BACON & CROWHURST LTD.
1720-1055 West Hastings Street
Vancouver 1, B.C.

REPORT

ON THE PROPERTY OF

AFTON MINES LIMITED

IRON MASK AREA

KAMLOOPS, B.C.

for

DR. S.E. MALOUF

by

W.R. BACON, Ph.D., P.Eng.

Vancouver, B.C. February 28th, 1972.

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673539

February 24th, 1972.

Dr. S.E. Malouf,
Consulting Geologist,
Suite 310 - 55 Yonge St.,
Toronto, 105, Ontario.

Dear Dr. Malouf:

Mr. J.J. Crowhurst has asked me to prepare a report for you embodying what I know and think about Afton Mines Limited.

Our first association with the property was in 1970 when the firm served as consultants for Great Plains Development Company of Canada Ltd. One of our geologists, Mr. G.D. Delane, logged and split for assay the core from 5 Afton NQ holes drilled in 1970. Two of these holes, 70-3 and 70-4, are pertinent to any appraisal of the Afton property.

During the period April 12 - May 13, 1971, Quintana Minerals Corporation undertook a program of mapping, rock geochemistry and percussion drilling on the Afton property. On the basis of this program, Quintana concluded that there was no room on the property for a porphyry type copper/molybdenum deposit.

In the autumn of 1971, Mr. C.F. Millar, P.Eng., President of Afton Mines Limited, initiated a percussion drilling program in the immediate vicinity of diamond drill hole 70-4. When 18 holes had been completed and some of the cuttings assayed, the writer was asked by Mr. Millar to prepare a progress report on the property. The writer did so and recommended a further program of twenty 300' percussion holes plus six 800' diamond drill holes at a cost of $102,396.

As of February 21, 1972 Afton has drilled 58 percussion and 4 diamond drill holes in the current program.

