Jon Schools - - Red Chris

886355

# AMERICAN BULLION MINERALS LTD.

### SUMMARY REPORT

### **RED-CHRIS GOLD-COPPER PORPHYRY DEPOSIT**

Liard Mining Division British Columbia Canada

N.T.S. 104H/12W Latitude 57° 45'N Longitude 129° 45'W

BY

## **REBAGLIATI GEOLOGICAL CONSULTING LTD.**

C.M. Rebagliati, P.Eng.

March 31, 1994

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### **SUMMARY**

The Red-Chris property, comprising 311 claim units, is located approximately **190** kilometres north of Stewart in northwestern British Columbia, Canada. Highway access is to within 15 kilometres of the property and the moderate topography will facilitate easy access road construction. At Stewart, deepsea docking facilities can be upgraded to accommodate the shipping of copper concentrates to Pacific Rim smelters.

The Red-Chris property hosts a partially explored porphyry gold-copper system. During the 1970's, Texasgulf Canada Ltd. drilled 118 shallow percussion and diamond drill holes, totalling 16,476 metres, partially outlining a large zone of gold-copper porphyrytype mineralization. In early 1994, American Bullion Minerals Ltd. acquired an option to earn an 80 percent interest in the property.

The Red-Chris property lies within the regionally extensive Quesnel Belt which is increasingly being recognized as a potentially important source of gold and copper. Within the belt, numerous gold-copper porphyry deposits are associated with intermediate to felsic plutons intruding Upper Triassic age volcanic and sedimentary strata of the Nicola-Takla-Stuhini Groups. The extensively altered Red monzonite porphyry stock hosts a large sulphide system at least 3.2 kilometres long, in which two coalescing porphyry gold-copper deposits are located. Combined, the deposits have a strike length of over 1200 metres, and widths of up to 300 metres. Pyrite is widespread throughout the extensive zone of phyllic alteration. In contrast, rocks mineralized with gold and copper are associated with a quartz stockwork and fracture systems containing chalcopyrite, that coincide with a remnant zone of alkali feldspar alteration.

A possible geological resource, at a 0.20 percent copper cutoff grade, of 136 million

tonnes (150 million tons) grading 0.38 percent copper and 0.25 grams gold per tonne (0.007 ounces per ton) is indicated. The geological resource contains higher grade core zones containing approximately 37 million tonnes (41 million tons) grading 0.67 percent copper and 0.45 grams gold per tonne (0.013 ounces/ton). The higher grade core zones are open to depth and potentially along strike. In addition, several indicated mineralized zones as well as geochemical and geophysical targets remain untested. By exploring the existing reserves with large diameter core and by improved sampling methods there is good potential to significantly upgrade gold grades. The potential to substantially increase reserves is considered to be excellent.

American Bullion's objective should be to upgrade and expand the higher grade core zones to outline an economic threshold tonnage of 90 million tonnes grading in the order of 0.6 percent copper and 0.55 grams gold per tonne (0.016 ounces per ton).

An aggressive \$3,000,000 exploration program, which includes 15,000 metres of diamond drilling, is recommended to upgrade and expand the higher grade core zones and to determine the ultimate property-wide reserves. This program must be periodically assessed to optimize its effectiveness.

#### INTRODUCTION

In February 1994, the writer was commissioned by the officers of American Bullion Minerals Ltd. to make an appraisal of the company's Red-Chris property situated in northwestern British Columbia, Canada.

This report is based on the writer's knowledge of the region gained during 24 years of exploration for gold-copper porphyry deposits in the Quesnel Belt. In 1971, while employed by Silver Standard Mines Ltd., the writer geologically mapped the core of

the Red-Chris property and excavated the trenches on the Red 10 and Red 25 claims, that first exposed extensive lengths of porphyry-type copper mineralization (McAusland, J.H., Rebagliati, C.M., 1971). The writer also examined the core from the 1976 diamond drilling program. All reports concerning the property listed in the references have been reviewed and have been used, as referenced, in this report.

This report describes the claim holdings, exploration history, geology and mineral inventory of the Red-Chris gold-copper porphyry deposit.

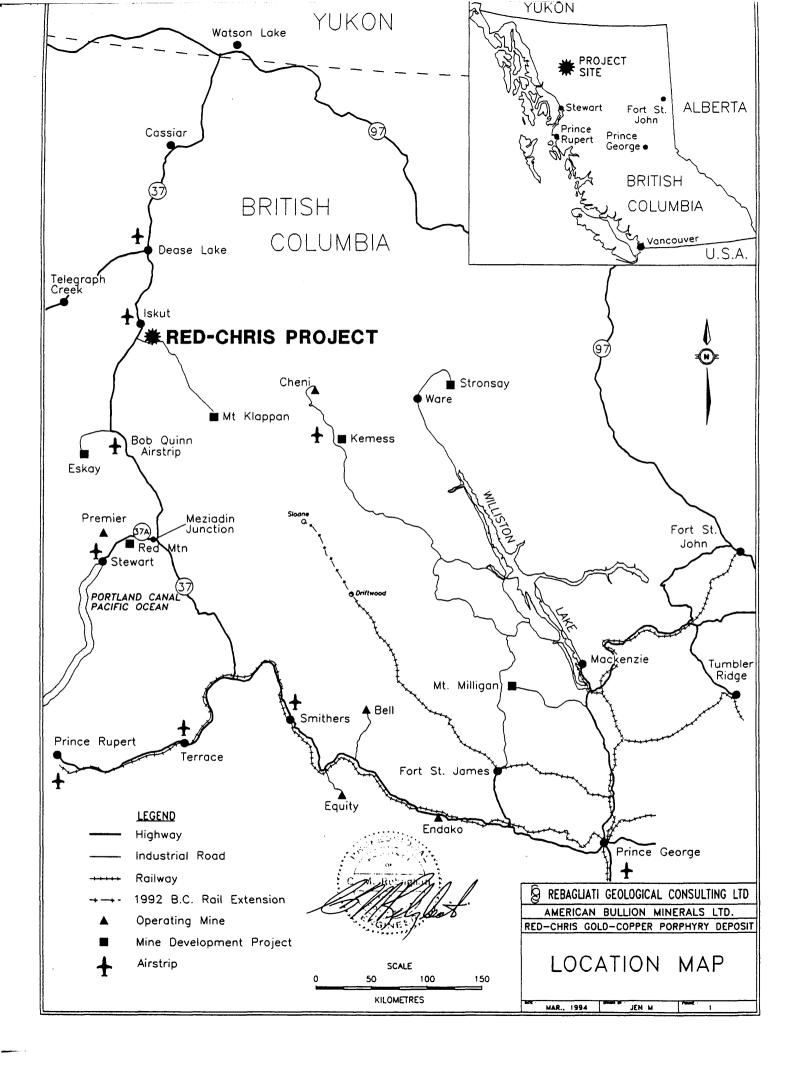
Recommendations are made for continued exploration of the Red-Chris deposit and for the exploration of other prospective geological, geochemical and geophysical features on the property.

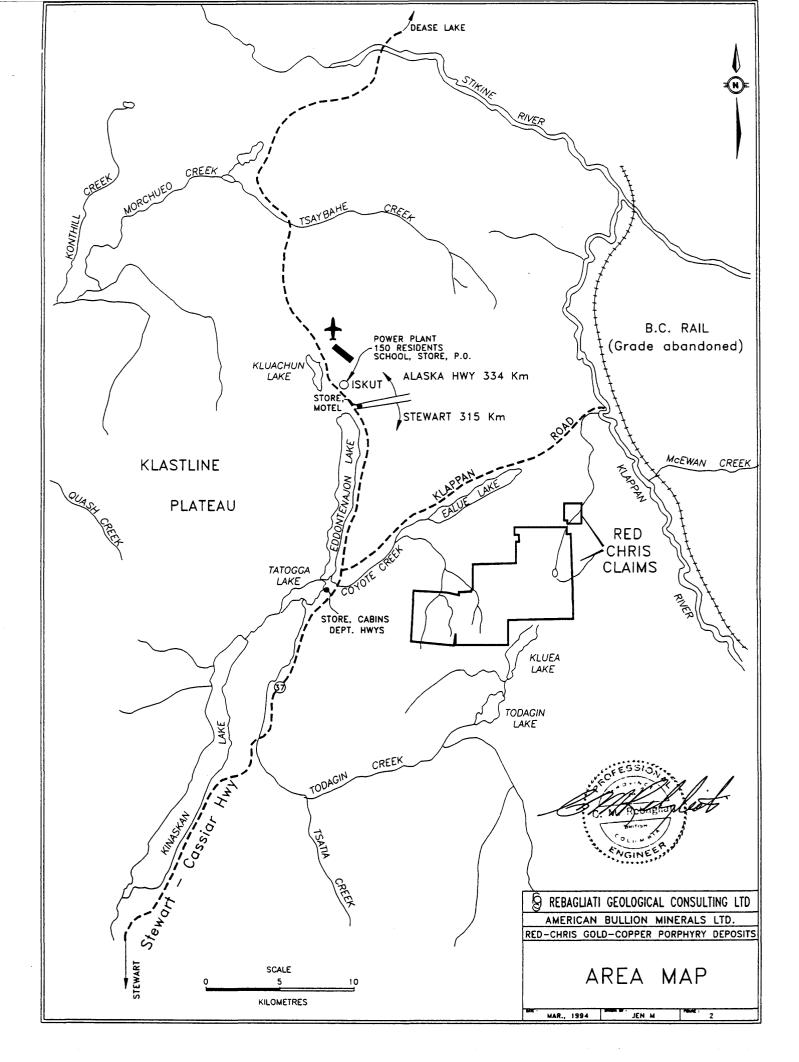
### LOCATION AND ACCESS

The Red-Chris property is located at latitude 57° 45' N and longitude 129° 45' W in the Liard Mining Division, approximately 190 kilometres north of the Pacific Ocean port of Stewart, British Columbia, Canada (Figure 1).

Access to the property from Stewart is via Highway 37 to Eddontenajon Lake, a road distance of approximately 314 kilometres. From Eddontenajon Lake, the Klappan coal field all weather gravel road follows the Ealue lake valley, which is approximately 8 km north of the Red-Chris deposit (Figure 2). Road access to the deposit could be gained by the construction of approximately 15 kilometres of road from the east end of Ealue lake. Current access to the property is by helicopter from Eddontenajon lake, a flying distance of only 12 kilometres.

An airstrip suitable for DC 3 aircraft is located adjacent to Highway 37, two kilometres north of the village of Iskut. Aircraft from Smithers and Terrace provide





scheduled flights to the Iskut airstrip. Transport companies from Smithers and Stewart provide scheduled and contract freight and supply services to the area.

Accommodation and meals may be obtained from resorts and motels at Tatogga Lake and at Iskut.

The Property covers a gently rolling upland surface between Ealue and Kluea lakes, with elevations ranging from 1200 to 1700 metres. At an elevation of 1550 metres, the deposit is approximately 100 metres above the tree line. Several deeply increased north-flowing stream gullies cut the western and central portions of the property.

Several electrical power options are available for supplying mine production facilities at the Red-Chris property.

These include:

- a) extending the B.C. Hydro transmission line from Stewart
- b) extending the powerline being considered for the impending mine development at Kemess (Figure 1)
- c) constructing a coal fueled thermal-electric plant at the Groundhog coal fields near Mt. Klappan
- d) a diesel generating plant at the mine site.

The Pacific Ocean port and resource-based community of Stewart is in a critical position as a transportation hub for the Red-Chris project. Paved Highway 37A provides excellent road access to Stewart from Smithers and Terrace, and the airport is open year round.

Sites on the Portland Canal, road accessible from Stewart, are suitable for the development of a deep water port for vessels in the 65,000 DWT capacity range. Copper concentrates shipped from such a facility would be well positioned to supply

Pacific Rim copper smelters in North America and Asia.

A bulk fuel unloading facility at the Stewart harbour is fully operational and currently supplies the Premier Gold Mine and the logging industry.

### <u>CLAIMS</u>

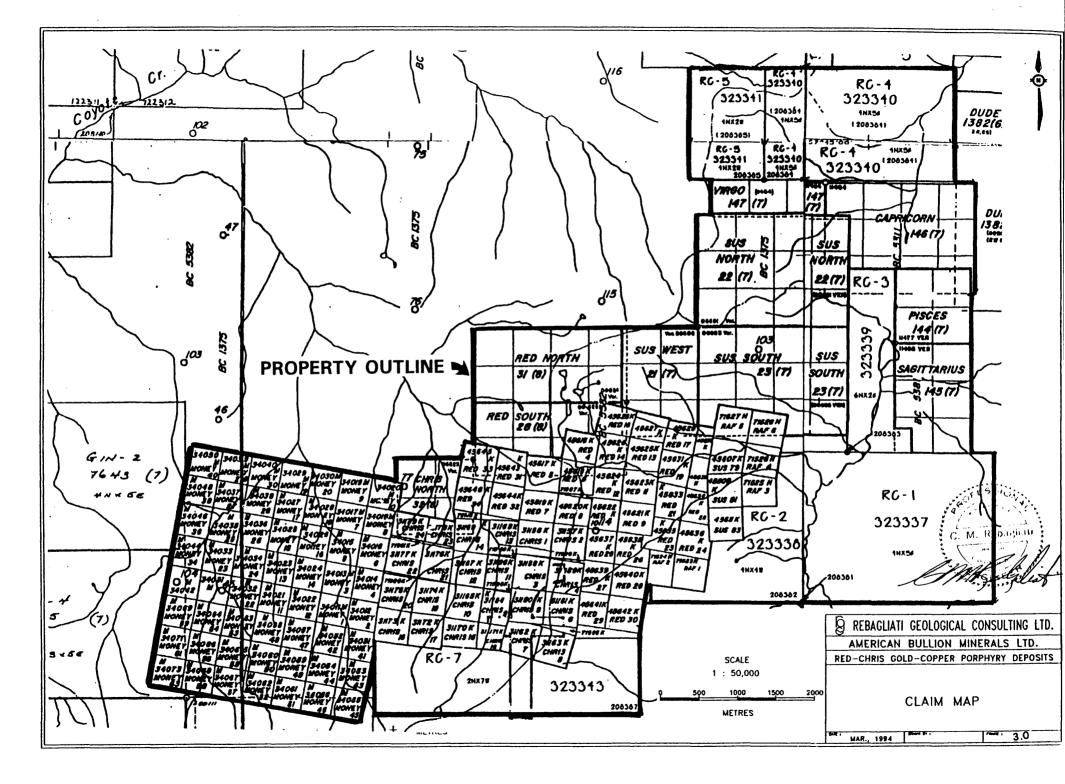
The 69.8 square km Red-Chris property, located in the Liard Mining Division, is comprised of 120 two post claims, 8 fractional claims and 17 modified grid claims totalling 311 units (Figures 3.0 and 3.1).

