Proceedings of the 14th Annual British Columbia Mine Reclamation Symposium *in Cranbrook, BC, 1990.*
The Technical and Research Committee on Reclamation

MINE-SPECIFIC B.C. RECLAMATION FUNDS

Fourteenth Annual Mine Reclamation Symposium
June 19, 20 & 21, 1990
Cranbrook, British Columbia

Duane Anderson
Sr. Economist
Mineral Policy Branch
Ministry of Energy, Mines
& Petroleum Resources

May 30, 1990

Disclaimer

This paper has been prepared for presentation to the 1990 Mine Reclamation Symposium at Cranbrook, B.C. The paper has benefited from the critical review and comments of people In government and Industry; particularly: Alf Lockwood, Ralph McGinn, and Bruce McRae. The paper is meant to be representative of current policy but is a draft that is subject to subsequent revision. Final responsibility for the paper's contents and presentation rests with its author, Duane Anderson.

TABLE OF CONTENTS

	Page
Executive Summary	ii
A. Introduction	**1**
B. Background	**1**
B-1 Reclamation Policy	2
B-2 Reclamation Scenarios	3
C. Reclamation Security Policy Considerations	**5**
C-1 Provincial Needs and Concerns	5
C-2 Industry Needs and Concerns	7
D. Determination of Reclamation Security	**7**
E. The Reclamation Fund (the Fund)	**8**
E-1 Fund Policy	8
E-2 Fund Management	11
F. Income Tax Deducibility	**12**
F-1 Current Law	13
F-2 Deducibility	14
F-2 a) Explicit Provision	14
b) Successful Appeal	16
G. Summary	**16**
Appendix 1 - Acid Mine Drainage	17
Appendix 2 - Reclamation Insurance and Captive Insurance Companies	19
Appendix 3 - Reclamation Funds and Inflation	20

Executive Summary

Section 12 of the Mines Act (S.B.C. 1989 c.56) provides for the establishment of mine-specific reclamation funds (Funds) as security for mine reclamation obligations. Section 6 of the Mineral Tax Act (1989) effectively allows Fund payments to be deductible from otherwise taxable income as calculated under that Act.

The Ministry of Energy, Mines and Petroleum Resources (EMPR) is developing the Funds as part of its revised mine reclamation security requirements. The intent of these security requirements will be to ensure that mine developments post security sufficient to ensure acceptable site reclamation. This policy is in response to the Province having to fund required reclamation at certain abandoned mines (such as Mt. Washington), a greater awareness of the technical complexities and environmental impacts of some conditions (such as; Acid Mine Drainage (AMD)), and increased environmental consciousness by the general public. EMPR is concerned that failure to satisfactorily address those issues could result in considerable cost to the province and/or significant restrictions on the industry (as has happened in other jurisdictions).

Currently, the Income Tax Act of Canada (the Act) is not conducive to reclamation by single-mine companies with long-lived, post-closure mitigation problems (e.g. AMD). The reason for this is that the Act does not allow such companies to deduct all of the associated expenditures from otherwise taxable income. Deductibility can only be achieved by the company posting the security and "walking away" from the reclamation obligation. This is not desirable as the Province must then perform the mine reclamation.

The Funds are intended as optional, tax-deductible, security for those mines that would otherwise have difficulty satisfying the province's requirements. The structure of the Funds, with their potential surpluses, will provide reasonable assurance to the Province that its reclamation needs will be addressed and allow the mine to benefit from the use of cost-effective reclamation techniques and/or successful research and development.

AMD mitigation is not necessarily a problem for mines owned by diversified companies that have other income sources with which to fund those post-closure reclamation costs and against which to deduct the expenditures. Such mines will be able to post other acceptable forms of security.

The Funds will be subject to certain provincial controls to ensure that the Province's reclamation concerns are addressed, facilitate tax deductibility, and maintain public confidence. The Funds' Investment Policies will determine how the Funds can be invested by the Funds managers and can affect the Province's risk exposure and the mine's Fund payments. The Investment Policies will endeavor to provide the maximum possible return to the Fund that is consistent with an appropriate level of risk to the Province.

Concerns have been expressed regarding the tax deductibility of the Funds. It is thought that tax deductibility can be achieved in two ways. The first is by amendment of the Act with explicit provision by the Federal Minister of Finance. The second is though a successful legal challenge by a company in response to an unfavourable Revenue Canada ruling.

MINE-SPECIFIC B.C. RECLAMATION FUNDS

A - Introduction;

Section 12 of the Mines Act (S.B.C. 1989 c.56) provides for the establishment of a mine reclamation fund by the Lieutenant Governor in Council. Security paid into the mine reclamation fund, on behalf of a mine, is to be credited to separate accounts in the fund in the name of the mine. Henceforth these accounts will be referred to as "Funds". The Minister of Energy, Mines and Petroleum Resources for the province of British Columbia (EMPR) may requisition payments from the Funds to refund amounts no longer required to the mine or to pay for the cost of work required under the Mines Act (section 10 (7) (b). Section 10 (7) (b) of the Mines Act allows the Chief Inspector of Mines, after giving notice, to use the Fund to pay for the rectification of deficiencies in reclamation work done by the mine.

The Mineral Tax Act (1989) compliments the above provisions in the Mines Act. Section 6 of the Mineral Tax Act (1989) enables the Lieutenant Governor in Council to establish a cumulative reclamation cost account and a cumulative tax credit account. These accounts effectively allow Fund payments to be deductible from otherwise taxable income as calculated under the Mineral Tax Act.

EMPR is currently drafting a code/regulations for the reclamation section of the Mines Act (S.B.C. 1989 c.56). This paper will discuss the various technical, financial, and taxation considerations that underlie the B.C. Reclamation Fund. Comments from mining companies and industry associations, other government ministries and agencies, and the general public are welcome.

B - Background

Mining is B.C.'s second leading industry and a major contributor to the province's economic development and its resultant prosperity. Mining is a highly valued but temporary use of the land base. Reclamation legislation ensures that all mining companies carry out a program of environmental protection and reclamation so that, upon termination of mining, the land and watercourses are returned to a safe and environmentally sound state and to an acceptable, productive end use.

