

MAP NO.: 116 B / 3  
ASSESSMENT REPORT X  
PROSPECTUS  
CONFIDENTIAL X  
OPEN FILE

DOCUMENT NO:092970  
MINING DISTRICT: Dawson  
TYPE OF WORK: Geological

REPORT FILED UNDER: Four Leaf Clover Property

DATE PERFORMED: Fall 1990

DATE FILED: July 30, 1991

LOCATION: LAT.: 64°03'N

AREA: Wind River

LONG.: 139°28'W

VALUE \$: 1,000.00

CLAIM NAME & NO.: Four Leaf Clover 1 -10, YB 23707 - YB 23716

WORK DONE BY: J.M. Kowalchuk, B.Sc, FGAC.

WORK DONE FOR: Ron McPhee

DATE TO GOOD STANDING:

REMARKS: # 116 B -

Author toured property in fall of 1990 and sampled mafic metavolcanic rocks for gold, silver and copper. Rocks display some minor malachite staining on joint faces along cliff faces. Except for samples taken from small shear zone assay values for all 3 elements were low. Possible volcanogenic massive sulfide deposit.

**GEOLOGICAL REPORT**

on the

**FOUR LEAF CLOVER PROPERTY**

Dawson Mining District

Yukon Territory

NTS 116 B/3

**CLAIMS**

**FOUR LEAF CLOVER 1-10**

**YB 23707 - YB 23716**

FOR

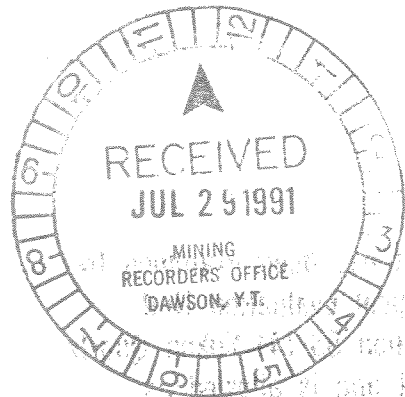
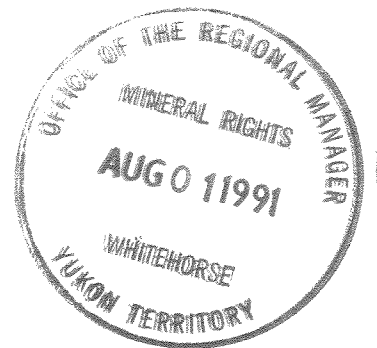
**RON McPHEE**

BY

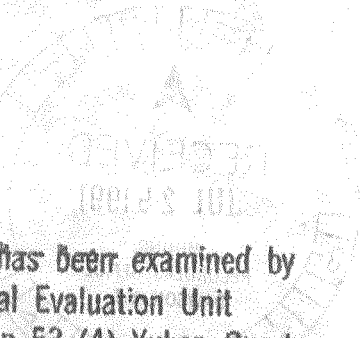
**J.M.KOWALCHUK, BSc, FGAC**

**April, 1990**

092970



02820



This report has been examined by  
the Geological Evaluation Unit  
under Section 53 (4) Yukon Quartz  
Mining Act and is allowed as  
representation work in the amount  
of \$ 1000.00.

*[Signature]*  
Regional Manager, Exploration and  
Geological Services for Commissioner  
of Yukon Territory.

## SUMMARY

Detailed geological traverses over parts of the Four Leaf Clover Claims indicate a steeply dipping, interbedded sequence of chloritic and sericitic metavolcanics with graphitic metasediments. Along the whole cliff section along the river this metavolcanic sequence is stained with copper oxides. Much of the copper mineralization appears to be a result of chalcopyrite mineralization along fractures and joints. Although some high copper values were obtained, most of the rocks gave only background levels of copper geochemistry.

