GEOCHEMICAL REPORT
on the
DIDDI (574), KATHRYN (666)
AND SARAH (710) CLAIMS
of the
ALPEN SOUTH PROPERTY

Mamquam River Area, Vancouver Mining Division

92G 10W, Lat. 49° 38.5' Long. 122° 58'

by

K.R. MacKenzie, B.Sc., M.D.

Endorsed by

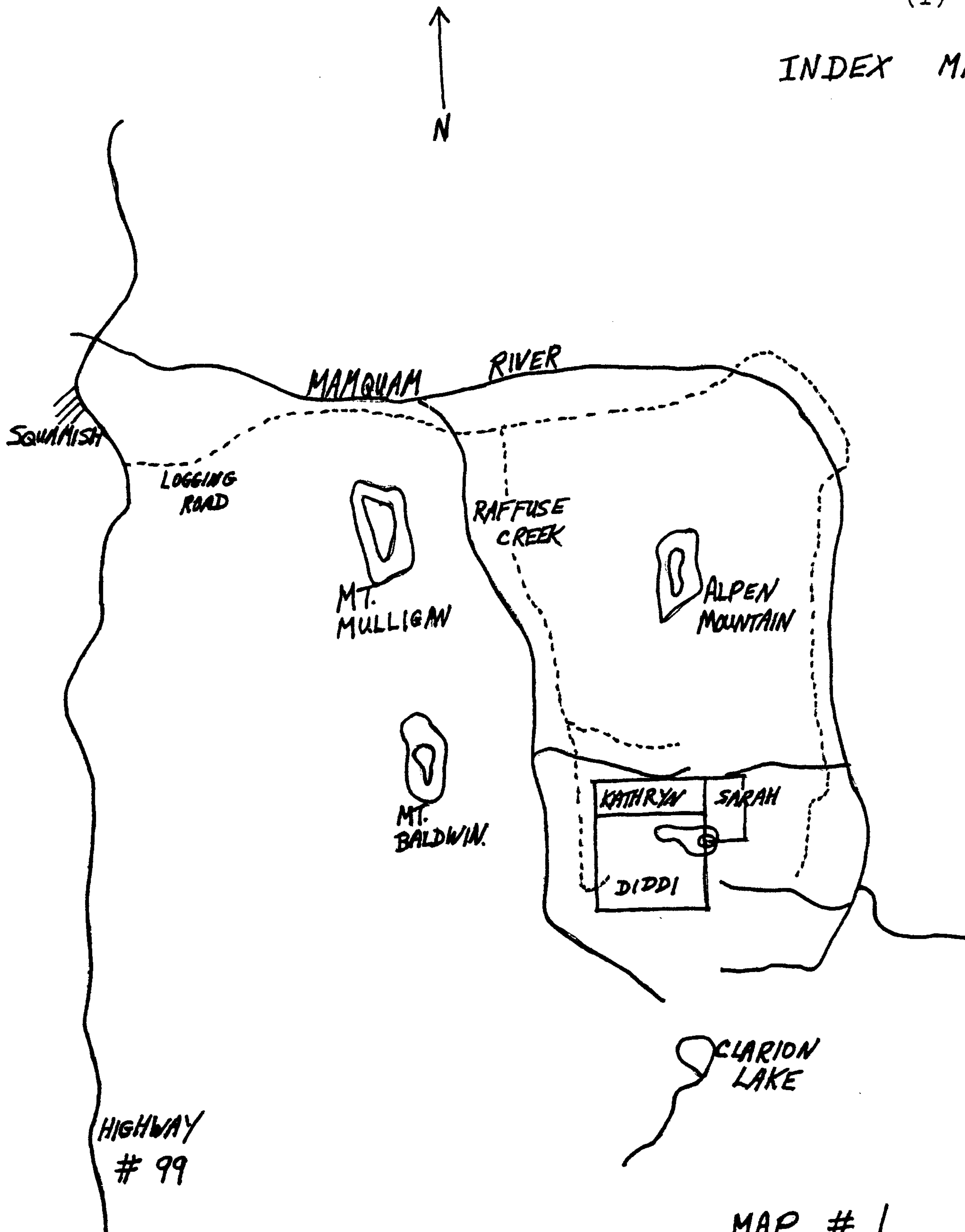
Frank W. Baumann, P.Eng.

Owner/Operator: Alpen Exploration Ltd.

