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Subject: Environmental Assessment Raven coals
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COMMENTS ON THE ENVIRONMENTAL ASSESSMENT OF THE PROPOSED

RAVEN UNDERGROUND MINE

It is important that the technical information provided by the proponents of the mine be fully substantiated in their proposal because the economic viability of the project depends on the fact that there is a substantial reserve of a metallurgical quality coal which can be extracted, cleaned and transported without major environmental impact. As a resident of Qualicum Beach and a member of the technical committee of Coalwatch, I wish to express my concerns about granting permission to proceed with the mine.

Coal Quality. The proponent's data show that the Raven coals are a high volatile bituminous coal with a high ash and sulphur content. The presence of ash and sulphur make it an unlikely candidate as a met coal and furthermore their claim that the high volatile content (between 30 and 50%) makes it unique in Western Canada as a met coal. I would challenge the statement and say it could make it almost unique in the world. It will be necessary to determine what factors contribute to its singularity and to provide an explanation of why it is restricted to this small area in the Vancouver Island coalfield.

Physical tests such as swelling and plasticity are a measure of a coal's suitability for coking and it will be necessary to document how many samples meet these parameters and to submit duplicate samples for independent testing of by other laboratories.

Coal Zone Continuity and Uniformity. Of the five zones in the Cumberland Member of the Comox Formation only coal zones 1 and 3 will be mined. The term 'coal zones' rather than 'seams' is used because the Raven coal layers are separated by shale partings. In coal zone 3 the shale parting which separates the two coals is sometimes thicker than the coals themselves. The composite nature of those coal zones means that volume of non-coaly sediments extracted during mining operations far exceeds the company's estimates. Fault displacement encountered during mining operations will also add to the amount of debris brought to the surface as miners search for the continuation of the coals on the other side of the fault plane.

Surface Accumulations of Rock Debris. Rock debris extracted during mining operations together with fractions removed during washing will be dumped at the surface. Mineral rich coals such as the Raven coal are likely to contain trace amounts of metals such as

zinc, copper, barium chromium, manganese, beryllium, selenium and vanadium. Leaching of heavy metals by surface run-off or percolating water will carry them into streams and aquifers water and eventually discharge these toxic elements into Baynes Sound. The destruction of the aquaculture industry is an inevitable consequence.

Sulphur in the coal and shale partings is mainly in the form of the mineral pyrite. Toxic elements such as mercury, phosphorus and arsenic are often incorporated into crystal lattice of pyrite. It is essential that analyses be performed to determine what elements are present in the rock rejects of the mine. The presence of disseminated pyrite also introduces an additional hazard of spontaneous combustion of the debris piles.

Gravity alone can initiate the downhill transport of saturated rock debris as a sediment slurry which can cause damage to life and property. The chances that debris slides will occur are vastly increased by the fact that the mine is located in an active seismic area.

Toxic Pulp Layer in Alberni Inlet. There is a layer of toxic material in the Alberni inlet due to the effluent discharged during chemical processing of the lignin-cellulose components in wood chips over many years of pulp mill operations. An impervious mud now covers this toxic layer and prevents the release of harmful chemicals into the overlying water column. Dredging to accommodate the coal freighters will remove the seal and cause irreparable damage to the fish and invertebrate population of the inlet.

Recommendations:

Explain why the high volatile, mineral and sulphur rich Raven coals are unique in Canada and possibly the rest of the world in their coke-forming properties. This study will involve detailed petrographic analyses of the coal and identification of the macerals that contribute to that character.

Permit the sampling by an independent and federally certified laboratory of core samples of the Raven coals to do physical testing for swelling and plasticity.

Conduct analyses to identify trace elements in the coal and associated sediments and assess the possible damage those present might cause to the water in wells within the aquifers and also to the shellfish population of Baynes Sound.

Sample and perform chemical analyses on the toxic pulp layer within Alberni inlet and to document its toxicity to the biota of the inlet and suggest remedial measures will have to be taken in order to prevent the release of those chemicals into the water column.

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Education and Relevant Experience of Correspondent

Education: 1954 -B. Sc (Hons.), University of Sheffield, UK

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Thesis topic – Petrography and chemistry of coal

Employment: 1959-1964 Lecturer, University of Sheffield

1964-1971 Research Scientist, Amoco Production Company, Tulsa, Oklahoma

1971-1983 Petroleum Geologist, Amoco Canada, Calgary, AB

1983-1988 Chief Geologist, Amoco Canada, Calgary, AB

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