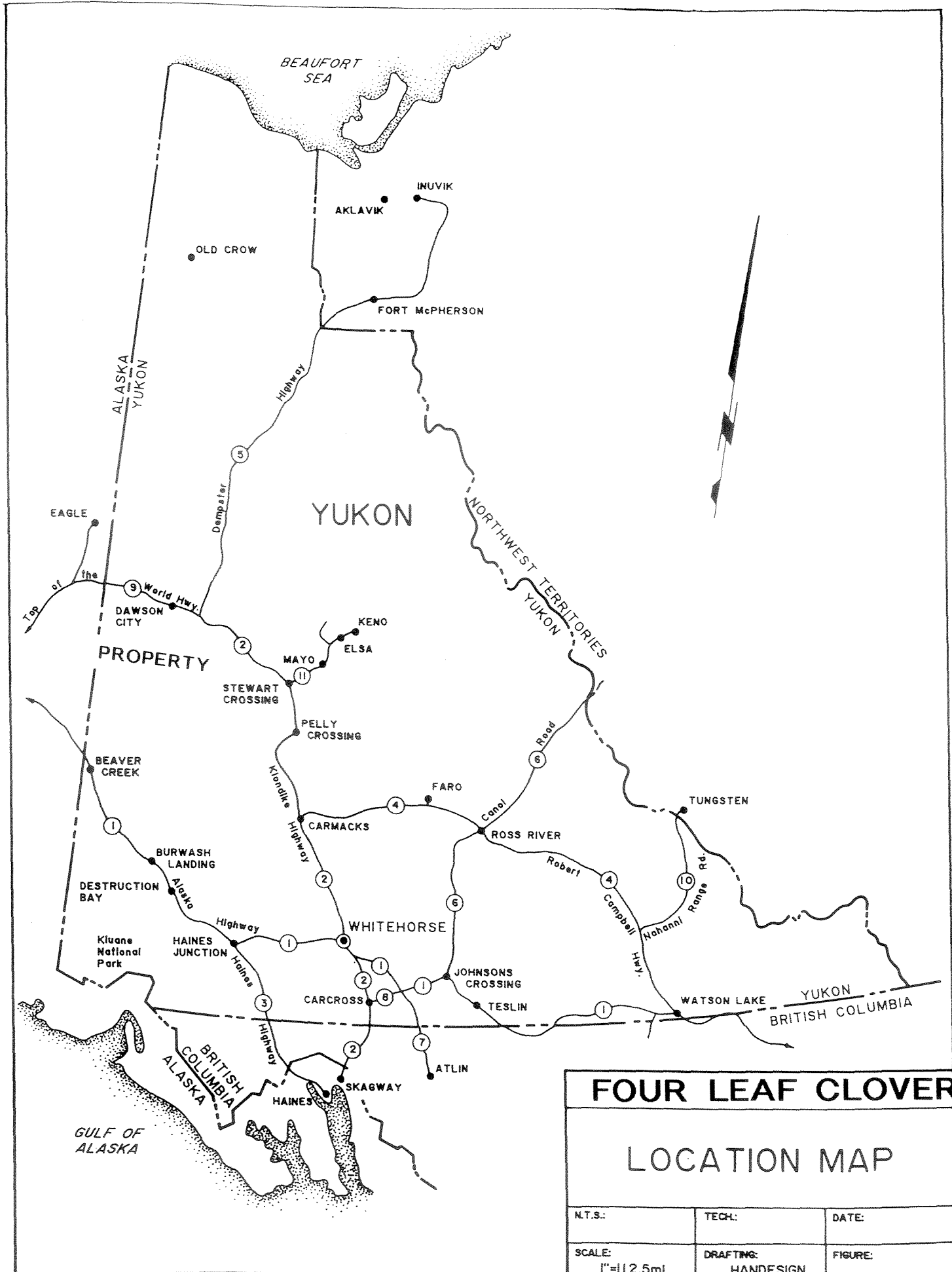
The mixed volcanic suite interbedded with graphitic sediments is anomalous in copper and may be indicative of a metalliferous volcanic pile in which a volcanogenic massive sulphide deposit may be found. This idea should be taken into account when further work is done on the property.

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# FOUR LEAF CLOVER

## LOCATION MAP

N.T.S.:	TECH.:	DATE:
SCALE: 1"=12.5ml.	DRAFTING: HANDSIGN	FIGURE:

## INTRODUCTION

After reviewing archival data of work in the Dawson area, Ron McPhee along with a partner staked the Four Leaf Clover claims across the Yukon River from Dawson, in the fall of 1989. The author visited the property in the summer of 1989, and then spent three days mapping and sampling the volcanic rocks covering the property. This report covers describes the work and results of this three day geological mapping program.

## LOCATION AND ACCESS (Figure 1)

The Four Leaf Clover Property on map sheet 116 B/3 lies within the boundaries of West Dawson across the Yukon River from Dawson. Access to the property is by car ferry across the Yukon River. The Top of the World Highway circles around the north end of the property.

## TOPOGRAPHY AND VEGETATION

Topographic relief on the property is quite moderate with maximum relief at 500 feet. The banks of the Yukon River consist mostly of 100 metre cliffs with very good outcrop exposure. Scrub spruce and dwarf birch grows over all of the property.

