GEOLOGY AND GEOCHEMISTRY REPORT

on the

COOPER PROPERTY

Cooper 1-4 Claims

Nelson Mining Division
N.T.S. 82F/8

Latitude 49^0 21' N Longitude 116^0 11' W

Owner/Operator: PLACER DOME INC.

M.B.Gareau
G.R.Haryett

November 1989

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1.0 INTRODUCTION

Geochemical and geological surveys were conducted on the Cooper 1 to 4 Claims in August 1989 by Placer Dome Inc. The claims are approximately 50 km northeast of Creston in southeastern British Columbia. This early stage exploration programme was designed to investigate the potential for precious metal mineralization on the property.

Results from the mapping, prospecting and sampling are the subject of this report, and are being submitted to meet provincial assessment requirements for the Cooper property.

2.0 SUMMARY

The Cooper claim group is underlain by siliciclastic sedimentary rocks of the Creston and Aldridge Formations which form part of the Purcell Supergroup. The property is on the southwest corner of a linear magnetic high that can be interpreted as a buried intrusive body. Igneous rocks were not encountered in outcrop within the claims.

Stream sediment sampling confirmed the previously discovered gold anomalies, and also identified a new gold anomaly in Little Moyie Creek located on the Cooper 4 Claim. Soil results are encouraging; two gold anomalies were found, and both are open in several directions. Geochemically elevated gold concentrations were obtained from a few float and outcrop samples. The best result was 180 ppb gold from a five meter wide quartz vein. Geochemical values of all other analyzed elements for all three sample media, with the exception of one stream sediment sample, are low and reflect background concentrations.

The 1989 field program identified several geochemical targets that warrant further exploration. Total assessment expenditures accrued on the Cooper claim group for 1989 are $13,124.85.

3.0 RECOMMENDATION

A modest program of geochemical sampling, prospecting and detailed mapping is recommended to follow-up the soil and drainage anomalies found by the 1989 field programme.

Contour soil lines should be run to establish the size and shape of the two best soil anomalies. These anomalies should be prospected and mapped to determine their source. Orientation studies should be initiated at the beginning of the programme to find the optimal size-fraction for gold analysis and to decide if analysis of trace elements should be continued.

The bulk sediment gold anomalies on the Cooper 4 Claim should be investigated by stream bank and contour soil sampling up stream and up slope from the stream sediment sample sites.

4.0 PROPERTY DEFINITION

4.1 Location and Access

The Cooper claim group is in the Nelson Mining Division in southeastern British Columbia. It is approximately 20 km east of Creston, and 45 km north of the small community of Kitchener (Figure 1).

Access is from Kitchener, located on Highway 3, via a well maintained gravel logging road which runs north along Goat River. A major junction occurs at approximately 25 km north and at this point the main road turns west. To reach the claims one must continue north and then east along Kamma Creek for about 20 km. A series of narrow logging roads cut across the middle of the claim group making access to the property quite easy. The property can also be accessed by the Moyie Lake logging road which begins at the eastern edge of Moyie Lake. This, however, is a long drive on roads which are not maintained.

4.2 Physiography

The Cooper property is in the Moyie Range of the Purcell Mountains; it is between Goat River to the west and Moyie River to the east. The claims are at the headwaters of Kamma Creek which empties into Goat River. The western property boundary is approximately parallel to the upper reaches of Kamma Creek. Topographically the claims lie between 1667 m to 2121 m above mean sea level (Figure 2).

Four creeks drain the claims; three flow into Kamma Creek and one into the Moyie River. Over part of their length the creeks are confined to steep-walled gullies where waterflow is marked by small rapids and waterfalls. Bedrock is exposed in these creeks and also forms cliffs on the steeper parts of the property. The area is well drained.

Active logging has removed about three-quarters of the trees on the upper parts of the claim group leaving it ready for re-forestation. A mature growth of pine trees with little to no undergrowth covers the remainder of the property.

4.3 Claim Information

The Cooper property consists of four contiguous claims which are owned 100% by Placer Dome Inc. Staking of the claims was contracted to Fox Geological Consultants Ltd. of Vancouver. Information for the individual claims is tabulated below.

Claim Name	No. Units	Record No.	Tag No.	Anniv. Date
COOPER 1	12	5866	30156	July 30
COOPER 2	20	5867	30157	July 31
COOPER 3	12	5868	30158	July 30
COOPER 4	16	5869	30159	July 31

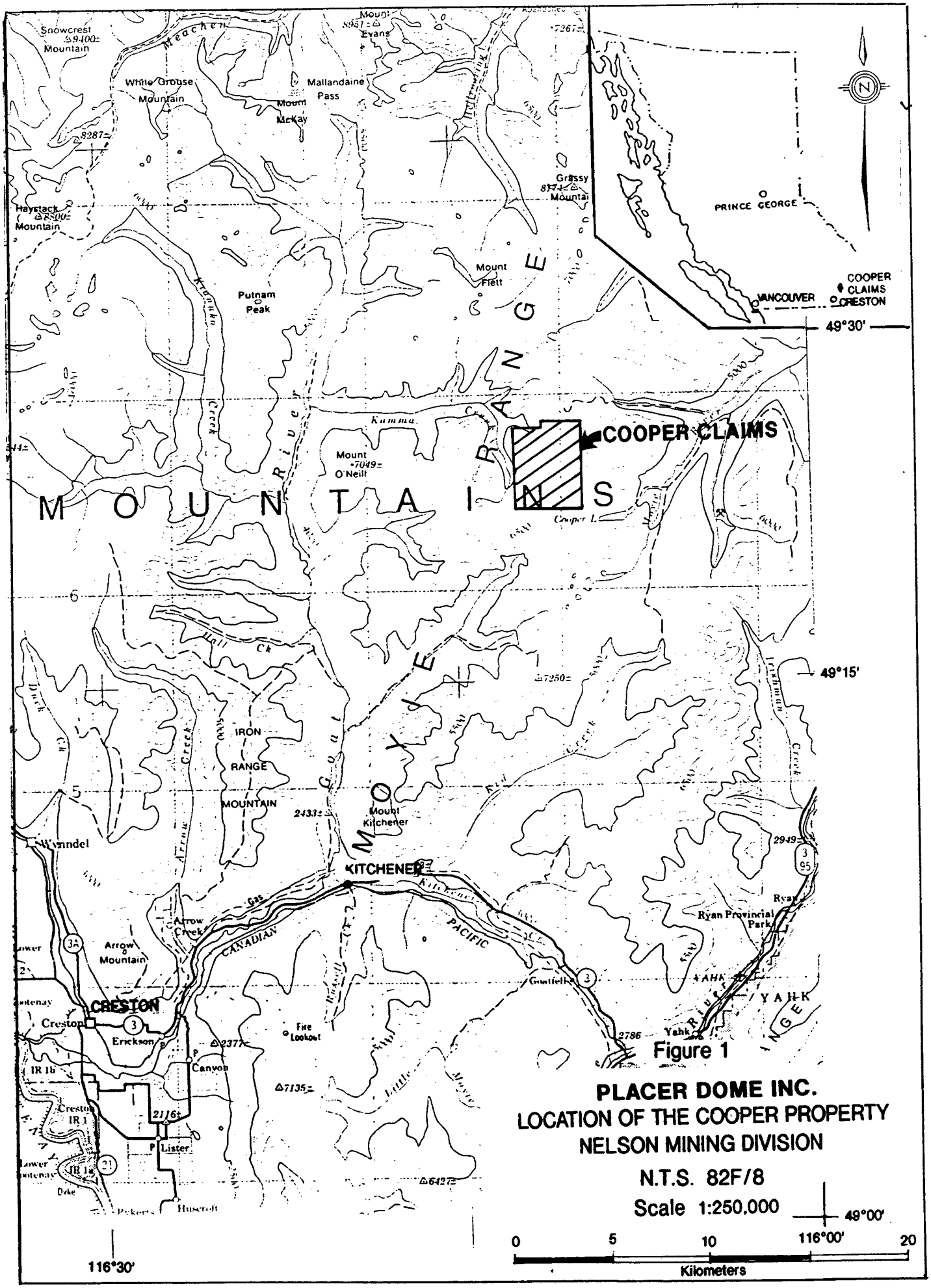

Figure 1

PLACER DOME INC.

