

LOG NO: 10-24	RD.
ACTION:	
FILE NO:	

SAMPLING REPORT

PINE CLAIMS

Liard Mining Division

93 0 10E

Lat. 55 30' N. Long. 122 37' W.

Owner
D.C.Rotherham

Author
D.C.Rotherham P.Eng.

September 28 1990

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

20,372

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INTRODUCTION

Location

The PINE 1 to 4 mineral claims, record numbers 4239 to 4242 inclusive are located in Pine Pass on the southern border of topographic map 93 O 10 east. They are at a latitude of 55 30' north and a longitude of 122 37' west on the northern flanks of Solitary Mountain. Highway 97 passes through the claims and mileage post 75 km. is within the claim group. The highway is along the edge of the Pine River with the B.C. Railway on the opposite side of the valley as is the Peace River Power transmission line. Natural gas and oil pipelines follow the highway through the valley. The topography is relatively steep away from the river with the higher portions of the claims being at 3700 feet relative to a valley bottom elevation of 2320.

Ownership and History

The Pine 1 to 4 mineral claims are owned by Mr. D. C. Rotherham of 931 Esquimalt Ave in the city of West Vancouver, B.C. The location has not been staked before to the best knowledge of the author. The area was investigated earlier by personal of Canex Placer Limited as part of a large scale reconnaissance exploration program aimed at the discovery of sedex type lead zinc deposits. It was found that an area within the Pine Pass contained high geochemical values in vanadium. Work at this time, 1976, was confined to sampling sections of two creeks and a limited amount along the highway as well as an extensive regional survey. At that time it was felt that the values were interesting but subeconomic. The Pine mineral claims were staked in July of 1987 to cover the zone of vanadium mineralization. At this time a limited amount of sampling was carried out along the highway to accurately determine the target area and to relate the values to the stratigraphy. A second series of samples was taken in 1989 to further define and expand the zone. This was further expanded in sampling carried out in July 1990 and described in this report.

Mineral claim map 93 O 10E is an old map and has a great deal of distortion. The location shown on the map is not accurate and the correct location is shown on Figure #2.

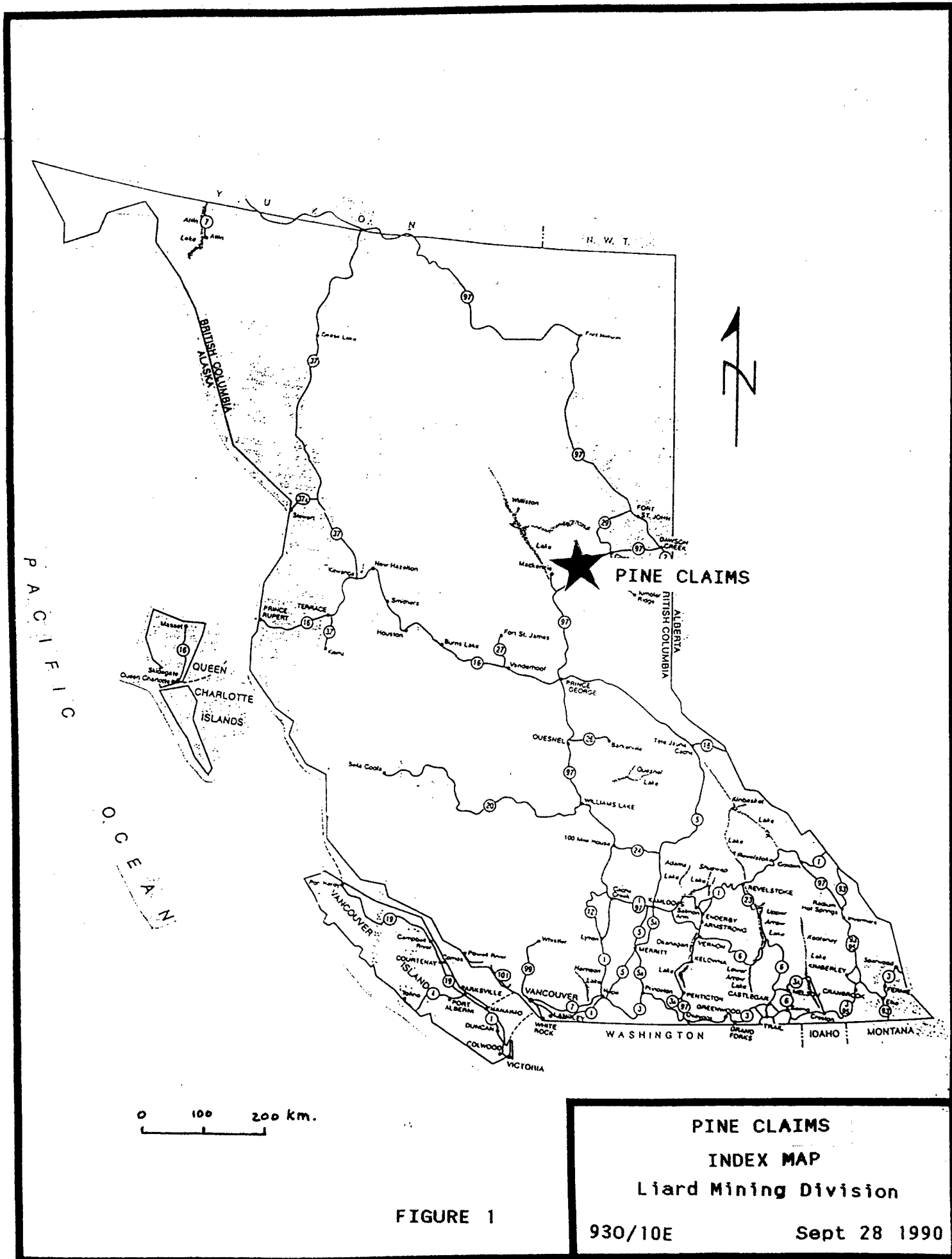
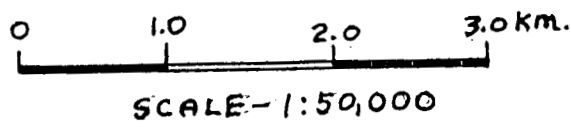