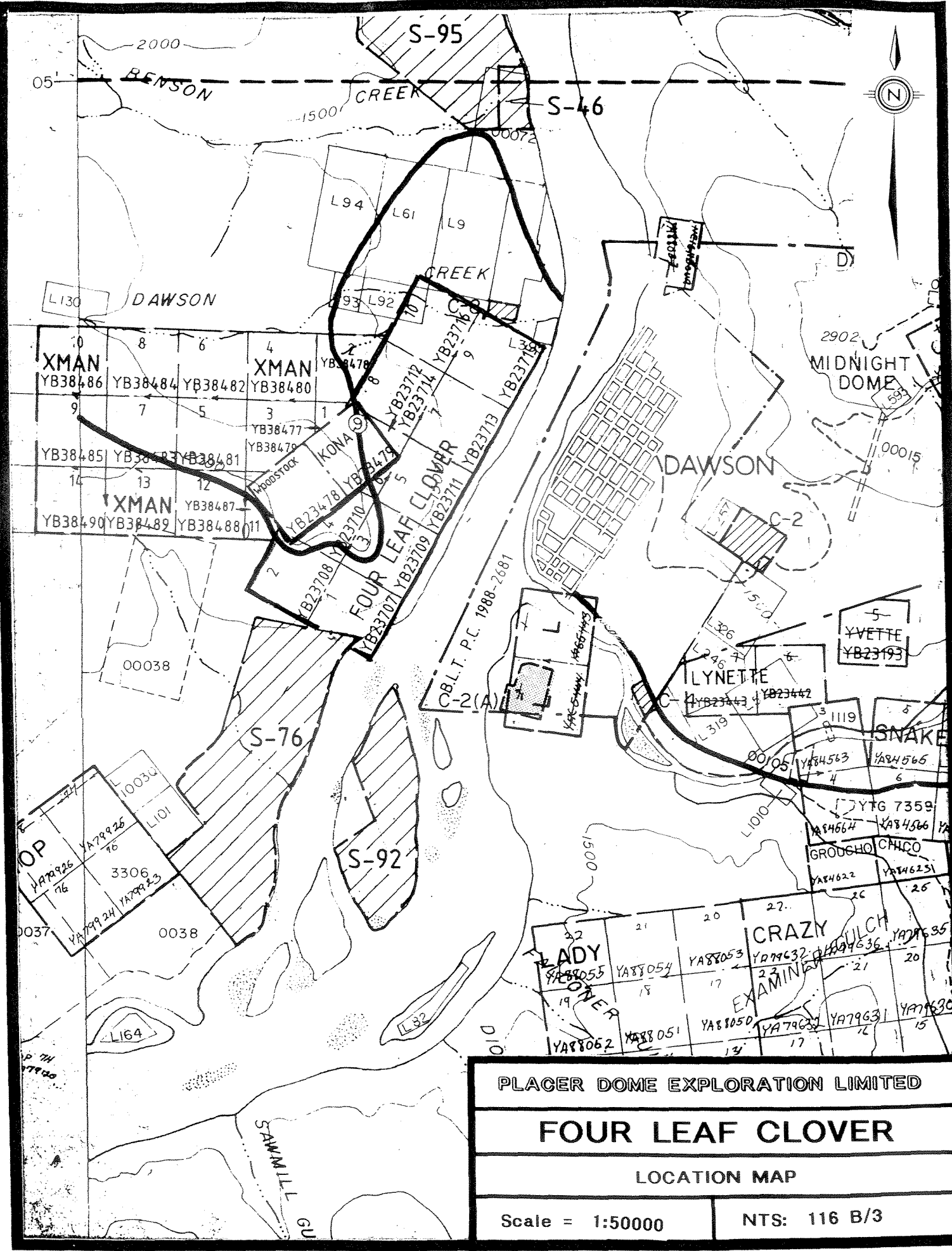
## MINERAL PROPERTY AND OWNERSHIP (Figure 2)

The property consists of 10 Four Leaf Clover claims owned by Ron McPhee. The claim information is as follows:

<u>CLAIM NAME</u>	<u>GRANT NUMBER</u>	<u>ANNIVERSARY DATE</u>
Four Leaf Clover 1 - 10	YB 23707-YB23716	September 7

## HISTORY

Information from the Yukon archives states that the property was mined in the early 1900's. An adit, 80 feet above the river, tested a mineralized zone containing copper. Two other adits were observed. Quartz veins within this zone, gave gold values up to 0.5 to 1.0 ounces per ton. Based on this information, Ron McPhee and Bill Borisenko staked the property in the fall of 1989. The author prospected and mapped the property in the fall of 1990.



PLACER DOME EXPLORATION LIMITED

**FOUR LEAF CLOVER**

LOCATION MAP

Scale = 1:50000

NTS: 116 B/3

## GEOLOGY and MINERALIZATION

Regionally the area is underlain by a suite of mafic metavolcanic rocks, primarily andesitic greenstone and mafic volcanic tuff. Mapping, shows that the property is underlain by well foliated volcanic rocks. The major part of the volcanic pile consists of green andesitic tuff, however these rocks are sometimes interbedded with thin beds of sericite altered tuff. Sericite altered beds are generally less than 10 metres in thickness. A few thin beds of black shale, generally less than 3.0 metres thick, were found on the property. The rocks are all schistose in nature and bedding can only be determined when the actual rock units change. The general degree of metamorphism is upper greenschist facies.

