Geol Expl. BC 94E

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DAC NTS Toodoggone Area

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For the information of Ray,
Please keep this confidential within Kerr but Doug Nicholson and you may discuss it with Giles Peatfield if you like

With the compliments of

Pete.

mailed

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PB
I agree with Giles generalities but feel that dilution and mining costs in these vein deposits (of this area) may be higher than expected and in any examination should be studied carefully
Nov 07/82 DR

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21 October, 1986

Mr. D.H. Nicholson
President
MFC Mining Finance Corporation
The Simpson Tower
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Dear Mr. Nicholson:

I have reviewed such data as are readily available on the Toodoggone district, and reached some tentative conclusions. Arne Birkeland of Energex tells me that they are three weeks away from a final calculation of reserves, and is reluctant to talk in detail until that time, but he has provided some "off the cuff" numbers which help in the analysis. Data on the Golden Rule/Manson Creek and Multinational (Teck-Baker Mine) deposits are derived from published sources. I visited the St. Joe people to discuss their Silver Pond property west of Serem, but they appear to be at a very early stage, despite having spent a large sum exploring the property. Two other groups are looking at this property, which St. Joe still like because of perceived similarities to their El Indio deposit in Chile. Lee Barker of Lacana advises that they appear to have the southern extension of the Golden Rule silicified zone on this property; the best intersection in four holes late this year was 2m at 0.2 ounce/ton, but Lee feels that trenching and more drilling can be justified. Other properties are at too early a stage to warrant serious consideration at this time.

First, some general impressions. The Toodoggone camp is beyond doubt an epithermal district, with a large number of apparently structurally controlled deposits. Production at some time seems almost inevitable. Any individual deposit or zone can range up to 400,000 tonnes (perhaps more), can have a grade between 0.25 and 0.45 oz/ton gold, and may or

most are !!

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may not have substantial silver credits. There appears to be a crude camp-scale zonation, with silver-rich deposits in the southern portion and gold dominant ones to the north. The deposits are steeply dipping, are generally in excess of two metres thick, where tested are competent rock, and generally represent physically attractive mining situations. Such test-work as has been completed suggests good to excellent recoveries of precious metals using standard milling techniques (i.e. gravity, cyanidation, residue flotation and further cyanidation at SEREM's Lawyers deposit).

The depth potential of the zones is unknown, in the sense that none has been clearly "bottomed". Given the nature of the mineralization, it is unlikely that the deposits will reach great depth, say beyond about 300 metres. This puts an apparent limit on the tonnage potential, but to offset this there is a large area with numerous essentially untested targets. Some of the "ore zones" are reportedly less than spectacular where exposed on surface. Evidence has been found for local areas of "bonanza" grade (>1.0 oz/ton Au; >100 oz/ton Ag) but such material does not on present information appear to be extensive, probably accounting for less than 20% of the total tonnage.

On the negative side, the district is remote. Although the often mentioned figure of $9 million for road and bridge construction may in fact be high by as much as 10%, this still represents an unacceptable capital cost, coming as it does so early in the cost stream. If the total cost of this road could be absorbed by the B.C. Government, or even covered by them at no interest until such time as the earnings stream started, the economics would change markedly.

A more fundamental problem, however, is the fragmented and often complex ownership and royalty interests involved. I doubt if any individual deposit or property as presently known, with the possible exception of the SEREM cluster of three deposits, would be viable given the apparent economics and the cost of the road. Even the SEREM operation, unless all went well, might turn out to be an exercise in trading dollars. Although Wright Engineers Ltd. indicate feasibility at $US 325/ounce, in what is described as a very conservative study, I cannot begin to duplicate their RoR figure using their base parameters and a 40% tax rate, making no allowance for royalties. My admittedly simplistic evaluation is based on the methods of Brian Mackenzie at Queen's University. The Wright's report would require detailed study, and an independant economic evaluation should be considered.