Squamish, B.C.   October 1981

TABLE OF CONTENTS

INDEX MAP

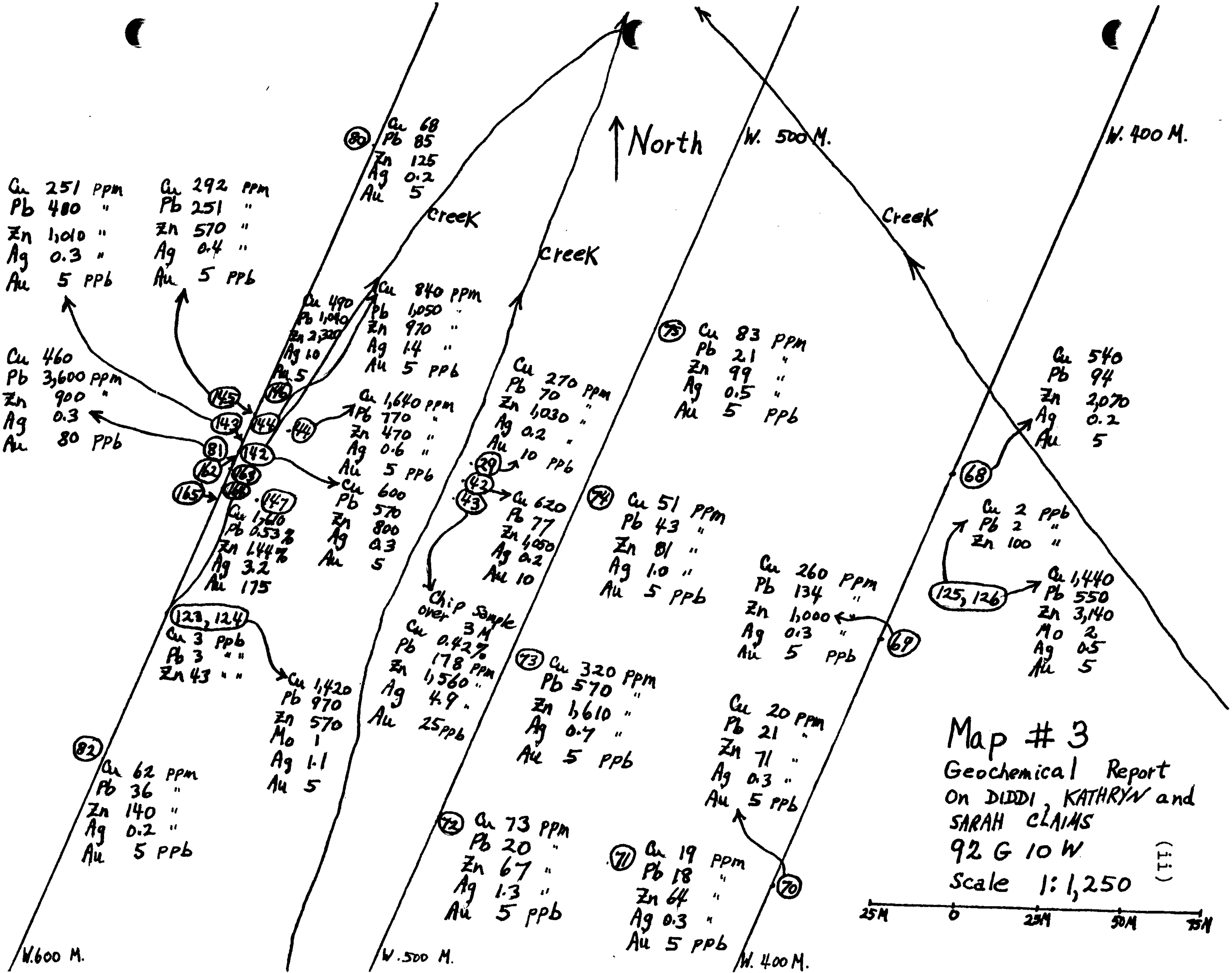


MAP # 1
LOCATION MAP
FOR ALPEN SOUTH
MINERAL PROPERTY

SCALE 1:125,000

92 G 11

92 G 10 W


North
W. 500 M.
W. 400 M.
Creek
Creek
Creek
80 Cu 68 Pb 85 Zn 125 Ag 0.2 Au 5
Cu 251 ppm Pb 480 " Zn 1,010 " Ag 0.3 " Au 5 ppb
Cu 292 ppm Pb 251 " Zn 570 " Ag 0.4 " Au 5 ppb
Cu 490 Pb 1,040 Zn 2,320 Ag 1.0 Au 5
Cu 840 ppm Pb 1,050 " Zn 970 " Ag 1.4 " Au 5 ppb
Cu 460 Pb 3,600 ppm Zn 900 " Ag 0.3 Au 80 ppb
145 146 143 144 144 81 142 162 163 165 164 147
Cu 1,640 ppm Pb 770 " Zn 470 " Ag 0.6 " Au 5 ppb
Cu 600 Pb 570 Zn 800 Ag 0.3 Au 5
Cu 1,210 Pb 0.53% Zn 1.44% Ag 3.2 Au 175
123, 124 Cu 3 ppb Pb 3 " " Zn 43 " "
Cu 1,420 Pb 970 Zn 570 Mo 1 Ag 1.1 Au 5
82 Cu 62 ppm Pb 36 " Zn 140 " Ag 0.2 " Au 5 ppb
Cu 270 ppm Pb 70 " Zn 1,030 " Ag 0.2 " Au 10 ppb
29 42 43
Cu 620 Pb 77 Zn 1,050 Ag 0.2 Au 10
Chip sample over 3 M Cu 0.42% Pb 178 ppm Zn 1,560 " Ag 4.9 " Au 25ppb
75 Cu 83 ppm Pb 21 " Zn 99 " Ag 0.5 " Au 5 ppb
74 Cu 51 ppm Pb 43 " Zn 81 " Ag 1.0 " Au 5 ppb
73 Cu 320 ppm Pb 570 " Zn 1,610 " Ag 0.7 " Au 5 ppb
72 Cu 73 ppm Pb 20 " Zn 67 " Ag 1.3 " Au 5 ppb
71 Cu 19 ppm Pb 18 " Zn 64 " Ag 0.3 " Au 5 ppb
Cu 260 ppm Pb 134 " Zn 1,000 " Ag 0.3 " Au 5 ppb
69
Cu 20 ppm Pb 21 " Zn 71 " Ag 0.3 " Au 5 ppb
70
Cu 540 Pb 94 Zn 2,070 Ag 0.2 Au 5
68
Cu 2 ppb Pb 2 " Zn 100 "
125, 126
Cu 1,440 Pb 550 Zn 3,140 Mo 2 Ag 0.5 Au 5
Map # 3
Geochemical Report
On DIDDI, KATHRYN and
SARAH CLAIMS
92 G 10 W
Scale 1:1,250
25M 0 25M 50M 75M
(11)
W.600 M.
W. 500 M.
W. 400 M.

INTRODUCTION

The Alpen South property is located approximately fifteen kilometers southeast of Squamish on a northwest trending ridge to the south of Alpen Mountain and north of Clarion Lake. The mamquam River lies to the east and Raffuse Creek to the west.

Access is by logging road that leaves Highway 99 approximately one-half kilometer south of the turnoff to Squamish. The road is used for active logging by McMillan-Bloedel and Weldwood. Permission to use road can be obtained from the McMillan-Bloedel offices near the entrance to the road. The two logging roads to the area are shown on the index map.

A prospecting report was filed on these claims one year ago and was written by the author of this report.

The property is owned by Alpen Exploration Ltd. of Squamish, B.C.

To date, no mineral of economic grade and extent has been found.

For this report, a total of one hundred and eleven geochemical samples have been analysed. The total includes ten silt samples, sixty-six soil samples, four shear gouge samples, ten water samples and twenty-one rock samples. The results of these geochemical analyses can be found in Appendix C.

A description of each individual sample and the site where it was obtained is included in Appendix E.

In general, silt samples were obtained by using a clean hand and scooping fine material from creek bottoms and sides. Usually two or more pools in one creek were sampled and mixed in one bag so that the results obtained would be a reasonably true picture of the amount of mineral present in that creek. Standard brown paper sample bags were used to carry the samples.

Soil sampling was done using an ice axe as a digging tool. The ice axe has a good scooping blade that is useful for cutting roots or pulling dirt from a hole. The ice axe also has a long sharp pick that is useful for digging around rocks or breaking up sheared rock that the scoop cannot penetrate. Every effort was made to reach "B" level soil. Occasionally, the "B" level could not be found and so a sample was taken of whatever was available beneath the organic layer.

Once the hole was dug and the appropriate soil loosened, the sample was removed by hand, and placed in a brown paper sample bag. Both the ice axe and the hand were cleaned after each use to reduce contamination between samples.

At each sample site, field notes were made and a number was placed on the sample bag and also recorded in the notes.

Shear gouge was easily obtained with the ice axe and was handled in the same way as a soil sample.