LOCATION OF THE COOPER PROPERTY

NELSON MINING DIVISION

N.T.S. 82F/8

Scale 1:250,000

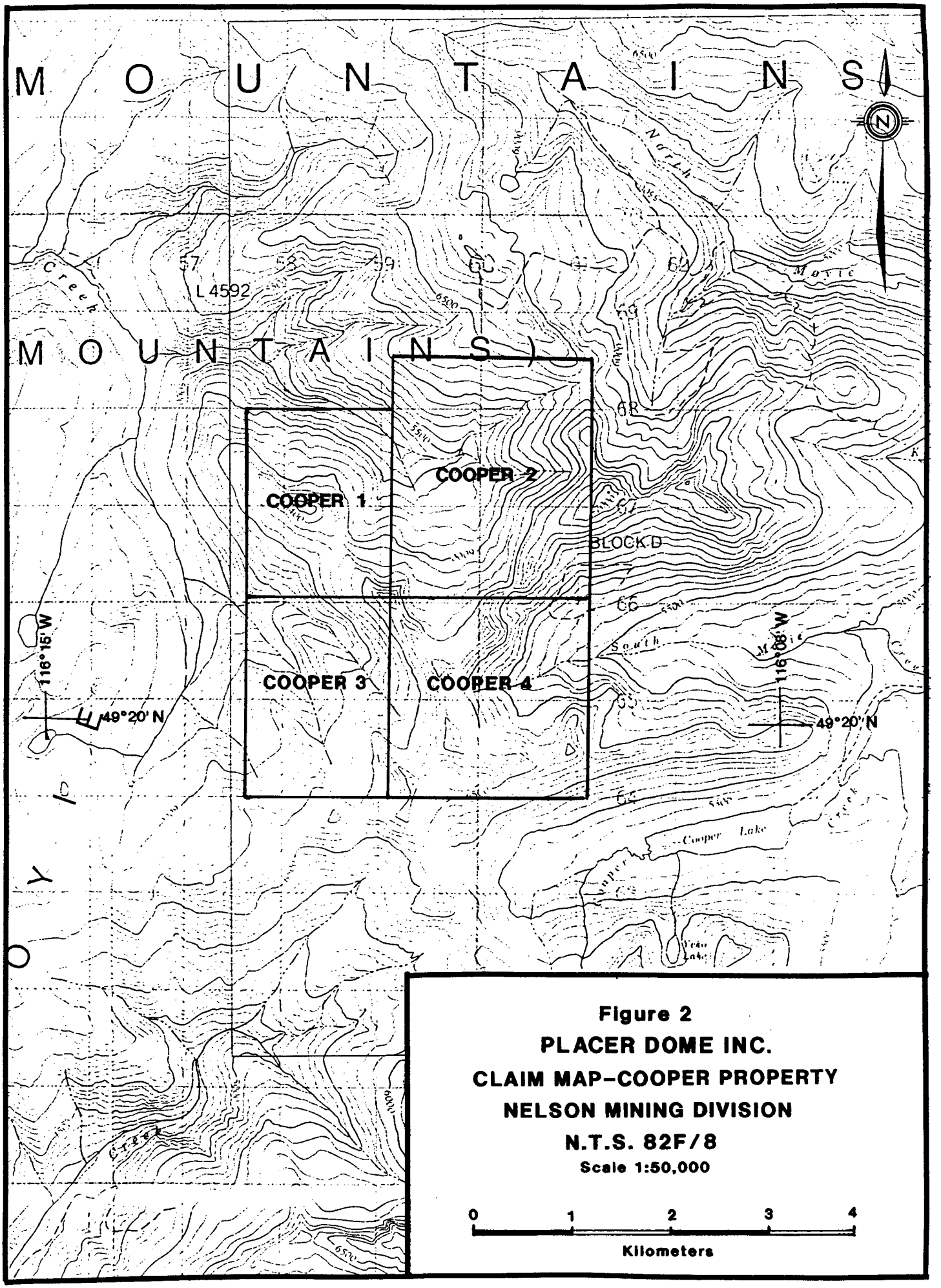

Figure 2
PLACER DOME INC.
CLAIM MAP–COOPER PROPERTY
NELSON MINING DIVISION
N.T.S. 82F/8
Scale 1:50,000

0 1 2 3 4
Kilometers

4.4 Summary of Work

A total of 24 man days from August 8 to August 19, 1989 was spent conducting geological mapping, prospecting and geochemical sampling on the Cooper claims. One geologist, G.R.Haryett, and one field assistant were responsible for this work. Field operations were based out of Creston, British Columbia.

Geochemical work on the Cooper claims included the collection of 18 stream sediment samples, 139 soil samples, and 24 rock samples. All samples were analyzed for gold, copper, zinc, lead, silver, arsenic and molybdenum.

Figure 3 shows the location of the stream sediments and soil samples. Figure 4 shows the location of the rock samples and the geology.

5.0 ECONOMIC ASSESSMENT

The most important economic deposit within the region is Cominco's Sullivan Mine. The Sullivan orebody is a syn-sedimentary, stratiform lead-zinc-silver deposit of 155 million tonnes. The mine is immediately north of Kimberly, British Columbia. Stratigraphically the Sullivan deposit occurs at the top of the lower-middle Aldridge Formation transition. Aldridge siltstones are exposed within the claim group. They are apparently conformably overlain by Creston strata and probably belong to the upper Aldridge assemblage which has a low potential for hosting a Sullivan-type deposit.

Several small, structurally controlled, lead-zinc deposits in the area have been exploited by past mining operations. This deposit type has limited economic interest in the prevailing metal market and is not a target on the property.

Gold is the other commodity of possible importance in the region. Several exploratory and active placer operations are present along the Goat and Moyie Rivers, respectively. Lode gold mineralization has been found in the Perry Creek drainage northeast of the Cooper property; no economic zones of mineralization have been discovered to date. Three styles of lode gold occurrences have been described in various government assessment reports and junior company news bulletins for the Perry Creek area.

1. Gold in individual quartz veins: the larger veins (2 to 20 m wide) usually return low gold assays, and are sub-economic; whereas, small quartz-sulphide veins (up to 2 m wide) can carry several ounces of gold.

2. Mineralized shear zones associated with Moyie intrusions; irregular veins are contained within the shears, and the wallrock is altered.

3. Low grade gold associated with sulphide mineralization, quartz vein stockworks, and intense alteration within and immediately adjacent to small syenite intrusive bodies. Major faults apparently impose a regional control on the distribution of these zones.

The geology on the Cooper claims displays some similarities to the Perry Creek camp. Stream sediment samples previously collected from creeks draining the property indicate the presence of gold. The opportunity exists for the discovery of high-grade, gold-quartz veins minable by underground methods, and for low-grade, large tonnage, open pit gold reserves.

6.0 REGIONAL GEOLOGY

The Cooper claims are situated within the Purcell Anticlinorium which is a north plunging tectonic unit bounded to the east by the Rocky Mountain Thrust and Fold Belt, and to the west by the Omineca Crystalline Belt. The strata which forms the anticlinorium ranges in age from the Helikian Purcell Supergroup, through the Hadrynian Windermere Supergroup, to younger Paleozoic rocks.

Purcell Supergroup stratigraphy from oldest to youngest includes the Aldridge, Creston, Kitchener-Siyeh, Dutch Creek, and Mount Nelson Formations. Aldridge rocks consist of argillaceous quartzites and argillites that were deposited in a deep water environment. The Creston Formation includes shallow water mudstones, siltstones, and fine grained quartzites. Platformal carbonates, argillites and calcareous quartzites were deposited to form the Kitchener-Siyeh strata. The overlying Dutch Creek and Mount Nelson Formations are comprised of argillites, dolomites, and quartzites.

The Windermere Supergroup, situated above the Purcell Supergroup, consists of the Toby Formation and the Horsethief Creek Group. Conglomeratic rocks derived from the underlying Dutch Creek and Mount Nelson Formations form the Toby stratigraphy. Pelite, slate and quartzites and polymictic units make up the Horsethief Creek Group.

Paleozoic strata in the region unconformably overlies the Windermere Supergroup. They are lower Cambrian in age and are represented by the quartzites and conglomerates of the Cranbrook Formation and the shales of the Eager Formation.

Two major periods of igneous activity are evident within the anticlinorium; they are Helikian and Mesozoic in age. Helikian intrusions consist of tholeiitic gabbro sills and granitoid bodies that are probably associated with the east Kootenay Orogeny. Mesozoic intrusions are granite plutons which are thought to be related to subduction accompanying accretion of the Kootenay Terrane to the North American craton.

Major faults within the area, such as the Moyie Fault, strike approximately northeast to southwest and dip towards the northwest. This dip direction is continuous with the Rocky Mountain Thrust and Fold Belt.

The government regional airborne magnetic survey (Map 7685G) shows the Cooper group to be located at the southwest end of a magnetic high. This feature is elongated northeast to southwest. It extends approximately ten kilometres in length and has a maximum width of about two kilometres. This anomaly is interpreted to be an intrusive body. The southwest end of the magnetic high is less pronounced than it is further north; it may be that the source of the anomaly is hidden beneath a cover of sedimentary rocks in this area.

7.0 PROPERTY GEOLOGY

7.1 Lithology

Rocks of the Aldridge and Creston Formations are found on the Cooper property. Field observations and information from government regional geology maps were used to determine the location of the Creston-Aldridge contact on the property geology map (Figure 4).

The Geological Survey of British Columbia (Hoy et al, 1985) subdivides the Aldridge and the Creston Formations into upper, middle, and lower units. The lower Aldridge (HAl) consists of rusty argillites, siltstones and quartzites. Middle Aldridge (HAm) strata is composed of grey turbiditic wacke beds with minor laminated siltstone. Upper Aldridge (HA_u) rocks include rusty laminated argillites and siltstones.

The Creston formation overlies the Aldridge and represents a shallow water sedimentary facies. Lower Creston (HCl) strata is composed of alternating light to dark grey to green grey mudstones and siltstones with minor fine grained quartzites. The middle Creston (HCm) consists of grey argillaceous siltstone interbedded with thin beds of deep purple to black to maroon bands of quartzite. Upper Creston (HCu) rocks include green siltstones with brown to grey quartzites which may be interbedded with green or purple mudstones or silty mudstones.

The most recent government regional geology map for the area is Geological Survey Map 603A, vintage 1940. Sub-units of the Aldridge and Creston Formations were not yet recognized. Insufficient time was available during the 1989 field programme for detailed stratigraphic mapping. Consequently, the Creston and Aldridge rocks within the Cooper claims have not been subdivided into their respective lower, middle and upper units. On the property geology map (Figure 4) the strata are only separated into Creston and Aldridge Formations.

7.2 Structure

The strata of the Cooper Claim has an average strike of 215^0 azimuth with the dip ranging from 40^0 to 85^0 west. There are a number of medium to small sized shear or fault zones throughout the property. They strike northeast to southwest and dip vertically.

7.3 Mineralization

Pyrite associated with small quartz veins (up to 0.5 m) within the Aldridge Formation is the most notable metallic mineral on the Cooper claims. This pyrite occurs as single cubes and as fine disseminated grains throughout the veins. Specular hematite is also associated with small quartz veins.

Pyrrhotite as irregular fine to medium blebs were noted occasionally in argillaceous quartzite float. The pyrrhotite is weakly magnetic. Other pieces of similar material displayed weak magnetism but no visible sulphides. This float was found in areas underlain by the Aldridge Formation and is typical of upper Aldridge rocks exposed elsewhere.

Float of milky white quartz is abundant on the property, and ranges in size from pebbles to large boulders. Large angular boulders of quartz vein float (sub-crop !), up to five metres in diameter, were found in the southwest corner of the Cooper 1 Claim (Figure 4). Their size and shape suggest a local source.

8.0 GEOCHEMISTRY

8.1 Objective

The stream sediment, soil and rock geochemistry program had three objectives. Resampling of stream sediment was to confirm the original gold anomalies. Soil samples of stream bank material were collected to locate possible eluvial input sources for the gold along the drainage. Rock sample results would hopefully identify the types of lithology, structures and/or alteration associated with high gold values.