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Taken all together, on the other hand, the deposits and the exploration potential of the entire camp appear to be sufficient to justify serious study of the feasibility of an integrated operation feeding a central mill, probably with a capacity of 750 to 1,000 tonnes per day. Such a central milling complex could be established, situated such that the maximum haulage distance for ore from any of the known deposits would be of the order of 20 kilometres one way. The average for the bulk of the tonnage might be 15 km one way, depending on the road configuration. Given winter conditions, such a scenario implies seasonal hauling from at least some of the deposits, which also implies seasonal mining. This is probably not a problem in a purely technical sense, but it would require a rather complex set of agreements given the fragmented ownership.

Table 1 lists the known and speculative tonnages, equivalent (undiluted) Au grades, and distances (one-way) from a central mill site tentatively placed near the junctions of Lawyers Creek and Moosehorn Creek with the Toodoggone River (see sketch map attached). Note that most of the figures contained in the Table are first-order approximations only.

I think that the Toodoggone represents an opportunity, but only if the various ownerships can be resolved and the entire situation rationalized. There is enormous exploration potential, but such exploration would best and most economically be done as part of an on-going search for replacement reserves. For example, St. Joe (in a j.v. with Imperial Metals & Cassidy Resources) on the ground immediately west of Serem, have a large number of targets, including some attractive trench results (i.e. 9g/9m), which are essentially untested, despite the fact that they have spent a large sum, mostly on drilling in one small zone. Despite the attractiveness of the property, St. Joe are interested in having someone else fund the next stage of work, which would lead to more fragmentation rather than less. Many other exploration targets exist on other properties; in my analysis I have considered only situations with some "reserves".

Present reserves for the total camp, in seven separate deposits or zones, are probably about 1.14 million tonnes grading 0.34 oz/ton (undiluted) gold equivalent (Au:Ag = 85:1). Note that this ratio allows for the price differential and for the lower recoveries generally realized for silver. This estimate is based on rather spotty data, and unavoidably mixes different types of reserve figures. It must be regarded as a first approximation only. Several

of the zones are open, and other targets exist; I can see no problem with postulating an aggregate 2 million tonnes of resources. SEREM figure about $5/tonne to provide additional reserves; this may be somewhat conservative and I would suggest $6 to 7 million over three to five years to provide the additional 860,000 tonnes. A total of 2 million tonnes of material through a 750 tonne/day mill means a mine life of about 7.5 years; if the recovered grade averaged 0.28 ounces gold equivalent/ton milled, this would mean total production of about 615,000 ounces of gold (or silver equivalents). While these figures are by no means firm, I believe them to be reasonable. Based on these reserves and recoveries, on $C475 gold and a 40% tax rate, and on some admittedly very rough capital and operating cost estimates, I calculate an RoR of about 19%.

The question of whether an integrated scheme not including the SEREM deposits could be made viable is a more complex one. On the face of it, there is insufficient tonnage available to feed a mill without the SEREM reserves; much hinges on ones best estimate of the exploration potential. One must assume that Energex will be amenable to a deal because they probably cannot raise money any other way, and that Golden Rule, Multinational (Teck) and others will join in. It is not immediately obvious that a mill could be placed close to the known reserves; some haulages will probably still be necessary. This comes about because the creek draining the Energex/Golden Rule complex flows very near the Metsantan Lake Indian Reserve and this might constitute a permitting problem. Also, it is likely that additional exploration successes will come in the area south of the Energex ground, so that a central mill near the Toodoggone River still makes some sense.

Referring to Table 1, one can see that the present reserves excluding SEREM total only about 350,000 tonnes at 0.30 ounce/ton, or about 117,000 ounces contained gold. The speculative resource excluding SEREM might be as much as 1 million tonnes grading 0.35 ounces/ton (uncut), or about 385,000 ounces contained gold. This grade should become about 0.28 ounce/ton after allowing for recoveries and dilution. Preliminary calculations of RoR for this speculative resource, based on capital and operating costs commensurate with those for SEREM and on $C475 gold and 40% tax rate yield only about 12.5%; obviously more detailed study would be required, but this is not an auspicious start.

