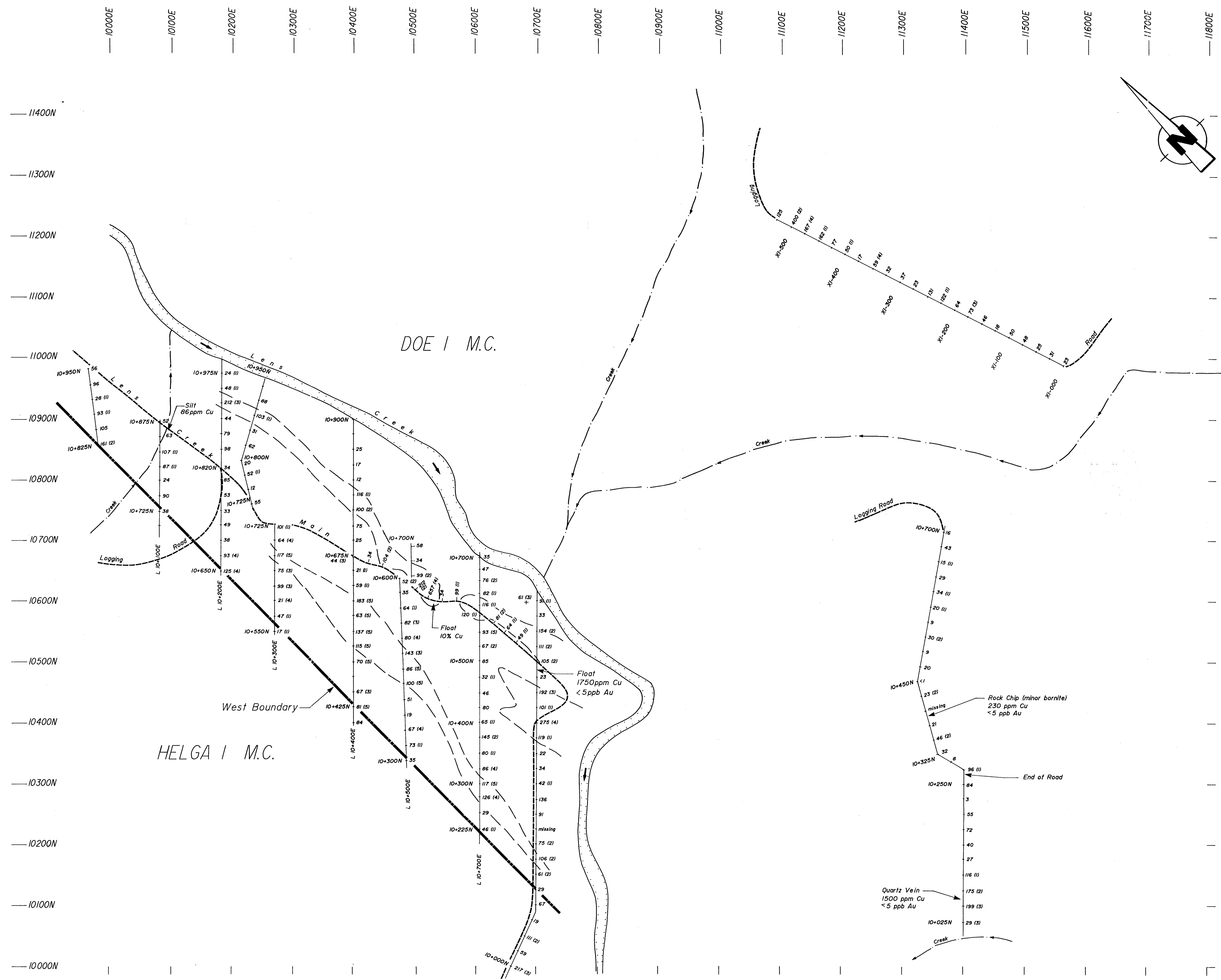
  
Andre J. Audet P.Eng.

Appendix 9

STATEMENT OF EXPENDITURES

Fees	A. J. Audet 8 days @ \$400/day	\$3,200
Lodging	5 days	159.84
Meals		106.98
Transportation		496.50
Field Supplies and Consumables		77.35
Shipping		20.85
Draughting and Reproduction		300.00
Analytical Costs		
	181 soil	1,657.50
	3 rock	69.00
	1 silt	12.00
		-----
TOTAL	.....	\$6,100.00

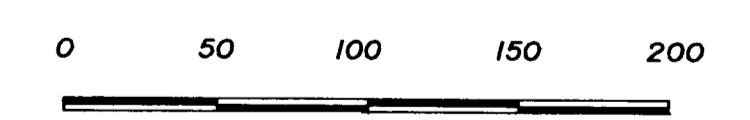




- LEGEND**
- 10+325N Sample Location
  - 67(3) Copper ppm (N° of Anomalous Values at the Site)
  - 100 ppm Copper Contour (Approximate)

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

**20,875**



BREAKWATER RESOURCES LTD.	
DOE CLAM GROUP	
SOIL GEOCHEMISTRY RESULTS	
COPPER	
DRAWN A.J.A.	SCALE 1 : 2500
DATE JANUARY 1991	FIGURE 2