Water samples were gathered by carefully approaching the stream without disturbing the bottom. The sample was collected in a clean plastic bottle used only for water samples. The samples were not acidified in the field. Once the water sample had been taken, either a silt or a soil sample was taken from the stream as a comparison with the water. These are always numbered consecutively with the water sample being first. On the accompaning maps, These samples are shown as (123 124) with a circle drawn around both numbers to show they were taken from the same site. At home the next day, five cc's of water was carefully removed from each sample bottle and tested with Dithizone to determine the total amount of heavy metal ions present in the water. The results of this investigation are shown in Appendix F.

Rock samples were collected with a standard geological rock hammer. Fresh, unweathered rock was taken whenever possible. Chip samples were placed in a labelled, brown paper sample bag while larger hand samples were labelled with black marker pen.

All of the sample sites were marked with coloured plastic ribbon, with the sample number written on the ribbon, so that the site can be easily found and re-examined.

Abbreviations frequently used in this report are:

Cu	copper
Pb	lead
Zn	zinc
Mo	molybdenum
Ag	silver
Au	gold
ppm	parts per million
ppb	parts per billion
%	percentage or parts per hundred
cc's	cubic centimeters
cm	centimeter
m	meter

Element values are reported in the following units:

Cu, Pb, Zn, Mo and Ag, in silt soil, shear and rock are usually reported in parts per million. If a value exceeds the upper limit of the geochem test, then it is sent for assay and the results are then given in percentages.

Cu, Pb, and Zn values in water are reported in parts per billion.

Gold levels are reported in parts per billion.

Map #2 shows the relevant numerical values for all the tests reported, in their approximate location. A grid system was used to locate the positions of the samples. The main base line of the grid runs along the top of the ridge and grid lines run perpendicular to the base line every two hundred meters. The base line and grid lines were sampled every one hundred meters. The grid lines are marked as "0", west 200 meters, west 400 meters and west 600 meters. On the north side of the ridge, west 500 meters was also sampled because it ran over an area of known mineralization. This area has been sampled so extensively that all the results could not be marked on map #2. As a result, it was necessary to produce map#3 which is an enlargement of a portion of map #2.

Near the northwestern end of the ridge, the base line changes direction and runs due west, as this takes the line more directly over the presumed anomaly. It is also a better direction for marking line because of the topography.

Only the base line has been sampled beyond west 600 meters. Grid lines will be set up and sampled on the rest of the claims in the future and will be reported later.

All lines marked on this map have been located by map, air photo, compass, pacing and altimeter.

Background values for this area have been defined as: Cu 100 ppm or less, Pb 50 ppm or less, Zn 100 ppm or less, Mo 5 ppm or less, Ag 0.3 ppm or less, and Au 10 ppb or less. Water sample background values were taken to be: Cu 5ppb or less, Pb 5 ppb or less, Zn 10 ppb or less.

If values above background are taken as anomalous, then much of this area shows increased readings. In actual practice, higher readings have been used to look for mineralization in this area. Significant anomalous values have been taken to be: Cu 300 ppm or more, Pb 100 ppm or more, Zn 500 ppm or more, Mo 10 ppm or more Ag 0.8 ppm or more and Au 25 ppb or more in silt, soil shear or rock samples.

In water, significant anomalies have only been found in zinc values where readings of 20 ppb or higher are considered significant.

Areas showing highly anomalous values in the silt soil and shear samples will, with some careful work and often considerable digging, produce mineralized rock.

Zinc can travel quite well dissoved in water, however, and so the source of a high zinc anomaly in water may not be close to the outlet of the spring.

The highly significant anomalies found on this property have nearly always been associated with water. They are found either in the silt or in wet soil where a small spring comes to the surface. There has always been some question as to whether these anomalies were caused mainly by leaching of low grade mineral from the surrounding rocks or whether they represented dilution anomalies from ore grade material hidden within the mountain.

I feel that the second possibility is the true one for the following reasons.

Rock float and bedrock has been found in the region of some of these anomalies that contain assayed values of copper 1%, lead .5% and zinc 1.4%.

The pH of the water in all these springs has been measured at 7.0 ± 0.2, which is essentially neutral. Water of pH 7.0 can carry zinc, but as our results show, very little lead or copper can be carried by neutral water. To dissolve lead ions in water, the pH must be at 6.0 or less and to dissolve copper ions the pH must be even lower at 5.3.

I feel that the neutral pH shows that the water has not spent a lot of time underground, that it has not been acidified by reacting with pyrite and that the zinc anomalies found in the water probably represent the fact that higher grade material exists deeper within the mountain.

In the book <u>Geochemistry in Mineral Exploration</u> by Rose, Hawkes and Webb, page 376, it is stated that close to known zinc deposits, the zinc values in water attain levels of 200 to 400 ppb. The fact that we have at least one spring with values within that range may indicate that significant mineralization does occur in this area.

Dry soils that contain highly anomalous metal values seem particularly worthy of careful follow-up.

Examples of this are sample 28, that led to the finding of sample 108 containing 2.25% zinc, sample 29 that led to sample 43, a three meter section containing 0.42% copper and sample 81 that led to sample 147 which held 0.53% lead and 1.44% zinc.

Significant mineralization of approximately this level has been found in rhyolites, rhyodacites and pyroclastics. The rock most commonly associated with mineralization is the rhyodacites. The heavy metal mineralization contained in these rocks is usually in veins or clots and is usually associated with red or white quartz veins, which may or may not contain metallic mineral as well. Pyrite is frequently found in these rocks as well.

These mineralized rocks seem to fit the description of stringer ore that often accompanies massive sulphide ore bodies. To date no rock sample has been found that could be called a massive sulphide.

Frequently these mineralized areas are associated with large shears and the stringers are developed in the sheared rock. Shear gouge in these areas usually shows high heavy metal values and so can also be used as a guide for locating metallic mineralization in rock.

CONCLUSION

There appear to be three main anomalous areas identified by this study. They are characterized by having anomalous values in silt, soil, shear, water and rock. The anomalous zones seem to occur in roughly horizontal bands that occur between 1200 and 1320 meters on the north and south sides of the ridge and between 1100 and 1250 meters on the west side of the ridge. The ridge crest itself appears relatively non-mineralized and may represent a cap covering the mineralized strata lying 100 to 200 meters below.

Dithizone has been found to be a highly effective method of estimating the zinc content in water.

The metallic mineralization found probably represents stringer ore. No definite massive suphide ore has been found yet. The stringer ore identified occurs in small outcrops only and does not occur in economic volumes at present.

The recent finding of siliceous pyroclastic rock with pyrite, galena and sphalerite, combined with the extensive anomalous geochemistry of this area, clearly indicates that further study and investigation is warranted.