8.2 Stream Sediments

8.2.1 Sample Collection, Preparation and Analysis

A technique called bulk stream sediment sampling was developed "in-house" by Placer Dome's exploration personnel. It is specifically designed for use in detailed and semi-detailed stream sediment geochemical surveys where gold mineralization is the target of interest. This exploration technique was employed on the Cooper property. Bulk stream sediment samples were collected from natural drop-out sites for heavy minerals in the stream channels; examples of these sites included plunge pools, riffles and the upstream side of channel bars. Clastic stream sediments from the selected sites were wet sieved through a 20 mesh stainless steel screen and caught in an aluminum basin. A steel shovel was used to dig the sediment. Approximately two to three kilograms of sieved sample were collected and transferred to a plastic bag to form one sample. Descriptions of each sample site were recorded; these notes are presented in Appendix 2.

All creeks draining the Cooper property are third to fourth order drainages. The predominant channel type consists of waterfalls and rapids which provide excellent sites for bulk sediment sample collection. Waterflow, at the time the samples were taken, ranged from dry to low.

Some of the stream sediment bulk samples (A8220 to A8225) were sent to Placer Dome's laboratory in Vancouver, British Columbia. The remainder (A8976 to A8984, A9032 and A9033) were forwarded to Eco-Tech Laboratory Ltd. in Kamloops, British Columbia. At both facilities the samples were oven-dried and sieved to produce a -150 mesh fraction. This fraction was geochemically analyzed for Au, Ag, Cu, Zn, Pb, As and Mo. Table 1 and Table 2 in Appendix 5 summarize the extraction and detection procedures used for the respective laboratories. Each sample was analyzed three times for gold in an attempt to address the erratic gold distribution in natural materials, i.e. the "nugget-effect".

8.2.2 Results

A list of the analytical results for the stream sediment bulk samples is given in Appendix 2. The small number of samples precludes a statistical treatment of this data set. Consequently only a visual inspection of the results is possible.

Gold concentrations of less than 15 to 20 ppb in the bulk sediment samples are considered to be threshold and background values. Gold from 20 to 50 ppb is weakly anomalous; from 50 to 100 ppb is moderately anomalous; while values greater than 100 ppb are highly anomalous.

The triplicate gold analyses for each stream sediment bulk sample demonstrates the erratic distribution of gold in natural materials and the necessity for multiple determinations. Highly anomalous concentrations of gold were obtained for eight bulk samples; the highest result is 670 ppb gold for one split of sample A8982. Weakly to moderately anomalous values are reported for three samples.

Bulk samples A9032 and A9033 returned the best gold results; both were collected from the upper reaches of Little Moyie Creek which drains east off the Cooper 4 Claim. All three cuts in both samples have highly anomalous gold concentrations that range from 135 to 620 ppb. Copper is also anomalous in sample A9032 (116 ppm).

Five of the samples with anomalous gold were collected from the northern most drainage which crosses the Cooper 1 and Cooper 2 Claims. Only one bulk from the Cooper 3 Claim contained anomalous gold concentrations.

Geochemical results for the other elements that were analyzed were all low and reflect background concentrations. The only exception is the elevated copper value in sample A9032 mentioned above.

8.2.3 Discussion and Interpretation

The 1989 bulk sediment sample programme improved on the strength of the original gold anomalies in the large drainage located on the Cooper 1 and Cooper 2 Claims. Gold concentrations in the old samples were less than 50 ppb. Little Moyie Creek was not previously sampled and represents a new gold anomaly. Gold results for the remaining drainages are similar in tenor to those previously obtained.

Examination of the gold data reveals no clear patterns suggestive of upstream cut-offs for anomalous samples. This may indicate that there are multiple input sources for the anomalies rather than a single target. It may also reflect inconsistencies in the quality of the sample sites or naturally erratic gold distribution in the sample material.

Soil sample gold anomalies upstream from some of the bulk sediment samples suggest that there are a number of relatively local sources that may be contributing to the drainage gold anomalies.

With exception of copper in sample A9032, other elements give no support to help locate a lode source for gold stream sediment anomalies. Gold occurrences along Perry Creek have various associated metals, such as copper, zinc, lead and silver that are probably detectable as anomalous concentrations in sediments of cross-cutting drainages. It is disturbing that the majority of the bulk samples from the Cooper claims give gold-only anomalies.

8.3 Soils

8.3.1 Sample Collection, Preparation and Analysis

Sampling was conducted along the drainages where previous bulk stream sediments yielded anomalous gold values. Soils were taken at 50 m intervals on both sides of the drainage above the influence of flowing water (Figure 3).

A steel mattock, plastic spoon and Kraft paper bag were used to obtain and package the samples. B-horizon soil material was collected from most sites. Sample depths ranged from 20.0 to 50.0 cm, but more commonly average 20.0 to 30.0 cm. Notes on the nature of the soil material taken and on site conditions were recorded in the field and are presented in Appendix 3.

Soils on the Cooper claims are generally well drained but are poorly developed; they consist of a thin to no organic horizon over a variable thickness of B-horizon. The B-horizon, which is the zone of mineral accumulation, is grey-brown to orange-brown in colour, and is transitional to the underlying soil parent material.

The soils in the areas sampled have developed on a limited variety of parent materials that are dominated by transported overburden. Colluvium is the most common soil-forming substrate. A large component of the colluvium is derived from down slope mass-wasting of bedrock. Colluvium is recognized by a certain uniformity in its lithological composition, by grain size composition, and by the angularity of the clasts. A minor quantity of till contributes to the make-up of some colluvium as evidenced by poorly sorted material and the presence of sub-rounded to rounded clasts. Locally soils are also developed directly over weathered bedrock and are "in place".

The soil samples were forwarded to Eco-Tech Laboratory in Kamloops where they were oven dried and sieved to produce a -80 mesh fraction. A sub-sample was weighed for geochemical analysis. Each sample was analyzed for Au, Ag, Cu, Zn, Pb, As and Mo. The digestion and detection techniques used for each element are given in Table 1, Appendix 5.

8.3.2 Results

A list of the analytical results for the soil samples is given in Appendix 3. The results were inspected visually to determine which samples displayed anomalous concentrations for the various elements. No statistical calculations were performed on the data.

Gold concentrations in the soil samples ranged from less than 5 to 75 ppb. Only geochemical values greater than 20 ppb, four times the detection limit, are considered anomalous. There are 26 samples with gold concentrations equal to and greater than 20 ppb.

Most of the soil samples with anomalous gold are one- or two-point spot "highs" which are scattered along all the sampled drainages, even those with no anomalous bulk sediment samples. However, two coherent gold anomalies have been identified. The best one occurs in the Cooper 3 Claim near the top of the northern most creek located on this claim. It extends over a distance of 100 m on both sides of the creek and consists of six adjacent sites with gold ranging from 20 to 70 ppb. The second area of interest is at the top of a short creek near the west boundary of the Cooper 2 Claim. Three sites on the west side of this creek contained gold concentrations from 40 to 70 ppb; the samples on the opposite bank contained no appreciable gold. Another less coherent, weak soil gold anomaly exists in the Cooper 2 Claim in the middle of the northern most creek. It stretches over 200 m and includes sites on both sides of the creek. Five of nine samples within this area returned weakly anomalous gold values that ranged from 20 to 25 ppb; the other four contained less than 20 ppb gold.

Silver, copper, lead, zinc, molybdenum and arsenic concentrations in all the soil samples are low and represent background values. No anomalies are evident for these elements.

8.3.3 Discussion and Interpretation

The gold soil anomaly in the northeast corner of the Cooper 3 Claim and the anomaly on the west side of the Cooper 2 Claim are the most attractive soil geochemical targets on the property. There is insufficient geological information to comment on the nature of the source for these anomalies. Both are open in several directions; they are however "gold only" with no support from other trace elements. These two anomalies are approximately 1.7 km apart and may represent two separate targets.

The remaining soil samples classified as anomalous contain low gold concentrations (20 to 30 ppb),and are generally widespread. They might be interpreted to represent multiple bedrock sources, possibly weakly mineralized quartz veins and shear zones. These structures are probably of limited size. Single point soil gold anomalies are considered low priority targets. These point anomalies are near the visually determined threshold value 20 ppb gold, consquently some may merely represent analytical "noise".

8.4 Rocks

8.4.1 Sample Collection, Preparation and Analysis

Chip samples were collected from most of the bedrock exposures encountered within the property. Sampling was oriented, where applicable, perpendicular to recognizable geological contacts or structures. Individual sample widths across the face of the outcrops varied from approximately one to ten metres.

All rock samples were sent to Placer Dome's laboratory in Vancouver for analysis. The samples were crushed and pulverized; a sub-sample was weighed, then digested, and finally analyzed geochemically for Au, Ag, Mo, Cu, Zn, Pb and As. Table 2 in Appendix 5 summarizes the extraction and detection techniques used by the laboratory.

8.4.2 Results

The geochemical results for the rock samples are listed in Appendix 4. A brief geological description for each sample is also given as well as the sample length.

The small number of samples precludes a statistical treatment of the analytical data; only visual inspection is possible. Figure 4 shows the plotted locations of the rock samples and gold results, greater than 20 ppb. None of the other elements have been plotted.

Two rock samples returned gold analyses that were greater or equal to 20 ppb. Samples A9046 and A9041 contained 180 and 20 ppb gold respectively. Sample A9046 is from a five metre wide quartz vein which contains hematite and chlorite; the vein subcrops near the southwest corner of the Cooper 1 Claim (Figure 4). Its orientation is uncertain. Elevated copper and arsenic values, 100 ppm and 177 ppm respectively, were also obtained from sample A9046. Sample A9041 is a black limestone nodule with abundant pyrite.

Slightly elevated concentrations of copper and arsenic are evident in a few other rock samples, none of which exhibit obvious mineralization.

8.4.3 Discussion and Interpretation

Initial results suggests that gold mineralization is related to quartz veins; but this interpretation is based on a single rock sample. More information is needed to formulate an understanding of the economic potential of the property. The only area of significant mineralization identified by rock sampling is the body of quartz found in the southwest corner of the Cooper 1 Claim.

9.0 STATEMENT OF EXPENDITURES

The following field expenditures were incurred by Placer Dome Inc. to conduct geochemical and geological surveys on the Cooper claims during the period between August 8th to 19th, 1989.