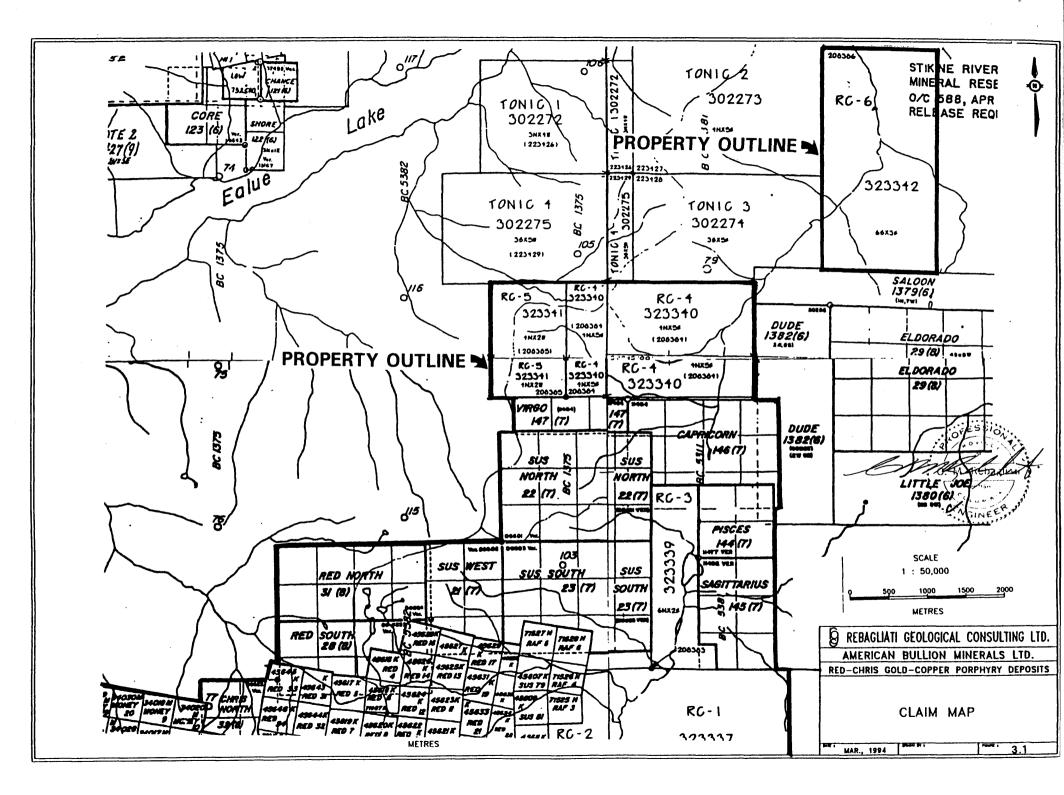
American Bullion Minerals Ltd. has an option to earn an 80 percent interest in the Red-Chris property.

The writer has not made a field examination of all of the claim posts and can pass no opinion on the manner of staking, nor can he verify the position of the claims as depicted by Figures 3.0 and 3.1.

Essential claim data are listed as follows:	Essential	claim	data	are	listed	as	follows:
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Claim	Units	Record	Tenure	Record	Expiry
Number		Number	Number	Date	Date
Capricorn	12	146	221682	July 7, 1976	July 7, 1994
Chris North	4	32	221642	Aug 13, 1975	Aug 13, 1994
Chris 01	1	31156	226748	Aug 24, 1968	Aug 24, 1994
Chris 02	1	31157	226749	Aug 24, 1968	Aug 24, 1994
Chris 03	1	31158	226750	Aug 24, 1968	Aug 24, 1994
Chris 04	1	31159	226751	Aug 24, 1968	Aug 24, 1994
Chris 05	1	31160	226752	Aug 24, 1968	Aug 24, 1994
Chris 06	1	31161	226753	Aug 24, 1968	Aug 24, 1994
Chris 07	1	31162	226754	Aug 24, 1968	Aug 24, 1994





Number   Number   Number   Date   Date     Chris 08   1   31163   226755   Aug 24, 1968   Aug 24, 1994     Chris 09   1   31164   226756   Aug 24, 1968   Aug 24, 1994     Chris 10   1   31165   226757   Aug 24, 1968   Aug 24, 1994     Chris 11   1   31166   228758   Aug 24, 1968   Aug 24, 1994     Chris 12   1   31167   228759   Aug 24, 1968   Aug 24, 1994     Chris 13   1   31168   226760   Aug 24, 1968   Aug 24, 1994     Chris 14   1   31169   226761   Aug 24, 1968   Aug 24, 1994     Chris 15   1   31170   226763   Aug 24, 1968   Aug 24, 1994     Chris 16   1   31171   226765   Aug 24, 1968   Aug 24, 1994     Chris 17   1   31172   226767   Aug 24, 1968   Aug 24, 1994     Chris 19   1   31174   226767   Aug 24, 1968   Aug 24, 1994     Chris 2	Claim	Units	Record	Tenure	Record	Expiry
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Cougar 2FR 1 71986 228049 Aug 29, 1974 Aug 29, 1994   Cougar 3FR 1 71987 228050 Aug 29, 1974 Aug 29, 1994   Cougar 4FR 1 71987 228050 Aug 29, 1974 Aug 29, 1994   Cougar 4FR 1 71988 228051 Aug 29, 1974 Aug 29, 1994   Cougar 5FR 1 71989 228052 Aug 29, 1974 Aug 29, 1994   Cougar 6FR 1 72180 228054 Aug 29, 1974 Aug 29, 1994   Cougar 7FR 1 71990 228053 Aug 29, 1974 Aug 29, 1994   Cougar 7FR 1 71990 228053 Aug 29, 1974 Aug 29, 1994   Cougar 8FR 1 71991 228060 Aug 29, 1974 Aug 29, 1994   Money 01 1 34011 226792 Sept. 30, 1968 Sept. 30, 1994   Money 02 1 34012 226793 Sept. 30, 1968 Sept. 30, 1994   Money 03 1 34013 226794 Sept. 30, 1968 Sept. 30, 1994						
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Cougar 5FR 1 71989 228052 Aug 29, 1974 Aug 29, 1994   Cougar 6FR 1 72180 228054 Aug 29, 1974 Aug 29, 1994   Cougar 7FR 1 71990 228053 Aug 29, 1974 Aug 29, 1994   Cougar 7FR 1 71990 228060 Aug 29, 1974 Aug 29, 1994   Cougar 8FR 1 71991 228060 Aug 29, 1974 Aug 29, 1994   Money 01 1 34011 226792 Sept. 30, 1968 Sept. 30, 1994   Money 02 1 34012 226793 Sept. 30, 1968 Sept. 30, 1994   Money 03 1 34013 226794 Sept. 30, 1968 Sept. 30, 1994	Cougar 3FR	1	71987	228050	Aug 29, 1974	Aug 29, 1994
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Cougar 7FR   1   71990   228053   Aug 29, 1974   Aug 29, 1994     Cougar 8FR   1   71991   228060   Aug 29, 1974   Aug 29, 1994     Money 01   1   34011   226792   Sept. 30, 1968   Sept. 30, 1994     Money 02   1   34012   226793   Sept. 30, 1968   Sept. 30, 1994     Money 03   1   34013   226794   Sept. 30, 1968   Sept. 30, 1994	Cougar 5FR	1	71989	228052	Aug 29, 1974	Aug 29, 1994
Cougar 8FR   1   71991   228060   Aug 29, 1974   Aug 29, 1994     Money 01   1   34011   226792   Sept. 30, 1968   Sept. 30, 1994     Money 02   1   34012   226793   Sept. 30, 1968   Sept. 30, 1994     Money 03   1   34013   226794   Sept. 30, 1968   Sept. 30, 1994	Cougar 6FR	1	72180	228054	Aug 29, 1974	Aug 29, 1994
Money 01   1   34011   226792   Sept. 30, 1968   Sept. 30, 1994     Money 02   1   34012   226793   Sept. 30, 1968   Sept. 30, 1994     Money 03   1   34013   226794   Sept. 30, 1968   Sept. 30, 1994	Cougar 7FR	1	71990	228053	Aug 29, 1974	Aug 29, 1994
Money 02   1   34012   226793   Sept. 30, 1968   Sept. 30, 1994     Money 03   1   34013   226794   Sept. 30, 1968   Sept. 30, 1994	Cougar 8FR	1	71991	228060	Aug 29, 1974	Aug 29, 1994
Money 02   1   34012   226793   Sept. 30, 1968   Sept. 30, 1994     Money 03   1   34013   226794   Sept. 30, 1968   Sept. 30, 1994						
Money 03 1 34013 226794 Sept. 30, 1968 Sept. 30, 1994	Money 01	1	34011	226792	Sept. 30, 1968	Sept. 30, 1994
	Money 02	1	34012	226793	Sept. 30, 1968	Sept. 30, 1994
Money 04 1 34014 226795 Sept. 30, 1968 Sept. 30, 1994	Money 03	1	34013	226794	Sept. 30, 1968	Sept. 30, 1994
	Money 04	1	34014	226795	Sept. 30, 1968	Sept. 30, 1994

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Claim	Units	Record	Tenure	Record	Expiry
Number		Number	Number	Date	Date
Money 05	1	34015	226796	Sept. 30, 1968	Sept. 30, 1994
Money 06	1	34016	226797	Sept. 30, 1968	Sept. 30, 1994
Money 07	1	34017	226798	Sept. 30, 1968	Sept. 30, 1994
Money 08	1	34018	226799	Sept. 30, 1968	Sept. 30, 1994
Money 09	1	34019	226800	Sept. 30, 1968	Sept. 30, 1994
Money 10	1	34020	226801	Sept. 30, 1968	Sept. 30, 1994
Money 11	1	34021	226802	Sept. 30, 1968	Sept. 30, 1994
Money 12	1	34022	226803	Sept. 30, 1968	Sept. 30, 1994
Money 13	· 1	34023	226804	Sept. 30, 1968	Sept. 30, 1994
Money 14	1	34024	226805	Sept. 30, 1968	Sept. 30, 1994
Money 15	1	34025	226806	Sept. 30, 1968	Sept. 30, 1994
Money 16	1	34026	226807	Sept. 30, 1968	Sept. 30, 1994
Money 17	1	34027	226808	Sept. 30, 1968	Sept. 30, 1994
Money 18	1	34028	226809	Sept. 30, 1968	Sept. 30, 1994
Money 19	1	34029	226810	Sept. 30, 1968	Sept. 30, 1994
Money 20	1	34030	226811	Sept. 30, 1968	Sept. 30, 1994
Money 21	1	34031	226812	Sept. 30, 1968	Sept. 30, 1994
Money 22	1	34032	226813	Sept. 30, 1968	Sept. 30, 1994
Money 23	1	34033	226814	Sept. 30, 1968	Sept. 30, 1994
Money 24	1	34034	226815	Sept. 30, 1968	Sept. 30, 1994
Money 25	1	34035	226816	Sept. 30, 1968	Sept. 30, 1994
Money 26	1	34036	226817	Sept. 30, 1968	Sept. 30, 1994
Money 27	1	34037	226818	Sept. 30, 1968	Sept. 30, 1994
Money 28	1	34038	226819	Sept. 30, 1968	Sept. 30, 1994
Money 29	1	34039	226820	Sept. 30, 1968	Sept. 30, 1994
Money 30	1	34040	226821	Sept. 30, 1968	Sept. 30, 1994
Money 32	1	34042	226822	Sept. 30, 1968	Sept. 30, 1994
Money 34	1	34044	226823	Sept. 30, 1968	Sept. 30, 1994
Money 36	1	34046	226824	Sept. 30, 1968	Sept. 30, 1994
Money 38	1	34048	226825	Sept. 30, 1968	Sept. 30, 1994
Money 40	1	34050	226826	Sept. 30, 1968	Sept. 30, 1994

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Claim	Units	Record	Tenure	Record	Expiry
Number		Number	Number	Date	Date
Money 41	1	34051	226827	Sept. 30, 1968	Sept. 30, 1994
Money 42	1	34052	226828	Sept. 30, 1968	Sept. 30, 1994
Money 43	1	34053	226829	Sept. 30, 1968	Sept. 30, 1994
Money 44	1	34054	226830	Sept. 30, 1968	Sept. 30, 1994
Money 45	1	34055	226831	Sept. 30, 1968	Sept. 30, 1994
Money 46	1	34056	226832	Sept. 30, 1968	Sept. 30, 1994
Money 47	1	34057	226833	Sept. 30, 1968	Sept. 30, 1994
Money 48	1	34058	226834	Sept. 30, 1968	Sept. 30, 1994
Money 49	1	34059	226835	Sept. 30, 1968	Sept. 30, 1994
Money 50	1	34060	226836	Sept. 30, 1968	Sept. 30, 1994
Money 51	1	34061	226837	Sept. 30, 1968	Sept. 30, 1994
Money 52	1	34062	226838	Sept. 30, 1968	Sept. 30, 1994
Money 53	1	34063	226839	Sept. 30, 1968	Sept. 30, 1994
Money 54	1	34064	306687	Sept. 30, 1968	Sept. 30, 1994
Money 55	1	34065	226840	Sept. 30, 1968	Sept. 30, 1994
Money 56	1	34066	226841	Sept. 30, 1968	Sept. 30, 1994
Money 57	1	34067	226842	Sept. 30, 1968	Sept. 30, 1994
Money 58	1	34068	226843	Sept. 30, 1968	Sept. 30, 1994
Money 59	1	34069	226844	Sept. 30, 1968	Sept. 30, 1994
Money 61	1	34071	226845	Sept. 30, 1968	Sept. 30, 1994
Money 63	1	34073	306685	Sept. 30, 1968	Sept. 30, 1994
Pisces	4	144	221680	July 7, 1974	July 7, 1994
Raf 1	1	71523	227970	July 31,1974	July 31, 1994
Raf 2	1	71524	227971	July 31,1974	July 31, 1994
Raf 3	1	71525	227972	July 31,1974	July 31, 1994
Raf 4	1	71526	227973	July 31,1974	July 31, 1994
Raf 5	1	71527	227974	July 31,1974	July 31, 1994
Raf 6	1	71528	227975	July 31,1974	July 31, 1994