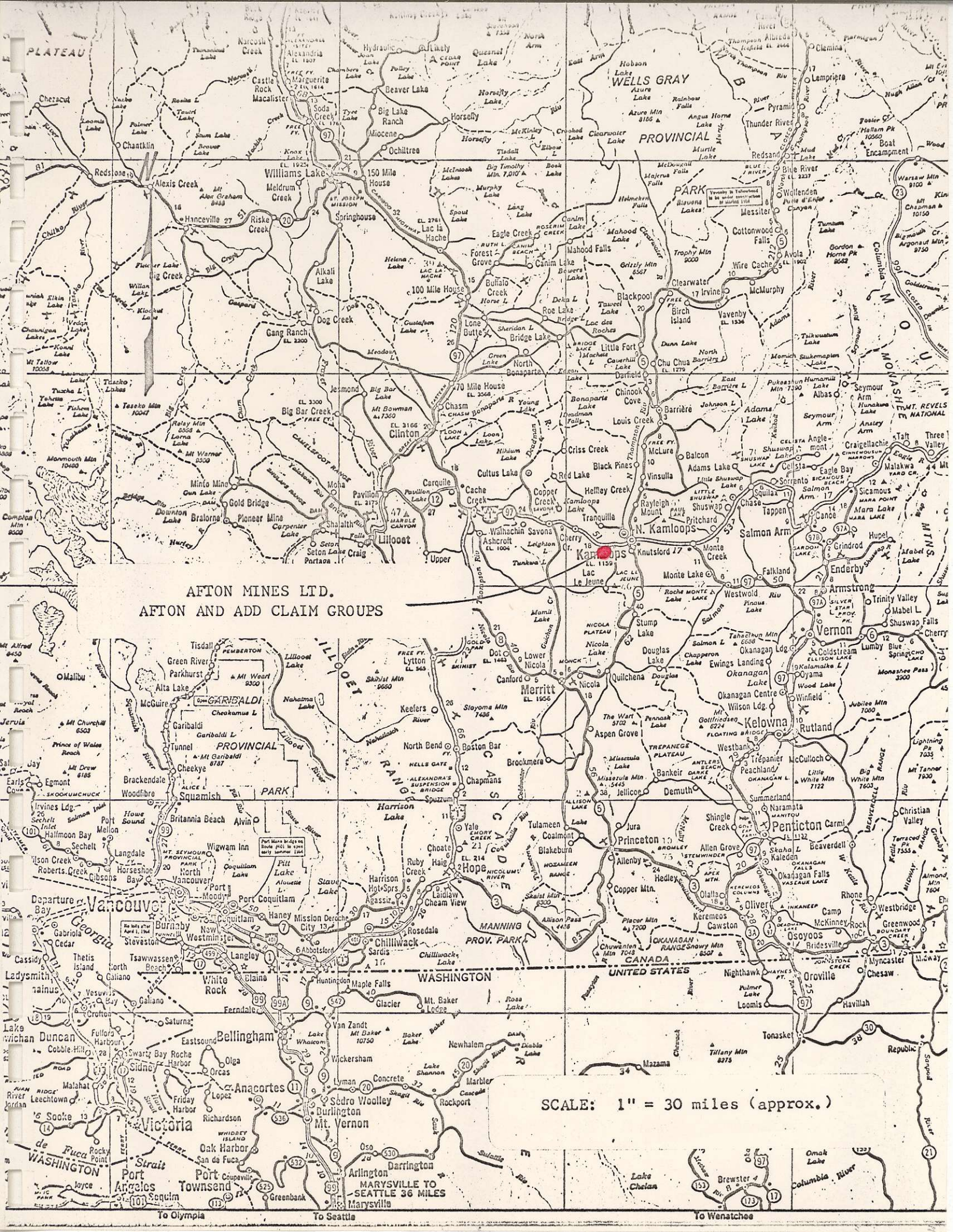
Respectfully submitted,

BACON & CROWHURST LTD.

W.R. Bacon

W.R. Bacon, Ph.D., P.Eng.

WRB/ic


AFTON MINES LTD.
AFTON AND ADD CLAIM GROUPS
SCALE: 1" = 30 miles (approx.)
MARYSVILLE TO SEATTLE 36 MILES
To Olympia
To Seattle
To Wenatchee
CANADA
UNITED STATES
WASHINGTON
PLATEAU
WELLS GRAY PROVINCIAL PARK
MONASHEE MTNS
CASCADE RANGE
MANNING PROV. PARK
Kamloops
Vancouver
Victoria
Kelowna
Penticton
Vernon
Merritt
Lillooet
Williams Lake
Quesnel
Prince George
Georgia Strait
Strait de Fuca
Okanagan Lake
Shuswap Lake
Columbia River

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INTRODUCTION

The location of the Afton property is shown on the frontispiece. It is 9 miles west of Kamloops, mainly on the south side of the Trans-Canada Highway. Afton Mines Limited holds or holds options on 47 mineral claims and one mineral lease.

The ground is beautiful rolling rangeland, having the odd clump of trees. Elevations on the claims range from 2400' to 2600' above sea level.

REGIONAL GEOLOGY

The Afton claims are in the environment of the Iron Mask batholith, long known for its numerous copper occurrences.*

The Iron Mask batholith is about 2½ miles wide and extends for about 18 miles in a northwesterly direction. It is about 3 miles southwest of Kamloops and about 40 miles northeast of the Highland Valley copper belt which is in the Guichon batholith. The Iron Mask and Guichon batholiths are two of several on the eastern margin of the Coast Intrusions.

The rocks of the Iron Mask batholith are considered to be of Jurassic Age. They are rather unusual for batholithic rocks. They consist mainly of syenite, monzonite, diorite and gabbro but micro-varieties constitute half the batholith and, in the Afton area, the rocks are exclusively fine grained.

The batholithic rocks are intrusive into the Upper Triassic Nicola rocks (andesite, basalt, limestone, argillite) which occur on the eastern and western margins of the batholith. On the Afton property, dark green, metamorphosed rocks may represent either Nicola volcanics or micro-diorites of the batholith.

* Production almost exclusively from the Iron Mask Mine:
1901-28 - 189,230 T. - 1.45% Cu.

LOCAL GEOLOGY

The local geology is shown on the Quintana map included in this report. As noted above, the Afton property is in a complex igneous area. There is less than 5% outcrop and relatively large areas completely covered with overburden.

Within the boundaries of the Afton property are no less than 4 recognizable intrusive rock types. Of these, 3 are varieties of diorite and the fourth is a reddish syenite. In addition to these, on the southside of the highway just east of Afton, the Cherry Creek Intrusions outcrop intermittently for 1½ miles.