Personnel Costs	
G. Haryett (Geologist)	
8-19 Aug/89 12days x $210	2,520.00
K. Dyke (Field Assistant)	
8-19 Aug/89 12days x $135	1,620.00
Analytical Costs (Cu, Pb, Zn, Au, Ag, As, Mo)	
Soils 139 x $17.75	2,467.25
Rocks 24 x $20.25	486.00
Stream 18 x $21.75	391.50
Camp Operations	
Accommodation at Creston - 12 days	1,047.00
Meals - 12 days x 2 men x $32/day	768.00
Vehicle Expense	
Rental - Ford Bronco 12 days x $45	540.00
Repairs	393.00
Rental - GMC 4x4 4 days x $55	220.00
Repairs	53.00
Report Preparation	
M.Gareau 1 day x $360	360.00
G.Haryett 4 days x $210	840.00
Typist 2 days x $105	210.00
Drafting 3 days	595.00
Miscellaneous	
Freight	96.10
Supply Purchase	368.00
Map Production	100.00
Report Production	50.00
TOTAL	**$13,124.85**

10.0 CONCLUSION

Two soil gold anomalies and one gold drainage anomaly warrant further exploration. The soil anomalies are on the Cooper 2 and Cooper 3 Claims. The drainage of interest is the upper reaches of Little Moyie Creek.

The five metre wide subcropping quartz vein on the Cooper 1 Claim also requires additional investigation.

Respectfully submitted by,

M.B. Gareau

G.R. Haryett

M B Gareau

APPENDIX 1

STATEMENT OF QUALIFICATION

STATEMENT OF QUALIFICATION: M.B. GAREAU

I, M.B. Gareau, of Placer Dome Inc., Vancouver, British Columbia, do hereby certify that:

1. I am a geologist.

2. I am a graduate of the University of Dalhousie, Halifax, Nova Scotia with a Bachelor of Science in Geology dated 1977 and an Honours Certificate in Geology dated 1978.

3. I am a Fellow in good standing of the Geological Association of Canada.

4. I have been engaged in mineral exploration throughout Canada since graduation in 1977.

5. I supervised the 1989 exploration program on the Cooper property. I reviewed all the resulting data and assisted in preparing the enclosed report.

M.B. Gareau

STATEMENT OF QUALIFICATION: G.R.HARYETT

I, Gregory R. Haryett, of the City of Edmonton, Alberta, do hereby certify that:

1. I am a graduate of the University of Alberta where I received a BSc with specialization in geology in May 1989.

2. I am currently employed by Placer Dome Inc.

3 I am a geologist in training with A.P.E.G.G.A.

4. I have practised my profession since graduation, primarily being involved in a variety of exploration projects in British Columbia.

5. I was present for all work done on the Cooper property. I reviewed all resulting data and wrote this report.

Gregory R. Haryett

APPENDIX 2

A) STREAM SEDIMENT SAMPLE ANALYTICAL RESULTS

B) STREAM SEDIMENT DESCRIPTIONS

ECO-TECH LABORATORIES LTD.
ASSAYING - ENVIRONMENTAL TESTING
10041 East Trans Canada Hwy., Kamloops, B.C. V2C 2J3 (604) 573-5700 Fax 573-4557

OCTOBER 30, 1989

CERTIFICATE OF ANALYSIS ETK 89-817

Placer Dome Inc.
401, 1450 Pearson Place
KAMLOOPS, B.C.
V1S 1J9

DATE RECEIVED: OCTOBER 23, 1989
PROJECT: IP - COOPER/CAM
LAB NUMBER: 9411/9412
NUMBER SAMPLES: 16
TYPE SAMPLES: BULK

REJECTS: STORE
PULPS: STORE
N O T E : > = MORE THAN
** = INSUFFICIENT SAMPLE

ET#	Description	Au (ppb)	Au (ppb)	Au (ppb)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mo (ppm)	As (ppm)
PROJECT COOPER LAB# 9411										
817 - 1	8976	35	20	400	.6	24	54	117	<1	26
817 - 2	8977	15	<5	290	.4	16	25	76	3	15
817 - 3	8978	145	5	25	.6	19	45	103	4	20
817 - 4	8979	5	10	10	.2	12	44	97	5	8
817 - 5	8980	150	25	25	<.1	21	35	91	3	26
817 - 6	8981	10	15	20	.1	18	38	92	5	13
817 - 7	8982	5	5	670	<.1	16	27	76	<1	17
817 - 8	8983	5	5	5	<.1	25	41	101	3	18
817 - 9	8984	10	5	5	<.1	16	27	63	2	12
817 - 15	9032	135	165	410	<.1	116	33	82	3	15
817 - 16	9033	255	490	620	<.1	67	34	104	6	14

ECO-TECH LABORATORIES LTD.
FRANK J. PEZZOTTI, A.Sc.T.
B.C. Certified Assayer

F A X - BOB MOWER @ VCR

PDI GEOCHEM SYSTEM: Data From: BC GEN - 1P COOPER CLAIMS DATE: 89:11:29 PAGE: 1

GRID	SAMPLE		PROJECT	Ag PPM	As PPM	Au1 PPB	Au-A PPB	Au-B PPB	Cu PPM	Mo PPM	Pb PPM	Zn PPM
82F8	A	8219	9348	<0.2	8	25	<5	<5	15	<1	20	71
82F8	A	8220	9348	<0.2	8	<5	<5	<5	13	1	25	83
82F8	A	8221	9348	<0.2	8	40	<5	<5	16	<1	21	71
82F8	A	8222	9348	<0.2	9	10	<5	<5	16	<1	27	70
82F8	A	8223	9348	0.2	9	125	10	<5	15	<1	24	54
82F8	A	8224	9348	<0.2	3	10	<5	<5	15	<1	21	64
82F8	A	8225	9348	<0.2	3	30	30	30	7	<1	9	34
test	STD P1		9348	0.2	20				22	50	50	115
test	STD AU5		9348			560		340				

END OF LISTING - Run on: 89:11:29 at 9:37:43

COOPER CLAIM - BULK STREAM SEDIMENT SAMPLE DESCRIPTIONS

SAMPLE	DSCH	ORDER	AREA	CTYP	BANK	POSN	CWID	WWID	DEPTH	DIRN	GRADIENT
A8219	2	4		WF	CL	MCC	5.0	4.0	15.0	320.0	45.0
A8220	1	5		WF	CL	MCC	8.0	3.0	10.0	350.0	25.0
A8221	2	4		WF	CL	MCC	15.0	3.0	20.0	340.0	20.0
A8222	2	4		WF	CL	MCC	8.0	2.0	10.0	320.0	20.0
A8223	1	4		WF	CL	MCC	5.0	1.0	15.0	295.0	20.0
A8224	3	4		WF	CL	DBL	10.0	5.0	15.0	331.0	25.0
A8225	1	4		WF	CL	MCC	5.0	1.0	5.0	250.0	60.0
A8976	1	4		WF	CL	MCC	3.0	1.0	10.0	310.0	15.0
A8977	1	4		WF	CL	MCC	3.0	1.0	10.0	240.0	10.0
A8978	1	4		WF	CL	MCC	4.0	2.0	10.0	270.0	15.0
A8979	1	4		WF	CL	MCC	6.0	1.0	8.0	340.0	20.0
A8980	1	4		WF	CL	MCC	6.0	2.0	8.0	350.0	20.0
A8981	2	3		WF	CL	MCC	6.0	2.0	15.0	320.0	10.0
A8982	2	3		WF	CL	MCC	10.0	2.0	20.0	330.0	15.0
A8983	2	3		WF	CL	MCC	8.0	2.0	10.0	340.0	50.0
A8984	1	3		WF	CL	MCC	6.0	2.0	10.0	230.0	35.0
A9032	1	3		WF	CL	MCC	5.0	1.0	10.0	360.0	20.0
A9033	1	3		WF	CL	MCC	10.0	2.0	10.0	360.0	20.0

* for sample locations, see Fig.3

COOPER CLAIMS - BULK SEDIMENT SAMPLE DESCRIPTION CODES

DISCHARGE: general condition of the stream, 0 is a dry stream, X is a stream in flood, 5 is normal.
ORDER: relative position of stream in the network of tributaries, 1 being the highest tributaries.
AREA: approximate catchment area upstream from sample site (G-Scale).

CTYP - Channel type:

BR	Braided channel
MA	Meandering in alluvium
CH	Rocky chute
WF	Waterfalls and rapids
AB	Abrading channel
AG	Aggrading with gravel bars

BANK - Bank material:

BR	Bedrock: solid rock in situ.
TL	Talus: talus, scree, broken rock.
CL	Colluvium: material of uncertain origin formed by mass wasting on hillsides.
AL	Alluvium: Recent fluvial deposits.
TI	Glacial Till: basal till, moraine and drumlin deposits.
FG	Fluvioglacial: eskers, kames and glacial outwash deposits.
GL	Lacustrine: stratified sediments in old lake beds.
AT	Artificial Channel: canalized banks, concrete, drainage ditches.

POSN - Position in stream:

LBK	Left bank
RBK	Right bank
MCC	Mid channel
PTB	Point bar
PLP	Plunge pool
RIF	Riffle
CCB	Channel bar
DBL	Downsteam of boulder

CWID - Channel width: average width in metres.
WWID - Water width: average width in metres.
DEPTH - Depth of water: average depth in centimetres.
DIRN - Direction of flow: average direction in degrees true.
GRADIENT - Average inclination of stream in degrees.