B-1 Reclamation Policy

Since 1969, all mining companies in British Columbia have been required to reclaim disturbances caused by exploration and mining. Over the years, reclamation standards have been refined and planning for progressive reclamation has been integrated into the overall mine planning process. Reclamation has evolved from simple revegetation towards returning land to a level of productive use that equals or exceeds that which existed previously. Reclamation programs also pay particular attention to ensuring that water quality is maintained to an acceptable standard. Conceptual reclamation plans are filed and approved before mine development begins and are up-dated as work proceeds. In B.C., reclamation work and its costs are an integral part of mining.

As part of the permit approval process, mining companies are required to post security to ensure that the specified reclamation is performed to the satisfaction of the Minister/Chief Inspector. This security, which covers the concerns of other agencies (e.g. Ministry of Parks, Ministry of Environment, etc.), is returned to the company upon satisfactory completion of the reclamation work.

Initially, the security did not cover the actual costs associated with mine reclamation. However, with the potentially serious and long-term consequences of acid mine drainage, there has been mounting pressure to ensure that increased security is obtained.

At the same time that EMPR security policy has been changing to reflect new technical concerns, the general public has become much more sensitive to environmental issues. An increasingly affluent, and expanding, urban population has lead to a rapid growth in the demand for recreational opportunities and wilderness experiences. Concerns that these opportunities and experiences be provided for has lead to land-use conflicts with established resource industries such as forestry and mining. News reports indicate that such conflicts are hampering the resource industries in other jurisdictions, such as California. EMPR's position is that mine reclamation security which is consistent with expected costs will give the general public confidence that their mine reclamation concerns will be satisfied. This will contribute to a stable framework for mineral resource development in B.C. Conversely, if EMPR fails to do so, other groups are likely to emerge.

While mine reclamation is now required, problems do exist for some of the mines that operated prior to the 1969 legislation. For those mines that have been abandoned and require reclamation, the Province has become involved by default. The current work at Mt. Washington is an example of this. That abandoned minesite was identified as the source of Acid Mine Drainage (AMD) that affected fish production and water quality in the Tsolum River. Accordingly, the Province is trying to prevent and/or inhibit the production of the AMD. Costs to date are in the order of $1.0 million and the success of the research program is still to be determined.

B-2 Reclamation Scenarios

For policy purposes, two "typical" reclamation problems are considered. The first involves "traditional" or "normal" reclamation where buildings are dismantled, slopes are stabilized, the area is re-seeded, and the site is reclaimed in accordance with reclamation standards and permit conditions in effect for that mine. Some of this work can be performed while the: mine is operating with the balance after it closes. Post-closure reclamation will usually only take one or two years; although, in the case of some of the largest open-pit mines, it could take four or five years.

"Normal" reclamation usually involves construction-related activities (such as building demolition, earth moving, etc.) and reseeding. "Normal" post-closure reclamation costs can usually be estimated quite accurately. The Province will generally accept an irrevocable commercial letter of credit (C/L/C) as security.

The other situation Involves mines with long-lived post-closure environmental and mitigation problems. AMD is an example of this and a brief discussion is presented in Appendix 1.

AMD can be somewhat difficult to predict but its mitigation is not complex (theoretically). As there is currently limited experience in the field, there can be considerable uncertainty on the effectiveness of the mitigation technology that is selected, the true dimensions of the problem, and future mitigation costs.

Since an AMD problem can last for much longer than the operating life of the mine, other income sources must exist to meet the associated mitigation costs. While not necessarily a problem for a diversified company with other income sources (such as Cominco Ltd.), this can be a major problem for a company whose only income-earning asset is the exhausted mine (such as may be the case for Equity Silver Mines Limited in 1992). The reason for this is that, while the diversified company may have other operating Income with which to fund the work and against which to deduct the expenses, the single mine company will not. This means that the single-mine company must provide for post-closure reclamation costs while the mine is operating. Providing for those post-closure mitigation costs is discouraged by the Income Tax Act of Canada which does not allow companies that provide for such costs to claim a deduction from otherwise-taxable income - so the company would do so with after-tax income.

In the case of AMD, having adequate reclamation security becomes very important because the environmental damages can be significant, mitigation very expensive, and the problem persist for long after mine closure. If such security is not in place then, where the company fails to do the work and no industry association assumes the burden, the province will be faced with funding the ongoing mitigation costs by default. Depending on the circumstances, the mine's benefits to society could be dissipated and the public could question the ability of EMPR to manage the resource and/or the mining industry's role in the B.C. economy.

To ensure adequate security, EMPR proposes the establishment of mine-specific reclamation funds (the Funds) the earnings from which will be sufficient to cover the associated mitigation costs for as long as is necessary. The considerations underlying the structure of these Funds, and when they will be required, are discussed in the next section.

In summary, it is B.C. government policy that mine developments post security to ensure acceptable site reclamation. While this is not a problem for "normal" reclamation, the nature of AMD and other problems involving long-term commitments (such as the monitoring and maintenance of protective works for large tailings dams) are such that different security arrangements may be required.

C - Reclamation Security Policy Considerations

To be successful, reclamation security arrangements should address the needs and concerns of both the province: and industry. Otherwise, for example, the security policy could expose the province to a future reclamation liability or be unnecessarily expensive for the industry.

C-1 - Provincial Needs and Concerns

The province's primary need is to ensure that all required mine reclamation is performed and/or financed by each mine operator. The mine operator is expected to cover all costs associated with the mine's development so the province will not be required to fund reclamation work out of general revenues. If the mine operator is unable to perform the required reclamation then the province can use the security to do so. Not reclaiming the sites or funding the reclamation out of general revenues or a "super fund" would present other serious difficulties and is not a preferred option of either the industry or the province.

The amount and timing of the security should be such that the mine's development and operation does not, at any time, expose the province to financial risk should it have to reclaim the site. Conversely, there is no need for the province to have security in excess of that amount or when it is not required. Accordingly, the amount and timing; of security should vary and be adjusted in light of:

- the environmental risks associated with the mine's proposed development and reclamation plans;

- the mine's actual development and the success of its ongoing reclamation program;

- technological developments affecting the actual and expected costs of reclamation.