There are two ages of volcanic rock on the Afton property, the older being the Nicola Group. There are 4 discrete occurrences of Nicola rocks shown on the Quintana map. In one of these, as indicated, the current drilling program is being undertaken. As noted above, exposures of the dark green Nicola rocks are easily confused with microdiorite. It would appear that in the area of drilling we may have both rock types, altered andesite and microdiorite.

The southern part of the Afton property and much of the northern margin is overlain by post-mineral, Miocene volcanics called the Kamloops Group. These volcanics can be hundreds of feet thick as 5 Quintana holes disclosed.

MINERALIZATION

The numerous occurrences of copper mineralization in the Iron Mask batholith generally consist of chalcopyrite with, here and there, minor bornite. The Afton occurrence presently being drilled is native copper in Nicola andesite and/or micro-diorite. The native copper is not coarse but is easily discernible in cuttings and drill core. It occurs almost exclusively in fractures. It is prevalent over the vertical range of the percussion holes (300') and appears less commonly below 500'. Sulphides, with the possible exception of chalcocite, are rare in the native copper zone but are discernible in minor amounts to 700'. Chalcopyrite is the dominant sulphide, bornite occurring but rarely.

In the mineralized area, the rock is quite fresh except for the development of epidote, chlorite and various other low-grade metamorphic minerals. Magnetite is common but is not closely associated with the copper mineralization. Some hematite is present. The log of D.D.H. 70-4, the discovery hole, is included in the report. This hole, which was drilled northward at -45°, intersected 170' of 0.413% Cu or 250' of 0.35% Cu.

ANALYSIS

The Kamloops area is about as ideal an area for a mine as one can imagine in Canada. It has a delightful climate, power and wonderful access by both highway and railway. No camp would be necessary because of the proximity of Kamloops, as nice a town of 30,000 as can be found anywhere.

There has been some skepticism about the Afton, partly because of its nature. Firstly, it is not a 'porphyry' deposit. Secondly, although native copper in basic lavas is not uncommon in the west and elsewhere, we have here a different situation in which the native copper occurs along fractures in basic rock - rather than in amygdules or associated with other primary rock features. If a successful venture develops, it could be geologically unique and this always attracts doubters in the initial stages.

Some have queried whether there is a practical treatment for the ore. Again there should be no difficulty. A combination of jigs, tables and flotation should give a good recovery and here it is noteworthy that the metal is neither coarse nor very fine-grained.

What disturbed the writer at the time of his report (October 26, 1971) was the rather casual approach to the project. 18 percussion holes had been drilled but not completely sampled. The orders to the young man in charge were to examine the cuttings under the binocular microscope and, if native copper was evident, send the sample for assay; if native copper was not evident, don't send the

sample for assay. Naturally, the writer strongly recommended a change in this procedure, also that the grid be surveyed properly.

At the present stage of development, there are 58 percussion holes drilled at 100 foot centres on a grid pattern and 5 diamond drill holes drilled at 400 foot centres within the same grid.

The percussion holes (Q) penetrate to a depth of 300 feet and many terminate in interesting mineralization. The assays from two diamond drill holes, 71-1 and 71-2, indicate that in these holes the mineralization extends to depths of 500 feet and 700 feet respectively.

A sketch of the grid is included with this report and available assays (as published) are cited below:

		Post-mineral volcanics
Section 88E	Q133	
	134	260' - 0.57% Cu
	135	275' - 1.28
90E	Q105	260' - 0.87
	102	260' - 0.52
	101	110' - 0.74
	D.D.H. 71-2	685' - 0.67
	Q115	180' - 0.22
91E	Q118	30' - 0.23
	93	80' - 0.63
	92	290' - 0.64
	100	70' - 0.45
	108	100' - 0.27
	113	80' - 0.72
	114	270' - 0.40
92E	Q119	295' - 0.36
	94	50' - 0.74
	97	280' - 0.66
	99	250' - 0.67
	104	230' - 0.45
	107	200' - 0.56
	112	150' - 0.58

Section 93E	Q120	130'	- 0.49% Cu
	95	20'	- 0.10
	96	80'	- 0.49
	98	170'	- 0.66
	103	150'	- 0.72
	106	280'	- 1.07
	111	180'	- 0.57
94E	Q123	160'	- 0.38
	122	107'	- 0.69
	121	282'	- 0.42
	D.D.H. 71-1	440'	- 0.57
	109	265'	- 0.43
	110	170'	- 0.99
95E	Q130	120'	- 0.93
	124	90'	- 0.50
	125	240'	- 1.20
	126	160'	- 0.35
	127	160'	- 0.41
	128	120'	- 0.55
	129	140'	- 1.15
96E	Q131	120'	- 0.93

On the basis of these holes, the writer has drawn an arbitrary outline of the deposit on the Afton grid. This has to be temporary because the deposit appears to be open to the west, south and east. The area encompassed by the dashed line on the grid is 400,000 square feet and therefore it is reasonable to think in terms of a possible 33,333 tons per vertical foot.