FIGURE 1

PINE CLAIMS
 INDEX MAP
 Liard Mining Division
 930/10E
 Sept 28 1990



PINE CLAIM LOCATION



LIARD MINING DIVISION

General Geology

A description of the geology of the area is given by Dr. J.E. Muller of the Geological Survey of Canada who mapped the area in 1961. This is shown as Map 11-1961 Pine Pass British Columbia. This map shows the geology to be fairly typical of the Rocky Mountains with a series of thrust sheets being the dominant geological feature. The map shows the area of the Pine claims to be underlain by unit #15, Lower (?), Middle, and Upper Triassic which is described as "calcareous siltstone and sandstone, black shale". The descriptive notes state " In the Front Range and below the Murray Range thrust, about 500 feet of black, recessive shales is the basal part of unit 15, with a Middle Triassic (Anisian) fauna from Northeast of Mount Hunter. Above these shales is 2,000 feet of silty carbonates with Middle Triassic (Landinian) fossils in the lower half and abundant terebratulid and rhynchonellid brachiopods in the upper part." The Pine claims would appear to be in the black shale part of the section although in detail the majority of the rock is not shale but would more accurately be described as a calcareous mudstone.

Local Geology

The local geology has not been mapped in detail. Exposure in the black shales is poor with outcrops occurring only along the edge of the road or in steep stream beds. The series where exposed has a strike averaging 125° and a moderate dip averaging 35° to the west. It shows gentle folding with a shallow plunge to the north. There is the suggestion that much of the folding may be related to the various thrust faults. The regional geochemistry suggests that the area within the Pine Claims and the Pine River valley has a unique signature and may represent an isolated fault slice that only daylights in this area.

SAMPLING

The first sampling in this locality was by personal of Canex Placer in 1976. They had confined the better mineralized stratigraphic section to two creek beds and a section along the highway. Unfortunately the location of the highway samples was not accurately recorded and could not be determined by field examination. The first sampling by D. C. Rotherham in 1987 was a series of widely spaced stratigraphic samples to locate the vanadium bearing horizons. These samples results, A to L, are included in Appendix 1. The sampling carried out in 1989 (Appendix 1) was a follow up of the anomalous samples from 1987. This was a series of chip samples that were taken stratigraphically and covered the outcrop exposed. There appear to be no exposure of the section except in road cuts or steep stream cuts. When the results were obtained it was realized that one could not visually separate the mineralized from the unmineralized samples and the most westerly sample (409120H) of 1989 was well mineralized. The sampling program of 1990 therefore extended the detailed coverage until a change to a more calcareous rock type.