Regionally and on the property, the rocks show a strong foliation striking N50°E and dipping steeply to the north. A strong north northwest trending vertical shear was mapped in the adit located on claim 7. The shear is about 2.0 to 3.0 metres wide and hosts most of the copper mineralization on the property.

The greenstones show some minor malachite stain on joint faces along the cliff faces exposed along the river bank. These appear to be as a result of copper leaching out of the volcanic rocks and into the joints. Although these rocks show extensive copper staining, the absolute copper values in the rocks appear to be rather low. Most of the copper mineralization occurs in the shear zone. The adits driven in the early 1900's to exploit copper gold mineralization, followed this shear.

A summary of the copper, silver and gold analyses of the samples taken on the property follows in Table 2. The sample locations are plotted on Figure 3, Geology.

TABLE 1

<u>SAMPLE NO.</u>	<u>COPPER (ppm)</u>	<u>GOLD (ppb)</u>	<u>SILVER (ppm)</u>
51401	770	< 10	< 0.2
51402	352	< 10	< 0.2
51403	3,000	< 10	0.4
51404	2,600	< 10	0.4
51405	3,500	< 10	0.4
A	937	< 10	0.3
B	23,400	< 10	144.2
4LC	2,354	< 10	1.6
728	22	187	3.2
729	9	45	0.5
730	46	30	0.4
731	33	17	0.2
734	21	11	0.3
735	12	< 10	0.5