The marked discrepancies between the Wright Engineers RoR figures and those which I have calculated are disturbing (16.5% vs 8% for the SEREM base case). If my figures are correct, anything less than an integrated camp-scale operation is not attractive. If Wright Engineers' figures are correct, then the SEREM situation is reasonably

attractive and a fully integrated camp scale operation, by extrapolation, would be a bonanza. The summary of the Wrights' report does not detail the taxation rate or method of allowing for royalties, but I cannot believe that they used a tax rate of less than 40%, and I have made no allowance for royalties.

All things considered, I could not recommend becoming involved in the Toodoggone situation without considerable detailed study of all information available. There is, however, no harm in preliminary discussions.

Yours truly,

G.R. Peatfield.

G.R. Peatfield

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Encls.
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TABLE 1

Company (Zone)	Present Reserve (tonnes) (order of magnitude)	Grade[1] (Au equiv o/t)	Speculative Resource (total tonnes)	Grade[1] (Au equiv o/t)	One-Way Haul[6] (km approx)
SEREM (AGB)	380,000	0.39 (cut)	400,000	0.38 (cut)	11
SEREM (Cliff Creek)	360,000	0.30 (cut)	400,000	0.28 (cut)	14
SEREM (Duke's Ridge)	50,000	0.41 (cut)	200,000	0.38 (cut)	13
Energex (BV)	120,000	0.25 (cut?)	400,000[2]	0.35[2] (uncut)	17
Energex (Thesis II & III)	130,000	0.25 (cut?)	300,000[3]	0.30[3] (uncut)	18
Energex (Bonanza)	?	high	50,000[4]	0.50[4] (uncut)	21
Golden Rule (Mets)	50,000	0.38 (uncut)	100,000	0.35 (uncut)	19
Multinational Res. (Baker)	50,000	0.50 (uncut?)	75,000	0.45 (uncut)	17[7]
Other unspecified	-	-	125,000[5]	0.30[5]	?
	1,140,000	0.34	2,000,000	0.35	

Notes for Table 1:

1. All grades given are for gold equivalent (Au + Ag ÷ 85), and are for undiluted ore.

2. This figure is a compromise. Birkeland's preliminary "off the cuff" was 500,000 (tons?) at 0.50 ounce/ton Au; I have been somewhat more conservative.

3. This figure is highly speculative, based on the information that Thesis II and III appear to be continuous.

4. This figure is pure "blue sky".

5. The location of this speculative resource, even as regards which property, is unspecified.

6. This assumes a mill site on the south side of the Toodoggone River; this is optimal as long as a majority of the ore comes from the south, which would appear to be the more likely case.

7. This would very definitely be summer haulage only.

KEY

- approx. location of planned road
- approx. location of existing road
- Sturdee Airstrip
- Gold-silver occurrence
- Gold-silver deposit
- Baker Mine and Mill Site
- tentative millsite

Moosehorn Ck.
Moyez Ck.
McClair Ck.
Toodoggone R.
Lawyers Ck.
Boundary of staked ground
Sturdee R.
Black L.
Finlay R.
Firesteel R.
Attycelly Ck.
Thutade L.
5 km

DEPOSITS

A - Multinational - Baker Mine
B - SEREM - Amethyst Gold Breccia Zone
C - SEREM - Cliff Creek Zone
D - SEREM - Duke's Ridge Zone
E - Energex - BV Zone
F - Energex - Thesis II & III Zones
G - Energex - Bonanza Zone
H - Golden Rule/Manson Creek - METS

PROPERTIES

1 - Multinational Resources
2 - SEREM
3 - Energex
4 - Golden Rule/Manson Creek
5 - St. Joe, Imperial Metals, Cassidy
6 - Lacana
7 - Newmont/International Shasta
8 - Imperial Metals/Cassidy Resources
9 - Imperial/Cassidy/Western Pacific Energy

MFC MINING FINANCE CORP.

TOODOGGONE DISTRICT

DEPOSIT LOCATION MAP

G.R. Peatfield	Oct. 86	1
	N.T.S. 94/E	

MineQuest Exploration Associates Ltd.