The initial samples were analyzed by multi-element ICP in part to determine what other elements were concentrated in the black shale. The results showed very little in anomalous metal content except for low values in zinc.

It was realized that the ICP analysis used a partial digestion and therefore would probably recover only part of the vanadium present. A series of samples was sent for vanadium assays using a total digestion. The results are shown on Table 2. This shows that the majority of the vanadium, averaging 89.5%, reported in the ICP analysis. It was therefore concluded that the ICP analysis were fairly close to the total amount present, gave conservative numbers and also information on other components of the rock. I.C.P. analysis was therefore used for the later sampling.

The price of vanadium is normally reported as so much per pound of V_2O_5 . The conversion factor for V to V_2O_5 is $V \times 1.78$. The content of vanadium pentoxide is shown on Table 1.

Table I
List of Samples and Assays

<u>Sample No.</u>	<u>V ppm.</u>	<u>V₂O₅ ppm.</u>	<u>lbs. V₂O₅</u>	
1987				
D1451	36			Sample A
D1452	40			Sample B
D1453	94			Sample C
D1454	145			Sample D
D1455	134			Sample E
D1456	75			Sample F
D1457	1960			Sample G
D1458	1455			Sample H
D1459	1680			Sample J
D1460	750			Sample K
D1461	265			Sample L
1989				
409105H	2172	3866	7.7	D-1
409106H	1577	2807	5.6	D-2
409107H	1390	2474	4.9	D-3
409108H	508	904	1.8	D-4
409109H	4486	7985	15.9	D-5
409110H	298	530	1.0	D-6
409111H	698	1240	2.5	D-7
409112H	2461	4380	8.7	D-8
409113H	1052	1872	3.7	D-9
409114H	1952	3474	6.9	D-10
409115H	2110	3757	7.5	D-11
409116H	1404	2499	5.0	D-12
409117H	2174	3870	7.7	D-13
409118H	2399	4270	8.5	D-14
409119H	2129	3790	7.5	D-15
409120H	1420	2527	5.0	D-16
409121H	2554	4546	9.1	D-17
1990				
2308	4626	8234	16.4	E-1
2309	470	836	1.6	E-2
2310	2255	4014	8.0	D-18
2311	1879	3344	6.6	D-19
2312	3315	5900	11.8	D-20
2313	1444	2570	5.1	D-21
2314	1239	2205	4.4	D-22
2315	1076	1915	3.8	D-23
2316	1118	1990	3.9	D-24
2317	1333	2372	4.7	D-25
2318	1402	2495	5.0	D-26
2319	1434	2552	5.1	D-27

Note: Samples E-1 and E-2 are resamples of D-5 and D-6

TABLE II

Comparison Between Assay Values and I.C.P.

<u>Sample No.</u>	<u>% V</u>	<u>I.C.P.</u>	<u>Diff.</u>	<u>I.C.P. %</u>
409105H	0.271	0.217	+0.054	80
409109H	0.470	0.449	+0.021	95
409112H	0.282	0.246	+0.036	87
409117H	0.243	0.217	+0.026	89
409118H	0.270	0.240	+0.030	89
409119H	0.219	0.213	+0.006	97

CONCLUSIONS

The assay results show an intermittent outcrops over an exposure length of 200 meters with values in vanadium averaging 6.25 lbs. V_2O_5 . The dip of this section is in the range of 35 degrees which indicates a true thickness in the range of 100 meters. One cannot see stratigraphic repetition of the section so this is considered a true width.

These results are comparable to those reported by Canex Placer on the two adjacent creek exposures to the east but the road exposure shows greater width. This may be due to only part of the section being exposed in the creeks due to the recessive nature of the shale. The results indicate that there is a potential for several millions of tons of low grade vanadium bearing rock on the Pine claims. The location is excellent with respect to transportation and energy.

RECOMMENDATIONS

1/ Due to the unknown mineralogy and fine grained nature of the mineralization preliminary metallurgical work should be carried out with tests for recovery of vanadium before an extensive program of sampling and drilling to accurately determine grade and tonnage the mineralized rock is warranted.

2/ Further detailed sampling should be carried out in the area between samples "H" and "G" extending as far as "F" to determine the lower extent of the mineralized zone.