# LEGEND

1 CHLORITE & SERICITE SCHIST

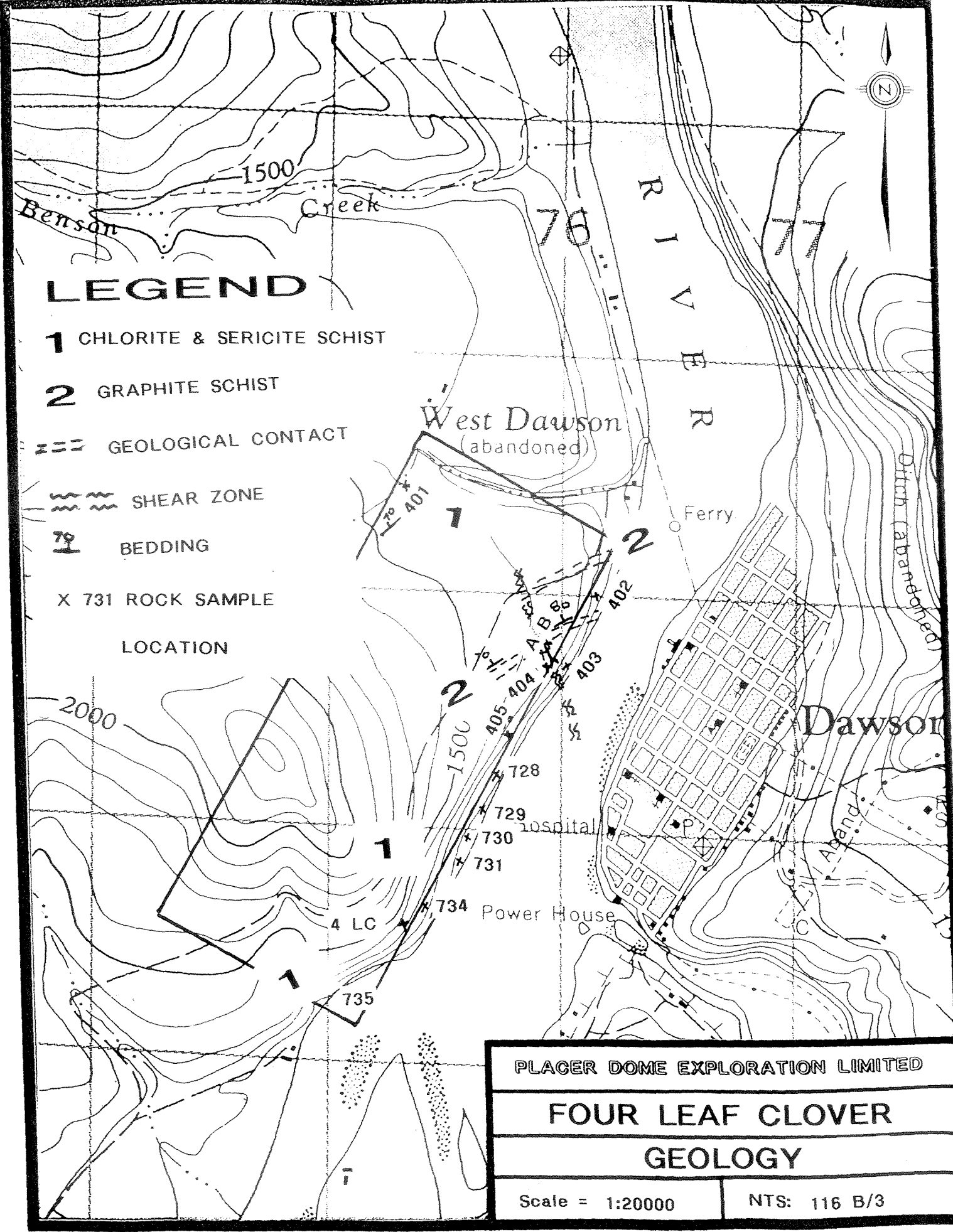
2 GRAPHITE SCHIST

--- GEOLOGICAL CONTACT

~ ~ ~ SHEAR ZONE

79 BEDDING

X 731 ROCK SAMPLE  
LOCATION



PLAGER DOME EXPLORATION LIMITED

## FOUR LEAF CLOVER GEOLOGY

Scale = 1:20000

NTS: 116 B/3

## CONCLUSIONS

A suite of mafic volcanics is stained with malachite along cleavage and joint faces. Most of this staining is a supergene concentration of copper oxides leached out of the surrounding volcanic rocks. The volcanics appear to be slightly anomalous in copper.

A northerly trending shear zone is mineralized with quartz, chalcopyrite, bornite and malachite. The mineralized zone varies in thickness from 1.0 to 2.0 metres in width. Mining of the shear at the turn of the century dug two adits into the cliff face. Although mineralization looks spectacular and the copper grades get up to 2.0% , the shear hosted mineralization is much too narrow to be of interest.

The volcanic stratigraphy on the Four Leaf Clover Property, consisting of a mixed sequence of mafic and felsic rocks, interbedded with occasional beds of black shales is favourable for hosting volcanogenic massive sulphide deposits. The mafic volcanics on the property , as indicated by the extensive secondary malachite mineralization, are anomalous in copper. There is a good potential for VMS mineralization in the volcanic section if not on the property. This potential should be investigated before dismissing the property as uneconomic.

## STATEMENT OF EXPENDITURES

### PERSONNEL

John Kowalchuk	
3 days @ \$300/day	900

### CAMP COSTS

3 days @ \$100/day	300
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### VEHICLE EXPENSE

3 days @ \$60/day	180
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### ASSAYING

14 rocks (Ag,As,Au,Cu,Pb,Zn) @15	200
----------------------------------	-----

### REPORT AND DRAFTING

	500
--	-----

### TOTAL

	<b>\$2080</b>
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**REFERENCES**

Archer Cathro and Associates, 1989; Northern Mineral Inventory, 116 B/3 West Dawson

Debicki, R.L.; Bedrock Geology and Mineralization of the Klondike Area (west), 115 O/14,15 and 116 B/2, 3 ; Indian and Northern Affairs 1984 Open File

**STATEMENT OF QUALIFICATIONS**

I, JOHN M. KOWALCHUK, do hereby certify that:

1. I am a Geologist, resident at 35 Cedar Crescent, Whitehorse, Yukon.
2. I am a graduate of Mc Master University, Hamilton, Ontario, with a B.Sc. in geology in 1970.
3. I am a Fellow of the Geological Association of Canada.
4. I have practised my profession across Canada over the past 20 years.
5. This report is based on a field mapping of the property, sampling and evaluation of the results.

APPENDIX NO 1

Analysis Techniques

GENERAL TEST

Elements: Mo Cu Zn Pb Cd Ni Co Ag Mn

Procedure:

1. Weigh 0.50 g of -80 mesh soil, sediment or -100 mesh pulverized rock into numbered 16 x 150 test tubes. Every tenth sample should be a duplicate sample or an internal known reference standard.
2. Add 1 mL of  $\text{HNO}_3$  followed by 2 mL  $\text{HClO}_4$ . Samples containing carbonates may react vigorously at first so add 1 mL  $\text{HNO}_3$  and let stand until the reaction stops before adding 2 mL  $\text{HClO}_4$ .
3. Place tubes in test tube block on hot plate at  $160^\circ\text{C}$ . The samples will boil vigorously at first and then decrease as the  $\text{HNO}_3$  boils away. Organic samples should be watched to see that they do not foam. If they do foam, then take the test tube out of the block and gently tap the bottom of the tube on an asbestos pad. Highly organic soils can be handled by adding the acid and letting them stand overnight.

The temperature of the hot plate should be set so that after the  $\text{HNO}_3$  boils away (45 min  $\longrightarrow$  1 h), then the  $\text{HClO}_4$  boils gently and refluxes down the sides of the test tube.<sup>4</sup> Total digestion time is 4 hours.