With regard to depth, anything in the range of 300 feet to 500 feet appears reasonable in spite of the fact that data on this dimension are scanty. Taking the more conservative outlook, one obtains a figure of 10,000,000 tons; taking a depth of 500 feet, one obtains 16,666,500 tons - both only possible figures.

As the Quintana map shows, there appear to be certain definite limiting factors to the lateral extent of the Afton deposit. Westward and eastward, percussion holes A-2 and A-1 were essentially blanks although native copper was observed in A-2; it ran 0.06% Cu over its length of 290 feet with a maximum interval of 0.10% copper over 15 feet.

Southward the Afton deposit is up against D.D.H. 70-3 and percussion hole A-6, both of which showed only minute amounts of copper in the form of chalcopyrite.

Northward the deposit will run into the Kamloops post-mineral volcanics within a few hundred feet.

Considering its present dimensions, the Afton can truthfully be described as economically interesting. Presuming that favourable results continue to be obtained, particularly with respect to overall depth and average grade, the writer believes that a 5000 ton per day operation is within the realm of possibility. In so stating, the writer is assuming a grade of 0.6 per cent copper which he obtained by taking an arithmetical average of grades obtained in holes where the mineralized sections were 100 feet or greater.

With regard to grade, much more work is required, particularly because the percussion holes are not completely penetrating the mineralization. There has got to be more diamond drilling and eventually bulk sampling from underground - before financing can possibly be arranged.

FOOTNOTE

A great cluster of closely spaced holes will be noted on the Quintana map, to the south and southeast of the Afton grid. The greatest density of holes is in the area of the Pothook shaft which was sunk to a depth of 330 feet; four short levels were driven out from the shaft. This work was done in 1898. (The workings are water-filled.)

The drilling was done by various interests in 1952 (Kennco), 1958 (Noranda) and in 1964, 1965, 1967, 1969-70 (Afton).

This drilling apparently disclosed 600,000 tons of 0.63% Cu in selected zones. Chalcopyrite and bornite were extracted from the old workings which were driven in diorite.

001

— 88 E. — 89 E. — 90 E. — 91 E. — 92 E. — 93 E. — 94 E. — 95 E. — 96 E.

133 ● 132 ○ 72-1 △ 118 ● 119 ● 120 ● 72-2 △ 130 ● 131 ● — 132 N.

105 ● 93 ● 94 ● 95 ● 123 ● 124 ● — 131 N.

134 ● 102 ● 92 ● 97 ● 96 ● 122 ● 125 ● 144 ○ — 130 N.

70-4 ▲

POND

101 ● 100 ● 99 ● 98 ● 121 ● 126 ● — 129 N.

72-3 △ 135 ● 71-2 ▲ 108 ● 104 ● 103 ● 71-1 ▲ 127 ● 143 ○ — 128 N.

116 ○ 113 ● 107 ● 106 ● 109 ● 128 ● — 127 N.

136 ○ 115 ● 114 ● 112 ● 111 ● 110 ● 129 ● 142 ○ — 126 N.

137 ○ 138 ○ 139 ○ 140 ○ 141 ○ — 124 N.

N

LEGEND

- ● Percussion Hole (assayed)
- ○ Percussion Hole (to be assayed)
- ▲ Diamond Drill Hole (assayed)
- △ Diamond Drill Hole (to be assayed)
- TEMPORARY OUTLINE OF DEPOSIT (Pending further information)

BACON & CROWHURST LTD.

AFTON MINES GRID

IRON MASK AREA

KAMLOOPS M.D., B.C.