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Claim	Units	Record	Tenure	Record	Expiry
Number		Number	Number	Date	Date
RC-1	20	323337	323337	Jan 11, 1994	Jan 11, 1995
RC-2	16	323338	323338	Jan 14, 1994	Jan 14, 1995
RC-3	12	323339	323339	Jan 12, 1994	Jan 12, 1995
RC-4	20	323340	323340	Jan 17, 1994	Jan 17, 1995
RC-5	8	323341	323341	Jan 16, 1994	Jan 16, 1995
RC-6	18	323342	323342	Jan 18, 1994	Jan 18, 1995
RC-7	14	323343	323343	Jan 18, 1994	Jan 18, 1995
Red North	8	31	221641	Aug 13, 1975	Aug 13, 1994
Red South	8	28	221638	Aug 13, 1975	Aug 13, 1994
Red 04	1	45616	227043	Aug 5, 1970	Aug 5, 1994
Red 05	1	45617	227044	Aug 5, 1970	Aug 5, 1994
Red O6	1	45618	227045	Aug 5, 1970	Aug 5, 1994
Red 07	1	45619	227046	Aug 5, 1970	Aug 5, 1994
Red 08	1	45620	227047	Aug 5, 1970	Aug 5, 1994
Red 09	1	45621	227048	Aug 5, 1970	Aug 5, 1994
Red 10	1	45622	227049	Aug 5, 1970	Aug 5, 1994
Red 11	1	45623	227050	Aug 5, 1970	Aug 5, 1994
Red 12	1	45624	227051	Aug 5, 1970	Aug 5, 1994
Red 13	1	45625	227052	Aug 5, 1970	Aug 5, 1994
Red 14	1	45626	227053	Aug 5, 1970	Aug 5, 1994
Red 15	1	45627	227054	Aug 5, 1970	Aug 5, 1994
Red 16	1	45628	227055	Aug 5, 1970	Aug 5, 1994
Red 17	1	45629	227056	Aug 5, 1970	Aug 5, 1994
Red 18	1	45630	227057	Aug 5, 1970	Aug 5, 1994
Red 19	1	45631	227058	Aug 5, 1970	Aug 5, 1994
Red 20	1	45632	227059	Aug 5, 1970	Aug 5, 1994
Red 21	1	45633	227060	Aug 5, 1970	Aug 5, 1994
Red 22	1	45634	227061	Aug 5, 1970	Aug 5, 1994
Red 23	1	45635	227062	Aug 5, 1970	Aug 5, 1994

Claim	Units	Record	Tenure	Record	Expiry
Number		Number	Number	Date	Date
Red 24	1	45636	227063	Aug 5, 1970	Aug 5, 1994
Red 25	1	45637	227064	Aug 5, 1970	Aug 5, 1994
Red 26	1	45638	227065	Aug 5, 1970	Aug 5, 1994
Red 27	1	45639	227066	Aug 5, 1970	Aug 5, 1994
Red 28	1	45640	227067	Aug 5, 1970	Aug 5, 1994
Red 29	1	45641	227068	Aug 5, 1970	Aug 5, 1994
Red 30	1	45642	227069	Aug 5, 1970	Aug 5, 1994
Red 31	1	45643	227070	Aug 5, 1970	Aug 5, 1994
Red 32	1	45644	227071	Aug 5, 1970	Aug 5, 1994
Red 33	1	45645	227072	Aug 5, 1970	Aug 5, 1994
Red 34	1	45646	227073	Aug 5, 1970	Aug 5, 1994
Sagittarius	6	145	221681	July 7, 1976	July 7, 1994
Sus North	12	22	221636	July 15, 1975	July 15, 1994
Sus South	12	23	221637	July 15, 1975	July 15, 1994
Sus West	6	21	221635	July 15, 1975	July 15, 1994
Sus 79	1	45607	227040	Aug 5, 1970	Aug 5, 1994
Sus 81	1	45609	227041	Aug 5, 1970	Aug 5, 1994
Sus 83	1	45611	227042	Aug 5, 1970	Aug 5, 1994
Virgo	3	147	221683	July 7, 1976	July 7, 1994

Total Number of Claims	14
Total Number of Units	31

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#### **EXPLORATION HISTORY**

The earliest recorded work in the area of the current property was done by Conwest, who drilled some short diamond drill holes in 1956. Locations of these holes are not known. In 1968, Great Plains Development Company of Canada Ltd. staked the Chris and Money claim groups, to cover the head waters of a stream yielding a strong copper stream sediment geochemical anomaly. Soil geochemical and geological surveys were followed in 1970 by the drilling of two diamond drill holes totalling 390 metres. Hole 70-2 intersected 73 metres grading 0.25 percent copper (McInnis, M.D., 1972). In 1972, after additional geological, magnetic and induced polarization surveys, eight diamond drill holes totalling 922 metres were drilled. These holes, while extensively altered, returned low copper concentrations (Gold concentrations were not assayed).

In 1970, Silver Standard Mines Ltd. staked the Red and Sus claim groups adjacent to the north and east sides of the Chris claims, to cover the newly discovered eastern extension of the mineralized intrusion. In 1971, after soil geochemical and geological surveys, a bulldozer trenching program tested the prospective area at the common boundary between the Red and Chris claim groups. An 84 metre long trench interval graded 0.25 percent copper and a separate 9 metre section contained 0.57 percent copper (McAustand, J.H., Rebagliati; C.M., 1972).

In 1973, Texasgulf Canada Ltd. (formerly Ecstall Mining Limited) optioned the Red claim group from Silver Standard Mines Ltd. and drilled 14 percussion holes totalling 911 metres. Encouraged by the results, Texasgulf Canada Ltd, in 1974, consolidated the Red, Sus, Chris and Money claim groups under one option agreement. Additional geotechnical surveys indicated a large area of coincident copper soil geochemical and IP anomalies, overlying a strongly altered monzonitic intrusion.

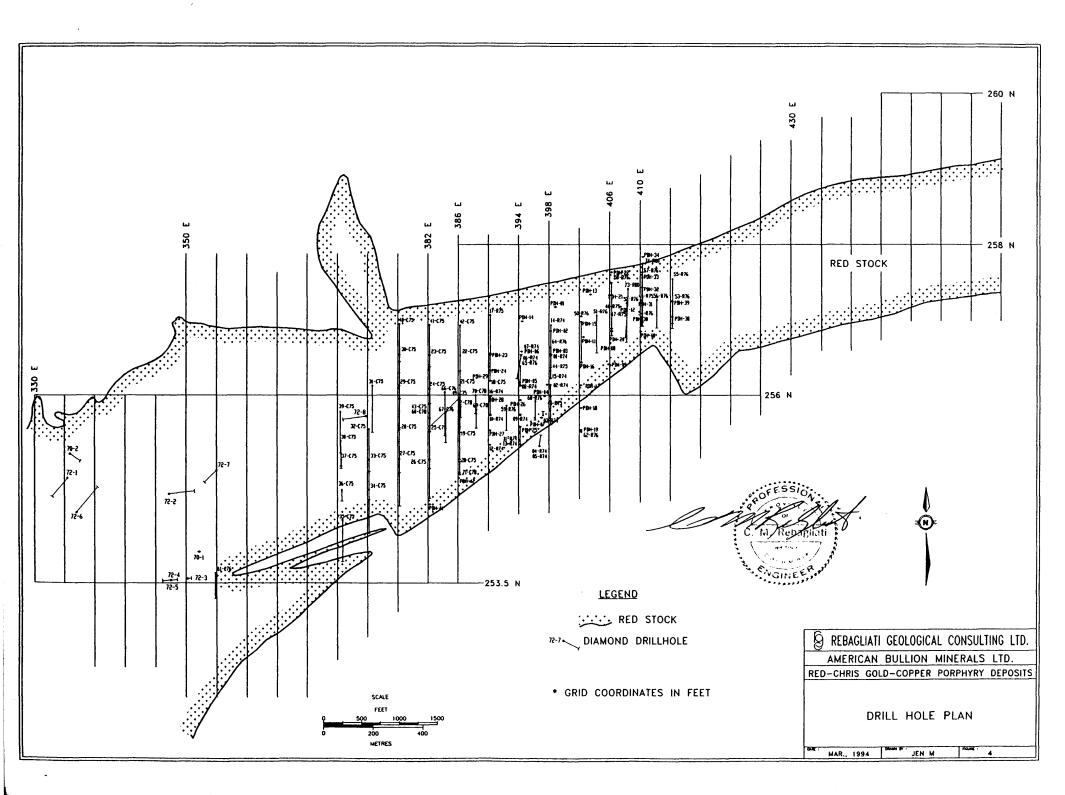
The drilling programs undertaken by Texasgulf Canada Ltd. are summarized as follows.

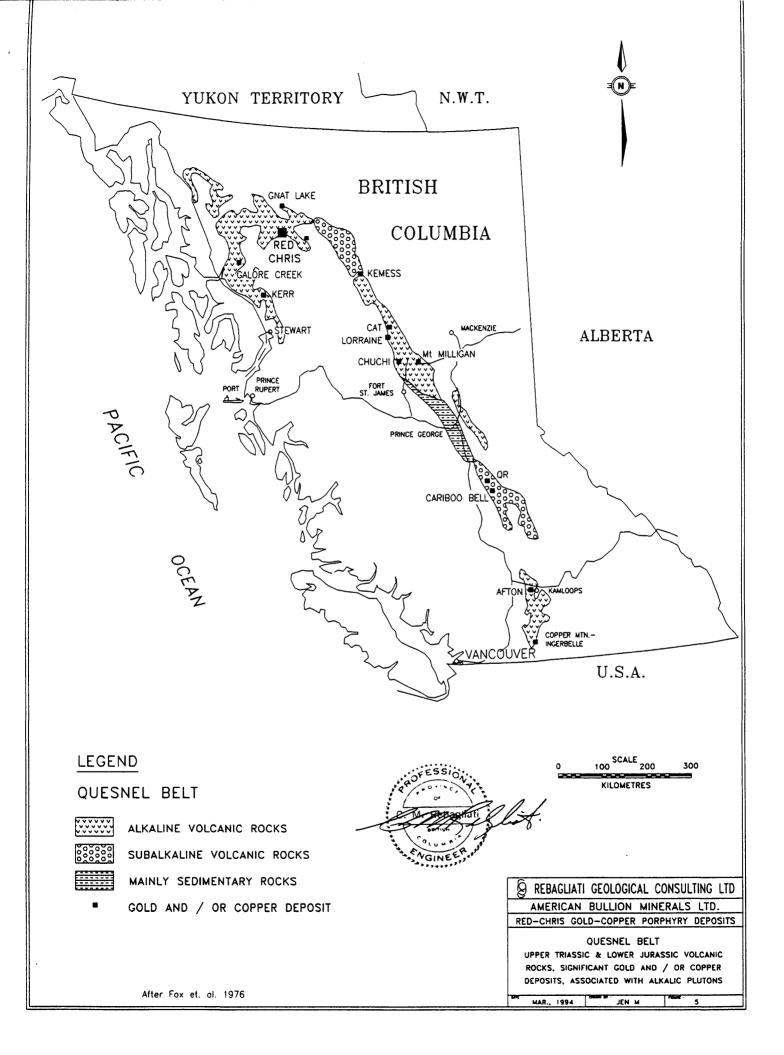
<u>Year</u>	<u>Percussic</u> <u>Holes</u>	on Drilling <u>Metres</u>	<u>Diamon</u> Holes	<u>d Drilling</u> <u>Metres</u>
1973	14	914		
1974	10	780	16 BQ	2265
1975	20	1481	33 BQ	6925
1976			18 BQ	3094
1978			5 BQ	391
1980			2 BQ	626
		0475		10001
TOTAL	44	3175	74	13301

A drill hole plan is shown in Figure 4.

In total, 5058 copper assays were generated from the drilling programs. Copper grades range from a low of 0.01 percent to a maximum of 6.60 percent. Approximately 1000 samples were not assayed for gold, and many of the approximately 1500 gold assays were done on composite samples with intervals up to 15 metres (50 feet) in length. Gold assays range from 0.017 grams per tonne (0.0005 opt) to a maximum of 8.228 grams per tonne (0.240 opt). The 68 silver assays range from 0.686 to 10.286 grams per tonne.

These drilling programs outlined two coalescing higher grade gold-copper zones lying within a much larger gold-copper porphyry system. Using an arbitrary cut-off grade of 0.25 percent copper (irrespective of gold grades) and a specific gravity of 2.81,





Texasgulf estimated there were possible open pit mining reserves in the Main Zone of 33 million tonnes, grading 0.51 percent copper and 0.27 grams gold per tonne (0.008 oz/ton) (Newell, J.M., and Schmitt, H.R., 1978) and 6.7 million tonnes in the East Zone grading 0.78 percent copper and 0.65 grams gold per tonne (0.019 oz/ton) (Peatfield 1981). A waste: ore stripping ratio of 1.4:1 was projected for the combined reserves.

### **REGIONAL GEOLOGICAL SETTING**

The Red-Chris property lies within the regionally extrusive early Mesozoic Quesnel Belt (Figure 5). This belt extends northwesterly for 1200 km and includes equivalent rocks of the Upper Triassic - Lower Jurassic Nicola, Takla and Stuhini Groups. In the vicinity of the Red-Chris property, the uniform northwest trend of the Quesnel Belt is disrupted and forms a crude westerly trending segment.

Intruding the volcanic-sedimentary strata of the Quesnel Belt are alkaline syenite, monzonite and diorite batholiths, stocks and dykes. Many of the stocks lie along linear trends, which are interpreted to reflect the fault zones which controlled the location of volcanism and stock emplacement.

The alkalic stocks of the Quesnel Belt commonly host porphyry copper deposits, which are increasingly being recognized as an important source of gold. It has also been recently recognized that porphyry systems also have the potential to generate disseminated gold deposits (ie QR and the 66 zone at Mt. Milligan).

The following auriferous porphyry copper deposits occur within the Quesnel Belt and many more prospects are under active exploration.