4. Cool the sample by adding 6 mL demineralized water and immersing the test tube rack in cold water for 2 min. After cooling, bring the volume up to 10 mL, cap, and shake.
5. Read on AA using air/acetylene flame for all elements except Mo which should be run using  $\text{N}_2\text{O}$ /acetylene flame. Background correction should be used on Pb, Cd, Ag. Turn burner head for Zn.

/ojt  
1988-01-15

U, Cu, Zn, Pb, Ag  
GEOCHEM.

GENERAL TEST  
Page 2 of 2

Standards:

- all standards are made in 15% HClO<sub>4</sub>
- factor is 20

	Standard Concentrate (µg/ml)	AA Setting (ppm)
Cu Zn Pb Co Ni Mn	5.0	100
	10.0	200
Mo	1.0	20
	2.0	40
	4.0	80
Cd	0.10	2.0
	0.50	10.0
	1.00	20.0
Ag	0.50	1.0
	0.10	2.0
	0.20	4.0

add 2ml per 100ml  
20% AsCl<sub>3</sub> to  
STI

Samples giving a reading above the high standard are diluted 1 to 10 with 15% HClO<sub>4</sub> and re-analyzed.

<u>Wavelengths:</u>	
Mo	313.3 nm
Cu	324.7
Zn	213.8
Pb	283.3
Cd	228.0
Ni	232.0
Co	240.7
Mn	279.5
Ag	328.0

/ojt  
1988-01-15

Au

GEOCHEM

GOLD TEST

Procedure:

1. Weigh 10.0 g sample into #07 crucible.
2. Heat in furnace for 1 1/2 h @ 600°C.
3. Cool, transfer to 150 mL glass beaker and add 30 mL Aqua Regia (3 parts HCl, 2 parts H<sub>2</sub>O, add 1 part HNO<sub>3</sub>).
4. Digest at just off the boil for 2 hours.
5. Cool, and bulk up to 110 mL mark on beaker.
6. Stir and leave overnight to settle.
7. Decant 50 mL of sample solution into 25 x 200 mm test-tube.
8. Add 7 mL MIBK, cap, and shake in shaker for 3 min.
9. Read organic layer on A.A.

Standards:

1. In 250 mL separate funnel add 10 mL H<sub>2</sub>O, 1 mL HCL, 2 drops of HNO<sub>3</sub> and the following amounts of Au:

0.1 mL of 1000µg/mL Au standard = 1 ppm

0.2 mL of 1000µg/mL Au standard = 2 ppm

0.4 mL of 1000µg/mL Au standard = 4 ppm

2. Add 100 mL<sub>A</sub><sup>MIBK</sup> and shake for 3 min.
3. Drain aqueous layer.

For higher samples, standards can be made in 30% aqua regia and the remaining half of the sample can be run in the aqueous phase.

/ojt

1987-11-24

DETERMINATION OF AU BY FIRE ASSAY &

ATOMIC ABSORPTION

1. Weigh out 25 g sample into a 40 g fire assay crucible containing 150 g flux (2 parts PbO:1 part Na<sub>2</sub>CO<sub>3</sub>), and 25 g silica flour.
2. Add 1 1/2 tsp flour (~4.5 g) and 1 silver inguirt.
3. Mix thoroughly with a large spatula until homogeneous and cover with a thin layer of flux.
4. Place the crucible in a preheated (2000°F) furnace for 45 min.
5. Remove the molten assay from the furnace and pour into an iron mold. Allow to cool for ~20 min.
6. Break the slag from the lead button and hammer into a cube for cupellation.
7. Place the lead button on a preheated cupel.
8. When cupellation has been completed, the cupel is removed from the furnace and allowed to cool.
9. The prill is removed from the cupel and transferred to a graduated test tube.
10. 5 mL 25% HNO<sub>3</sub> is added to each test tube and the test tube rack is placed in a boiling water bath.
11. Continue heating until all Ag is in solution (no bubbling, and Au appears as black speck.)
12. Cool, decant off acid solution. Wash once with 10 mL deionized H<sub>2</sub>O, and decant off H<sub>2</sub>O.
13. To each test tube add 0.3 mL acid mixture (5 HCl:1 HNO<sub>3</sub>) using a pipette.

. . . . /2

14. Return test tube rack to water bath and heat until all Au is in solution.
15. Wash down the side of test tube, heat for another 15 min.
16. Remove, cool, and bulk to appropriate volume; making sure the final acid strength is 5% HCl and 1% HNO<sub>3</sub>.
17. Stopper test tube & mix by shaking.
18. Run on Atomic Absorption instrument vs Au standards (0-15 ppm).
19. Calculate amount of gold present in sample.