SIZE - Maximum particle size:

J	1.41 mm
M	11.3 mm
N	22.6 mm
O	45.3 mm
P	90.5 mm
Q	181 mm
R	362 mm
S	724 mm
T	1450 mm
U	2900 mm

COOPER CLAIMS - BULK SEDIMENT SAMPLE DESCRIPTION CODES

SORT - Degree of sorting:

1	extremely poorly sorted
2	very poorly sorted
3	poorly sorted
4	moderately poorly sorted
5	moderately sorted
6	moderately well sorted
7	well sorted
8	very well sorted
9	extremely well sorted

COLOUR - # indicates a single colour designation

W	WHITE	R	RED
9	PALEST	U	BROWN
8	PALE	O	ORANGE
7	LIGHT	T	TAN
6	LIGHTER	Y	YELLOW
5	MEDIUM	L	LIME
4	DARKER	G	GREEN
3	DARK	Q	AQUA
2	VERY DARK	B	BLUE
1	DARKEST	V	VIOLET
N	BLACK	P	PURPLE
		M	MAUVE
		A	GREY

BOL1 - BOL3 - Boulder types:

AN	Andesite
AR	Argillite
DR	Diorite
GN	Greenstone
GT	Granite
PH	Phyllite
QT	Quartzite
QV	Quartz vein
QZ	Quartz
SD	Sedimentary rock
SS	Sandstone
VL	Volcanic rock

COOPER CLAIMS - BULK SEDIMENT SAMPLE DESCRIPTIONS

SCALE VALUE	ASSIGNED VALUE	RANGE
X	100%	100%
9	90	85 TO 99
8	80	75 TO 85
7	70	65 TO 75
6	60	55 TO 65
5	50	45 TO 55
4	40	35 TO 45
3	30	25 TO 35
2	20	15 TO 25
1	10	7 TO 15
=	5	3 TO 7
+	2.5	2 TO 3
)	1.0	0.5 TO 2
*	0.3	0.2 TO 0.5
(	0.1	0.05 TO 0.2
-	0.03	0.02 TO 0.05
.	0.01	TRACE TO 0.02
0	0	NIL, ABSENT
?	0	POSSIBLY PRESENT
/	0.07	PRESENT: ESTIMATE
		NOT POSSIBLE

APPENDIX 3

A) SOIL SAMPLE ANALYTICAL RESULTS

B) SOIL SAMPLE DESCRIPTIONS

C) DATA STATISTICS AND HISTOGRAM PLOTS

ECO-TECH LABORATORIES LTD.
ASSAYING - ENVIRONMENTAL TESTING
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OCTOBER 30, 1989

CERTIFICATE OF ANALYSIS ETK 89-812

Placer Dome Inc. - RESEARCH
323 ALEXANDER STREET
VANCOUVER, B.C.

DATE RECEIVED:	OCTOBER 23, 1989	TYPE SAMPLES:	SOIL
PROJECT:	IP COOPER	REJECTS:	N/A
LAB NUMBER:	9410	PULPS:	STORE
NUMBER SAMPLES:	102	N O T E :	< = LESS THAN

ET#	Description	Au (ppb)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mo (ppm)	As (ppm)
812 - 1	8363	5	.1	26	40	87	2	42
812 - 2	8364	70	<.1	19	32	47	1	25
812 - 3	8365	10	.1	18	15	63	<1	14
812 - 4	8366	15	.2	13	17	68	<1	31
812 - 5	8367	10	<.1	14	57	77	5	46
812 - 6	8368	40	<.1	44	44	85	<1	42
812 - 7	8369	10	<.1	20	25	45	5	17
812 - 8	8370	45	<.1	26	40	109	<1	41
812 - 9	8371	5	.1	18	30	76	<1	19
812 - 10	8372	<5	.6	25	37	54	<1	29
812 - 11	8373	10	.1	22	49	96	3	22
812 - 12	8374	5	<.1	12	23	53	3	13
812 - 13	8375	5	<.1	24	50	49	2	10
812 - 14	8376	25	<.1	13	35	45	<1	15
812 - 15	8377	10	<.1	20	30	52	<1	8
812 - 16	8378	15	<.1	15	22	68	<1	13
812 - 17	8379	10	<.1	14	19	56	1	8
812 - 18	8380	10	<.1	19	35	78	3	22
812 - 19	8381	5	<.1	22	25	54	<1	11
812 - 20	8382	25	<.1	18	44	71	<1	26
812 - 21	8383	15	<.1	15	20	49	<1	9
812 - 22	8384	10	<.1	7	12	30	<1	5
812 - 23	8385	10	<.1	18	33	63	3	11
812 - 24	8386	10	<.1	21	23	47	<1	9
812 - 25	8388	5	<.1	9	13	39	2	6
812 - 26	8389	<5	<.1	14	29	56	<1	12
812 - 27	8390	<5	.1	13	22	47	<1	15
812 - 28	8391	10	<.1	11	16	49	1	11
812 - 29	8392	5	<.1	10	12	47	2	7
812 - 30	8393	15	<.1	12	16	52	2	8

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Placer Dome Inc.

OCTOBER 30, 1989

ET#	Description	Au (ppb)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mo (ppm)	As (ppm)
812 - 31	8394	10	<.1	17	9	39	3	7
812 - 32	8395	<5	<.1	13	20	44	3	9
812 - 33	8396	<5	<.1	20	9	42	4	8
812 - 34	8397	10	<.1	14	7	41	2	5
812 - 35	8398	20	<.1	13	4	27	4	7
812 - 36	8399	10	<.1	10	7	38	<1	5
812 - 37	8400	20	<.1	9	4	28	2	6
812 - 38	8401	<5	<.1	10	3	28	1	5
812 - 39	8402	5	<.1	10	14	30	<1	7
812 - 40	8403	5	<.1	16	10	41	5	6
812 - 41	8404	10	.4	34	97	179	6	23
812 - 42	8405	5	<.1	14	11	37	<1	7
812 - 43	8406	<5	.2	19	49	92	2	11
812 - 44	8407	5	<.1	21	36	105	5	35
812 - 45	8408	<5	.3	22	38	71	9	18
812 - 46	8409	20	.5	34	69	85	4	18
812 - 47	8412	30	.5	18	30	59	1	12
812 - 48	8413	10	.6	20	45	92	1	13
812 - 49	8414	5	.5	26	43	110	5	14
812 - 50	8415	5	<.1	20	34	74	2	15
812 - 51	8416	<5	<.1	22	38	77	5	20
812 - 52	8417	10	.2	17	26	74	4	10
812 - 53	8418	15	.4	27	39	106	7	14
812 - 54	8419	10	.2	15	38	66	2	9
812 - 55	8420	<5	.3	12	32	44	5	11
812 - 56	8421	<5	.1	13	23	39	4	8
812 - 57	8422	<5	<.1	11	21	43	2	9
812 - 58	8423	<5	.1	14	25	52	8	11
812 - 59	8424	15	<.1	12	22	48	2	10
812 - 60	8425	10	.1	15	30	69	2	11
812 - 61	8426	<5	<.1	14	23	50	1	11
812 - 62	8427	<5	.1	19	34	61	7	10
812 - 63	8428	15	<.1	21	25	56	2	10
812 - 64	8429	10	<.1	17	32	69	2	14
812 - 65	8430	20	<.1	28	39	75	1	13
812 - 66	8431	<5	<.1	15	23	71	<1	15
812 - 67	8432	<5	<.1	24	45	72	6	18
812 - 68	8433	5	.1	36	34	119	2	19
812 - 69	8434	<5	<.1	22	31	74	7	18
812 - 70	8435	30	<.1	10	19	54	4	10
812 - 71	8436	15	<.1	11	25	43	3	12
812 - 72	8437	10	<.1	23	38	78	<1	14
812 - 73	8438	10	<.1	27	52	68	4	15
812 - 74	8439	<5	<.1	22	28	74	5	21
812 - 75	8440	10	<.1	19	35	74	6	19

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Placer Dome Inc.

OCTOBER 30, 1989

ET#	Description	Au (ppb)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mo (ppm)	As (ppm)
812 - 76	8441	5	<.1	19	44	73	2	17
812 - 77	8442	25	.4	17	29	71	<1	16
812 - 78	8443	<5	.1	13	18	53	<1	12
812 - 79	8444	15	.2	15	28	85	<1	28
812 - 80	8445	30	.1	20	33	97	<1	22
812 - 81	8446	30	.1	11	21	52	<1	24
812 - 82	8447	10	.1	12	14	54	<1	11
812 - 83	8448	20	.2	13	19	57	<1	9
812 - 84	8449	15	.1	22	25	88	3	11
812 - 85	8450	5	.5	28	62	136	5	35
812 - 86	8451	10	.2	9	21	90	<1	10
812 - 87	8452	15	<.1	18	21	77	2	11
812 - 88	8453	<5	.1	13	28	56	<1	10
812 - 89	8454	5	.4	12	30	46	<1	5
812 - 90	8455	<5	<.1	12	17	41	5	10
812 - 91	8456	10	.4	11	31	59	<1	9
812 - 92	8457	<5	<.1	11	16	62	1	9
812 - 93	8458	<5	<.1	14	24	63	2	9
812 - 94	8459	<5	<.1	12	23	74	2	14
812 - 95	8460	10	<.1	16	19	83	<1	10
812 - 96	8461	<5	<.1	13	21	50	<1	6
812 - 97	8462	<5	.2	17	20	84	<1	13
812 - 98	8463	<5	<.1	15	24	56	<1	12
812 - 99	8464	10	.1	11	27	54	4	8
812 - 100	8465	<5	.1	15	23	66	1	13
812 - 101	8466	<5	<.1	17	16	45	<1	7
812 - 102	8411	15	.2	20	45	85	7	13

ECO-TECH LABORATORIES LTD.
FRANK PEZZOTTI, A.Sc.T.
B.C. Certified Assayer

F A X - MICHAEL GAREAU @ VCR
SC89/PLACER9

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ASSAYING - ENVIRONMENTAL TESTING
10041 East Trans Canada Hwy., Kamloops, B.C. V2C 2J3 (604) 573-5700 Fax 573-4557

OCTOBER 27, 1989

CERTIFICATE OF ANALYSIS ETK 89-813

Placer Dome Inc.
401, 1450 Pearson Place
KAMLOOPS, B.C.
V1S 1J9

DATE RECEIVED: OCTOBER 23, 1989 — TYPE SAMPLES: SOIL/PULP
PROJECT: IP: COOPER/CAM/ARMITAGE — REJECTS: N/A
LAB NUMBER: 9410 — PULPS: STORE
NUMBER SAMPLES: 101 — N O T E : < = LESS THAN

ET#	Description	Au (ppb)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mo (ppm)	As (ppm)
PROJECT IP - COOPER (9410)								
813 - 1	8467	5	<.1	17	22	69	3	15
813 - 2	8468	25	.1	22	41	72	4	13
813 - 3	8469	5	<.1	13	26	62	<1	13
813 - 4	8470	20	.1	16	23	54	<1	9
813 - 5	8471	10	<.1	14	25	41	<1	9
813 - 6	8472	15	<.1	25	47	76	3	11
813 - 7	8473	25	<.1	19	22	45	3	10
813 - 8	8474	20	.2	12	24	51	4	7
813 - 9	8475	5	.1	25	34	77	1	11
813 - 10	8476	<5	.1	21	34	86	5	12
813 - 11	8477	20	<.1	21	27	63	3	8
813 - 12	8478	15	<.1	17	23	73	3	7
813 - 13	8494	25	<.1	19	39	66	3	15
813 - 14	8495	30	<.1	17	39	55	4	11
813 - 15	8496	75	<.1	19	36	66	<1	17
813 - 16	8497	20	<.1	17	18	51	2	13
813 - 17	8498	70	<.1	15	34	63	<1	17
813 - 18	8499	50	.2	14	20	61	3	9
813 - 19	8500	15	.1	16	23	42	<1	15
813 - 20	8501	<5	.2	16	22	49	<1	11
813 - 21	8502	15	.4	12	28	44	2	7
813 - 22	8503	<5	.1	17	33	113	2	12
813 - 23	8504	<5	.1	17	39	88	1	16
813 - 24	8505	15	.2	27	36	112	4	12
813 - 25	8506	5	<.1	25	23	59	2	11
813 - 26	8507	5	.1	23	46	104	3	12
813 - 27	8508	15	.2	16	25	34	6	11
813 - 28	8509	5	.2	29	61	94	4	17

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ASSAYING - ENVIRONMENTAL TESTING

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[redacted]acer Dome Inc.