K.R. MacKenzie, B.Sc., M.D.

Frank W. Baumann, P.Eng.

APPENDIX A

AUTHOR'S QUALIFICATIONS

K. R. MacKenzie, B.Sc., M.D.

Doctor MacKenzie is a medical doctor who graduated from the University of British Columbia in 1963 with a B.Sc. in Chemistry and Mathematics. Geology 105 was taken as part of his undergraduate studies. He spent three summers working for the Geological Survey of Canada under Dr. J. O. Wheeler.

After graduating from U.B.C. in 1968 with a medical degree, Dr. MacKenzie has continued to prospect as a hobby.

Recent reading by the author inludes:

- G.S.C. Memoir No. 335 - J.A. Roddick
- Prospecting in Canada (G.S.C.) by A.H. Lang.
- G.S.C. Paper 72-53, Rock and Mineral Collecting in British Columbia, by S. Leaming.
- G.S.C. Paper 72-22, Precambrian Volcanogenic Massive Sulphide Deposits in Canada: A Review by D.F. Sangster.
- Geol. Soc. Malaysia, Bulletin 9, Nov. 1977, pp.1-16, Mineralization in the Coast Plutonic Complex of British Columbia, south of latitude 55°N by G.J. Woodsworth and J.A. Roddick.
- International Geologic Congress, Field Excursion A09-C09, Copper and Molybdenum Deposits of the Western Cordillera.
- Exploration and Mining Geology by William C. Peters.
- A Field Guide to Rocks and Minerals by Pough.
- Volcanogenic Deposits and their Regional Setting in the Canadian Cordillera - Abstracts from the Geological Association of Canada Conference, January 25, 26, 1980.
- Colorimetric determination of traces of Metals by E.B. Sandell
- Geology and Economic Minerals of Canada (G.S.C.) by Douglas

- The Geochemistry of Silver and its Deposits (G.S.C.) by Boyle.
- The Geochemistry of Gold and its Deposits (G.S.C.) by Boyle.
- Geophysics and Geochemistry in the search for Metallic Ores by Duncan R. Derry, Michener, Booth.
- Geochemistry in Mineral Exploration by Rose, Hawkes, Webb.
- Time and Stratabound Ore Deposits by Klemm, Schneider.
- Theory and Practice of Regional Geochemical Exploration by M. Foldvari-Vogl.
- Summary Report on War Eagle, Clarke and Janette Claims (Maggie Mines Ltd.) by Andrew E. Nevin Ph.D., P.Eng. September 18, 1980.
- Western Mines- Myra, Lynx and Price deposits by R.H. Seraphim C.I.M. Bulletin, December 1980.
- Western Mines-Myra, Lynx and Price deposits: a discussion by R.R. Walker C.I.M. Bulletin, December 1980.

APPENDIX A

AUTHOR'S QUALIFICATIONS

Frank W. Baumann, P.Eng.

Mr. Baumann graduated in 1971 from U.B.C. with a B.A.Sc. in Geological Engineering and obtained his P.Eng. in 1973. Prior to graduation, he had spent four summers working with Amax Exploration Inc. and Duval Corp. as a geological field assistant. From 1971 until 1975, he worked for Duval Corporation as an exploration geologist, specializing in the evaluation of mineral deposits. In 1976, he left Duval to do a four month consulting job for the United Nations Development Program in Burma. This job also entailed the evaluation of mineral properties.

Since 1977, Mr. Baumann has been teaching geology and physics at Howe Sound Secondary School in Squamish, as well as doing summer projects in exploration geology. His last major project was in the summer of 1981 when he was the project manager of a program to re-evaluate the Cariboo Gold Quartz mine at Wells, B.C.

Mr. Baumann is the author of numerous private technical reports and has also co-authored a United Nations paper on the Shangalon Porphry Copper Deposit in Burma and a second published paper on the North Fork Copper Deposit in Washington State, U.S.A.

APPENDIX B

ITEMIZED COST STATEMENT

for

DIDDI (574), KATHRYN (666)

AND SARAH (710) CLAIMS

<u>Value of work performed</u>

K. Mackenzie period 1981.

June 5, 8, 15, 19, 24.

July 1, 5, 11, 13, 15, 17 (½ day), 20, 21(½ day), 23, 27, 28(½ day).

Aug. 2, 5(½ day), 6, 7(½ day), 18, 19, 21(½ day), 26, 27, 28(½ day).

Sept. 2, 4(½ day), 6, 10(½ day), 12, 14(½ day), 22.

28 days @ $110/day	3,080.00
R. Price period 1981	
July 1.	
1 day @ $75/day	75.00
D. Peterson period 1981	
July 23	
1 day @ $130/day	130.00
E. Kimura period 1981	
Aug. 2 1 day @ $ 130/day	130.00
R. Sebastion period 1981	
Aug. 27 1 day @ $ 130/day	130.00
R. Page period 1981	
Sept. 22 1 day @ $130/day	130.00
<u>TOTAL</u>	3,675.00

Transportation

Motor vehicles

19 miles on 22 days	418 miles	
90 miles on 15 days	1,350 miles	
total	1,768 miles	
@ 0.38¢/mile		671.84

Helicopter

2 days @$240/day		480.00
	TOTAL	1,159.60

Laboratory Analyses

10 silt samples @ $10.65		106.50
66 soil samples @ $10.65		702.90
4 shear samples @ $10.65		42.60
10 water samples @ $28.00		280.00
21 rock samples @ $12.55		263.55
	TOTAL	1,395.55

Report Preparation

K. Mackenzie period 1981

Aug. 24-4hrs, 25-8hrs.

Sept. 3-8hrs, 8-8hrs, 24-6hrs, 25-2hrs
27-8hrs.

Oct. 3-2hrs, 5-6hrs, 6-2hrs, 7-4hrs, 8-8hrs
9-8hrs, 10-8hrs, 12-10hrs, 13-4hrs
14-8hrs, 15-4hrs.