SCALE

Feet 100 0 100 200 Feet

Feb. 28, 1972

DRILL HOLE RECORD

LEVEL	BEARING DIP TYPE OF SURVEY	CORE SIZE NQ	HOLE No. Afton 70-4
LOCATION Afton - Pothook	COLLAR N -45°	LENGTH 450'	SHEET No. 1 of 2
ELEVATION not available		COMPLETED	LOGGED BY: G. D. Delane
LATITUDE 129+00 N N		PURPOSE	Aug. 29/70
DEPARTURE 92 E E		TOTAL RECOVERY	Bacon & Cowburst Ltd

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION OF ROCK TYPES	DRILL HOLE	MINERALIZATION AND STRUCTURES	ESTIMATED % OF SULPHIDES
0'	30'	no core - casing (?)			
30	50	Massive Magnetite - dk grey to black, fine gr, massive with abund. epidote on fract		Possible fault @ 50.5'	
50	450 (end)	Altered Diorite H=45 - greenish, med gr. altered dio; epidote alteration sporadic & is associated with mineralization. K'spar alteration @ 59' - fractures usually with calcite. K'spar alter. @ 68'-70'. Some brecciation of intensely altered frags with abund. native Cu (70'-118'). Intense K'spar alter @ 94', 126'-132', 143'-145', 165' At 187'; 6" band epidote @ 40° Diorite locally is quite fine gr. approaching a microdiorite Core resembles a syenite @ 186'. A 1/2" magnetite vein @ 45° @ 188.5'. which is 'rimmed' with some native Cu. Intense K'spar pink alteration @ 190', 208', 215'. Epidote strong @ 204' -205', & from 211'-217'. At 213' -214', several 60° epid. veins. Locally core resembles an altered hybrid andesite-diorite. Calcite veinlets usually assoc. with magnetite veins. Epidote from 279'-285', 295'-330'. Intense brick-red K'spar alteration from 288.5'-289.5', & 293'-296'		8" band massive magnetite ~40° @ 51.5'; contains some magnetite bands & macro hematite with scattered blebs of native Cu from 58'-67' At 93', 1/2" hematite bands @ 30° with blebs native Cu with epid. Many fractures are calcite-filled; ~@ 30° fract. with chlorite @ 97.5' 105' 122'. A 50° fract. @ 144'. Two 40° slips with 1/2" greenish gouge @ 154 to 154.3'. A 15° chlorite & slickensided slip @ 163.5'. A 40° slip with epidotized gouge @ 168.5'. A 1/2" hematite & native Cu vein @ 20° @ 164.5' Specks native Cu scattered thru' diorite eg 180'-233' but as large blebs @ 224'-230'	3T790 3T791 3T751 3T781 no tag

ASSAYS SAMPLE NO.	FROM	TO	WIDTH	REC.	% CU	% ZN	OZS. AU	OZS. AG	GROUPED AVERAGE
790	30	40	10		0.01				
791	40	50			.01				
751	50	60			.20				
52	60	70			.38				
53	70	80			.41				
54	80	90			.86				
55	90	100			.55				
56	100	110			.34				
57	110	120			.25				
58	120	130			.27				
59	130	140			.36				
60	140	150			.24				
63	150	160			.52				
61	160	170			.48				
62	170	180			.40				
64	180	190			.47				
65	190	200			.50				
66	200	210			.15				
67	210	220			.11				
68	230	240			.73				
69	240	250			.04				
70	250	260			.01				
71	260	270			.02				
72	270	280		10.	.12				
73	280	290		10	.02				
74	290	300		9.9	.73				
75	300	310		10.	.48				
76	310	320		9.9	.29				
77	320	330		10	.22				
78	330	340		10.3	.16				
79	340	350		10.4	.13				
80	350	360		9.7	.04				
781	360	370	10	9.8	.03				