OCTOBER 27, 1989

ET#	Description	Au (ppb)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mo (ppm)	As (ppm)
PROJECT IP - COOPER (9410)								
813 - 29	8510	<5	<.1	12	29	58	3	20
813 - 30	8511	<5	<.1	61	27	70	1	15
813 - 31	8512	10	.2	18	36	76	1	18
813 - 32	8513	5	.1	16	26	49	<1	15
813 - 33	8514	10	.3	11	31	33	<1	7
813 - 34	8515	10	.1	15	22	79	<1	12
813 - 35	8516	15	2	16	25	57	<1	18

COOPER CLAIMS - SOIL SAMPLE DESCRIPTIONS

SAMPLE	HRZN	COLOR	TERR	ENV1	ENV2	DRAINAGE	CLAY	SILT	SAND	GRAVEL	PARENT	DEPTH cm
A8363	B2	4AU	ST			EX	0	3	1	6	CL	30.0
A8364	B1	7AU	GV	ST		EX	+	4	1	4	CL	40.0
A8365	B2	4AU	ST			EX	0	3	1	6	CL	35.0
A8366	B1	4OU	GV	ST		FR	+	3	3	3	CL	30.0
A8367	B1	4AU	ST	DG		EX	1	3	1	5	CL	40.0
A8368	B1	3AO	GV	ST	RN	FR	1	2	2	4	CL	20.0
A8369	B2	4AU	ST	DG	BT	EX	1	3	0	6	CL	30.0
A8370	B1	5OU	GV	ST	LG	FR	1	2	1	5	CL	10.0
A8371	B2	4AU	ST	DG	BT	EX	1	3	0	6	CL	40.0
A8372	B1	3OU	GV	ST	LG	FR	1	2	1	5	CL	20.0
A8373	B1	6UT	ST			EX	0	3	1	5	CL	30.0
A8374	B1	4OU	GV	ST		EX	+	3	1	6	CL	30.0
A8375	B2	4AU	ST			EX	0	4	0	6	CL	40.0
A8376	B1	4OT	GV	ST		EX	+	5	1	3	CL	40.0
A8377	B1	5AU	ST	OC		EX	0	3	0	7	CL	45.0
A8378	B1	5OT	GV	ST	OC	FR	+	4	+	5	CL	40.0
A8379	B2	4AU	ST	GV		EX	0	3	0	7	CL	35.0
A8380	B1	7AU	GV	ST		EX	+	5	+	4	CL	30.0
A8381	B2	4AU	ST	OC		EX	0	4	0	6	CL	45.0
A8382	B1	7AU	GV	ST	OC	EX	+	3	+	6	BR	20.0
A8383	B1	6AU	ST	OC		EX	0	3	0	7	CL	50.0
A8384	B1	5AU	GV	ST	OC	FR	1	2	2	4	BR	40.0
A8385	B1	5AU	ST			EX	0	3	0	7	CL	40.0
A8386	B1	5OU	GV	ST		FR	1	2	1	5	CL	30.0
A8387	B2	4AU	ST			EX	1	3	1	6	CL	30.0
A8388	B1	6YO	GV	ST		FR	+	3	2	4	CL	30.0
A8389	B1	5AU	ST			EX	)	3	1	6	CL	35.0
A8390	B1	5OU	GV	ST	OC	EX	1	2	1	5	BR	20.0
A8391	B2	3AU	ST			EX	)	2	X	8	CL	30.0
A8392	B1	3OU	GV	ST	OC	FR	1	3	+	6	BR	50.0
A8393	B2	3AU	ST	OC		EX	)	3	X	7	CL	40.0
A8395	B2	3AU	ST	OC		EX	)	3	1	6	CL	30.0
A8402	B1	6AU	ST	GV		FR	1	2	1	5	CL	50.0
A8404	B1	5AU	ST	GV		FR	1	2	1	5	CL	30.0
A8406	B1	5OU	ST	GV		FR	1	3	+	4	CL	30.0
A8407	B1	5AU	ST	OC		EX	0	3	1	6	CL	30.0
A8408	B1	6YU	ST	GV	LG	FR	1	2	2	4	CL	40.0
A8409	B1	4AU	ST	OC		EX	1	2	1	5	CL	40.0
A8410	B1	5OU	ST	GV	LG	FR	1	3	2	2	CL	50.0
A8411	B1	3AU	ST	OC		EX	1	2	1	5	CL	40.0
A8412	B1	5OU	ST	GV	LG	FR	1	2	3	4	CL	40.0
A8413	B1	4AU	ST			EX	)	3	1	6	CL	35.0
A8414	B1	6OT	ST	GV	LG	FR	1	3	2	2	CL	40.0
A8415	B2	3AU	ST			EX	)	4	1	5	CL	40.0
A8416	B1	6OT	ST	GV	LG	FR	1	2	3	3	CL	40.0
A8417	B2	3AU	ST	DG		EX	)	3	1	6	CL	40.0
A8418	B1	5OT	ST	GV	LG	FR	1	2	3	3	CL	30.0
A8419	B2	3AU	ST	DG		EX	)	3	1	6	CL	40.0
A8420	B1	6OT	ST	GV		FR	+	2	3	3	CL	40.0
A8421	B2	3AU	ST	DG		EX	)	3	1	5	CL	50.0
A8422	B1	7AU	ST	GV		EX	0	2	3	3	CL	40.0
A8423	B1	5AU	ST	DG		EX	)	4	)	6	CL	40.0

COOPER CLAIMS - SOIL SAMPLE DESCRIPTIONS

SAMPLE	HREM	COLOR	TERR	ENV1	ENV2	DRAINAGE	CLAY	SILT	SAND	GRAVEL	PARENT	DEPTH cm
A8424	B1	7AU	ST	GV		EX	+	4	2	2	CL	30.0
A8425	B1	5AU	ST			EX	)	3	1	6	CL	40.0
A8426	B1	5OU	ST	GV		FR	1	3	2	3	CL	20.0
A8427	B1	5AU	ST			EX	)	4	)	5	CL	50.0
A8428	B1	5AU	ST	GV		FR	1	2	3	3	CL	30.0
A8429	B1	5AU	ST			EX	)	3	1	5	CL	50.0
A8430	B1	4AU	ST	GV	RW	FR	1	3	1	4	CL	20.0
A8431	B1	5AU	ST	DG		EX	)	3	1	6	CL	30.0
A8432	B1	5AU	ST	GV		FR	+	2	1	6	CL	30.0
A8433	B1	5AU	ST	DG	OC	EX	1	3	)	6	CL	40.0
A8434	B1	6OU	ST	GV		FR	+	2	1	6	BR	20.0
A8435	B1	6AU	ST	OC	DG	EX	)	3	1	5	CL	40.0
A8436	B1	6OU				FR	1	2	1	6	BR	30.0
A8437	B1	5AU	ST			EX	1	3	1	4	CL	30.0
A8438	B1	7OT	ST	GV		EX	0	2	2	6	BR	30.0
A8439	B1	6AU	ST			EX	>	3	1	6	CL	20.0
A8440	B1	6OT	ST	GV		EX	0	2	3	4	CL	20.0
A8441	B1	6AU	ST	OC		EX	>	3	>	7	CL	20.0
A8442	B1	6OT	ST	GV		EX	0	1	2	7	BR	40.0
A8443	B2	4AU	ST			EX	2	3	)	6	CL	40.0
A8444	B1	5OU	ST	GV		EX	1	1	2	6	CL	50.0
A8445	B1	5AU	ST			EX	)	3	2	5	CL	40.0
A8446	B1	5RO	ST	GV		EX	+	3	2	4		40.0
A8447	B2	4AU	ST			EX	1	3	1	5	CL	40.0
A8448	B1	5OU	ST	GV		FR	+	3	2	4	CL	40.0
A8449	B2	3AU	ST			EX	1	3	1	5	CL	30.0
A8450	B1	6YO	ST	GV		EX	+	4	+	3	CL	40.0
A8451	B2	3AU	ST			EX	)	3	2	5	CL	40.0
A8452	B1	6OU	ST	GV		EX	0	3	2	4	CL	30.0
A8453	B2	3AU	ST	GV		EX	>	3	2	4	CL	30.0
A8454	B1	6YO	ST	GV		EX	0	3	1	4	CL	40.0
A8455	B1	6AU	ST	GV		EX	)	4	1	4	CL	40.0
A8456	B1	6OY	ST	GV		EX	0	3	2	4	CL	40.0
A8457	B1	8AU	ST	GV		EX	)	4	)	6	CL	40.0
A8458	B1	7AU	ST	GV		EX	+	2	3	4	CL	30.0
A8459	B2	4AU	ST	GV		EX	1	3	1	5	CL	50.0
A8460	B1	6YO	ST	GV		FR	+	2	3	4	CL	30.0
A8461	B1	5AU	ST	GV		EX	)	7	1	5	CL	40.0
A8462	B1	6AO	ST	GV		EX		2	3	5	CL	40.0
A8463	B1	5AU	ST	GV		EX	)	3	2	5	CL	50.0
A8464	B1	6OU	ST	GV		FR	+	4	1	3	CL	30.0
A8465	B1	5AU	ST	GV		EX	)	3	1	5	CL	40.0
A8466	B1	6YO	ST	GV		FR	+	5	2	3	CL	30.0
A8467	B2	4AU	ST	GV		EX	)	4	)	6	CL	30.0
A8468	B1	7AU	ST	GV		FR		6	2	2	CL	20.0
A8469	B1	6AU	ST	GV		EX	)	4	1	5	CL	30.0
A8470	B1	6OU	ST	GV		FR	+	4	2	3	CL	20.0
A8471	B1	6AU	ST	GV		EX	)	3	)	5	CL	30.0
A8472	B1	7AU	ST	GV		FR	+	3	3	3	CL	20.0
A8473	B2	3AU	ST	GV		EX	)	3	)	7	CL	30.0
A8474	B1	6OU	ST	GV		FR	+	3	2	4	CL	30.0
A8475	B2	3AU	ST	GV		EX	)	3	1	0	CL	40.0