The amount and timing of the security should be consistent for all operators and not related to a mine's expected profitability. The reason for this is that a mine's actual performance can be significantly different from that projected in the feasibility study. Should this occur, the risk that the company would not be able to fulfill its reclamation obligations would increase. This would suggest a higher level of security - at precisely the time when the company may be less able to provide that additional security.

The following two examples illustrate how the timing of security requirements can vary with the circumstances. The first is a mine development that could give rise to an immediate and significant AMD problem. This mine's approvals would be contingent on it providing most of its reclamation security prior to its commencing development. While the financial burden could be significant, anything less would expose the province to the risk that the mine might not develop and/or operate according to expectations and that the province would be left with an unfunded AMD mitigation problem. The second example is of a mine with a "traditional reclamation problem" whose net reclamation liability is expected to peak several years into operation, and decline thereafter. Reclamation security for this mine would increase in line with the liability and then decline accordingly. It is important to note that the reclamation security is influenced by the mine's reclamation plan and its actual reclamation results.

While the issues of amount and timing are relatively straightforward for a proposed mine, their modification may be required for an existing mine. For existing mines, that are owned by companies that have no other significant sources of income, the amount of security should also be consistent with the mine's ability to provide the required security (the mine's financial capacity). If the amount of security exceeds the mine's expected net after-tax cash flows then it could be in the mine operator's interest to shut down rather than post the specified security. This would be a "lose-lose" situation that would generally not be in anybody's interests. Such exceptions will have to be supported by detailed analysis of the mine's capacity.

Currently, reclamation security can take any one of several forms: cash, government bond or treasury bill with a safekeeping agreement, or an irrevocable commercial letter of credit issued by a major Canadian chartered bank (C/L/C). While these instruments are adequate for "normal" mine reclamation, they either do not generate income, are not deductible from taxable income, or must be backed by significant other assets, so they can be inadequate where ongoing post-closure mitigation is required (e.g. an AMD problem exists) by a "single-mine" company. The need for a security instrument to provide for reclamation problems

of an Indefinite nature lead to the development of the "Reclamation Fund" concept (the Fund) that is discussed below. It should be noted that, since an adequate C/L/C can be "rolled into" a Fund to generate the required amount of income, they are not mutually exclusive.

A final set of concerns is that the new security policy should encourage industry to remain responsible for the reclamation work. Similarly, the policy should not require a significant increase in government personnel. The Province does not wish to become directly involved in the detailed planning, scheduling, and budgeting of mine reclamation projects throughout B.C.

C-2 Industry Needs and Concerns

Discussions with industry representatives have identified several concerns. The first is that the amount of the security should be consistent with a realistic assessment of the reclamation problem. Related to this is the concern that the regulators' perceptions of risks may change (increase) to account for all available security so reductions, in the amount of security posted, will not occur. To address this concern, and others, provision will be made for appeals.

A second concern is that the costs should be deductible from taxable income.

Finally, industry would like flexibility as to the form of the security posted. Therefore, where the province's concerns are satisfied, the choice will be left with the company.

The formation of (a) "captive insurance company (ies)" is a possibility that the industry has been considering. Recent provincial legislation facilitates this; however, its applicability to British Columbia mine reclamation is not known. This concept is briefly discussed in Appendix 2.

D - Determination of Reclamation Security

The Mine Development Review Process (MDRP), which is fundamental to B.C.'s "one-window" approach, provides for technical reviews of the environmental and socioeconomic impacts of a proposed mine. The Mines Act provides for an inter-agency committee to review the proposed mine reclamation plan, the timing of the reclamation, and the associated costs. Reclamation security, provided by the mine, will ensure that those costs do not default to the Province should the mine's plans not be realized.

The committee will annually review the mine's reclamation program, compare actual results with what was forecast, and make upward or downward adjustments to its reclamation security requirements. The review period for long-lived operations, with satisfactory reclamation programs, could be lengthened to three or five years. Interim reclamation security adjustments may also occur due to significant changes in actual or expected reclamation costs and/or security amounts. Reclamation security requirements and adjustments thereto, will not be directly related to mine production.

Continued advances in the understanding and costing of mine reclamation should make the estimation of reclamation requirements, their costs, and the corresponding security requirements straight-forward and non-controversial.

E - The Reclamation Fund (the Fund)