108 hours @ $13.75/hr 1,485.00

F. Baumann period 1981

Oct. 13-4hrs @ $16.25/hr 65.00

Report Preparation

Maps	50.00
Reproduction	30.00
Miscellaneous	25.00
TOTAL (including previous page)	1,655.00

Total Cost

Value of work performed	3,675.00
Transportation	1,159.60
Laboratory Analyses	1,395.55
Report Preparation	1,655.00
GRAND TOTAL	7,885.15

APPENDIX C

RESULTS OF GEOCHEMICAL ANALYSES

Sample Number	Type of Sample	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm	Au ppb
5	silt	93	35	3,600		0.2	
18	silt	260	46	1,600		0.2	
21	soil	32	30	75		0.2	5
22	soil	55	66	900		0.8	5
23	soil	114	48	580		0.8	5
24	silt	360	144	1,300		0.2	
25	soil	118	144	271		0.4	5
26	soil	78	24	68		0.8	5
27	soil	28	22	62		0.6	5
28	soil	370	29	690		2.0	5
29	soil	270	70	1,030		0.2	10
35	rock	91	1,420	1,400			
38	rock	82	41	820			
42	shear	620	77	1,050		0.2	10
43	rock	4,200	178	1,560		4.9	25
44	rock	1,640	770	470		0.6	5
47	rock	9	9	612		0.2	5
55	rock	142	1,360	1,100		0.2	5
62	rock	2,600	12	1,230		0.2	5
63	rock	1,000	101	3,800		0.5	5
65	rock	34	12	700		0.2	5

APPENDIX C

RESULTS OF GEOCHEMICAL ANALYSES

Sample Number	Type of Sample	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm	Au ppb
66	rock	38	13	290		0.2	5
67	rock	1,220	31	250		1.0	5
68	soil	540	94	2,070		0.2	5
69	soil	260	134	1,000		0.3	5
70	soil	20	21	71		0.3	5
71	soil	19	18	64		0.3	5
72	soil	73	20	67		1.3	5
73	soil	320	570	1,610		0.7	5
74	soil	51	43	81		1.0	5
75	soil	83	21	99		0.5	5
76	soil	71	83	570		0.6	5
77	shear	113	126	335		0.3	5
78	soil	130	310	126		0.2	5
79	rock	800	3,800	7,400		1.3	5
80	soil	68	85	125		0.2	5
81	soil	460	3,600	900		0.3	80
82	soil	62	36	140		0.2	5
83	soil	33	26	61		0.2	5
84	rock	17	1,600	1,300		0.8	5
85	soil	153	127	171		0.2	5

APPENDIX C

RESULTS OF GEOCHEMICAL ANALYSES

Sample Number	Type of Sample	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm	Au ppb
86	soil	89	37	320		0.3	5
87	soil	54	49	176		0.2	5
88	soil	400	90	950		0.2	5
89	soil	153	127	171		0.2	5
90	silt	1,580	94	1,440		0.3	5
91	soil	60	41	570		0.2	5
92	silt	390	131	3,500		0.2	5
93	soil	26	14	51	1	0.2	5
94	soil	55	14	93	1	o.2	5
95	soil	22	25	56	1	0.2	5
96	soil	44	30	121	1	0.2	5
97	soil	13	13	59	1	0.4	5
98	rock	10	46	106	5	0.5	5
99	shear	12	43	295	1	0.5	5
100	silt	164	67	1,550	10	0.3	30
101	soil	100	79	359	22	1.1	40
102	soil	40	31	620	2	0.3	5
103	soil	36	61	163	1	0.2	5
104	rock	3	5	28	4	0.2	5
105	rock	72	87	820	2	0.2	5
106	soil	38	16	130	2	0.8	5
107	soil	34	10	113	2	0.8	5

APPENDIX C

RESULTS OF GEOCHEMICAL ANALYSES

Sample Number	Type of Sample	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm	Au ppb
108	rock	0.36%	15	2.25%	2	2.9	5
109	soil	19	21	67	9	0.6	5
110	soil	18	23	33	2	0.5	5
111	soil	93	353	86	4	0.8	5
112	soil	51	39	139	1	0.5	5
113	soil	52	53	610	1	0.5	5
114	soil	5	7	21	1	0.2	5
115	soil	8	9	34	1	0.3	5
116	soil	30	31	86	1	0.2	5
117	water	2	2	9	(ppb)	pH=7.0	
118	silt	73	21	322	1	0.2	5
119	water	1	1	2	(ppb)	pH=7.1	
120	silt	44	59	272	1	0.2	5
121	water	2	2	125	(ppb)	pH=7.0	
122	soil	144	119	2,170	2	0.2	5
123	water	3	3	43	(ppb)	pH=7.1	
124	soil	1,420	970	570	1	1.1	5
125	water	2	4	100	(ppb)	pH=7.0	
126	soil	1,440	550	3,140	2	0.5	5
127	soil	169	92	355	1	0.2	5
128	soil	33	25	70	1	0.2	5
129	soil	28	29	60	1	0.2	5

APPENDIX C

RESULTS OF GEOCHEMICAL ANALYSES

Sample Number	Type of Sample	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm	Au ppb
130	rock	59	13	241	2	0.2	5
131	water	6	2	145	(ppb)	pH=7.0	
132	soil	620	194	2,760	1	0.2	5
133	soil	72	38	1,060	1	0.3	5
134	water	7	2	200	(ppb)	pH=6.9	
135	soil	2,310	179	1,560	8	1.7	5
136	water	2	2	50	(ppb)	pH=7.0	
137	soil	193	40	1,230	3	0.2	5
138	water	2	1	25	(ppb)	pH=7.0	
139	silt	110	70	800	2	0.2	5
140	water	1	2	6	(ppb)	pH=7.1	
141	silt	73	34	153	2	0.2	5
142	shear	600	570	800		0.3	5
143	rock	251	480	1,010		0.3	5
144	rock	840	1,050	970		1.4	5
145	rock	292	251	570		0.4	5
146	rock	490	1,040	2,320		1.0	5
147	rock	1,610	0.53%	1.44%		3.2	175
148	soil	70	32	205	1	0.2	5
149	soil	13	13	33	1	0.2	5
150	soil	11	4	86	7	0.4	5
151	soil	34	28	42	1	0.3	5

APPENDIX C

RESULTS OF GEOCHEMICAL ANALYSES

Sample Number	Type of Sample	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm	Au ppb
152	soil	164	244	253	2	0.7	5
153	rock	118	850	0.97%	32	1.6	5
154	soil	93	59	156	3	1.0	5
155	soil	18	13	36	1	0.4	5
156	soil	70	52	226	1	0.5	5
157	soil	106	108	168	1	0.4	5
158	soil	66	38	123	1	0.4	5

APPENDIX D

ANALYSIS METHODS USED

Samples analysed in this study have been done by two labs: Bondar-Clegg and Company Ltd. of 130 Pemberton Avenue, North Vancouver and Placer Development Ltd. research lab at 323 Alexander Street, Vancouver, B.C.

The methods used by the two labs differ but the results appear to be comparable.

ANALYSIS METHODS USED BY BONDAR-CLEGG & COMPANY LTD.