COOPER CLAIMS - SOIL SAMPLE DESCRIPTIONS

SAMPLE	HRZN	COLOR	TERR	ENV1	ENV2	DRAINAGE	CLAY	SILT	SAND	GRAVEL	PARENT	DEPTH cm
A8476	B1	5OU	ST	GV		EX	+	3	3	3	CL	30.0
A8477	B1	5AU	ST	GV		EX	)	4	)	6	CL	30.0
A8478	B1	7AU	ST	GV		EX	+	2	3	4	CL	30.0
A8479	B2	4AU	ST	GV		EX	)	4	)	6	CL	30.0
A8481	B2	3AU	ST	GV		EX	)	3	1	6	CL	40.0
A8483	B1	6AU	ST	GV		EX	)	3	1	6	CL	40.0
A8494	B1	5OU	ST	GV	LG	EX	-	2	3	4	CL	20.0
A8495	B1	5AU	ST	DG	BT	EX	2	2	)	6	CL	30.0
A8496	B1	6OU	ST	GV	LG	EX	-	3	3	3	CL	30.0
A8497	B2	3AU	ST	DG	BT	EX	1	3	)	6	CL	30.0
A8498	B1	5OU	ST	GV	LG	FR	+	3	2	5	CL	30.0
A8499	B2	3AU	ST	DG	BT	EX	1	4	)	5	CL	40.0
A8500	B1	5YA	ST	GV	LG	FR	1	2	2	4	CL	20.0
A8501	B2	3AU	ST	DG	BT	EX	)	4	)	6	CL	40.0
A8502	B1	6OT	ST	GV	LG	FR	+	3	2	4	CL	30.0
A8503	B2	3AU	ST	DG	BT	EX	)	4	)	6	CL	30.0
A8504	B1	5OU	ST	GV	LG	FR	+	3	1	5	CL	20.0
A8505	B2	3AU	ST	DG	BT	EX	)	3	)	7	CL	40.0
A8506	B1	6OT	ST	GV	LG	FR	+	2	3	4	CL	40.0
A8507	B1	6AT	ST	GV		IM	)	2	1	8	CL	40.0
A8508	B1	5OT	ST	GV	LG	FR	1	3	1	5	CL	30.0
A8509	B1	6AU	ST	GV		EX	)	3	1	6	CL	40.0
A8510	B1	6OA	ST	GV	LG	FR	3	3	+	3	CL	30.0
A8511	B1	5AU	ST	GV		EX	1	3	1	5	CL	40.0
A8512	B1	7AU	ST	GV		FR	2	1	3	3	CL	30.0
A8513	B1	5AU	ST	GV		EX	1	3	2	5	CL	30.0
A8514	B1	5AU	ST	GV		FR	1	3	1	4	CL	30.0
A8515	B1	5AU	ST	GV	DG	EX	1	3	)	6	CL	40.0
A8516	B1	6OT	ST	GV		FR	+	3	2	4	CL	40.0
A8517	B1	5AU	ST	GV		EX	1	3	1	6	CL	40.0
A8518	B1	6OU	ST	GV	DG	EX	+	2	1	6	CL	20.0
A8520	B1	7AU	ST	GV		EX	+	3	1	5	CL	30.0
A8521	B1	7AU	ST	GV	LG	EX	1	2	+	6	CL	20.0
A8522	B1	6OT	ST	GV		EX	+	2	2	5	CL	30.0
A8523	B1	6YO	ST	GV	LG	EX	+	4	+	6	CL	30.0
A8524	B1	5OT	ST	GV	LG	EX	1	4	+	5	CL	20.0
A8526	B1	5AU	ST	GV	DG	EX	)	3	1	6	CL	40.0

• for sample locations, see Fig.3

COOPER CLAIMS - SOIL SAMPLE DESCRIPTION CODES

HRZN - SOIL HORIZON

A0	Partially decomposed organic debris with no mineral matter.
A1	Dark brown to black organic rich horizon with some mineral matter.
B1	Brown to orange-brown soil. Characterized by accumulation of clay and < 30% organic matter.
B2	Rusty brown soil characterized by accumulation of iron oxides.
XC	Parent material derived by weathering and consists essentially of decomposed rock in situ.
AC	A lithosol consisting of a thin organic layer overlying rock fragments.
BC	Immature soils lacking distinct horizons; soil usually consisits of partially developed B and C material.

TERR - LOCAL TERRAIN

RG	Ridge crest
TP	Knoll or hill top
SS	Sidehill slope
BS	Base of slope
VF	Valley floor
HM	Rolling or hummocky ground
TR	Terrace
GV	Depression uf gulley
ST	Bank of stream or channel

ENV1 & ENV2 - SECONDARY FACTORS AFFECTING ENVIRONMENT

SW	Swamp, bog, or fen
SP	Groundwater seepage area
BO	Base of outcrop
GO	Gossan
CA	Caliche
PF	Permafrost
CS	Cemented soil
DG	Disturbed ground
RB	Road bed
BT	Burnt over
AG	Agricultural land
MN	Prospect trenches

DRAINAGE

EX	Excessive - all water moves rapidly down through the soil, site seldom saturated.
FR	Free - Normal soil with dominant downward water movement, site occasionally waterlogged.
IM	Imperfect - Site seasonally or perennially waterlogged but with unobstructed downward or lateral wtar movement.
IP	Impeeded - Water seasonally or Perennially ponded in soil, leaving site by flow across the surface.
IR	Irrigated - Water supplied to site by artificial means.

COOPER CLAIMS - SOIL SAMPLE DESCRIPTION CODES

PARENT

BR	Bedrock - intensely weathered rock.
TL	Talus - soils developed on talus or broken rock, usually on slopes.
CL	Colluvium - soils developed on material of uncertain origin as a result of mass sidehill wasting.
AL	Alluvium - soils developed on recent fluvial deposits.
TI	Glacial Till - soils on basal till, drumlinised till plains and morraine deposit.
FG	Fluvioglacial - outwash materials.
GL	Lacustrine Deposits - fine to coarse, usually stratified sediments deposited in old lakes.
MT	Mine Waste - spoil heaps and tailings from old workings.

THE G-SCALE

SCALE VALUE	ASSIGNED VALUE	RANGE
X	100%	100%
9	90	85 TO 99
8	80	75 TO 85
7	70	65 TO 75
6	60	55 TO 65
5	50	45 TO 55
4	40	35 TO 45
3	30	25 TO 35
2	20	15 TO 25
1	10	7 TO 15
=	5	3 TO 7
+	2.5	2 TO 3
)	1.0	0.5 TO 2
*	0.3	0.2 TO 0.5
(	0.1	0.05 TO 0.2
-	0.03	0.02 TO 0.05
.	0.01	TRACE TO 0.02
0	0	NIL, ABSENT
?	0	POSSIBLY PRESENT
/	0.07	PRESENT: ESTIMATE
		NOT POSSIBLE

APPENDIX 4

A) ROCK SAMPLE ANALYTICAL RESULTS

B) ROCK SAMPLE DESCRIPTIONS

PDI GEOCHEM SYSTEM: Data From: BC GEN 1P COOPER DATE: 89:11:29 PAGE: 1

GRID	SAMPLE		PROJECT	Ag PPM	As PPM	Au1 PPB	Cu PPM	Mo PPM	Pb PPM	Zn PPM
82F8		A8993	9407	<0.2	2	<5	9	1	14	34
82F8		A8994	9407	<0.2	11	<5	8	1	14	31
82F8		A8995	9407	<0.2	<2	<5	20	<1	14	47
82F8		A8996	9407	<0.2	12	<5	7	1	10	16
82F8		A9019	9407	<0.2	31	<5	3	6	3	2
82F8		A9020	9407	<0.2	<2	<5	9	3	24	30
82F8		A9021	9407	0.3	<2	<5	14	6	70	18
82F8		A9034	9407	<0.2	3	<5	20	<1	11	37
82F8		A9035	9407	<0.2	4	<5	26	2	37	40
82F8		A9035*	9407	<0.2	2	<5	25	2	37	40
82F8		A9036	9407	<0.2	<2	<5	15	7	32	48
82F8		A9037	9407	<0.2	6	<5	15	3	14	31
82F8		A9038	9407	0.4	4	<5	18	7	23	21
82F8		A9039	9407	<0.2	<2	<5	31	2	18	92
82F8		A9040	9407	<0.2	<2	<5	53	4	26	72
82F8		A9041	9407	<0.2	<2	20	23	2	18	23
82F8		A9042	9407	<0.2	<2	<5	19	2	14	37
82F8		A9043	9407	<0.2	8	<5	38	5	8	22
82F8		A9044	9407	<0.2	<2	<5	8	7	8	8
82F8		A9044*	9407	<0.2	2	<5	8	7	10	9
82F8		A9045	9407	<0.2	26	<5	36	4	7	14
82F8		A9046	9407	1.2	177	180	8	6	100	28
82F8		A9047	9407	<0.2	<2	<5	4	5	5	7
82F8		A9050	9407	0.5	6	15	28	5	76	56
82F8		A9051	9407	<0.2	<2	<5	6	5	4	8
82F8		A8952	9407	<0.2	<2	<5	3	2	2	4
test	STD P1		9407	0.3	14		23	52	50	110
test	STD AU6		9407			355				

END OF LISTING - 28 RECORDS PRINTED Run on: 89:11:29 at 15:54:08

ROCK SAMPLE DESCRIPTIONS TAKEN ON THE COOPER CLAIM

Sample	Description
A9036	Milky white quartz vein ten centimetres wide - 1 m chip sample.
A9037	Milky white quartz vein 2 cm wide with minor pyrite, calcite and chlorite along contact with country rock - 0.5 m chip sample.
A9038	Milky white quartz vein 5 cm wide, weathered surface is vuggy with a rustic appearance - 1 m chip sample.
A9039	Rusty sandy siltstone found within a 0.75 m wide shear zone - 2 m chip sample.
A9040	Highly siliceous rock found under shear zone - float
A9041	Black limestone nodule with abundant pyrite, found as round clasts around immediate vicinity, ranges in size from 5 cm to 30 cm in diameter.
A9042	Buff coloured sandstone (altered) with five percent cubic pyrite - 2 m chip sample.
A9043	Milky white quartz vein with minor pyrite - 1 m chip sample.
A9044	Milky white quartz - float.
A9045	Light greyish blue quartz with abundant disseminated pyrite - float.
A9046	Milky white quartz vein 5 m wide with hematite and chlorite - 5 m chip sample.
A9047	Rustic quartz with hematite and magnetite - float.
A9050	Medium grey quartzite approximately five percent pyrite on the fractured surface - float.
A9051	Bluish white quartz with limonite stains - 1 m chip sample.
A9052	Buff coloured fine grained sandstone (altered) - 1 m chip sample.