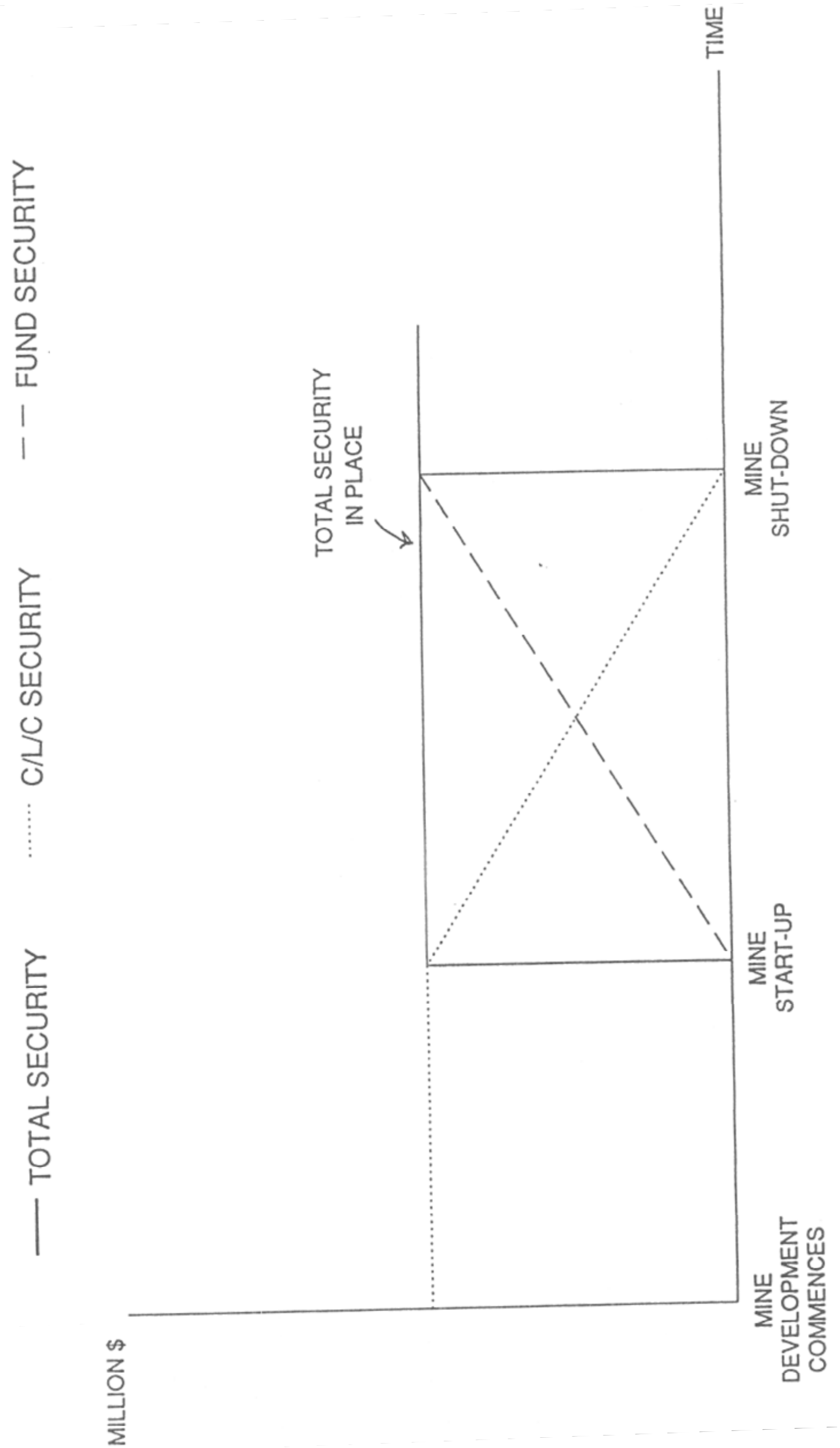
E-1 Fund Policy

Where it is expected that reclamation and mitigation work of an indefinite duration will be necessary, the reclamation security will be estimated such that, if invested in a mine-specific reclamation fund (the Fund), its expected earnings would equal the mine's expected annual mitigation costs. The mine will be able to provide C/L/C's and/or make Fund payments so that the total of the two equals the required amount of security. Where the company has other assets with which to secure the C/L/C, and other income sources with which to fund the required post-closure work and against which to deduct those expenditures, it is expected that the company will find it advantageous to continue with the C/L/C arrangement after the mine closes. In those circumstances, a C/L/C will have considerably less of an impact on the company's cashflow than a similarly sized Fund. However, where the mine is the company's only income generating asset, it is expected that the Fund's tax advantages will cause the company to prefer the Fund. Figure 1 depicts the change in security from C/L/C to Fund through the mine's life.

It will generally be EMPR policy to estimate Funds on the basis of constant dollar mitigation cost forecasts and expected real investment returns. A brief discussion of real and nominal investment returns, and constant and current dollar mitigation costs, is presented in Appendix 3.

Figure 1

EXAMPLE OF FLEXIBLE PROVISION OF SECURITY TO SATISFY PROVINCIAL NEEDS FOR AN ONGOING MITIGATION PROBLEM



Fund payments and disbursements will be subject to certain provincial controls for two reasons. The first is that the purpose of the Fund(s) is to mitigate damage to public, as opposed to private, resources. If the Fund is inadequate then the Province will probably have to finance the work from general revenues. Accordingly, the province is the primary beneficiary and provincial control is necessary to ensure that Fund administration is consistent with the public's interests. Provincial control will also contribute to public confidence in how difficult environmental problems are being managed in the mining industry.

The second reason is that, under the current Income Tax Act of Canada (the Tax Act), provincial control is necessary if Fund payments are to be deductible from taxable income (Federal and Provincial Corporate Income Tax). In the absence of specific provision for the Funds by the Federal Minister of Finance, if Revenue Canada should not allow Fund payments as eligible deductions from taxable income, then a successful court challenge will be necessary for the payments to be deductible. The B.C. government currently plans to structure the Funds so as to facilitate deducibility while allowing for the possibility of "refunds" to the companies. It is currently thought that without the "refund" provision, deducibility would not be contentious; however, since the refund provisions are considered very desirable, deducibility is less certain.

The provincial requirement for a mine to provide security that will completely provide for post-closure mitigation costs presents a relatively unique problem. This is because accurate prediction of how an AMD problem will evolve is generally not possible, the condition could worsen, and mitigation costs increase significantly after the mine shuts down. However, a single-mine company will not have operating income with which to make the required additional Fund payments. This exposes the province to the associated reclamation liability and is contrary to the intent of EMPR's reclamation policy. A possible solution to this problem is for the mitigation cost estimates to be made on a "conservative", low risk basis and be higher than if they were based on "expected values".

This approach addresses industry concerns that Fund requirements may be "excessive", and EMPR's desire not to become directly involved in mine reclamation, by allowing the operator to be eligible to receive (a portion of the) surpluses that develop in the Fund. Fund surpluses could develop as a result of actual reclamation costs being less than, or actual investment yields being greater than, those on which the Fund was based. This arrangement provides the operator with incentive to remain involved with the mine after it shuts down. The operator will also be able to benefit from successful employment of cost-effective reclamation techniques and research developments. It is hoped that those

features will contribute to a cooperative, problem-solving relationship between EMPR and company personnel and allow EMPR to ensure that satisfactory results are achieved with a minimum of staff.

However, in order to be eligible for any refunds, the operator would have to remain responsible for the mine's reclamation or mitigation work and make post-closure Fund payments should a deficiency develop. The operator would forfeit any claim on the Fund should he "walk away" from the mitigation problem (in which case the mitigation problem and the Fund's resources would default to the province).

A policy of refunding all "surpluses" to the company, and requiring the operator to fund deficiencies, could contribute to an asymmetrical distribution of risk between the company and the province. This would be the case if the exhausted mine was the company's only income-producing asset so the company benefits if a surplus develops in the Fund but, having no significant financial resources, "walks away" should a deficiency occur (so the problem defaults to the province). It is for this reason that arrangements based on "risk sharing" are being investigated.