Element	Extraction	Method	Size fraction
Cu	HNO3-HCL HOT EXTR	Atomic Absorption	-100
Pb	HNO3-HCL HOT EXTR	Atomic Absorption	-100
Zn	HNO3-HCL HOT EXTR	Atomic Absorption	-100
Ag	HNO3-HCL HOT EXTR	Atomic Absorption	-100
Au	AQUA REGIA	Atomic Absorption Fire Assay	-100

ANALYSIS METHODS USED BY PLACER DEVELOPMENT LTD.

Element	Extraction	Method	Size fraction
Cu	C HCLO4/HNO3	Atomic Absorption	-80
Pb	C HCLO4/HNO3	A.A. Background Correction	-80
Zn	C HCLO4/HNO3	Atomic Absorption	-80
Mo	C HCLO4/HNO3	Atomic Absorption	-80
Ag	C HCLO4/HNO3	A.A. Background Correction	-80
Au	C HBR/BR	A.A. Solvent Extract	-80

DESCRIPTION OF ANALYSED SAMPLES AND SAMPLE SITES

Sample Number	Description
5	This silt sample was taken from a small creek that originates from some small springs about fifty meters higher on the hill. The sample site was on a gently sloping bench that provided a good place for fine silt to settle out.
18	A silt sample taken from a small spring-fed stream. The site was a steep sidehill below the flat bench mentioned above.
21	Dry soil sample from the "B" level, thirty cm deep. Slight sidehill slope.
23	Dry soil from the "B" level, thirty cm deep. Moderate slope.
24	Silt sample from another small spring-fed stream below the gently sloping bench. Moderate slope with few small pools for silt to collect in.
25	Dry soil from the "B" level, thirty cm deep. Moderate slope.
26	Dry soil from the "B" level, thirty cm deep. On the flat bench.
27	Dry soil from the "B" level, thirty cm deep. On the gently sloping bench, just before a prominent ridge that is underlain by resistant rhyolites.

DESCRIPTION OF ANALYSED SAMPLES AND SAMPLE SITES

Sample Number	Description
28	Dry soil from a place where the "B" level was exposed. Sample taken from thirty centimeters deep. The site was near the top of the prominent ridge formed by the rhyolites.
29	Dry soil taken from a stream bank where the "B" level was exposed. Sample depth fifteen centimeters.
35	Rock float close to an outcrop of similar rhyodacite containing pyrite and sphalerite. Located on the flat bench above sample 24.
38	Green altered andesite near the source of sample 24 and just below 35. No sulphides were visible in this rock.
42	This is a sample of shear gouge that runs through sheared rhyodacite that contains visible chalcopyrite. Sample depth 15 cm.
43	Chip sample taken over three meters. Sheared, oxidized rhyodacite with white and red quartz veins.
44	This sample is a piece of rhyodacite float found in a stream bank. Small blebs of malchite could be seen in the rock.
47	Sheared, heavily jointed rhyolite containing about 1% pyrite.

Description of Analysed Samples and Sample Sites

Sample Number	Description
55	Rhyodacite outcrop with scattered veins of sphalerite and galena. Similar rock nearby also contains low grade chalcopyrite.
62	One Meter wide quartz vein containing pyrite, chalcopyrite and sphalerite.
63	Rhyodacite with pyrite and sphalerite. Sulphides occur sporadically over a width of twenty meters. Quartz veining also present nearby.
68	Wet soil, "B" level, 15 cm deep.
69	Dry soil from the "B" level 30 cm deep. Rock float (rhyodacite) from this site contained sphalerite.
70	Dry soil, "B" level 15 cm deep. Rhyodacites nearby were low in sulphides.
71	Dry soil, "B" level 30 cm deep. Rhyodacites.
72	Dry soil, "B" level 30 cm deep. Rhyodacites with pyrite.
73	Wet soil below small spring. "B" level exposed on surface. Sample taken from 15 cm.
74	Dry soil, "B" level, 30 cm.
75	Dry soil, "B" level, 30 cm.
76	Wet soil, "B" level, 30 cm deep.

DESCRIPTION OF ANALYSED SAMPLES AND SAMPLE SITES

Sample Number	Description
77	This is a sample of rusty coloured shear gouge that runs through andesites. Some of the rocks in this area contain red quartz veins that occasionally show pyrite and chalcopyrite.
78	Dry soil, "B" level, 30 cm deep.
79	Rhyodacite with pyrite, sphalerite and galena. This sample was found quite close to 78.
80	Dry soil "B" level, 15 cm deep. Rhyodacites nearby contain white and red quartz veins, epidote and sphalerite.
81	Dry soil, "B" level exposed at surface. Sample taken from 15 cm deep.
82	Dry soil, "B" level 30 cm deep.
83	Dry soil, "B" level 30 cm deep. Rock outcrops are composed of rhyodacites with pyrite and some quartz veining.
84	This rock is a quartz breccia or pyroclastic rock with pink quartz clasts 1 to 2 cm across in a matrix of grey-blue quartz. Fine grained pyrite is scattered throughout with some small galena veins.
85	Dry soil, "B" level 30 cm deep. Pyritic rhyodacites nearby.

DESCRIPTION OF ANALYSED SAMPLES AND SAMPLE SITES

Sample Number	Description
86	Dry soil, "B" level, 30 cm deep.
87	Dry soil, "B" level, 30 cm deep.
88	Wet soil in the drainage of a small stream. "B" level, 30 cm deep.
89	Dry soil on moderate hillside. "B" level, 30 cm deep.
90	A spring emerges from the hillside just west of the line. This sample is good silt from some pools just below the source of this stream.
91	This sample was taken from a swampy area at the base of the hill. The soil is composed of a thick layer of organics followed by a very thick layer of wet grey clay-like soil. I was unable to find the "B" level here so the grey material beneath the organics was taken for a sample.
92	Silt taken from a small stream that originates from a spring a small distance above the sample site.
93	Dry soil, "B" level 30cm deep.
94	Dry soil, "B" level, 30 cm deep.
95	Dry soil, "B" level, 30 cm deep.
96	Dry soil, "B" level, 30 cm deep.

DESCRIPTION OF ANALYSED SAMPLES AND SAMPLE SITES

Sample Number	Description
97	Dry soil, "B" level, 30 cm deep.
98	The next four samples were taken from an area of highly sheared rock that has been easily eroded by a small creek to produce banks 15 meters high. The shears in this area seem to be mainly oriented at 220 , dip 45 S.W. and 320 ,dip N. 80 . Sample 98 is a rhyolite that contains pyrite and quartz veins.
99	Shear gouge from the same site.
100	Silt from the creek about 50 meters below 99.
101	Soil from the stream bank at the same place. "B" level exposed on the surface. Sample taken 15 cm deep.
102	Wet soil on hillside. "B" level, 30 cm deep.
103	Wet soil from close to valley bottom. "B" level, 30 cm deep.
104	Rhyolite outcrop containing pyrite.
105	Rhyodacite with pyrite and sphalerite.
106	Dry soil on hillside, "B" level, 30 cm deep.
107	Dry soil, "B" level, 30 cm deep. Outcrop nearby composed of rhyolites with quartz veins.
108	This rock is a green altered rhyolite found at the site of previous sample 28. It contained visible chalcopyrite, malachite and sphalerite.