D. C. Rotherham P. Eng.

STATEMENT OF COSTS

<u>Labor</u>	D. C. Rotherham July 3, 4, 5, 26, 1990		
	4 days @ \$200.00		800.00
<u>Travel</u>	2115 km. @ 0.25		528.75
<u>Room & Meals</u>			155.38
<u>Assaying</u>			
	7 assays @ \$9.00	61.00	
	12 31 element ICP @ \$9.75	117.00	
		<u>\$178.00</u>	<u>178.00</u>
<u>TOTAL</u>			<u>\$1662.13</u>

STATEMENT OF QUALIFICATIONS

I, Donald C. Rotherham, residing at 931 Esquimalt Avenue, West Vancouver British Columbia, declare that:

- 1/ I am a geologist and have worked in mineral exploration and mining since 1951.
- 2/ I am a graduate of the University of Saskatchewan where I obtained a bachelors and a masters degree in geology.
- 3/ I am a registered Professional Engineer with the Association of Professional Engineers of British Columbia.
- 4/ I have carried out the work described within this report.

Donald C. Rotherham P.Eng

APPENDIX 1

Assay Certificates



Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers

212 BROOKSBANK AVE., NORTH VANCOUVER,
BRITISH COLUMBIA, CANADA V7J-2C1

PHONE (604) 984-0221

To: ROTHERHAM, D.C. EXPLORATION & MINING GEOLOGY

931 ESQUIMALT AVE.
WEST VANCOUVER, BC
V7T 1J9

Project :
Comments :

*Page No. : 1-B
Tot. Pages: 1
Date : 17-AUG-87
Invoice # : I-8719502
P.O. # : NONE

CERTIFICATE OF ANALYSIS A8719502

SAMPLE DESCRIPTION	PREP CODE	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Se ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
D 1451	205 238	0.02	41	1730	6	< 5	< 10	168	< 0.01	< 10	< 10	36	< 5	62
D 1452	205 238	0.02	44	910	8	5	< 10	176	< 0.01	< 10	< 10	40	< 5	43
D 1453	205 238	0.03	65	>10000	4	5	10	310	< 0.01	< 10	< 10	94	< 5	188
D 1454	205 238	0.03	64	>10000	4	5	< 10	269	< 0.01	10	< 10	143	< 5	276
D 1455	205 238	0.02	39	2630	< 2	5	< 10	244	< 0.01	< 10	< 10	134	< 5	32
D 1456	205 238	0.03	42	8020	4	< 5	< 10	232	< 0.01	< 10	< 10	75	< 5	85
D 1457	205 238	0.03	132	>10000	8	15	30	507	0.01	10	< 10	1960	5	1205
D 1458	205 238	0.03	97	8910	6	10	20	1350	0.01	< 10	< 10	1455	5	558
D 1459	205 238	0.04	121	880	< 2	15	20	727	< 0.01	< 10	< 10	1680	< 5	706
D 1460	205 238	0.02	91	1140	10	10	20	527	< 0.01	< 10	< 10	750	< 5	388
D 1461	205 238	0.01	106	960	8	5	10	292	< 0.01	< 10	< 10	265	< 5	271

CERTIFICATION :

COMP: D.C.ROTHERHAM
 PROJ: " "
 ATTN: D.C.ROTHERHAM

MIN-EN LABS — ICP REPORT
 705 WEST 15TH ST., NORTH VANCOUVER, B.C. V7M 1T2
 (604)980-5814 OR (604)988-4524

FILE NO: 9V-0755-RJ1
 DATE: JUL-27-89
 * TYPE ROCK GEOCHEM * (ACT:F31)