It is intended that refunds will be included in taxable income in the same manner that the payments were deductible. For example, since EMPR considers reclamation expenditures and Fund payments to be mining costs, they should be deducted before the Federal Resource Allowance is calculated. Similarly, Fund surpluses paid to the company should be eligible for the Resource Allowance.

E-2 Fund Management

Management of the Fund has two other issues that must be addressed. The first is "in what securities will the Funds be: able to invest?" and the second is "who will manage the Funds' investment portfolios?".

The Funds' Investment Policy will define what securities are eligible Fund investments (e.g Government of Canada Treasury Bills and Bonds, provincial and Canadian corporate debt, equities, etc.) and their compositional constraints (e.g. no less than 20% in T-Bills and no more than 25% in eligible fixed income securities of a certain maturity date, etc.). The Investment Policy will combine with the eligible investments' expected rates of return to produce the rate of return that the Funds can expect. Viewed simplistically, where ongoing mitigation work is required, this expected rate of return combines with estimated annual mitigation costs to determine the amount of principal that is required for the particular Fund. If a Fund is required for "normal" reclamation. Fund payments plus accumulated income will be sufficient to perform the required reclamation.

The other issue is the question of "who will manage the Fund and carry out the specified Investment Policy?". There are at least two alternatives: the Ministry of Finance's Investments Branch and independent third parties operating under a management contract (Trust Companies, Investment Management Firms, etc.). Industry has expressed concern that it will be penalized if the province's Investments Branch is not able to manage the Funds as effectively as private investment managers.

Until recently, the Financial Administration Act (FAA) required that all funds paid to the province in Trust be held and invested by the province (the Investments Branch of the Ministry of Finance). Recent amendments to the FAA allow the Minister of Finance to delegate these functions to private parties and this has been done since the Fall of 1989.

Regardless of who manages and invests the Fund, the Fund will provide for the associated fees. This will have the effect of reducing the effective real rate of return and necessitate a larger Fund. This could be significant as it is understood that Trust company fees are upwards of 0.3% of the principal being managed. The Ministry of Finance's Investments Branch fees, for multimillion dollar funds, are less than 0.1%.

In summary, the Fund's Investment Policy, which can affect the Province's risk exposure and the mine's Fund payments, and the performance of the Fund manager, are both important issues. Essentially, EMPR's position is that the Investment Policy and the management of the Fund should be consistent with the highest possible return for an appropriate level of risk to the Province.

F - Income Tax Deductibility;

The tax treatment of reclamation expenditures and reclamation security will now be discussed. A major problem is that the effective tax treatment of reclamation expenditures and security is not completely consistent with the technical complexities of mine reclamation. A result of this is that, while certain reclamation expenditures may technically be deductible from taxable income, the Income Tax Act of Canada (the Tax Act) is such that they may not provide any tax benefit. As a result, a mine may be penalized for doing what the province requires. However, a minor modification to the Tax Act should be sufficient to correct this problem.

F-1 Current Law

Federal and provincial corporate income tax payments are based on the Tax Act. In general, the Tax Act only allows expenditures that are actually incurred as deductions from taxable income. The Tax Act also makes provision for "tax loss carrybacks" so that losses can be used to recover taxes paid in earlier years (for three years).

Similarly, payments based on estimates of future liabilities only qualify if they are specifically prescribed by the federal Minister of Finance (Sec 18(l)(e))(such as quadrennial survey costs (for ships).

Accordingly, the Act is reasonable for reclamation expenditures that occur while the mine is operating or shortly after it closes. During operations, the mine treats current reclamation costs the same as its other operating costs and deducts them from operating income. After the mine closes down, tax deducibility may be realized via tax loss carrybacks.

Unfortunately, those rules can be a problem for a single-mine company where reclamation work is required more than three years after the mine closes down. In those circumstances, the company does not have any taxable operating income with which to fund the work or against which to deduct the expenditures. The work will have to be funded out of retained earnings or from a reserve that is created while the mine is operating. Since the Tax Act does not allow payments to company-controlled reserves as deductions from taxable income, the company must fund this post-closure reclamation work with after-tax income. Effective non-deductibility imposes a significant additional financial burden on single-mine companies and is not conducive to satisfactory mine reclamation.

For a mine owned by a diversified company, with other taxable income, reclamation work occurring more than three years after mine closure is not necessarily a problem . Such a company has income with which to fund the work and against which to deduct the expenditures.

B.C.'s recently-introduced Mineral *Tax* Act (B.C. MT) addresses the deducibility issue. Payments to provincially-mandated reclamation funds are deductible and the net revenue tax component of the B.C. MT is subject to indefinite clawback for post-closure reclamation expenses.

In summary, the Income Tax Act is not consistent with the technical complexities of modem mine reclamation. Operators who provide for post-closure reclamation by means of payments to government controlled Funds, or perform extended post-closure reclamation, may not be able to deduct those expenditures and could be penalized by the Tax Act. Such deficiencies are contrary to current concerns regarding protection of the environment but, fortunately, are amenable to satisfactory resolution.

F-2 Deducibility

While payments to company-controlled Funds are definitely not deductible, preliminary opinions are that such payments to provincially-controlled Funds would fall in a "gray area" that has elements of a "catch 22" situation. To the extent that the Fund payments are potentially refundable, and are based on estimates of future costs, the Act may consider them to be refundable Trust payments and not final expenditures (section (18.1.(e)). Conversely, to the extent that they are not refundable, the Act may consider them to be a disguised form of provincial royalty payment (Sec. 18(l)(m)); notwithstanding that there is no relationship whatsoever between mine production and required amounts of reclamation security. In either case, a company that makes Fund payments could find its claim for a deduction from taxable income disallowed by Revenue Canada. Such a ruling would penalize the company for adhering to a provincial requirement, the intent of which is to ensure satisfactory mine reclamation.