DESCRIPTION OF ANALYSED SAMPLES AND SAMPLE SITES

Sample Number	Description
109	Dry soil, "B" level, 30 cm deep. Rhyolite with quartz veins.
110	Dry soil, "B" level, 30 cm deep.
111	Dry soil, "B" level, 30 cm deep. Rhyodacite.
112	Dry soil, "B" level, 30 cm deep. Rhyodacite.
113	Dry soil, "B" level, 30 cm deep. Rhyodacite.
114	Dry soil, "B" level, 30 cm deep. Quartz Diorite.
115	Dry soil, "B" level, 30 cm deep. Quartz Diorite.
116	Dry soil, "B" level, 30 cm deep. Quartz Diorite.
117	Water sample with no suspended particulate matter.
118	Silt sample from the same site for comparison.
119	Water sample, clear and clean.
120	Silt from the same site.
121	Water from a very small stream on a swampy hillside. Water contained some suspended organic material.
122	Soil from the same site for comparison.
123	Water sample from small spring above 81. Clear.
124	Soil from the same site, "B" level, 30 cm deep.
125	Clear water sample from small spring.
126	Wet soil from the same place. "B" level close to surface, 15 cm deep.
127	Dry soil, "B" level, 30 cm deep.

DESCRIPTION OF ANALYSED SAMPLES AND SAMPLE SITES

Sample Number	Description
128	Dry soil, "B" level, 30 cm deep. Pyroclastic rock float nearby.
129	Dry soil, "B" level, 30 cm deep.
130	No "B" level soil was available here. The organics lay on bed rock, so a chip sample was taken. Pyroclastic rock.
131	Water sample with no suspended material
132	Soil from the same site. Wet, 30 cm deep, "B" level.
133	Wet soil "B" level exposed on hillside slump. 15 cm deep.
134	Water sample from small spring. Sample was clear.
135	Wet soil from the same site. "B" level 30 cm deep.
136	Water sample from small stream containing some suspended organic material.
137	Wet soil from the same site, "B" level, 30 cm deep.
138	Water sample from major drainage of the above samples. Clear water.
139	Fine silt from the same site.
140	Clear water sample from a creek draining the South ridge of this valley.
141	Fine silt from the same site for comparison.

DESCRIPTION OF ANALYSED SAMPLES AND SAMPLE SITES

Sample Number	Description
142	Samples 142 to 146 are follow-up samples taken from the region of 81. A trench was dug along line West 600 meters. Sample 142 was found about 45 cm below 81 and is shear gouge with manganese oxide staining.
143	Sheared oxidized rock from the same site.
144	Fresh rhyodacite with veins of white and red quartz containing chalcopyrite and sphalerite. Occasional veins of calcite with galena and sphalerite.
145	Chip sample from sheared area over 3 meters.
146	Rhyodacite with sphalerite and chalcopyrite in veins.
147	Rhyodacite float found about 10 meters south-east from 81. Contained sphalerite in veins and clots, along with pyrite.
148	Dry soil on ridge top. "B" level, 30 cm deep.
149	Dry soil, "B" level, 30 cm deep. Pyroclastics nearby. Some of the pyroclastics in this area appear bedded and strike 135 -145 and dip 60 south-west.
150	Dry soil, "B" level, 30 cm deep. Pyroclastics.

DESCRIPTION OF ANALYSED SAMPLES AND SAMPLE SITES

Sample Number	Description
151	Dry soil, "B" level, 30 cm deep. Dacites with no sulphides present.
152	Dry soil, "B" level, 30 cm deep. Pyroclastics.
153	Pyroclastic rock composed mainly of quartz with disseminated pyrite and sphalerite. Small one to two millimeter veins of quartz also present.
154	Dry soil, "B" level, 30 cm deep.
155	Dry soil, "B" level, 30 cm deep.
156	Dry soil, "B" level, 30 cm deep.
157	Dry soil, "B" level, 30 cm deep.
158	Dry soil, "B" level exposed on surface, 15 cm deep.

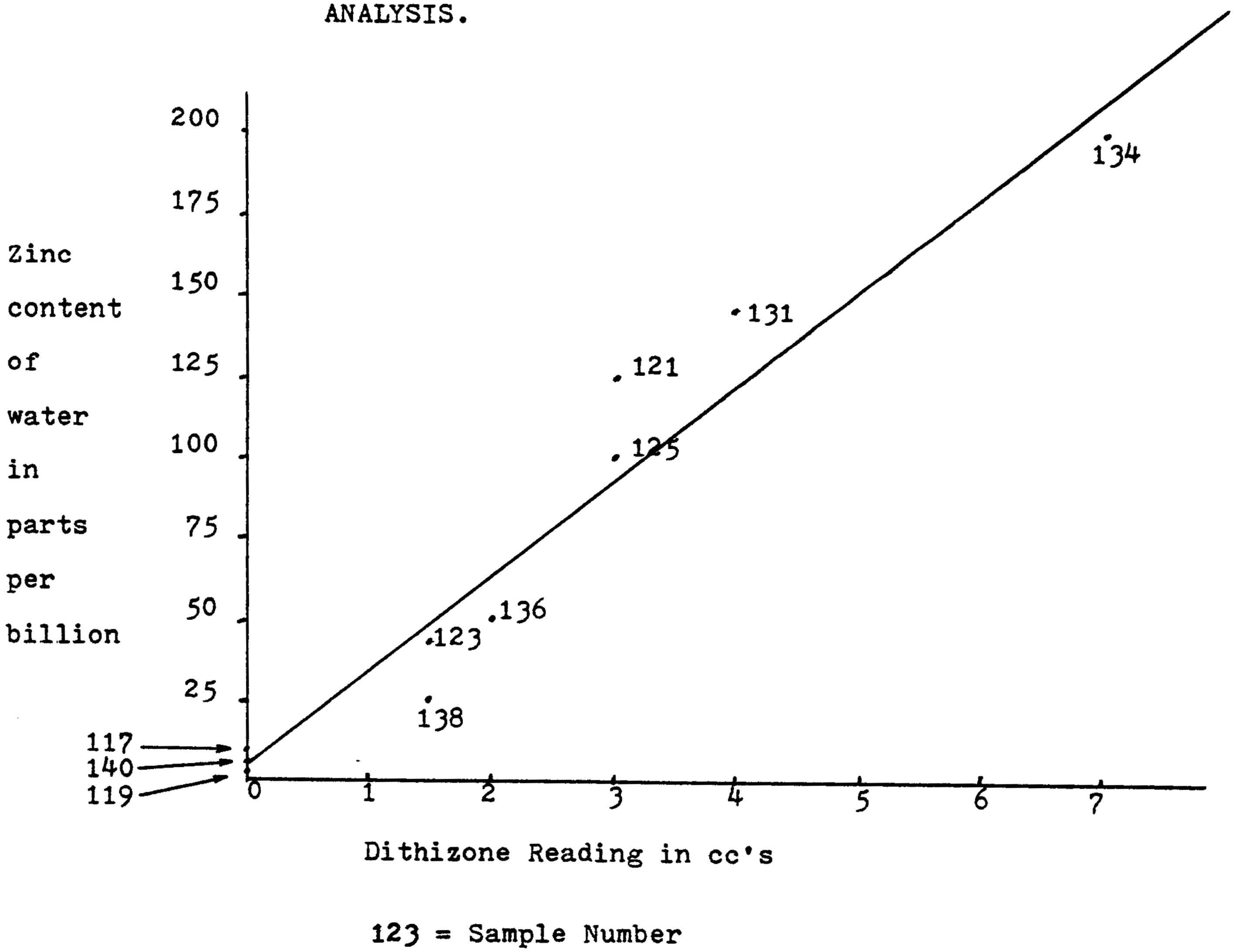
Table of Results of Dithizone and Geochemical tests