Gold-Copper Porphyry	<b>Deposits</b> Quesnel	Belt, British	Columbia

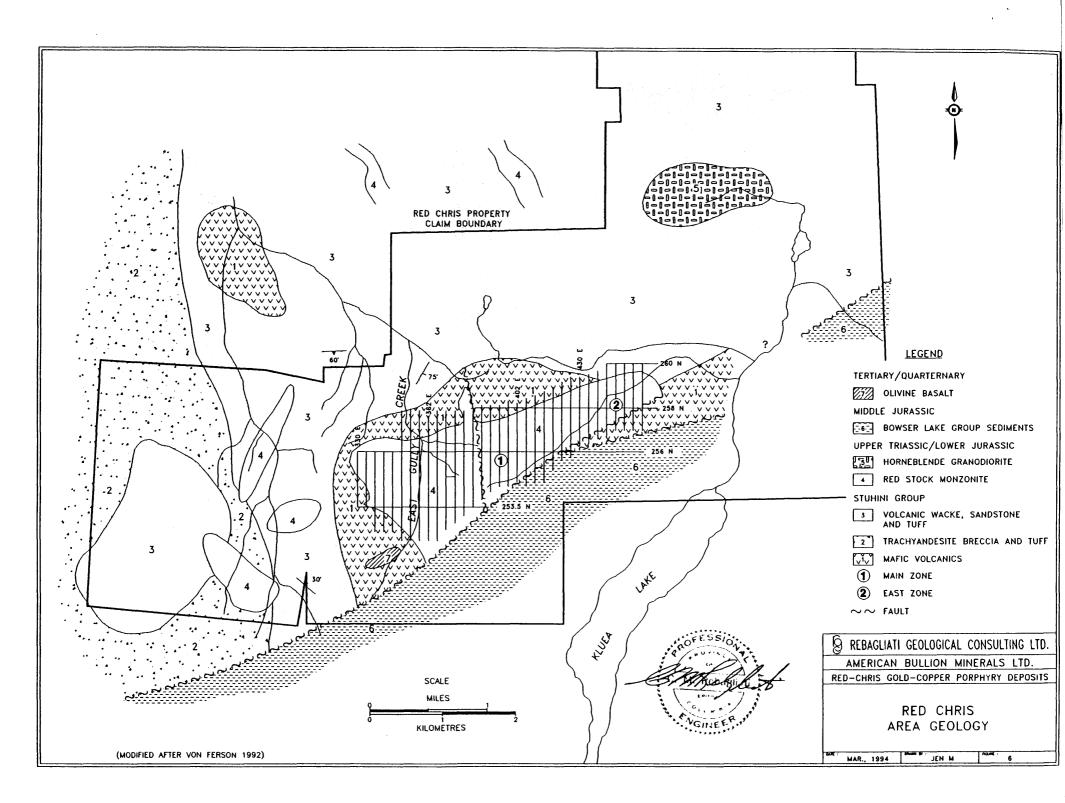
		<b>Reserves/Mineral Inventory</b>	
Property	No. of Deposits	Copper (x10 <sup>6</sup> lbs)	Gold (x10 <sup>6</sup> oz)
Production (past)			
Copper Mtn.	5	1,600	0.910
Afton	2	680	0.970
Development Stage			
Kemess	2	1,903	6.410
Mt. Milligan	2	1,680	6.37
U		•	
Mt. Polley	2	875	2.000
QR	4		.200
Exploration Stage			
Galore Creek	8	3,000	1.750
Red-Chris	2	1,030	.988
Lorraine	2	150	.100
20.10.10	-		

The Stuhini Group volcanic strata in the Red-Chris property area are intruded by several plutons. Some of these plutons display many of the geological characteristics related to the formation of gold-rich porphyry copper deposits in the Quesnel Belt.

### PROPERTY GEOLOGY

The Red-Chris gold-copper porphyry deposits are hosted by a Upper Triassic age (210 Ma) leucocratic feldspar porphyry of monzonitic composition which has intruded a thick pile of strata equivalent to the Nicola-Takla-Stuhini volcanic and volcaniclastic assemblages typical of the Quesnel Belt.

The Red Stock is elongate and irregular in shape, and roughly parallels a major eastnortheast cross structure of semi-regional extent. The stock is at least 4 kilometres in length and varies from 300 to 1500 metres in width (Figure 6). Satalitic plugs



continue to the west of the Red Stock. The southeast boundary of the stock is in fault contact with Middle to Upper Jurassic Bowser Lake Group sediments. To the north of the east-northeast trending fault, the stock is emplaced in Stuhini volcanic and sedimentary rocks. The west contact is severely disrupted and offset by a number of faults (Panteleyev, 1975). Near the west end of the Red Stock, remnants of Late Tertiary or Quaternary age olivine basalt flows cap local hills.

### **Bowser Lake Group**

Along the south edge of the Red Stock, the intrusive rocks are in fault contact with clastic sedimentary rocks of the Bowser Lake Group. This group includes large volumes of conglomerates and siltstones. Chert pebble conglomerates are distinctive and abundant. Medium-grained grits are interbedded with the conglomerates. The other major unit of the Bowser Lake Group comprises black siltstones, which are often finely laminated and occasionally fossiliferous. Several parallel northeast trending faults, down-dropping to the south, have brought both the basal conglomerate and the black siltstone into contact with both intrusive and volcano-sedimentary rocks of Upper Triassic age (Leitch and Elliott 1977). No where have the Bowser Lake Group sediments been found, as expected, unconformably overlying the Red Stock.

### Stuhini Group

In the Red-Chris property area, the Stuhini Group is comprised of subaqueous andesitic volcanic, volcaniclastic and volcano-derived sedimentary rocks.

The volcanic strata north of the Red Stock are mainly green and andesitic, and most are characterized by augite and plagioclase phenocrysts. Some units contain sufficient potassium feldspar to be classified as trachyandesites (Leitch, C.B., Elliott, T.M., 1976). Along the north contact of the Red Stock these volcanics are bleached and pyritized and are locally biotite hornfelsed.

A sequence of more intermediate to felsic volcanics crop out west of the stock. This assemblage of felsic volcanics range from dark green andesites, to pale coloured trachytes and white rhyolites. Some minor layers of tuffaceous rocks are included.

South of the stock felsic tuffs, lapilli tuffs, breccias and grey volcanic wackes, characterized by small, angular, black argillite fragments, outcrop.

To the southwest, reddish brown and purple hematitic volcanic flows, and flow breccias are interbedded with subordinate green andesite flows, tuffs and minor calcareous siltstones. The reddish brown and purple hematitic units, characteristic of subaerial volcanics in the Quesnel Belt, are indicative of a nearby emergent eruptive centre. These eruptive centres frequently host comagmatic high level, subvolcanic stocks, often with associated porphyry-type gold-copper mineralization.

The sedimentary assemblage comprises interbedded massive volcanic wacke, feldspathic sandstone and banded siltstone-argillite. These distinctive units occur in large volumes in the district. White broken feldspar laths and green broken hornblende, in a pale green chlorite-sericite matrix, characterize the feldspathic wackes. A distinctive feature of this unit is its low, but persistent, content of angular black argillite clasts. Banded, finely bedded grey siltstones are more common than black argillites. Slumping, crumpling and breaking of thin black argillite beds interbedded in siltstone into a fine-grained wacke, is a widespread feature. Thin, but laterally extensive calcareous lenses in the siltstones, occasionally occur.

Moderate biotite hornfelsing is locally present in the wackes and siltstones around the northeast margin of the Red Stock.

### **Red Stock and Associated Small Stocks and Dykes**

The Red Stock, a multiple intrusive with an east-northeast trend in excess of 4 kilometres long and from 300 to 1500 metres wide, can be divided into two major groups: the pre-mineral Main Phase, comprising 85 percent of the stock; easterly trending dykes and small masses of the post mineral Barren Phase comprising 10 percent; and several subordinate late stage intrusive dykes (Leitch, C.B., Elliott, T.M., 1976) (Figure 7). The contacts of the Barren Phase with the Main Phase are distinct and knife-edged. Minor chilling and flow handing occur in the Barren Phase at the contacts. Before alteration, both phases were hornblende-plagioclase monzonite porphyries, containing approximately 10 to 20 percent 2 to 4 millimetre euhedral hornblende phenocrysts and 30 to 60 percent 1 to 3 millimetre euhedral plagioclase laths, in an aphanitic to very fine-grained matrix of pink potassium feldspar. A Main Phase specimen gave a whole rock potassium-argon age of 210 Ma. The two major units of monzonite porphyry have been intruded by a series of later minor, postmineral porphyritic felsic, to andesitic dykes usually less then 10 metres wide. These dykes constitute less than 5 percent of the intrusive complex. Biotite phenocrysts from one dyke were dated at 195 Ma.

The Red Stock is host to a major sulphide system. It is well fractured and extensively flooded by vein quartz stockworks. Two potentially economic zones, referred to as the Main and East zones of gold-copper porphyry-type mineralization, have been partially outlined.

### **GEOCHEMISTRY AND GEOPHYSICS**

An extensive deep overburden geochemical survey was conducted over a grid comprising approximately 3.5 square kilometres centred on the Red Stock. Using power equipment, overburden samples were collected at the bedrock interface. This sampling program outlined a large area containing in excess of 200 ppm copper within which a substantial portion of the samples contained in excess of 500 ppm copper (Figure 7). The core of the copper anomaly, centred at 390E, coincides with the position of the Main and East Zones. Several lobes of the anomaly exceeding 200 ppm copper have not been explored. No overburden samples were analyzed for gold. The soil grid did not cover all of the Red Stock and some portions of the grid were not sampled. Expanded coverage is recommended for 1994.

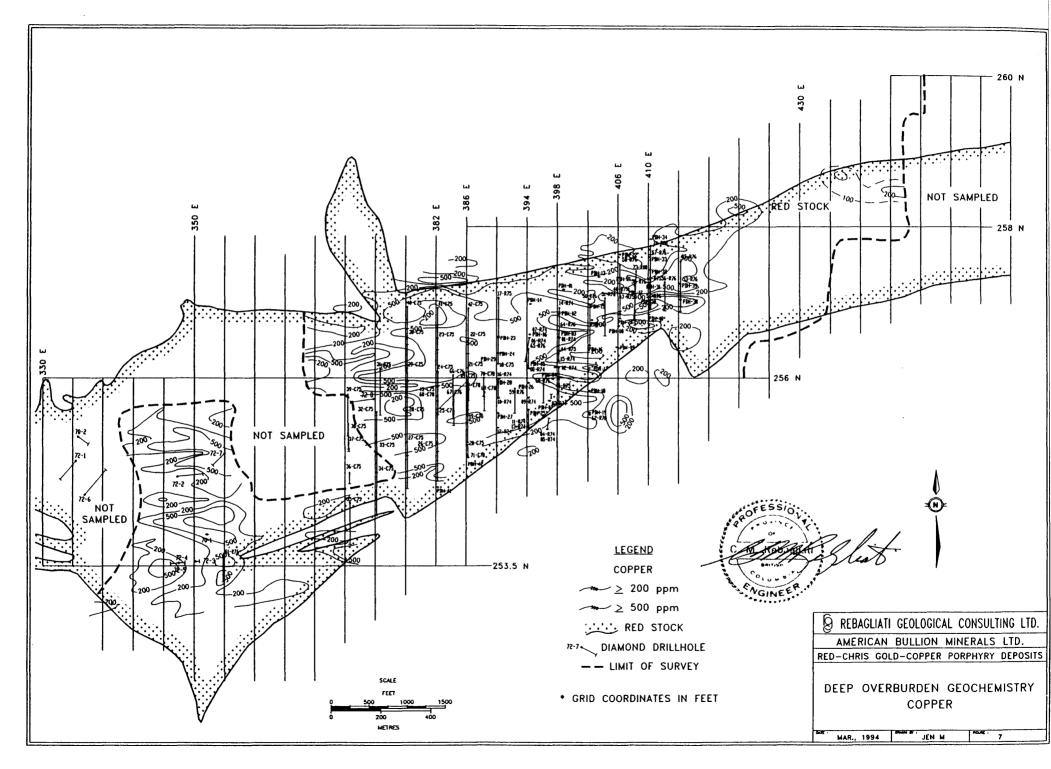
Induced polarization and magnetic surveys were also conducted over the grid. The high sulphide content of the Red Stock is clearly outlined by the 20 millisecond isopleth (Figure 8). Mineralization in the Main and East Zones lies within the 60 millisecond isopleth. Of particular interest is the chargeability high centred at 254N, 354E where diamond drill hole 61 and Trench A encountered significant copper mineraliqation (gold was not assayed). This portion of the IP anomaly has not been adequately explored. Other areas with strong IP response also remain untested. The IP survey also is incomplete and should be expanded.

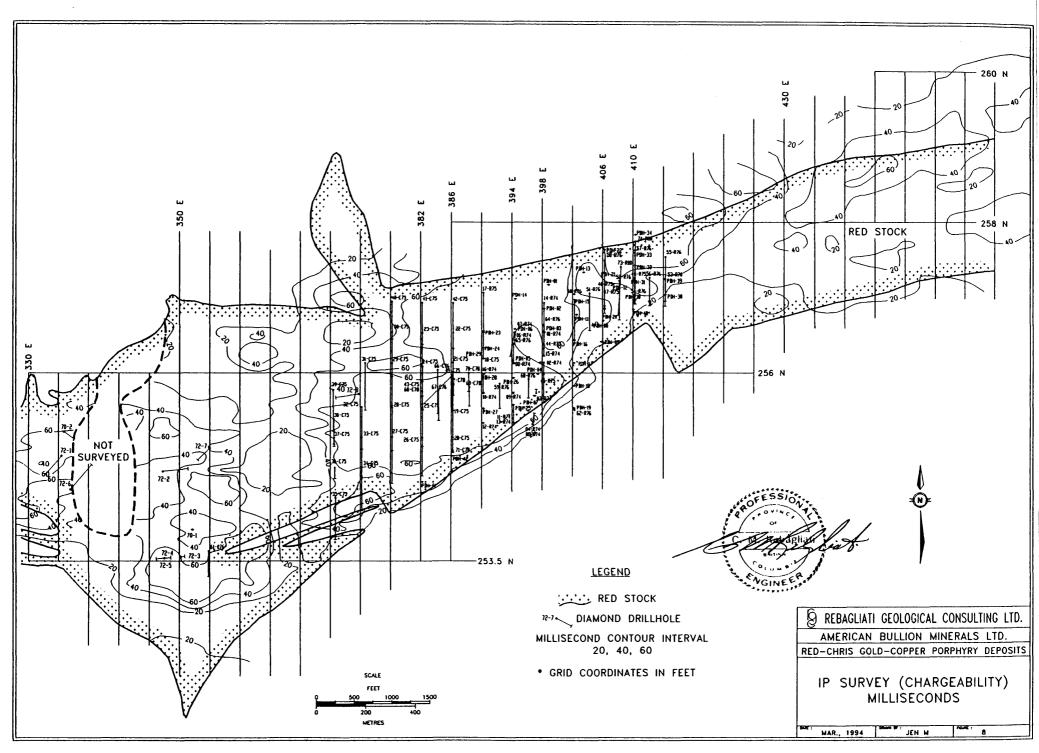
The magnetometer survey shows Red Stock as a broad area low magnetic intensity displaying little contrast, but the mineralized zones are not apparent (Figure 9). North of the stock, the mafic volcanic strata is outlined by an area of greater intensity and contrast.