F-2-a Explicit Provision

Deducibility can be achieved in at least two ways. The first is to amend the Act with explicit provision by the Federal Minister of Finance. This is also the most effective and least controversial route. The Fund concept is supported by virtually all of the provinces. The Aug/89 joint submission to the Mines Minister's Conference by the Mining Association of Canada (MAC) and the Ontario Mining Association described a similar mechanism for mine reclamation. Finally, the concept has received favourable reviews by various mining companies and is consistent with public opinion on environmental issues.

Several concerns have identified regarding the Fund concept. The first involves the "tax expenditure" impacts of the Fund. The argument is "that, if Fund payments were allowed as deductions from taxable income, a significant loss of federal (and provincial) income tax revenues will occur". However, this could only be the result of the provinces requiring Fund payments for reclamation work that otherwise would not be done (e.g. mine reclamation and mitigation as an optional expense). Given that the work must be done, not allowing payments to provincially controlled Funds can only produce sub-optimal or inequitable results. The results will be sub-optimal If not allowing Fund payments encourages companies to avoid performing the work and/or results in the individual provinces funding the work out of general revenues (with "100 cent" tax dollars). The results will be inequitable for the mining companies that are incurring an operating cost but, because it does not fit in with current concepts of costs, are unable to claim deductions from otherwise taxable income. This is similar to an existing inequity where diversified companies are able to deduct the costs against other income sources while "single mine" companies must fund the work with after-tax income (analogous to the rationale for flow-through shares).

However, the Funds could contribute to "timing differences". Timing differences will occur if mines are able to claim tax deductions for reclamation expenditures sooner than they otherwise would be able to.

Fund payments based on conservative estimates of future mitigation costs, and the possibility of refunds, are the second set of concerns. These concerns focus on the fact that deductions are being based on estimates, rather than actual expenditures. That the payments must be based on estimates reflects the nature of the problem (not unlike the treatment for automobile company warranties). Without refunds, deducibility is considered quite likely. However, this would put the Province in the "reclamation business" and, as discussed earlier, the possibility of refunds should give the companies incentive to use cost-effective reclamation practises and initiate desirable research and development.

The final concern relates to the tax avoidance possibilities. The concern is that companies will use the Fund mechanism to avoid *paying* taxes. These companies will make excess Fund payments in anticipation of receiving subsequent refunds. Such companies would seek an advantage by unnecessarily paying money into government-controlled funds that invest in comparatively low risk - low yield investments, and pay tax on the refunds. This in preference to the alternatives of investing in higher-yielding mining opportunities or paying dividends (which would allow their shareholders to invest in low risk - low yield securities if they chose to).

This concern also ignores the facts that the timing and amount of Fund payments, and any refunds, is subject to the prior review and approval of EMPR and that such avoidance will not be allowed.

F-2-b Successful Appeal

The second way that deducibility can be achieved is by a successful court challenge to an unfavourable Revenue Canada ruling. This involves the province requiring Fund payments, the mines claiming those payments as deductions, Revenue Canada disallowing the claims, and subsequent court proceedings. While opinions exist that the company(ies) would be successful, there is uncertainty. Furthermore, the process would require a considerable amount of time and expense to the company(ies). While the desirable end result would probably be achieved (deducibility of Fund payments), the amendment route appears more efficient in terms of time and money.

Finally, another way for a company to achieve deducibility under the current Tax Act is for it to "walk away" from its responsibility for post-closure mine reclamation. Such a company would post a C/L/C as reclamation security and, upon exhaustion of the ore body, "walk away" from its post-closure obligations. The province would fund the required reclamation work by realizing on the C/L/C and the Bank, which issued the C/L/C, would recover the funds from the company. The company would then be able to claim the funds recovered by the Bank as a deduction from taxable income. In summary, the reclamation security would effectively be deductible, but the previously-discussed advantages, associated with the Fund, would be lost.

In summary, modification of the Tax Act would ensure that Fund payments are deductible and be consistent with the realities of modem mine reclamation. However, even without such a modification, deducibility is achievable.

G - Summary

The B.C. government is developing the option of mine-specific Funds as part of its revised reclamation security requirements. The new security requirements seek to ensure that the costs of mine reclamation do not default to the province. The Funds will be for a unique set of technical and financial circumstances.

Appendix 1 - Acid Mine Drainage

Acid Mine Drainage is the result of specific circumstances that produce a complex interaction between moisture, oxygen, acid-generating (e.g. sulphur containing) materials, bacteria, and geo-physiological and geo-chemical environments. This interaction initially produces a mild acidic solution that lowers the pH, triggers a complex biological reaction and causes heavy metals (such as copper or zinc) to leach out. The acid and leached heavy metals have deleterious impacts on animal life in receiving streams and their nearby ecosystems. It has been estimated that the Equity mine near Houston, B.C. could generate AMD for thousands of years and this could have a significant impact on the Bulkley River system.

AMD can involve all users and regulators of water courses, which means that an AMD problem can involve federal, provincial, and U.S. authorities.

In addition to Equity, the Sullivan mine. Island Copper, Buttle Lake, the Bell mine, and Gibraltar mines all generate AMD. Furthermore, the following mines that have either recently commenced production or are in the development stage and have potential for AMD: the Johnny Mountain mine, Silbak Premier, the Snip, Windy Craggy, and Tulsequah Chief (refer to Figure 2, next page).

Although AMD is not a new phenomenon, it is a relatively recent concern in B.C. For example, a Norwegian copper mine is reported to have been producing AMD for around 400 years and high-sulphur coal mines in the Eastern U.S. have had the problem since the turn of the century. In Canada, the provinces of Ontario, Quebec, New Brunswick, and the Yukon Territory have former or currently producing mines that are major sources of AMD which are having significant impacts on the environment.

Figure 2.

1. A.M.D. PRODUCTION AT EXISTING MINES

2. PROPOSED MINES WITH A.M.D. POTENTIAL

METAL MINES

COAL MINES

Appendix 2 - Reclamation Insurance and Captive Insurance Companies

Ideally, it would be possible for the individual mines to purchase reclamation insurance from financially solid private insurance companies. Such Insurance would satisfy the province's concerns regarding the satisfactory reclamation of mines and the insurance premiums would be deductible from taxable income. While such insurance is currently not available, this may change as the need for it continues to develop and the risks become better understood. In the meanwhile, EMPR's security policy, which includes mine-specific reclamation funds (the Fund), is intended to address the needs of the various parties. The need for the Funds could disappear if and when an insurance market develops in this area.