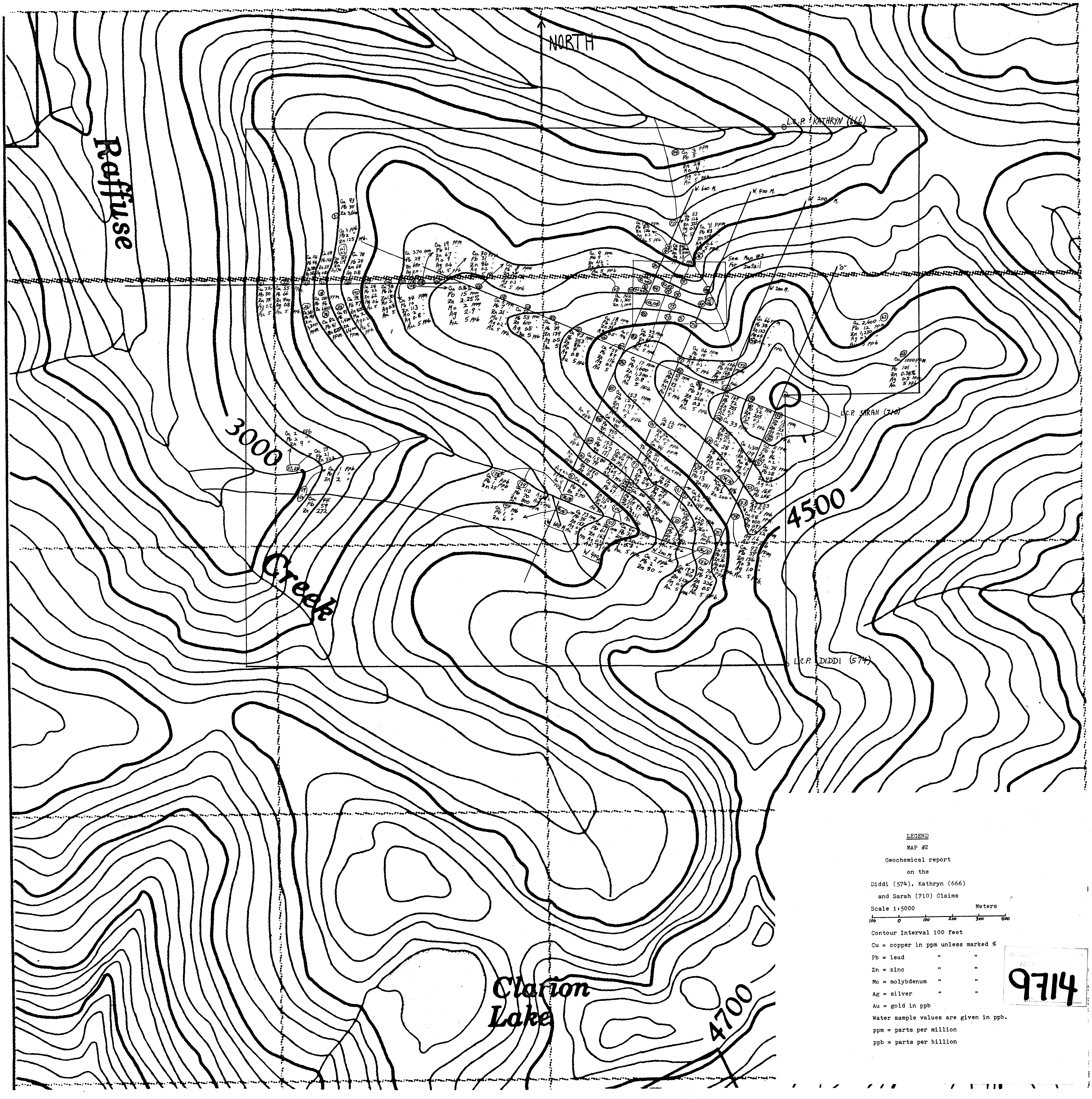
Sample Number	cc's of Dithizone to reach an end point	Geochem analysis of Zn in the water in ppb
117	0	9
119	0	2
121	3	125
123	1.5	43
125	3	100
131	4	145
134	7	200
136	2	50
138	1.5	25
140	0	6

A graph plotting these two sets of data can be found on the following page.

From this table and the graph, it can be seen that there is a good correlation between the Dithizone test and the subsequent laboratory analysis.

GRAPH OF THE VOLUME OF DITHIZONE REQUIRED TO REACH AN END POINT WHEN TITRATED WITH FIVE cc's OF WATER, PLOTTED AGAINST THE ZINC CONTENT OF THE SAME WATER SAMPLES SUBSEQUENTLY FOUND BY LABORATORY ANALYSIS.





LEGEND

MAP #2

Geochemical report
on the
Diddi (574), Kathryn (666)
and Sarah (710) Claims

Scale 1:5000 — Meters: 100, 0, 100, 200, 300, 400

Contour Interval 100 feet

Cu = copper in ppm unless marked %

Pb = lead " "

Zn = zinc " "

Mo = molybdenum " "

Ag = silver " "

Au = gold in ppb

Water sample values are given in ppb.

ppm = parts per million

ppb = parts per billion

9714