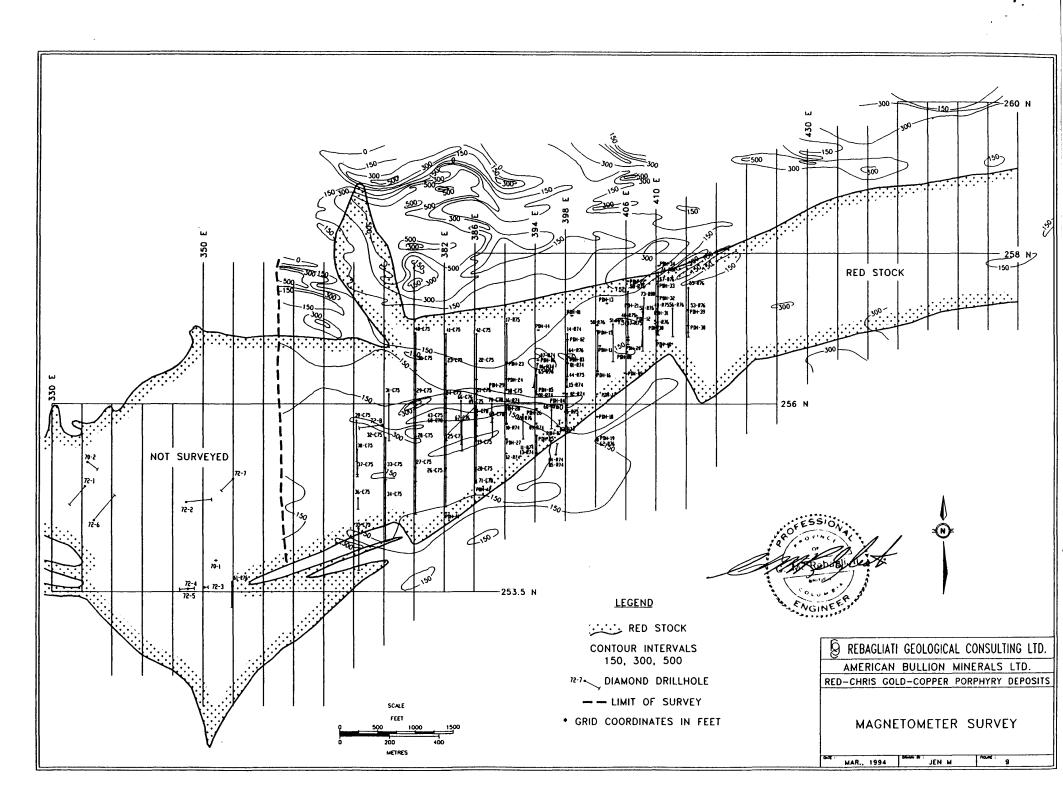
#### ALTERATION

The Main Phase of the Red Stock has been variably altered to a pink or orange albitemagnetite  $\pm$  biotite facies before being overprinted by a pervasive phyllic facies, which has largely obscured the original distribution of the earlier albitic alteration (Leitch,C.B., Elliott, J.M., 1976).

An inner alteration zone is coincident with the well developed quartz stockwork and







higher grade gold-copper mineralization (greater than 0.5 percent copper). It is characterized by intense sericitic-carbonate alteration accompanied by relatively strong hematite and relict magnetite in veins and disseminations. Local areas of pervasive albite and or potassium feldspar alteration and sporadic chloritization occur associated with the inner zone. The outer alteration zone is generally phyllic and is associated with less well developed copper mineralization in weak to moderate quartz stockwork areas.

In detail, the early stage hematite-stained albite facies is comprised of albite-magnetite  $\pm$  biotite  $\pm$  chlorite  $\pm$  epidote. The alteration feldspar colour ranges from pink to orange, and is probably best termed an "alkali feldspar" rather than albite or potassium feldspar. The pink alteration mineral is too hard to be carbonate, does not react to HCL and does not give a yellow colour when stained with sodium cobaltinitrate. It begins by replacing plagioclase grains and with stronger alteration, the groundmass is also recrystallized, destroying the porphyritic texture of the rock. In its strongest form, especially as vein selvages, the alteration feldspar grades into a true potassium feldspar, which gives a positive stain test.

Magnetite, a distinctive and widespread mineral of the early facies, occurs as disseminations, replacements with chlorite of hornblende, fracture fillings and veins. Biotite, which is relatively uncommon, occurs in two forms; as recognizable brown flakes and plates to 1 millimetre in diameter, and as fine fibrous mats and replacements of the groundmass that imparts a brownish hue to the groundmass between the white feldspar phenocrysts. Biotite altered sections of core seldom exceed 3 metres and usually alternate with albitized sections and propylitized sections. Biotite is most abundant under the East Zone.

The Red Stock is characterized by its widespread moderate grey to buff quartz-

sericite-pyrite-carbonate phyllic alteration. It is commonly cut by fracture or vein selvages of darker grey-green intense quartz-sericite-pyrite  $\pm$  chalcopyrite. Where the fracture selvages coalesce, an intense phyllic assemblage is formed where the original rock textures are destroyed. Carbonate (ferroan dolomite) is absent from this intense alteration, but may comprise up to 35 percent of the rock in the moderate phyllic assemblage.

In the moderate phyllic assemblage, hornblendes are psuedomorphed by carbonate, minor sericite and some pyrite. Plagioclase grains are replaced by white to green sericite and minor carbonate. The originally pink potassium feldspar microgranular matrix is usually the first to undergo phyllic alteration and is recrystallized to quartz and minor sericite.

Some short sections of rock received both albitic and sericitic alteration, some remnants of albitic alteration escaped sericitization and some rocks escaped both alteration phases to remain weakly altered or essentially unaltered. These rocks are difficult to distinguish from weakly mineralized Barren Phase rocks unless sharp intrusive contacts are seen.

A late phase black tourmaline-pyrite alteration where present, is intense but sporadic, and is spatially related to zones of structural weakness, brecciation and major faults.

Propylitic alteration is weakly developed in the Barren Phase monzonite porphyry dykes and in the volcanic strata proximal to the stock.

#### MINERALIZATION

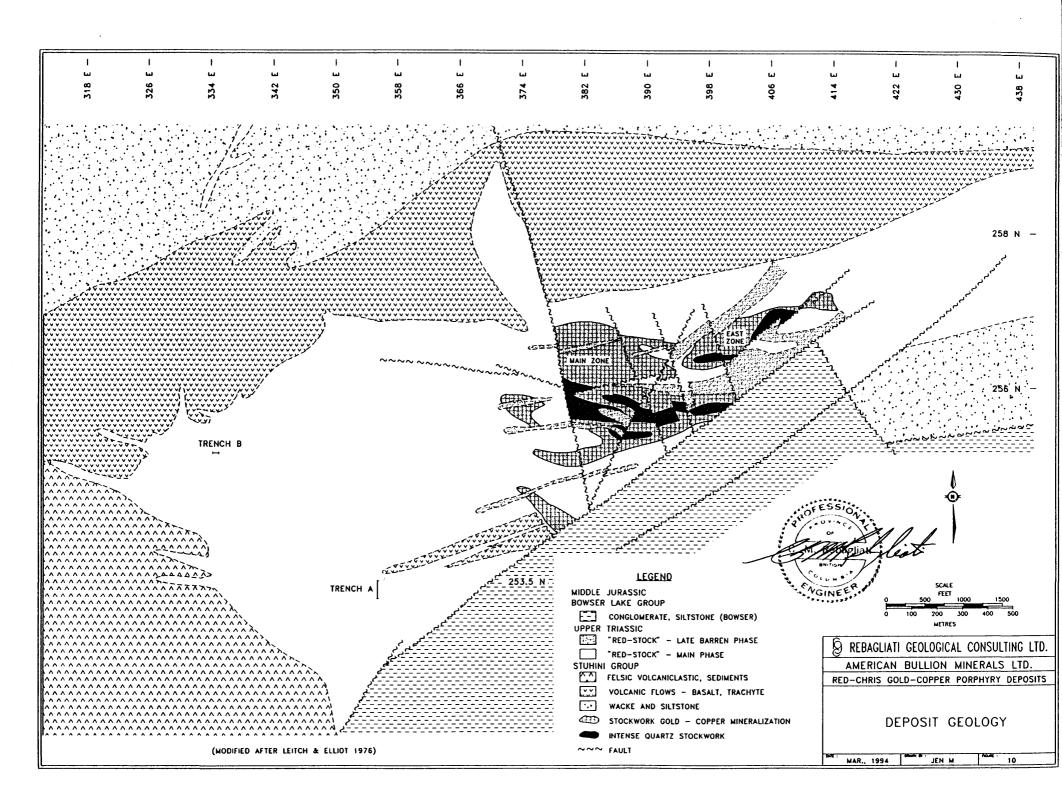
The extensively altered Red Stock hosts a large sulphide system at least 3.2 kilometres in length, in which two coalescing zones of porphyry gold-copper

mineralization have been partially defined by drilling (Figure 4 and 10). Combined, the Main and East deposits have a east- northeast strike length of over 1200 metres and a width ranging from 100 to 300 metres. Pyrite is widespread throughout the extensive zone of phyllic alteration, whereas rocks mineralized with gold and copper are associated with a quartz stockwork and fracture system, containing pyrite, chalcopyrite and minor bornite, that roughly coincide with the zone of remnant alkalic feldspar-magnetite alteration.

Four major veining events, each with their own distinctive mineralogy, occurred within the stock. The main gold-copper mineralization accompanies the first two events, which cut only the Main Phase monzonite porphyry.

These veining events were a magnetite-chalcopyrite  $\pm$  quartz system followed by quartz-pyrite-chalcopyrite veining. The latter two events, cutting all stock phases, including the Barren Phase, consist of carbonate  $\pm$  quartz followed by gypsum-anhydrite (Leitch, C.B., Elliott, T.M., 1976).

The early magnetite-chalcopyrite phase of veining accompanied the early albitemagnetite alteration. Fracture fillings and coatings of magnetite and chalcopyrite characterize this phase of mineralization. The majority of the magnetite has been psuedomorphed by hematite (martite). These oxidized magnetite-chalcopyrite veinlets locally occur in such density to give a sheeted appearance, such as observed in the core of East Zone, where the intensity of the quartz veining totally replaces the monzonite to form banded quartz-magnetite-chalcopyrite-bornite sections. In these sections magnetite is magnetic only in the core of the most strongly banded sections, where the later quartz-sericite-pyrite-chalcopyrite event could not oxidize the magnetite to martite. In these gold-rich sheeted sub zones, silica may replace up to 80 percent of the rock, with the remaining 20 percent comprised of magnetite and



sulphides. The linear, easterly trending sheeted mineralization is postulated to have replaced the Red Stock along an active fault zone (Leitch, C.B., Elliott, T.M. 1976).

The second main mineralizing event which affected the Main Phase monzonite porphyry was more intense, more pervasive and more widespread than the earlier magnetite-chalcopyrite  $\pm$  quartz stage. The bulk of the copper in the Red Stock is present in quartz vein stockworks and quartz-sericite selvages to these veins. Pyrite is always associated with chalcopyrite, and usually the two sulphides occur as intimate fine-grained mixtures.

A total sulphide content of 10 to 15 percent (pyrite) in rock devoid of copper in the pyrite halo (pyrite: chalcopyrite 20:1) ranges to 8 to 12 percent in the high-grade core assemblage where grades range from 0.5 to 3.0 percent copper.

In the core of the Main Zone quartz vein stockwork density decreases, but the copper grade remains relatively constant, due to the presence of very fine-grained, strongly disseminated chalcopyrite. A lesser, but still important feature is the pyrite and chalcopyrite present as fracture coatings and fillings, both along centres of quartz veins and cross-cutting the quartz veins. The cross-fractures often continue into the wall rock of the veins, indicating a late, weaker sub-event of pyrite and chalcopyrite mineralization lacking quartz, cutting through all the rocks and locally forming sulphide matrix breccias.

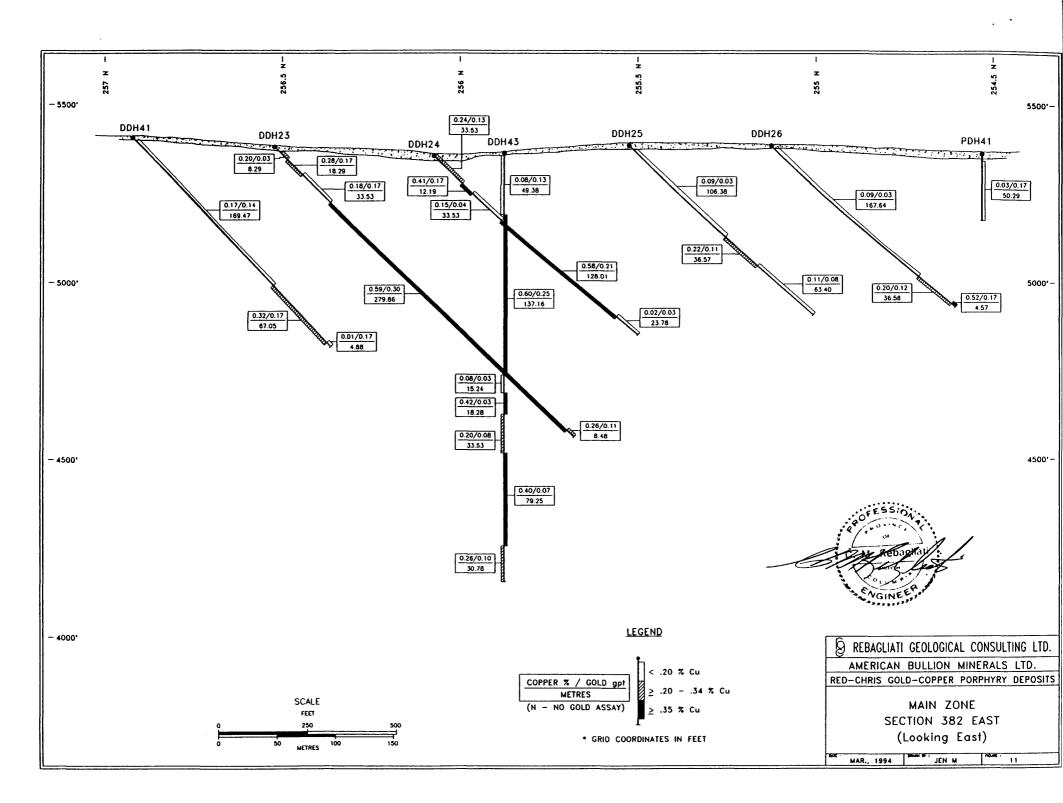
A minor late stage of mineralization occurred after the intrusion of the Barren Phase of the Red Stock. This is associated with traces of vague quartz veining cut by later sulphide-bearing fractures. The overall copper tenor the Barren Phase is correspondingly very low (0.01 to 0.09 percent copper).