EMPR has not proposed the creation of a general insurance fund, to which all operating mines would be required to make premium payments. Neither the Province or the individual companies are enthusiastic about this "super fund" approach. Its greatest deficiency is that it would not be mine-specific and result in the cross-subsidization of environmental costs and discourage cost-effective mine reclamation.

The formation of Captive Insurance companies, which could allow mining companies to voluntarily "self-insure" for certain risks, either separately or as a group, has been facilitated by recent provincial legislation. The first advantage of forming a captive insurance company is access to wholesale insurance in the re-insurance market. Other advantages are that a company may be able to get insurance where none is otherwise available, or only at extremely high premiums. A final advantage is the captive may become a profit centre for the sponsoring company. To date, captive insurance companies have been formed by major conglomerates (such as the Brascan Group), a major forest company (MacMillan Bloedel), and a group of professionals (medical doctors).

Should a single company, or a group of companies, with one or more mines, be interested in establishing a "captive", EMPR's primary concern is that the arrangements provide sufficient assurance that the reclamation work will be done. Furthermore, a review of captive insurance company requirements suggests that a company, with a single mine that is expected to close soon and a reclamation problem that is certain, would not be able to form a "pure captive" (where the mine is the only "client"). However, if that company were a subsidiary of a larger parent that had diverse, ongoing interest (such as the Bell mine and Noranda) then a "Group captive" may be possible.

Appendix 3 - Reclamation Funds and Inflation

A discussion of the difference between real and nominal investment returns, and constant and current dollar cost estimates, is presented in this appendix. Nominal investment returns include a component to compensate for the erosion of investment principal due to inflation. Real returns are net of inflation - there is no inflation so the reported return is a real return on invested capital. Similarly, current dollar cost estimates incorporate the underlying rate of inflation and, other things being equal, can be expected to increase at that rate of inflation. Conversely, constant dollar cost estimates are based on a zero rate of inflation and, other things being equal, will not change through time. These distinctions are important because market yields and returns are generally reported in nominal terms (e.g. on May 25/90, three month T-bills had a reported yield of 13.78%) while cost estimates are frequently as at a particular point in time and are essentially in constant dollars (e.g. $1.00 mm/year in QI/90 dollars). A Fund that was based, on nominal investment returns and constant dollar costs would soon be deficient as mitigation cost inflation caused an erosion of Fund principal. This would occur as, initially, all Fund income would be required to cover mitigation costs so there would be no growth in principal. Fund income would soon be insufficient to cover mitigation costs which had increased due to inflation. Either Fund principal would have to be spent or the shortfall would have to funded from other sources.

In estimating real rates of return, two points should be noted. The first is that, since we are trying to provide for future reclamation/mitigation costs, we should adjust the expected nominal rates of return by an estimate of expected mitigation cost inflation. While use of common estimates of inflation, such as the Consumer Price Index (CPI) or the Producer Price Index (PPI) is convenient, they may not be appropriate and could result in a Fund that is too high or too low. The second point is that the chosen estimate of inflation should be divided into the nominal rates of return rather than subtracted from them. Although not important when low estimates of inflation are involved, this can be significant (e.g. a 15% nominal return and 10% inflation implies real returns of 5% (15% - 10%) and 4.55% (1.15 / 1.10).

The issue is further complicated by the fact that estimated total rates of return consist of an interest component and a capital gain (or loss). Even for "safe" government of Canada bonds, the capital gain or loss component of the return can be very significant and will, in general, be an increasing function of time to maturity. This will in turn affect the volatility or risk of the associated securities' returns (Table 1 reports the total returns for different financial assets during the period 1948 to 1988). Thus, even

securities with a low default risk can still be very risky - which directly affects the ability of the investments to pay the associated mitigation costs and resulting Fund surpluses or deficits.

As compensation for the increased risk associated with longer term securities, efficient markets generally require higher yields as the securities' terms to maturity increase (known as the yield curve). That riskier securities should yield more is intuitively reasonable but this presents a possible conflict when it comes to specifying an Investment Policy for the Funds. A conflict could exist because an Investment Policy that emphasizes lower risk, but lower yielding, short-term securities will apparently require a larger Fund than one which allows a larger portion of riskier, but higher yielding, securities. The conflict is accentuated by estimated historical real rates of return that are much lower than current market rates of return (e.g. 2% to 4% compared to the 10.88% to 13.78% currently available in Canadian money markets (May 25/9O)). These low rates of return mean that small differences in the estimated rate of return, that result from a different Investment Policy, can combine with a given level of mitigation costs to produce a significant change in the required size of the Fund (e.g. with mitigation costs of $1.0 mln/yr, a 2.5 % rate of return implies a $40.0 mln Fund whereas a 3.0% rate of return implies a $33.3 mln Fund).

The conflict is, to a certain extent, more apparent than real. The reason for this is that since the returns to higher yielding securities are riskier/less certain, more money will have to be invested in them in order to be able to fund the expected annual mitigation costs with reasonable certainty. For example, while the expected return of speculative stocks is very high, the Province would have difficulty in accepting an Investment Policy that emphasized such securities. A possible solution to this dilemma is in "risk sharing" whereby the Province is appropriately compensated for an Investment Policy with riskier Investment Policies.

In summary, while the concept of combining an estimated real rate of return with expected annual mitigation costs to estimate the required Fund is quite straightforward, its actual application is very challenging.

Since the above concepts are not widely appreciated, but their Impact on the size of the Fund in relation to its mitigation costs quite significant, the issue could be very controversial. Accordingly, EMPR has participated In a third-part study of what, given certain circumstances, is an appropriate Investment Policy with its corresponding real rate of return.