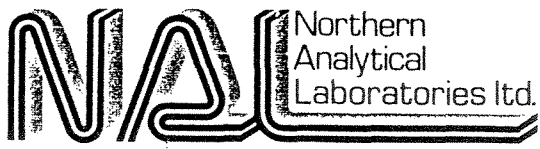
$$\text{ppm Au} = \frac{(\text{AA Reading } [\mu\text{g/mL}])}{\text{Wt Sample (g)}} \times (\text{Volume [mL]})$$

HCW/LDO:ojt  
1988-09-16  
File No. M-002

APPENDIX NO 2

Analyses

SAMPLE	PROJECT	Ag PPM	AS PPM	AU PPM	Co PPM	CU PPM	Ni PPM	Pb PPM	Pd PPB	Pt PPB	S PP
51401	9275	<0.2	<2	<0.01	300	770	0.39%	7	130	90	<
51402	9275	<0.2	<2	<0.01	160	352	0.25%	7	190	170	<
51403	9275	0.4	<2	<0.01	327	0.30%	0.72%	6	120	120	<
51404	9275	0.4	<2	<0.01	360	2600	0.58%	6	175	230	<
51405	9275	0.4	4	<0.01	315	0.35%	0.46%	7	40	120	<
STD P1	9275	0.2	17		10	22	34	50			<
STD CU	9275					0.39%					<



October 20, 1989

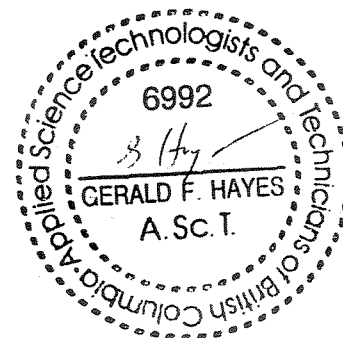
Ron McPhee  
 Box 636  
 Dawson City, Yukon  
 Y0B 1G0

ASSAY CERTIFICATE FOR SAMPLES PROVIDED

WORK ORDER # 29252

Sample	ppb Au	ppm Ag	ppm Cu	ppm Pb	ppm Zn	ppm As
A	<10	0.3	937	16	52	<10
B	<10	144.2	23400	3987	170	<10

Au -- 15g Fire Assay/AAS  
 Metals -- Aqua Regia Digestion/AAS



CAVENDISH ANALYTICAL LABORATORY LTD.