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Carbonate and quartz-carbonate veins form local stockworks in both Main Phase and Barren Phase rocks. These veins also form breccias of limited extent, but in general are widely spread throughout the intrusive and intruded strata on the property. Most of the carbonate-bearing veins are barren of sulphides. Some of these veins cut post mineral dykes, and as such are unrelated to the main copper mineralization. In the volcanic and sedimentary rocks around the periphery of the Red Stock, some late carbonate veins carry sphalerite and argentiferous galena. These carbonate-base metal veins are probably related to a distal phase of the porphyry mineralizing event, and predate the sulphide barren carbonate veins.

The youngest veins, which cut all previously described veins, are comprised of pink to white gypsum-anhydrite (Leitch, C.B., Elliott, T.M., 1976). They occur randomly scattered throughout the Red Stock, and are barren of all sulphide.

The distribution of copper and gold grades in the Main Zone are illustrated on Figures 11 to 14 and for the East Zone on Figures 15 and 16. Composite assay intervals for the holes on each cross section are summarized on the pages following each figure.



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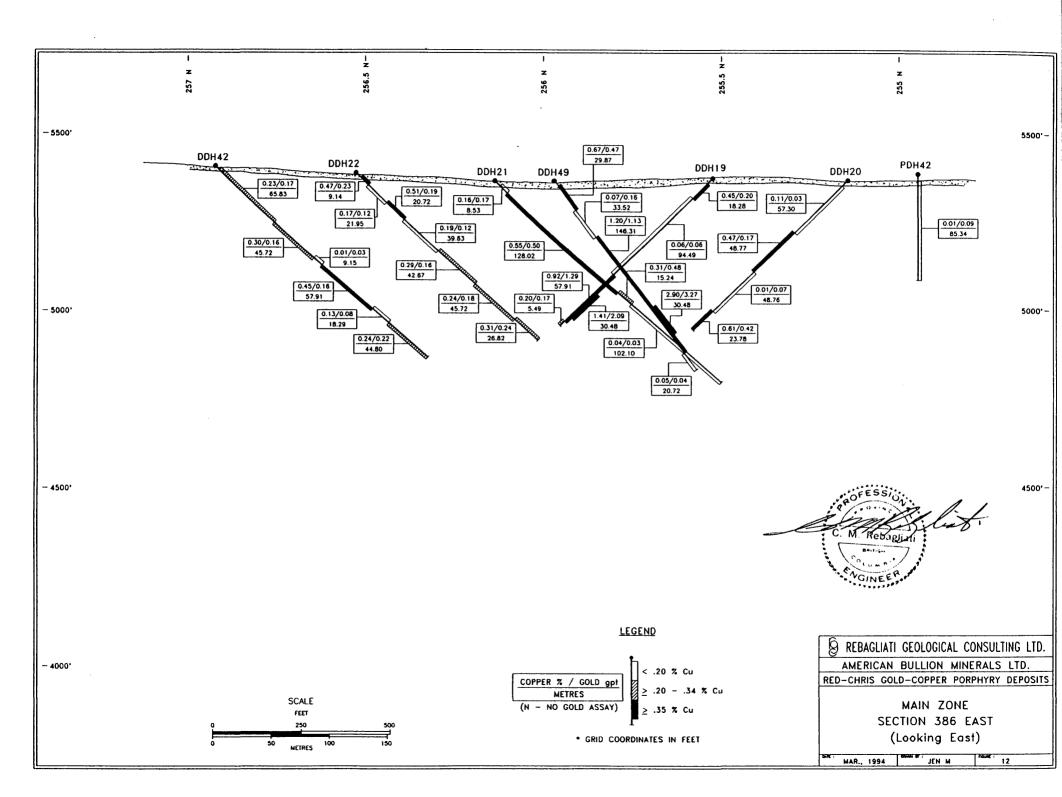
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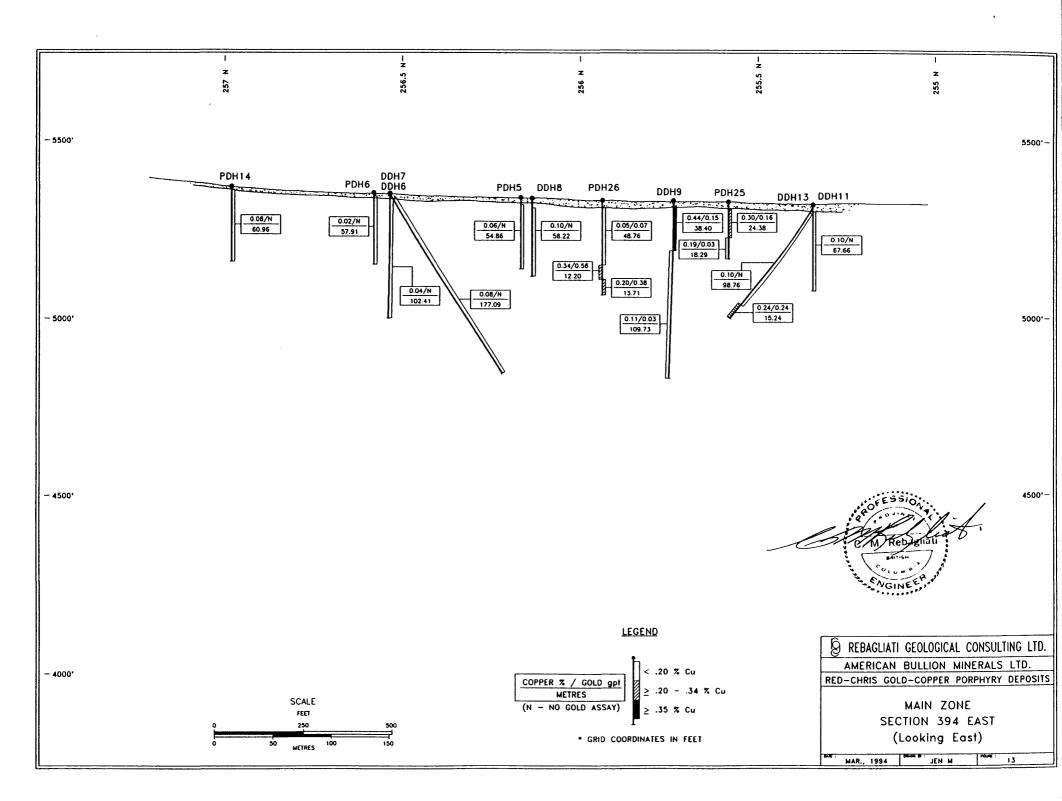
SECTION	DRILL HOLE	FROM	то	Length (m)	Cu %	Au g/t	Au oz/ton
382E	23-C75	6.95 15.24 33.53 67.06 346.92	15.24 33.53 67.06 346.92 355.40	8.29 18.29 33.53 279.86 8.48	0.20 0.28 0.18 0.59 0.26	0.03 0.17 0.17 0.30 0.11	0.0010 0.0050 0.0050 0.0088 0.0033
	24-C75	0.00 33.53 45.72 79.25 207.26	33.53 45.72 79.25 207.26 231.04	33.53 12.19 33.53 128.01 23.78	0.24 0.41 0.15 0.58 0.02	0.13 0.17 0.04 0.21 0.03	0.0039 0.0050 0.0014 0.0062 0.0010
	25-C75	6.40 112.78 149.35	112.78 149.35 212.75	106.38 36.57 63.40	0.09 0.22 0.11	0.03 0.11 0.08	0.0010 0.0033 0.0025
	26-C75	3.66 167.64 204.22	167.64 204.22 208.79	163.98 36.58 4.57	0.09 0.20 0.52	0.03 0.12 0.17	0.0010 0.0037 0.0050
	41-C75	4.27 173.74 240.79	173.74 240.79 245.67	169.47 67.05 4.88	0.17 0.32 0.01	0.14 0.17 0.17	0.0043 0.0050 0.0050
	<b>43-C75</b>	2.44 51.82 188.98 204.22 222.50 256.03 335.28	51.82 188.98 204.22 222.50 256.03 335.28 366.06	49.38 137.16 15.24 18.28 33.53 79.25 30.78	0.08 0.60 0.08 0.42 0.20 0.40 0.26	0.13 0.25 0.03 0.03 0.08 0.07 0.10	0.0038 0.0074 0.0010 0.0010 0.0025 0.0023 0.0030
	PDH-41	6.10	56.39	50.29	0.03	0.17	0.0050

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SECTION	DRILL HOLE	FROM	то	Length (m)	Cu %	Au g/t	Au oz/ton
386E	19-C75	6.10 24.38 118.87 176.78	24.38 118.87 176.78 182.27	18.28 94.49 57.91 5.49	0.45 0.06 0.92 0.20	0.20 0.06 1.29 0.17	0.0058 0.0018 0.0376 0.0050
	Including	140.21	170.69	30.48	1.41	2.09	0.0610
	20-C75	6.71 64.01 112.78 161.54	64.01 112.78 161.54 185.32	57.30 48.77 48.76 23.78	0.11 0.47 0.01 0.61	0.03 0.17 0.07 0.42	0.0010 0.0050 0.0023 0.0124
	21-C75	6.71 15.24 143.26 158.50	15.24 143.26 158.50 260.60	8.53 128.02 15.24 102.10	0.16 0.55 0.31 0.04	0.17 0.50 0.48 0.03	0.0050 0.0148 0.0140 0.0010
	22-C75	6.10 15.24 37.19 57.91 97.54 140.21 185.93	15.24 37.19 57.91 97.54 140.21 185.93 212.75	9.14 21.95 20.72 39.63 42.67 45.72 26.82	0.47 0.17 0.51 0.19 0.29 0.24 0.31	0.23 0.12 0.19 0.12 0.16 0.18 0.24	0.0067 0.0036 0.0057 0.0035 0.0046 0.0053 0.0072
	42-C75	4.27 70.10 115.82 124.97 182.88 201.17	70.10 115.82 124.97 182.88 201.17 245.97	65.83 45.72 9.15 57.91 18.29 44.80	0.23 0.30 0.01 0.45 0.13 0.24	0.17 0.16 0.03 0.16 0.08 0.22	0.0050 0.0047 0.0010 0.0048 0.0023 0.0066
	49-C75	6.71 36.58 70.10 216.41	36.58 70.10 216.41 237.13	29.87 33.52 146.31 20.72	0.67 0.07 1.20 0.05	0.47 0.16 1.13 0.04	0.0139 0.0046 0.0329 0.0011
	Including	137.16	167.64	30.48	2.90	3.27	0.0955
	PDH-42	6.10	91.44	85.34	0.01	0.09	0.0026