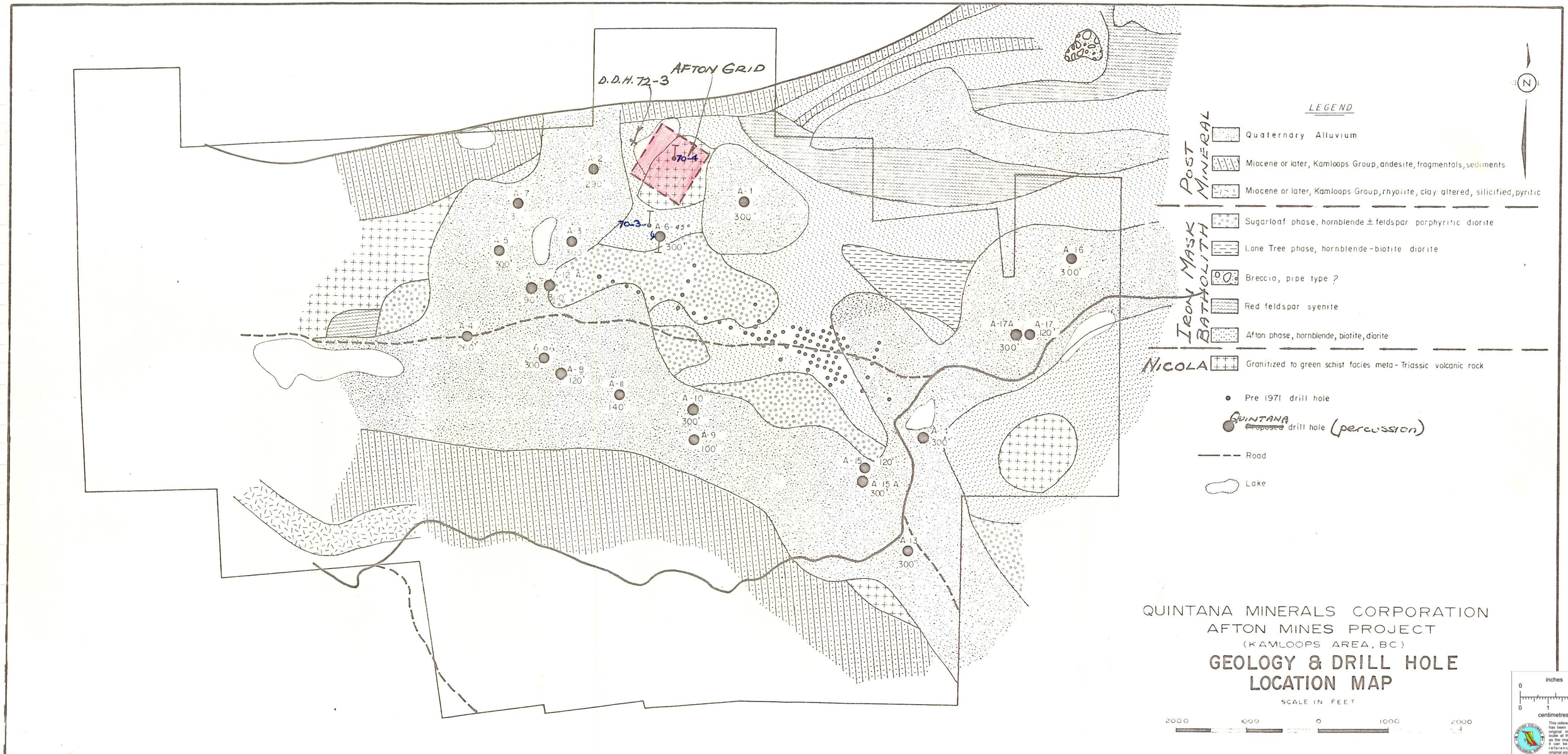
RECOVERY RUN	MEASUR'D	% REC
0		
30	—	
32	1.8	
43	11.7	
48	4.0	
53	4.8	
63	9.0	
73	9.7	
83	10.1	
93	9.8	
103	9.9	
113	10.0	
123	10.2	
133	9.9	
138	5.4	
143	4.5	
148	5.1	
153	4.7	
158	5.4	
163	4.6	
168	5.3	
178	9.2	
188	10.5	
198	9.8	
208	10.2	
218	10.0	
223	5.1	
228	5.1	
233	4.7	
238	5.2	
243	4.7	
248	5.4	
253	4.6	
258	5.1	

DRILL HOLE RECORD

LEVEL	BEARING DIP TYPE OF SURVEY	CORE SIZE NQ	HOLE No. Afton 70-4
LOCATION Afton - Pothook	COLLAR	LENGTH 450'	SHEET No. 2 of 2
ELEVATION		COMPLETED	LOGGED BY: G. D. Delane
LATITUDE 129 +00N N		PURPOSE	Bacon & Crowhurst Ltd
DEPARTURE 92E E		TOTAL RECOVERY	Aug. 29/70