2225 S. Spelover Ave., Surrey,  
British Columbia, Can. V3B 3M1  
Ph: (604) 299-2560 Fax: 299-6253

CERTIFICATE OF ANALYSIS

TO : NORTHERN ANALYTICAL LAB LTD  
105 COPPER RD  
WHITEHORSE, YT  
PROJECT : 29193  
TYPE OF ANALYSIS : ICP

CERTIFICATE # : 890919C  
INVOICE # : SEP B9  
DATE ENTERED : 89/09/21  
FILE NAME : ICP919C  
PAGE # : 1

PRE FIX	SAMPLE NAME	PPM NO	PPM CU	PPM PB	PPM ZN	PPM AG	PPM NI	PPM CO	PPM Mn	% FE	PPM AS	PPM U	PPM AU	PPM HG	PPM SR	PPM CD	PPM SD	PPM BI	PPM V	% CA	% P	PPM LA	PPM CR	% MG	PPM BA	% Tl	PPM B	% AL	% NA	% SI	PPM H	PPM NE
10051	544	3970	29793	444	294.1	5	1	23	1.23	3790	NA	ND	13	61	49	4666	33	4	0.01	0.07	1	37	0.01	60	0.01	1340	0.07	0.01	0.01	17	1	
10052	15	487	3565	391	73.9	10	24	2985	13.00	566	NA	ND	ND	37	17	04	00	20	3.97	0.20	3	62	1.03	169	0.01	13	0.15	0.01	0.01	43	1	
10053	7	173	262	41	2.5	5	6	122	1.62	122	NA	ND	ND	20	1	14	2	42	0.28	0.31	9	50	0.23	55	0.09	90	0.30	0.01	0.02	2	1	
10054	15	26	145	21	1.1	17	1	1066	2.44	43	NA	ND	ND	20	1	9	2	11	1.11	0.00	2	130	0.59	46	0.01	85	0.15	0.01	0.01	6	1	
10055	16	29	168	20	0.6	14	1	464	1.35	67	NA	ND	ND	26	1	11	2	0	0.97	0.19	5	145	0.36	260	0.01	61	0.14	0.01	0.02	4	1	
10056	9	4	39	22	0.1	4	1	56	0.90	12	NA	ND	ND	3	1	2	2	6	0.09	0.95	27	94	0.04	57	0.01	5	0.23	0.01	0.02	1	1	
10057	10	60	14	39	0.1	36	14	528	2.30	14	NA	ND	ND	5	1	2	2	17	0.12	0.00	24	109	0.45	73	0.02	43	0.70	0.01	0.02	1	1	
10058	8	67	28	100	0.6	55	28	1975	3.95	24	NA	ND	ND	17	1	4	2	25	1.13	0.12	20	69	0.00	104	0.02	5	0.65	0.01	0.02	12	1	
10059	9	26	12	79	1.1	56	25	1342	4.70	52	NA	ND	ND	24	1	10	6	16	0.16	0.09	21	63	0.52	313	0.01	5	0.34	0.01	0.01	13	1	
10060	4	6	24	95	1.9	65	26	1325	4.56	41	NA	ND	ND	100	4	9	2	53	5.06	0.20	23	222	3.22	75	0.01	5	0.53	0.01	0.02	21	2	
10061	8	39	16	51	0.5	10	13	1649	4.00	107	NA	ND	ND	30	1	11	2	12	0.99	0.09	28	63	0.05	151	0.01	5	0.34	0.01	0.02	12	1	
10062	5	103	23	96	0.9	59	41	1505	3.95	20	NA	ND	ND	9	2	2	2	07	0.41	0.20	29	143	1.15	107	0.07	124	1.46	0.01	0.01	3	3	
10063	4	35	33	105	2.0	90	48	1637	4.83	64	NA	ND	ND	123	6	7	2	133	3.30	0.30	30	166	2.03	362	0.13	26	2.14	0.01	0.01	9	4	
10064	8	61	52	75	2.0	20	27	545	2.04	35	NA	ND	ND	10	2	7	10	64	0.37	0.29	34	133	1.21	252	0.14	74	1.69	0.01	0.01	4	2	
10065	9	49	44	372	2.1	65	25	3450	5.07	67	NA	ND	ND	139	5	10	2	106	4.33	0.21	4	77	1.30	260	0.01	207	0.20	0.01	0.02	20	3	
10066	21	4	72	22	0.4	6	1	725	0.60	11	NA	ND	ND	9	1	5	2	5	0.53	0.03	3	210	0.03	21	0.01	5	0.05	0.01	0.02	3	5	
10067	10	127	5676	7653	03.0	777	53	1325	2.49	2114	NA	ND	ND	310	54	152	13	11	7.75	0.00	4	270	6.27	542	0.01	5	0.03	0.01	0.01	210	1	
10068	7	7	106	111	3.6	1007	63	570	3.46	409	NA	ND	ND	40	5	15	9	29	1.42	0.00	4	546	9.52	23	0.01	5	0.53	0.01	0.01	26	1	
10069	14	473	20172	47936	352.6	400	29	1036	2.50	740	NA	ND	ND	12	252	244	493	0	10	3.64	0.10	3	279	0.49	51	0.01	109	0.03	0.01	0.01	2	1
10070	15	50	169	332	4.4	19	19	41	6.61	1102	NA	ND	ND	6	9	3	217	41	3	0.04	0.00	5	102	0.07	56	0.01	NA	0.01	0.01	0.01	2	1
F. L. CLOVER	5	2354	25	42	1.6	53	45	649	4.26	249	NA	ND	ND	13	4	217	2	76	0.76	0.11	2	120	2.90	28	0.14	5	2.92	0.01	0.02	1	1	
STMS	22	817	493	461	16.6	227	275	909	2.96	372	NA	56	506	625	155	007	363	111	0.37	5.10	006	60	0.41	219	0.11	553	1.32	0.01	0.01	325	46	

CERTIFIED BY :

*A. King*

RECEIVED  
JUL - 4 1991  
RECEIVED

July 4, 1991

Work Order # 13186

Placer Dome Exploration Limited  
103 Platinum Road  
Whitehorse, Yukon  
Y1A 5M3

File #

Assay Certificate for Samples Provided

Sample	ppb Au	ppm Ag	ppm Cu	ppm Pb	ppm Zn
B728	187	3.2	22	416	1013
B729	45	0.5	9	43	77
B730	30	0.4	46	8	48
B731	17	0.2	33	7	57
B734	11	0.3	21	21	106
B735	<5	0.5	12	16	78

Certified by Chyokki



**REFERENCES**

Archer Cathro and Associates, 1989; Northern Mineral Inventory, 116 B/3 West Dawson

Debicki, R.L.; Bedrock Geology and Mineralization of the Klondike Area (west), 115 O/14,15 and 116 B/2, 3 ; Indian and Northern Affairs 1984 Open File

**STATEMENT OF QUALIFICATIONS**

I, JOHN M. KOWALCHUK, do hereby certify that:

1. I am a Geologist, resident at 35 Cedar Crescent, Whitehorse, Yukon.
2. I am a graduate of Mc Master University, Hamilton, Ontario, with a B.Sc. in geology in 1970.
3. I am a Fellow of the Geological Association of Canada.
4. I have practised my profession across Canada over the past 20 years.
5. This report is based on a field mapping of the property, sampling and evaluation of the results.