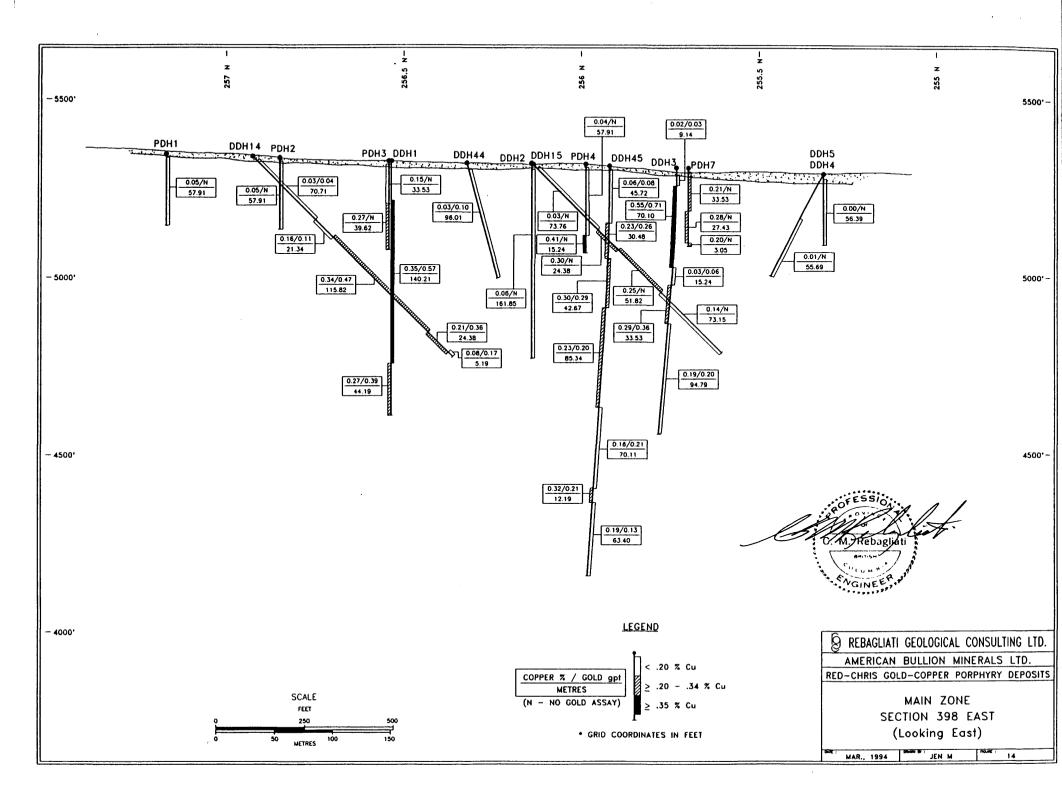


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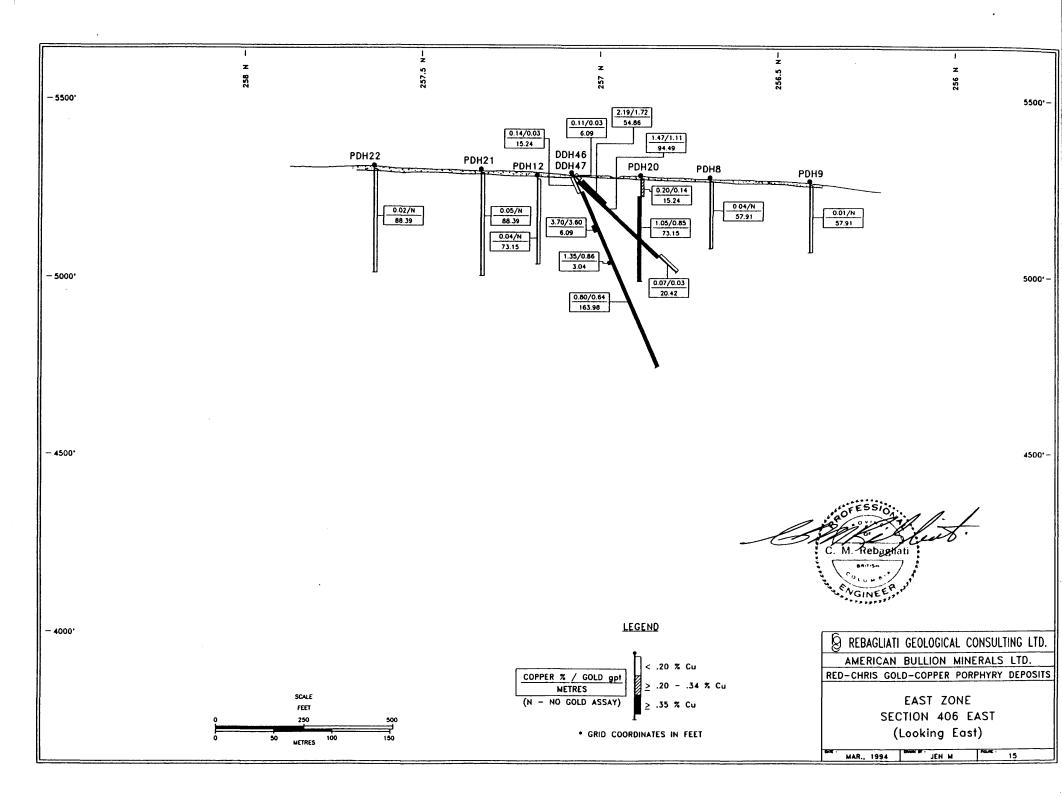
SECTION	DRILL HOLE	FROM	то	Length (m)	Cu %	Au g/t	Au oz/ton
394E	06-R74	4.27	106.68	102.41	0.04	NC	NC*
	07-R74	5.49	182.58	177.09	0.08	NC	NC
	08-R74	8.53	66.75	58.22	0.10	NC	NC
	09-R74	4.27 42.67	42.67 152.40	38.40 109.73	0.44 0.11	0.15 0.03	0.0044 0.0011
	11-R74	6.10	73.76	67.66	0.10	NC	NC
	13-R74	7.92 106.68	106.68 121.92	98.76 15.24	0.10 0.24	NC 0.24	NC 0.0070
	PDH-05	6.10	60.96	54.86	0.06	NC	NC
	PDH-06	3.05	60.96	57.91	0.02	NC	NC
	PDH-14	3.05	64.01	60.96	0.08	NC	NC
	PDH-25	6.10 30.48	30.48 48.77	24.38 18.29	0.30 0.19	0.16 0.03	0.0049 0.0010
	PDH-26	6.10 54.86 67.06	54.86 67.06 80.77	48.76 12.20 13.71	0.05 0.34 0.20	0.07 0.56 0.38	0.0021 0.0162 0.0111

\* NC = No Composite



SECTION	DRILL HOLE	FROM	то	Length (m)	Cu %	Au g/t	Au oz/ton
398E	01-R74	33.53 173.74	173.74 217.93	140.21 44.19	0.35 0.27	0.57 0.39	0.0166 0.0114
	02-R74	5.79	167.64	161.85	0.06	NC	NC*
	03-R74	6.10 15.24 85.34 100.58 134.11	15.24 85.34 100.58 134.11 228.90	9.14 70.10 15.24 33.53 94.79	0.02 0.55 0.03 0.29 0.19	0.03 0.71 0.06 0.36 0.20	0.0010 0.0207 0.0018 0.0105 0.0060
	04-R74	4.57	60.96	56.39	0.00	NC	NC
	05-R74	42.76	98.45	55.69	0.01	NC	NC
	14-R74	5.49 76.20 97.54 213.36 237.74	76.20 97.54 213.36 237.74 242.93	70.71 21.34 115.82 24.38 5.19	0.03 0.16 0.34 0.21 0.08	0.04 0.11 0.47 0.36 0.17	0.0012 0.0033 0.0137 0.0106 0.0050
	15-R74	5.49 79.25 103.63 155.45	79.25 103.63 155.45 228.60	73.76 24.38 51.82 73.15	0.03 0.30 0.25 0.14	NC NC NC NC	NC NC NC NC
	44-R75	6.10	102.11	96.01	0.03	0.10	0.0031
	45-R75	3.05 48.77 79.25 121.92 207.26 277.37 289.56	48.77 79.25 121.92 207.26 277.37 289.56 352.96	45.72 30.48 42.67 85.34 70.11 12.19 63.40	0.06 0.23 0.30 0.23 0.16 0.32 0.19	0.08 0.26 0.29 0.20 0.21 0.21 0.13	0.0023 0.0075 0.0086 0.0060 0.0063 0.0063 0.0038
	PDH-01	3.05	60.96	57.91	0.05	Ν	NC
	PDH-02	3.05	60.96	57.91	0.05	Ν	NC
	PDH-03	3.05 36.58	36.58 76.20	33.53 39.62	0.15 0.27	N N	NC NC
	PDH-04	3.05 60.96	60.96 76.20	57.91 15.24	0.04 0.41	N N	NC NC
	PDH-07	3.05 36.58 64.01	36.58 64.01 67.06	33.53 27.43 3.05	0.21 0.28 0.20	N N N	NC NC NC

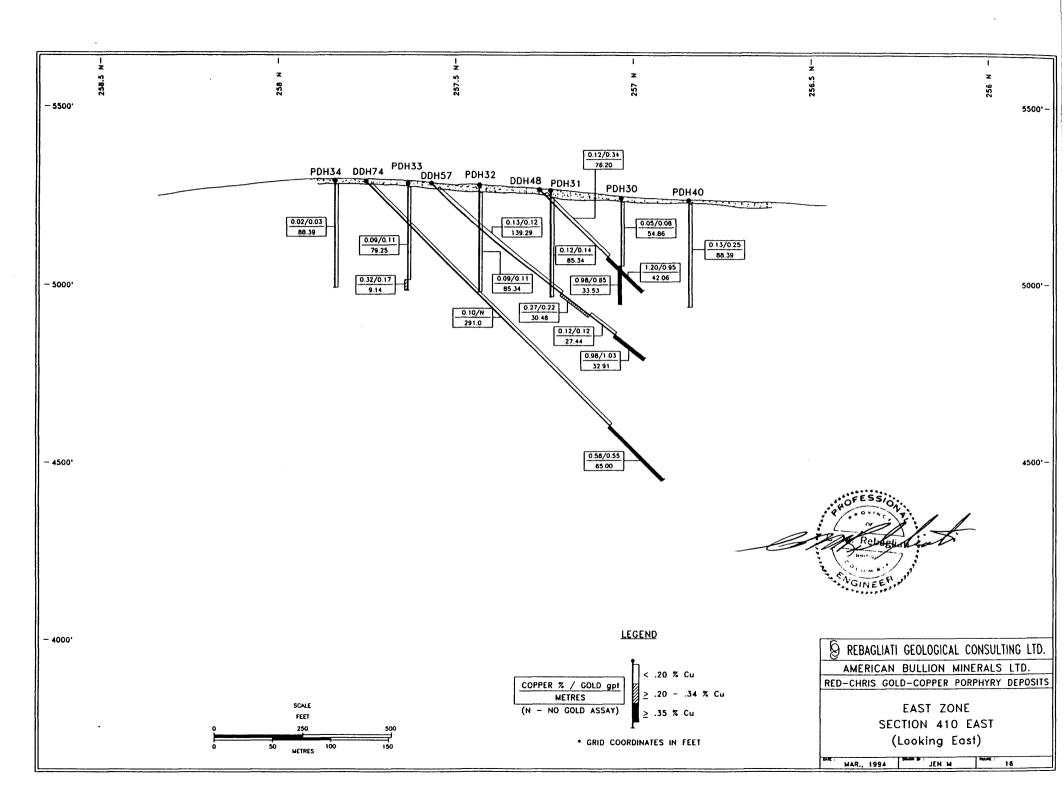
\* NC = No Composite



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DRILL HOLE	FROM	то	Length (m)	Cu %	Au g/t	Au oz/ton
46-R75 Including	3.05 9.14 103.63 36.58	9.14 103.63 124.05 91.44	6.09 94.49 20.42 54.86	0.11 1.47 0.07 2.19	0.03 1.11 0.03 1.72	0.0010 0.0324 0.0010 0.0503
47-R75 Including Including	3.05 18.29 48.77 82.30	18.29 182.27 54.86 85.34	15.24 163.98 6.09 3.04	0.14 0.80 3.70 1.35	0.03 0.64 3.60 0.86	0.0010 0.0187 0.1050 0.0250
PDH-08 PDH-09	3.05 3.05	60.96 60.96	57.91 57.91	0.04 0.01	N N	NC* NC
PDH-12 PDH-20	3.05 3.05 18.29	76.20 18.29 91.44	73.15 15.24 73.15	0.04 0.20 1.05	N 0.14 0.85	NC 0.0042 0.0248
PDH-21	3.05	91.44	88.39	0.05	N	NC
PDH-22	3.05	91.44	88.39	0.02	Ν	NC
	HOLE 46-R75 Including 47-R75 Including Including PDH-08 PDH-09 PDH-12 PDH-20 PDH-21	HOLE   46-R75 3.05   9.14 103.63   103.63 36.58   47-R75 3.05   1R.29 18.29   Including 48.77   Including 48.77   Including 48.75   PDH-08 3.05   PDH-09 3.05   PDH-12 3.05   PDH-20 3.05   PDH-21 3.05	HOLE   46-R75 3.05 9.14   9.14 103.63 124.05   103.63 124.05 103.63   1010 36.58 91.44   47-R75 3.05 18.29   18.29 182.27   Including 48.77 54.86   Including 82.30 85.34   PDH-08 3.05 60.96   PDH-09 3.05 60.96   PDH-12 3.05 76.20   PDH-20 3.05 18.29   18.29 91.44	HOLE (m)   46-R75 3.05 9.14 6.09   9.14 103.63 94.49   103.63 124.05 20.42   Including 36.58 91.44 54.86   47-R75 3.05 18.29 15.24   Including 48.77 54.86 6.09   Including 48.77 54.86 6.09   Including 82.30 85.34 3.04   PDH-08 3.05 60.96 57.91   PDH-09 3.05 18.29 15.24   PDH-20 3.05 18.29 15.24   PDH-21 3.05 76.20 73.15   PDH-21 3.05 18.29 15.24   18.29 91.44 73.15   PDH-21 3.05 18.29 15.24   18.29 91.44 73.15	HOLE(m)%46-R753.059.146.090.119.14103.6394.491.47103.63124.0520.420.07Including36.5891.4454.862.1947-R753.0518.2915.240.1418.29182.27163.980.80Including48.7754.866.093.70Including82.3085.343.041.35PDH-083.0560.9657.910.04PDH-093.0576.2073.150.04PDH-123.0518.2915.240.2018.2991.4473.151.05PDH-213.0591.4488.390.05	HOLE(m)%g/t46-R753.059.146.090.110.039.14103.6394.491.471.11103.63124.0520.420.070.03Including36.5891.4454.862.191.7247-R753.0518.2915.240.140.0318.29182.27163.980.800.64Including48.7754.866.093.703.60Including82.3085.343.041.350.86PDH-083.0560.9657.910.04NPDH-093.0576.2073.150.04NPDH-123.0518.2915.240.200.14PDH-203.0518.2915.240.200.14PDH-213.0576.2073.151.050.85PDH-213.0591.4488.390.05N

\* NC = No Composite



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# **RED CHRIS PROJECT**

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SECTION	DRILL HOLE	FROM	то	Length (m)	Cu %	Au g/t	Au oz/ton
410E	48-R75	6.10 82.30	82.30 124.36	76.20 42.06	0.12 1.20	0.34 0.95	0.0100 0.0277
	57-R76	7.01 146.30 176.78 204.22	146.30 176.78 204.22 237.13	139.29 30.48 27.44 32.91	0.13 0.27 0.12 0.98	0.12 0.22 0.12 1.03	0.0035 0.0064 0.0033 0.0300
	74-R80	5.00 296.00	296.00 361.00	291.00 65.00	0.10 0.58	N 0.55	NC* 0.0161
	PDH-30	3.05 57.91	57.91 91.44	54.86 33.53	0.05 0.98	0.08 0.65	0.0023 0.0191
	PDH-31	6.10	91.44	85.34	0.12	0.14	0.0041
	PDH-32	6.10	91.44	85.34	0.09	0.11	0.0033
	PDH-33	3.05 82.30	82.30 91.44	79.25 9.14	0.09 0.32	0.11 0.17	0.0032 0.0050
	PDH-34	3.05	91.44	88.39	0.02	0.03	0.0010
	PDH-40	3.05	91.44	88.39	0.13	0.25	0.0074

\* NC = No Composite

#### **EXPLORATION POTENTIAL**

From the cross sections on Figures 11 to 16 and the polygons on Figures 17 and 18, it is readily apparent that both the Main and East Zones extend below the current depths of drilling, thus the probability of increasing the resource base is good. Similarly, the deposits are open along strike to the east and to the west. The potential to find reserves west of the fault indicated near 374 E (figure 10) has not been adequately assessed.

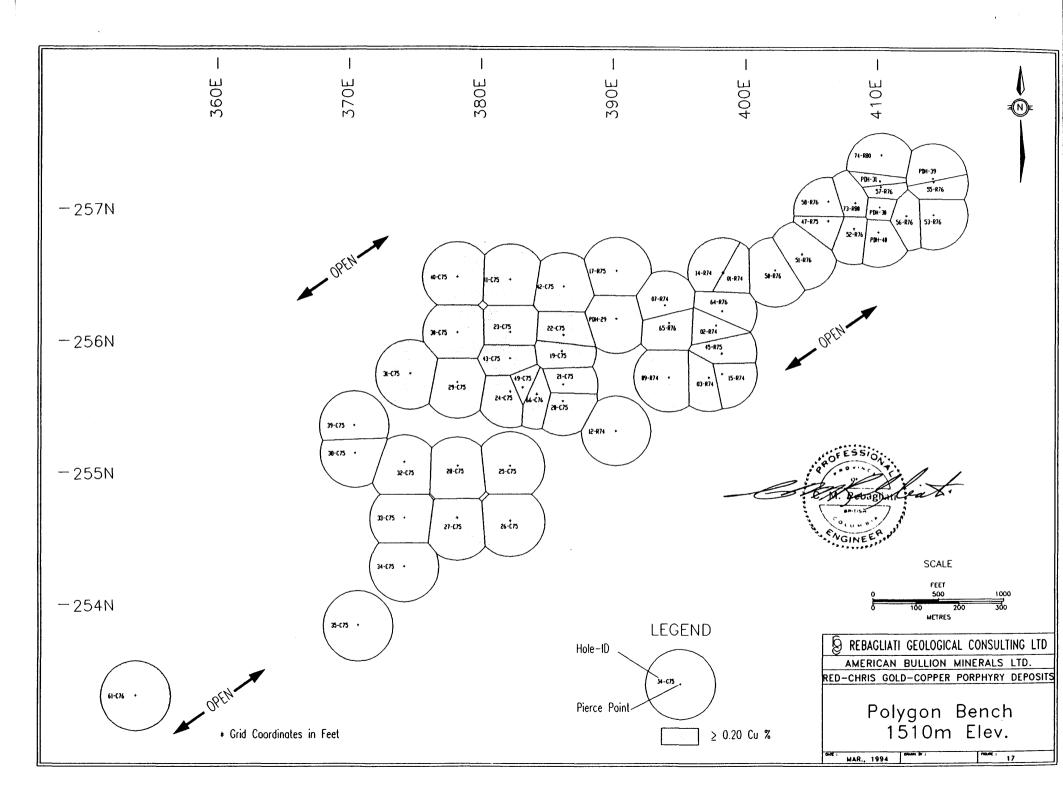
Other zones of mineralization, indicated by geological, geochemical and geophysical surveys and by holes 61-C76 and 70-1 (Figure 4) and nearby trenches A and B, which have not been adequately explored, also offer good potential to increase the resource base.