SAMPLE NUMBER	AG PPM	AL PPM	AS PPM	B PPM	BA PPM	BE PPM	BI PPM	CA PPM	CD PPM	CO PPM	CU PPM	FE PPM	K PPM	LI PPM	MG PPM	MN PPM	MO PPM	NA PPM	NI PPM	P PPM	PB PPM	SB PPM	SR PPM	TH PPM	U PPM	V PPM	ZN PPM	GA PPM	SN PPM	W PPM	CR PPM
409105H	1.8	8820	21	12	270	1.1	4	147010	53.6	6	53	7400	2920	11	11710	101	91	200	117	10510	49	14	279	1	1	2172.5	937	1	2	3	140
409106H	1.5	7780	29	12	353	1.1	6	174870	35.9	6	34	7960	2560	8	17040	124	57	230	77	6660	49	8	238	1	1	1577.0	516	2	2	2	99
409107H	1.4	8990	23	16	269	1.3	5	127240	36.0	9	46	11600	2890	9	23170	155	100	180	121	2860	50	7	94	1	1	1389.7	595	1	3	2	86
409108H	1.5	5560	26	8	227	1.2	6	138520	18.4	6	32	9730	1800	6	34250	301	32	230	59	5140	58	1	74	1	1	508.4	240	1	3	1	77
409109H	.2	17770	1	28	354	1.8	5	102340	68.0	10	70	11410	5440	17	14180	108	163	190	227	13890	38	22	126	1	1	4486.0	1188	1	1	5	163
409110H	1.0	6440	25	34	337	1.0	4	126390	10.3	8	31	12000	1900	5	23920	159	51	240	54	1610	51	1	57	1	1	298.1	128	2	1	1	42
409111H	1.3	7770	17	15	189	1.2	5	122950	16.7	10	52	12630	2350	6	34390	181	74	220	97	2660	62	4	55	1	1	697.3	213	1	4	1	60
409112H	1.1	14930	1	24	256	1.3	6	125180	37.9	8	51	11900	4630	13	26580	212	89	280	126	11840	54	16	104	1	1	2460.9	770	1	3	3	108
409113H	1.3	10680	23	20	262	1.2	5	152390	25.4	7	40	12150	3440	11	21300	186	71	260	71	8760	48	5	98	1	1	1052.4	405	2	1	2	107
409114H	1.3	9230	13	18	238	1.0	5	184010	46.1	7	48	8660	3110	10	13520	182	153	250	99	5510	39	12	239	1	1	1951.7	571	2	1	3	102
409115H	.6	9280	17	18	282	.9	5	153060	42.5	6	37	9180	3080	9	16600	146	145	210	91	4430	49	12	342	1	1	2110.0	563	1	1	3	90
409116H	1.2	5910	28	12	333	1.0	6	184390	40.2	6	33	7940	1940	4	19120	186	125	230	80	4250	44	13	440	1	1	1403.7	604	2	1	2	72
409117H	1.0	6710	21	12	310	.8	4	179000	37.3	5	38	7300	2320	6	12670	112	118	220	73	2950	35	18	697	1	1	2173.6	468	1	1	3	87
409118H	.9	7350	1	14	264	1.0	4	164660	37.3	6	40	7450	2580	7	15340	133	110	220	79	2700	43	20	624	1	1	2398.7	438	1	1	3	101
409119H	1.2	7100	11	12	394	.9	6	185010	38.1	6	40	7400	2490	6	15550	126	112	1130	85	2690	45	20	471	1	1	2129.4	602	2	1	3	88
409120H	1.0	6110	27	12	194	.9	5	167370	28.1	6	29	9580	2130	5	20100	169	106	220	79	1480	45	15	249	1	1	1419.7	486	2	2	2	69
409121H	1.1	8370	2	16	395	.9	5	154560	42.0	6	43	8850	3000	8	15820	126	102	210	93	2170	46	21	560	1	1	2554.5	498	1	2	3	107

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APPENDIX 2

Description of Analytical Procedures



**MINERAL
• ENVIRONMENTAL
LABORATORIES**

ANALYTICAL PROCEDURE REPORT FOR ASSESSMENT WORK:

PROCEDURE FOR 31 ELEMENT TRACE ICP:

Ag, Al, As, B, Ba, Be, Bi, Ca, Cd, Co, Cu,
Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sb,
Sr, Th, U, V, Zn, Ga, Sn, W, Cr

Samples are processed by Min-En Laboratories., at 705 West 15th Street, North Vancouver, employing the following procedures.

After drying the samples at 95^oC soil and stream sediment samples are screened by 80 mesh sieve to obtain the minus 80 mesh fraction for analysis. The rock samples are crushed by a jaw crusher and pulverized by ceramic plated pulverizer or ring mill pulverizer.

1.0 gram of the sample is digested for 4 hours with an aqua regia HClO₄ mixture.

After cooling samples are diluted to standard volume. The solutions are analysed by computer operated Jarrall Ash 9000 ICAP or Jobin Yvon 70 Type II Inductively Coupled Plasma Spectrometers. Reports are formatted and printed using a dot-matrix printer.