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION OF ROCK TYPES	DRILL HOLE	MINERALIZATION AND STRUCTURES	ESTIMATED % OF SULPHIDES
		Core badly crushed and broken in fault zone with green gouge @ 50° from 318' -320' - contains much calcite, magnetite & hematite		A 3/4" magnet. vein @ 45° with blebs native Cu @ 211', 211.3' - a 1 1/2" magnet vein @ 50° @ 216' & native Cu. Thin veinlets native Cu @ 35° @ 217'	3
		328' - 430' - Altered Diorite - med. to fine gr. greenish (chloritic), diorite 'salt & peppery' texture, - greenish cast		Magnet. abund. as stringers from 231-234'. Massive magnet. from 234'-246', 252.5'-254', 268'-279'. Native Cu & magnet veinlets @ 286', 306'. Small shear with cuprite (?) & native Cu @ 50° @ 306'	3
		Core badly broken from 413'-415'		A 4" band magnet. @ 35° @ 321', with blebs native Cu.	
		Locally brecciated from 423' and 430'.		Native Cu blebs & cuprite as thin veinlets @ 30° @ 285.5', 294' 303', 306', 308'. Cuprite in fract. @ 332', 333' 409'. Magnetite scattered from 328' - 430' - with calcite.	
		Locally syenitic @ 378'-386', 392'-393'		Possible fault @ 40° @ 428.5' with some red-brown gouge & fragments. Cuprite(?) coatings on fract. surfaces abundant from 409'-420'.	
		430-450' Altered Diorite (?) brownish, rusty, tan flecky fine gr., amorphous - looking rx, contains several dk. greyish cuprite (red streak) - wispy veinlets @ ~30° @ 433', 438', 444'. Core is limonitic - looking locally - appears greenish & altered Diorite @ 449'-450'. - considerable calcite within this interval			
-	450	END OF HOLE			

ASSAYS										RECOVERY		
SAMPLE NO.	FROM	TO	WIDTH	REC.	% CU	% ZN	OZS. AU	OZS. AG	GROUPED AVERAGE	RUN	MEASUR'D	% REC.
										263	4.9	
77782	370	380	10	10	.03					268	5.2	
83	380	390		9.9	.04					273	4.7	
84	390	400		10	.06					278	5.4	
85	400	410		9.3	.06					288	10.2	
86	410	420		9.3	.08					298	10.0	
87	420	430		9.3	.05					308	10.0	
88	430	440		10.	.06					318	9.9	
77789	440	450	10	10.1	.06					328	9.9	
										333	5.3	
Grouped Averages:										338	5.4	
										348	10.3	
	60	230	170'		0.413 % Cu					353	4.7	
										358	5.1	
	60	310	250		0.35 % Cu					363	4.6	
										368	5.2	
										373	5.0	
										378	4.7	
										383	4.9	
Recovery = 415.4 (100) = 92.4 %										388	5.2	
450										393	4.6	
										403	10.0	
										413	8.9	
										426	11.4	
										437	10.6	
										447	10.0	
										450	3.8	
										eod		


D.D.H. 72-3
AFTON GRID
70-4
70-3
A-1
300'
A-2
230'
A-3
A-4
A-5
300'
A-6 45°
300'
A-7
A-8
120'
A-9
100'
A-10
300'
A-11
140'
A-12
A-13
300'
A-14
A-15
120'
A-15A
300'
A-16
300'
A-17
120'
A-17A
300'
LEGEND
POST MINERAL
Quaternary Alluvium
Miocene or later, Kamloops Group, andesite, fragmentals, sediments
Miocene or later, Kamloops Group, rhyolite, clay altered, silicified, pyritic
IRON MASK BATHOLITH
Sugarloaf phase, hornblende ± feldspar porphyritic diorite
Lone Tree phase, hornblende-biotite diorite
Breccia, pipe type ?
Red feldspar syenite
Afton phase, hornblende, biotite, diorite
NICOLA
Granitized to green schist facies meta-Triassic volcanic rock
Pre 1971 drill hole
QUINTANA drill hole (percussion)
Road
Lake
N
QUINTANA MINERALS CORPORATION
AFTON MINES PROJECT
(KAMLOOPS AREA, BC)
GEOLOGY & DRILL HOLE
LOCATION MAP
SCALE IN FEET
2000
1000
0
1000
2000
inches
centimetres
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.