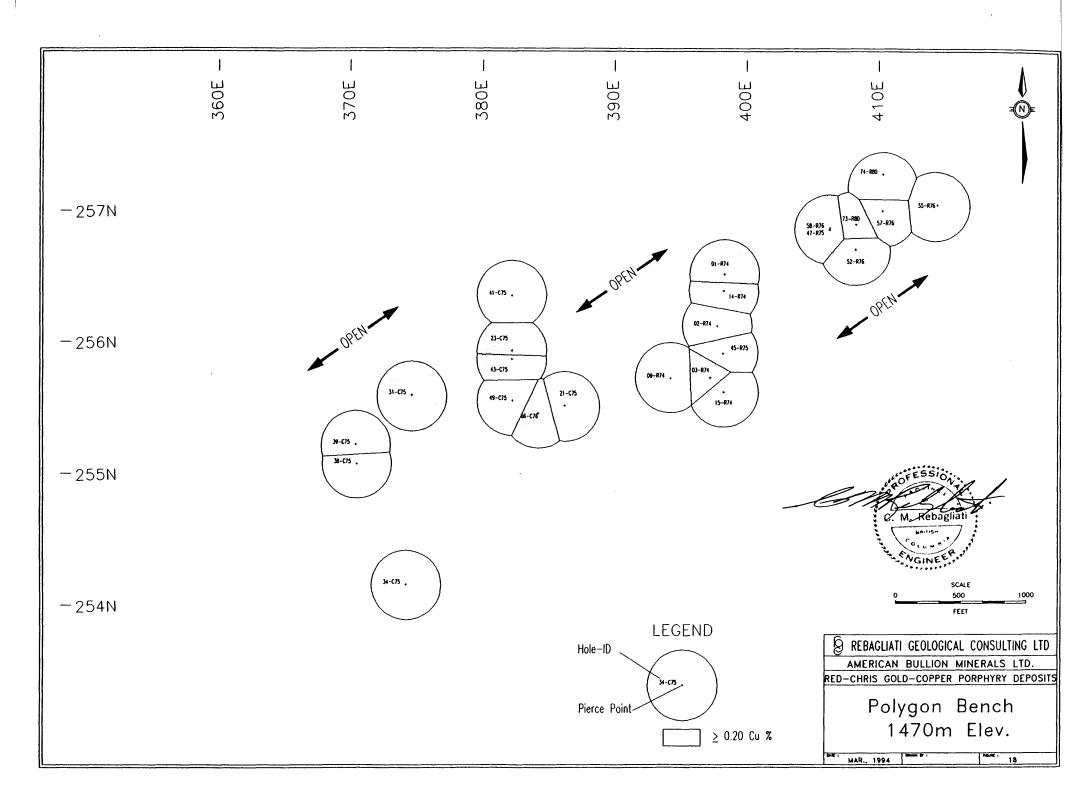
#### **SUPERGENE MINERALIZATION**

A zone of supergene copper mineralization, comprised of sooty chalcocite, digenite, covellite, neotocite and various iron and manganese oxides, forms a thin veneer over the two deposits. With the exception of hole 61, located 550 metres southwest of the Main zone, in which the upper 6 metres assayed 1.0 percent copper, the supergene zone seldom exceeds one metre in thickness. It is not clear whether the supergene zone has formed since glaciation, or represents the glacially eroded remnants of a much thicker zone developed during an extended period of Tertiary arid weathering.

## **STRUCTURE**

The Red-Chris property is dominated by east-northeast trending structural features. Faulting in this direction appears to have been pre-mineral to post-mineral. It has controlled the emplacement of the Main Phase monzonite, quartz stockwork zones, Barren Phase monzonite, and most of the later post mineral dykes, and later breaking





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up and cutting off the mineralized stockwork zones. At the eastern end of the Main Zone, faulting has terminated the mineralized stockwork (Figure 10).

The faulting is normal dip-slip in character, typified by hinge movements with the south side blocks rotating and sliding down. The strike of these faults ranges from  $60^{\circ}$  to  $90^{\circ}$  and the dip is about  $75^{\circ}$  south.

The Bowser is entirely in fault contact along the southern margin of the earlier rocks. Parallel faults north of this contact cut and displace blocks of the mineralized stockwork.

A complementary north-northwest fault set at 340<sup>°;</sup> which is marked by late andesite dykes, has in part segmented the elongate mineralized zone into rectangular blocks.

#### MINERAL INVENTORY

Prior drilling programs on the Red Stock have partially delineated two adjacent porphyry deposits where grades of gold and copper compare favourably with grades of mines currently producing in British Columbia.

To determine an "order of magnitude" geological inventory a polygon reserve estimation was undertaken using GEOMODEL (Ver. 2.01) software. Each polygon had an 80 metre radius of influence and a 10 metre thickness. A specific gravity of 2.81 was used. No consideration was given to faults or geological contacts which may have influenced the actual edges of the mineralization. Drill hole samples with no gold assays were assigned a zero gold grade, therefore the gold grades in the inventory presented below will be slightly lower than if assays were available for all samples. The polygon geological resourse estimation is as follows:

CUTOFF GRADE Copper Percent	TONNES	COPPER Percent	GOLD Grams per Tonne	GOLD Ounces Per Ton
0.15	163,842,000	0.34	0.23	0.007
0.20	135,565,000	0.38	0.25	0.007
0.25	97,866,000	0.44	0.29	0.008
0.30	70,576,000	0.51	0.35	0.010
0.35	48,254,000	0.60	0.40	0.012
0.40	36,947,000	0.67	0.45	0.013

POSSIBLE GEOLOGICAL RESOURCE

The foregoing inventory estimate does not imply that all or any of these reserves are mineable. Substantially more drilling and detailing engineering studies are required to determine potentially mineable reserves.

#### **METALLURGY**

Preliminary metallurgical tests were undertaken on composite samples from diamond drill holes 1,9 and 15 located in the Main Zone. The composite samples assayed 0.32 percent copper 0.42 grams per tonne gold; 0.41 percent copper 0.11 grams per tonne gold and; 0.25 percent copper 0.29 grams per tonne gold respectively. Specific gravities averaged 2.81 and the grindability Bond work indices were relatively low, ranging between 13.4 to 14.0 kwhr/ton. Flotation copper recoveries in rougher concentrates were 83.8, 83.8 and 86.3 percent producing, after cleaning, concentrate grades of 18.34, 17.22 and 16.21 percent copper respectively. After flotation of pyrite, copper recoveries were increased to 90.5, 91.1 and 93.0 percent respectively. Gold recoveries in the final copper concentrates were 42.9%, 23.9; and 36.7 percent respectively (Britton Research Limited, 1975).

These metallurgical tests were very preliminary and no attempt was made to optimize the recovery circuit for either copper or gold. Copper and gold recoveries and concentrate grades could probably be substantially improved by finer grinding of the flotation feed, regrinding the rougher concentrate before cleaner flotation, and most importantly, by selecting flotation reagents to maximize gold recoveries.

#### **ENVIRONMENTAL CONSIDERATIONS**

The two gold-copper deposits outlined on the Red-Chris property contain in the order of 4 percent pyrite and are enclosed by a barren pyrite shell containing up to 15 percent pyrite. From an environmental perspective, of considerable significance is the 10 to 35 percent carbonate that accompanies the pyrite in the enclosing phyllic alteration zone. In the streams draining the highly pyritic Red Stock, slightly alkaline pH levels ranging from 7.7 to 8.4 (Beak Consultants, 1975) indicate that the acid rock drainage generating potential of the oxidizing pyritic rock, is totally buffered by the high content of reactive carbonate. Furthermore, preliminary qualitative analyses of the biota in the streams draining the stock indicated that the taxonomic composition of bethis invertebrates inhabiting those streams was typical of natural, relatively clean undisturbed mountain communities (Beak Consultants, 1975). With appropriate engineering design, it is anticipated that any acid drainage potential from the pit, and the waste and tailings storage facilities, can be mitigated.

Exploration personnel and environmental consultants have noted the presence of sheep, goats, caribou, moose, black and grizzly bears, wolverine, marmots, ptarmigan, grey jays, sparrow, hawks and golden eagles on the property. Renewed exploration work and mine development will require planning to minimize the impact on these populations.

#### CONCLUSIONS

The Red-Chris property lies within the Quesnel Belt, which is increasingly being recognized as a potentially major gold and copper producing district.

Integrated geological, geochemical and geophysical surveys have substatiated that a major metal-rich hydrothermally-altered sulphide system has formed within a 4 kilometre long monzonite porphyry intrusion.

Prior shallow percussion and diamond drilling has identified two coalescing monzonitehosted gold-copper porphyry deposits. With a possible geological resource in the higher grade core of 37 million tonnes grading 0.67 percent copper and 0.45 grams gold per tonne, as defined by Texasgulf Canada Ltd.'s shallow drilling program, the Red-Chris deposits are significant gold and copper resources. The East Zone, with its higher gold and copper grades, may make an excellent starter pit. There is, with continued exploration, a reasonable probability that geological and potential mineable reserves at the Red-Chris property can be substantially upgraded and increased. Both deposits are open at depth, potentially along strike, and several mineralized zones and geotechnical features remain to be tested by drilling. Ultimately, mineable reserves and grades are dependent on final deposit configurations, appropriate gold and copper cut-off grades, production costs, metallurgical recovery rates, smelting and refining charges, dollar exchange rates and commodity prices. The objective of American Bullion Minerals Ltd. should be to outline a threshold tonnage of 90 million tonnes grading approximately 0.6 percent copper and 0.55 grams gold per tonne.

Continued metallurgical studies are necessry to demonstrate that the Red-Chris mineralization is amenable to conventional extractive metallurgical processes, and that acceptable recoveries of both gold and copper can be achieved.

With appropriate engineering design, and with the characteristics of the mineralization and production by-products, all environmental parameters necessary for mine production permitting are anticipated to be achievable.

An accelerated program is fully warranted to determine ultimate property-wide reserves and to initiate environmental and engineering studies necessary for early production permitting. To achieve these objectives, a budget in the order of \$3,000,000 is required.

#### RECOMMENDATIONS

Three levels of exploration, metallurgical testing and environmental studies are appropriate for the Red-Chris property.

 Previous drilling campaigns did not define the ultimate lateral extent of the deposit nor did they adequately test the deposit to depth. Hole spacing was also relatively wide and did not adequately define internal subzones containing above average grades.

Undertake more diamond drilling to delineate all potential reserves to a minimum vertical depth of 350 metres below surface. Begin this program by redrilling two or three key sections to determine the potential for upgrading the existing reserve. Because the Barren Phase dykes cross cut mineralization, no holes should be terminated within the Barren Phase monzonite. Good-grade gold-copper mineralization may occur on both sides of the barren dykes. All samples must be assayed for gold and copper. Systematic geochemical analyses should be made for other potentially recoverable metals and possible deleterious elements.

To obtain large samples to ensure representative assays and to provide sufficient material for metallurgical testing, HQ size core is recommended. A nonmagnetic photobore or gyroscopic-type directional survey instrument should be utilized to survey drill hole orientations.

Drill results should be assessed at 4,000 metre intervals to optimize the effectiveness of the drilling program and to justify the program's continuation.

- 2. Initiate diamond drilling to: a) explore outlying areas indicated by past drilling programs to host porphyry-type copper mineralization, such as in the vicinity of diamond drill holes 70-2 and 61-C76 b) evaluate previously untested segments of the large induced polarization and copper soil geochemical anomalies that extend beyond the areas of the two deposits.
- 3. Some segments of the property have received, either no exploration at all, or only a cursory examination. All under explored areas of the property need to be explored by geological, geochemical and geophysical surveys, especially those areas along the mineralized east-northeast trend and where other monzonite porphyry plutons have been mapped. Each defined exploration target should then be evaluated by diamond drilling.
- 4. Undertake metallurgical testing to identify and optimize those techniques and reagents needed to obtain high recoveries of gold and copper and to maximize copper concentrate grades.
- 5. Initiate environmental and socioeconomic studies and information meetings with local residents essential for early mine development permitting.

# PROPOSED BUDGET

Supervisory, Technical and Support Staff (including travel
and accommodation)
HQ Diamond Drilling including all assays (15,000 metres) 2,450,000
Metallurgical Testing
Environmental Baseline Surveys 70,000
Geological, Geochemical and geophysical Surveys
Access Road Construction
TOTAL BUDGET

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## **Certificate of Qualifications**

I, Clarence Mark Rebagliati, of 317 - 2200 Highbury Street, Vancouver, B.C., hereby certify that:

- 1. I am a consulting Geological Engineer with offices at 317 2200 Highbury Street, Vancouver, B.C.
- 2. I am a graduate of the Provincial Institute of Mining, Haileybury, Ontario (Mining technology, 1966).
- 3. I am a graduate of the Michigan Technological University, Houghton, Michigan, U.S.A. (B.Sc., Geological Engineering, 1969).
- 4. I have practised my profession continuously since graduation.
- 5. I am a member in good standing of the Association of Professional Engineers and Geoscientists of British Columbia.
- 6. The foregoing report is based on:
  - a) A study of all available company and government reports.

b) My personal knowledge of the general area resulting from visits to the property and participation in the exploration.

- I have not directly or indirectly received nor do I expect to receive any interest, direct or indirect, in the property of American Bullion Minerals Ltd., or any affiliate. I do not beneficially own, directly or indirectly, any securities of American Bullion Minerals Ltd. or any affiliate.
- 8. I consent to the inclusion of this report in a statement of Material Facts or Prospectus.

C.M. Rebagliati, P.Eng. March 31, 1994