COOPER ROCK DESCRIPTIONS

A8993	Light grey fine grained quartzite, the fractured surface is coated with fine grained pyrite and pyrrhotite (slightly magnetic) - float.
A8994	Light grey sandstone with small quartz veins running through it. Hematite, limonite and chlorite noted in the rock - float.
A8995	Light grey siltstone with highly rustic surface - float.
A8996	Light grey fine grained sandstone with small quartz veins throughout it, hematite is present the rock is slightly magnetic - float.
A9019	Milky white quartz with stringers of specular hematite and less than five percent pyrite - float.
A9020	Light grey siltstone with a small quartz vein running through it - 1 m chip sample.
A9021	Milky white quartz vein 10 cm wide, crosscuts bedding, contains less than five percent pyrite - 1 m chip sample.
A9034	Light grey quartzite with some iron staining with minor amounts of pyrite - 2 m chip sample.
A9035	Light grey quartzite with small rustic pits - 2 m chip sample.

APPENDIX 5

ANALYTICAL EXTRACTION AND DETECTION TECHNIQUES

TABLE 1

Analytical Extraction and Detection Techniques
used by Eco-Tech Laboratories Ltd.

Element	Unit	Sample Weight	Digestion	Instrumentation	Detection Limit
Cu	ppm	0.5 gm	Aqua-Regia	Atomic Absorption	1 ppm
Zn	ppm	0.5 gm	Aqua-Regia	Atomic Absorption	1 ppm
Pd	ppm	0.5 gm	Aqua-Regia	Atomic Absorption (background corrected)	2 ppm
Ag	ppm	0.5 gm	Aqua-Regia	Atomic Absorption (background corrected)	0.1 ppm
Au	ppb	10.0 gm	Fire Assay	Atomic Absorption	5 ppb
As	ppm	0.5 gm	Aqua-Regia Potassium Iodide	Hydride Gen. A.A.	1 ppm
Mo	ppm	0.5 gm	Aqua-Regia	Atomic Absorption	1 ppm

TABLE 2

Analytical Extraction and Detection Techniques used by Placer Dome's Vancouver Geochemical Laboratory

Element	Unit	Weight (Gram)s	Digestion	Detection Limit	Instrumentation
Cu	ppm	0.5	HC104/HN03 4 Hrs	2-4000	Atomic Absorption
Zn	ppm	0.5	HC104/HN03 4 Hrs	2-3000	Atomic Absorption
Pb	ppm	0.5	HC104/HN03 4 Hrs	2-3000	A.A. Background Cor.
Ag	ppm	0.5	HC104/HN03 4 Hrs	0.2-20	A.A. Background Cor.
Au1	ppb	10.0	Aqua Regia 3 Hrs	5-4000	A.A. Solvent Extract
As	ppm	0.5	Aqua Regia 3 Hrs	2-2000	DC Plasma
Mo	ppm	0.5	HC104/HN03 4 Hrs	1-1000	Atomic Absorption

APPENDIX 6

REFERENCES

REFERENCES

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Geological Survey of Canada, 1973, Geophysical Series (Aeromagnetics), Map 7685G, Sheet 82F, Department of Energy, Mines and Resources.

Hoy, T., et al, 1985, Stratabound Base metal Deposits in southeastern British Columbia in Field Guides to Geology and Mineral Deposits in the Southern Canadian Cordillera, Geological Society of America, Cordilleran Section. Annual meeting, Vancouver, B.C.

Rice, H., 1940, Map 603A, Nelson (East Half) Kootenay District British Columbia, Canada. Department of Mines and Resources, Mines and Geology Branch.

CLAIM BOUNDARY

LOGGING ROAD

KAHAMA CREEK

LOGGING ROAD

Cooper Lake

(5,5,670) A8982 A8395 A8393 A8392 A8391 A8389 A8390 A8388 A8387 A8385 A8386 A8384 A8383 (25) A8382 A8381 A8379 A8380 A8377 A8378 A8375 (25) A8376 A8981 (10,15,20) (150,25,25) A8980 A8374 A8373 A8372 A8371 A8369 (45) A8370 A8367 (40) A8368 A8365 A8366 (70) A8364 A8363

A8453 A8455 A8448 A8457 A8450 A8452 A8454 A8984 (10,5,5) A8456 A8458 A8460 A8462 A8464 A8467 65 63 (25) 69 71 73 75 A8481 79 A8483 (15,5,290) A8977 A8478 (20) 76 74 72 68 (20) (25) A8978 (145,5,25) A8427 A8424 A8422 A8420 A8418 A8416 A8415 A8409 (20) A8407 A8402 A8979 (5,10,10) A8976 (35,20,400)

A8225 (30,30,30) A8523 A8526 A8521 A8524 A8223 (25,10,5) A8522 A8517 A8520 A8515 A8518 A8513 A8516 A8511 A8514 A8512 A8509 A8510 A8507 A8508 A8505 A8506 A8503 A8504 A8222 (10,5,5) A8502 A8501 A8500 A8499 (50) A8498 A8497 (20) A8496 A8495 (30) (25) A8494 A8451 A8449 (30) A8446 A8447 A8444 (25) A8442 A8445 (30) A8440 A8443 A8438 A8221 (40,5,5) A8441 A8436 A8439 A8434 A8437 A8432 A8435 (30) (20) A8430 A8433 A8428 A8431 A8426 A8220 (5,5,5)

A8224 (10,5,5)

A8219 (25,5,5)

A8980 (5,5,5)

A9033 (255,490,620)

A9032 (135,165,410)

LEGEND

+A8394 (30) SOIL SAMPLE (GOLD IN PPB).

■ A8225 (145,5,25) BULK STREAM SEDIMENT SAMPLE (TRIPLICATE GOLD IN PPB).

NOTE: SOIL LOCATIONS WITH NO RESULTS SHOWING ARE <20 PPB AU.

APPROXIMATE MEAN DECLINATION 1989
ANNUAL CHANGE DECREASING 9°7'.

T.N.
0° 34'
16° 28'
UTM GRID NORTH
MAGNETIC NORTH

0 200 400 800 1600
Meters

GEOLOGICAL BRANCH
ASSESSMENT REPORT

19,436

FIGURE 3

WITH GOLD RESULTS

PLACER DOME INC.

COOPER 1-4 CLAIMS

DRAWN BY: G.H.	**SOIL SAMPLE BULK STREAM SEDIMENT SAMPLE LOCATIONS**
DATE: NOV. 89	
SCALE 1:10,000	
REVISED:	FILE No. 82F/8

CLAIM BOUNDARY

LOGGING ROAD

KAMMA CREEK

LOGGING ROAD

LOGGING ROAD

Cooper Lake

A9046
180 ppb Au

A9052

A9051

A9019

A9020
A9047

A9050

A8996

A8993
A8994
A8995

A9021

A9034

A9035

A9036
A9037

A9038

A9039
A9040
A9041
20 ppb Au
A9042
A9045
A9043
A9044

LCP

HK–S

HC

HA

GEOLOGICAL LEGEND

PROTEROZOIC HELIKIAN

LOWER PURCELL

HK–S KITCHENER - SIYEH FORMATION: medium to light grey to green-grey argillaceous siltstone and silty quartzite

HC CRESTON FORMATION:

- **HC_U** UPPER CRESTON: green siltstone, brown to grey quartzite which may be interbedded with green or purple mudstone or silty mudstone
- **HC_M** MIDDLE CRESTON: grey argillaceous siltstone interbedded with thin beds of deep-purple to black mudstone; fine grained quartzite with grey to maroon bands
- **HC_L** LOWER CRESTON; alternating light to dark grey to green grey mudstone, siltstone with minor fine grained quartzite

HA ALDRIDGE FORMATION:

- **HA_U** UPPER ALDRIDGE: rusty laminated argillite and siltstone
- **HA_M** MIDDLE ALDRIDGE: grey turbidites wacke beds with minor laminated siltstones
- **HA_L** LOWER ALDRIDGE: rusty argillite, siltstone, and quartzite

REFERENCES: Map 603A Nelson (east half) Kootney District British Columbia; Geolgical Survey of Canada.

SYMBOLS

- Large body of quartz subcrop and/or float.
- Strike of vertical cleavage
- Strike and dip of cleavage
- Strike and dip of bedding
- Strike and dip of quartz veins with width in cm
- Strike and dip of joints
- Trend and plunge of minor folds
- Strike of vertical shear
- Strike and dip of shears
- Inferred fault
- Inferred geological contact
- Legal claim post
- Outcrop
- Rock sample

APPROXIMATE MEAN DECLINATION 1989
ANNUAL CHANGE DECREASING 9°7'.

T.N.
0° 34'
18° 28'
UTM GRID NORTH
MAGNETIC NORTH

GEOLOGICAL BRANCH
ASSESSMENT REPORT

19,436

FIGURE 4

0 200 400 800 1600
Meters

PLACER DOME INC.

COOPER 1-4 CLAIMS

DRAWN BY: G.H.	**ROCK SAMPLE LOCATIONS AND GEOLOGY**
DATE: NOV. 1989	
SCALE 1:10,000	
REVISED:	FILE No. 82F/8