Table 1

COMPARATIVE TOTAL RATES OF RETURN ON SPECIFIC SECURITY CLASSES (%)

— December to December —

Annual Returns	Prime Corp. Paper		Canada T-Bills		Total Return (% Change In Total Return Indices)					
	30-Day	90-Day	30-Day	91-Day	Conv. Res. Mortgages	Short Bonds	Mid Bonds	Long Bonds	Universe Bonds	TSE 300 Stocks
	%	%	%	%	%	%	%	%	%	%
1948	N/A	N/A	N/A	N/A	N/A	N/A	N/A	−0.08	N/A	N/A
1949	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5.18	N/A	N/A
1950	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.74	N/A	N/A
1951	N/A	N/A	N/A	N/A	N/A	N/A	N/A	−7.89	N/A	N/A
1952	N/A	N/A	N/A	N/A	3.71	N/A	N/A	5.01	N/A	N/A
1953	N/A	N/A	N/A	N/A	3.00	N/A	N/A	5.00	N/A	N/A
1954	N/A	N/A	N/A	1.53	4.71	N/A	N/A	12.23	N/A	N/A
1955	N/A	N/A	N/A	1.36	4.28	N/A	N/A	0.13	N/A	N/A
1956	N/A	N/A	N/A	2.75	1.64	N/A	N/A	−8.87	N/A	N/A
1957	5.02	5.34	N/A	3.83	4.14	N/A	N/A	7.94	N/A	−20.58
1958	3.08	3.61	N/A	2.51	5.82	N/A	N/A	1.92	N/A	31.25
1959	4.64	4.98	N/A	4.62	3.67	N/A	N/A	−5.07	N/A	4.59
1960	3.83	4.11	N/A	3.31	6.81	N/A	N/A	12.19	N/A	1.78
1961	3.04	3.64	N/A	2.89	5.55	N/A	N/A	9.16	N/A	32.75
1962	4.00	4.39	N/A	4.22	5.49	N/A	N/A	5.03	N/A	−7.09
1963	3.85	4.07	N/A	3.63	5.50	N/A	N/A	4.58	N/A	15.60
1964	3.90	4.31	N/A	3.79	5.43	N/A	N/A	6.16	N/A	25.43
1965	4.63	4.84	N/A	3.92	3.94	N/A	N/A	0.05	N/A	6.68
1966	6.10	6.35	N/A	5.03	4.12	N/A	N/A	−1.05	N/A	−7.07
1967	5.75	6.03	N/A	4.59	4.51	N/A	N/A	−0.48	N/A	18.09
1968	6.77	6.99	N/A	6.44	5.73	N/A	N/A	2.14	N/A	22.45
1969	7.69	7.71	N/A	7.09	3.47	N/A	N/A	−2.86	N/A	−0.81
1970	7.70	7.97	N/A	6.70	11.18	N/A	N/A	16.39	N/A	−3.57
1971	4.48	4.61	N/A	3.81	12.88	N/A	N/A	14.84	N/A	8.01
1972	4.94	5.08	N/A	3.55	7.79	N/A	N/A	8.11	N/A	27.38
1973	6.79	6.87	N/A	5.11	5.55	N/A	N/A	1.97	N/A	0.27
1974	10.81	10.95	N/A	7.85	3.44	N/A	N/A	−4.53	N/A	−25.93
1975	8.13	8.59	N/A	7.41	10.86	N/A	N/A	8.02	N/A	18.48
1976	9.60	9.84	N/A	9.27	13.86	N/A	N/A	23.64	N/A	11.02
1977	7.75	7.77	N/A	7.66	13.47	N/A	N/A	9.04	N/A	10.71
1978	8.57	8.47	N/A	8.34	5.23	N/A	N/A	4.10	N/A	29.72
1979	12.11	11.79	N/A	11.41	3.79	N/A	N/A	−2.83	N/A	44.77
1980	14.00	15.50	13.10	14.97	6.52	10.60	6.26	2.18	6.57	30.13
1981	20.18	19.07	19.89	18.41	12.82	9.23	3.30	−2.09	4.20	−10.25
1982	15.67	16.36	15.14	15.42	28.15	27.97	35.94	45.82	35.36	5.54
1983	9.85	9.83	9.55	9.62	18.69	13.37	10.94	9.61	11.53	35.49
1984	11.51	11.73	11.17	11.59	11.79	12.83	14.44	16.90	14.66	−2.39
1985	9.95	10.07	9.72	9.88	14.42	15.00	21.92	26.68	21.23	25.07
1986	9.74	9.53	9.25	9.33	10.93	11.37	13.98	17.21	14.70	8.95
1987	8.53	8.61	8.09	8.48	8.74	7.00	3.89	1.78	4.04	5.88
1988	9.72	9.63	9.29	9.41	8.31	8.45	9.18	11.30	9.79	11.08
Dec/58-Dec/88 (30 yr)	8.07	8.26	N/A	7.52	8.63	N/A	N/A	7.45	7.15	10.32
Dec/63-Dec/88 (25 yr)	8.94	9.08	N/A	8.30	9.29	N/A	N/A	7.94	7.84	10.65
Dec/68-Dec/88 (20 yr)	9.83	9.94	N/A	9.20	10.45	N/A	N/A	9.66	9.28	10.21
Dec/73-Dec/88 (15 yr)	11.03	11.14	N/A	10.56	11.24	N/A	N/A	10.42	10.26	11.75
Dec/78-Dec/88 (10 yr)	12.08	12.16	N/A	11.81	12.23	N/A	N/A	11.81	11.73	14.23
Dec/83-Dec/88 (5 yr)	9.89	9.91	9.50	9.73	10.82	10.89	12.52	14.48	12.74	9.36

* The ScotiaMcLeod Short Term Index contains bonds with maturities between 1-5 years (average term 3 years). The ScotiaMcLeod Mid Term Index measures bond performance in the 5-10 year area of the yield curve and has an average term to maturity of 7 years. The ScotiaMcLeod Long Term Index measures total return performance of issues whose term is greater than 10 years and has an average term of16 years. The Universe Bond Index measures bonds whose maturities are greater than 1 year. The average term of this Index is 9-10 years.

All Price and Total Return Indices except TSE 300 Price and Total Return Indices are Copyright©™ ScotiaMcLeod Inc. 1989. Reproduction in whole or in part without acknowledgment of ScotiaMcLeod Inc. as the source is prohibited.

Historical data and a general description of the ScotiaMcLeod Bond Indices are available on request.