

KERR ADDISON MINES LIMITED  
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007174  
Swim Lake  
**COPY**  
*Geochem*

Mr. Fred Chow

W. M. Sirola

August 3, 1966

A geologist from the Geological Survey by the name of J. Fortescue plans to arrive in Whitehorse on approximately August 5th.

Mr. Fortescue would like to do some biogeochemical studies on both the Faro and Swim Lakes deposits and has requested permission from this office through the medium of Lew Green. I have discussed this matter with Paul Kavanagh and he has agreed to have Fortescue visit the Swim Lakes property provided he is not shown any confidential data. He should however, be shown where to take his profiles to best advantage and you would have to put him up for two or three days.

Conceivably, the type of work which is being undertaken by Fortescue will prove useful in detecting mineralization in permafrost areas because of the ability of the roots of some trees to absorb elements from considerable depth. I understand that the results of these studies will be made available to us at the time they are completed or shortly thereafter.

Please give Mr. Fortescue as much help as time will permit.



W. M. Sirola.

WMS/lk

cc/ Mr. P. M. Kavanagh  
Mr. J. K. Thompson

GEOLOGICAL SURVEY OF CANADA

Proposal for consideration by the Subcommittee on Mineral Deposits  
of the National Advisory Committee on Research in the Geological  
Sciences

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by J.A.C. Fortescue

In 1962 the Geological Survey of Canada began a long term research program aimed at a systematic examination of the scope of geobotanical and biogeochemical prospecting for mineral deposits in Canada. Research carried out to date during this program has shown that in order to obtain meaningful results field investigations should be carried out in the vicinity of mineral deposits which are drilled, but undisturbed by stripping or mining.

Owing to the absence of systematic data on the geobotany or biogeochemistry of Canadian landscapes our research program has been aimed at producing a number of sets of similar systematic data describing the morphology and chemistry of landscapes of the kind described above. The results of these studies will focus attention on the scope of the plant prospecting methods in each area studies and also provide a fund of basic information on the distribution of chemical elements which are not major components of the ore. To this end, in the first instance, it is planned to determine nine elements (Zn, Cu, Pb, Ba, Sr, Ni, Ti, Mn, and Cr) in all samples collected. It is hoped to carry out systematic studies in the vicinity of mineral deposits containing one or more of all these elements before the end of the program.

Before any plans of this kind can be carried out suitable mineral deposits must be located and it is here that the subcommittee on Mineral Deposits can assist us. If the committee considers this approach to the systematic study of undisturbed mineral deposits is valid then perhaps we may mention that we have the backing of the Subcommittee when Companies are approached for suggestions regarding the location of areas where investigations may be carried out.

The basic problem which we are attempting to study is brought into focus on Figure 1. The problem of the location of buried mineral deposits by indirect methods will always involve the measurement of geological, geophysical and geochemical properties of the landscape being explored. Each point within a landscape being studied can be considered as a prism as shown in the diagram and the indirect prospecting methods measure the properties of the prism. Unfortunately the prism is seldom uniform vertically or horizontally for any significant distance and these variations usually limit the effectiveness of specific geological, geophysical and especially geochemical methods of prospecting. In this proposal we are interested only in geochemical methods listed on Figure 1.

The biogeochemical and geobotanical research program generally involves investigation of specific mineral deposits at two levels of detail:-

- 1) Pilot Project: involving examination of data already obtained at a property together with geological and geobotanical investigations made during a brief visit to the property.
- 2) Main Projects: involving detailed geobotanical and ecological studies together with sampling of overburden, soils and plants and determination of the depth of the prism of landscape (i.e. surface to bedrock surface) by a shallow seismic method.

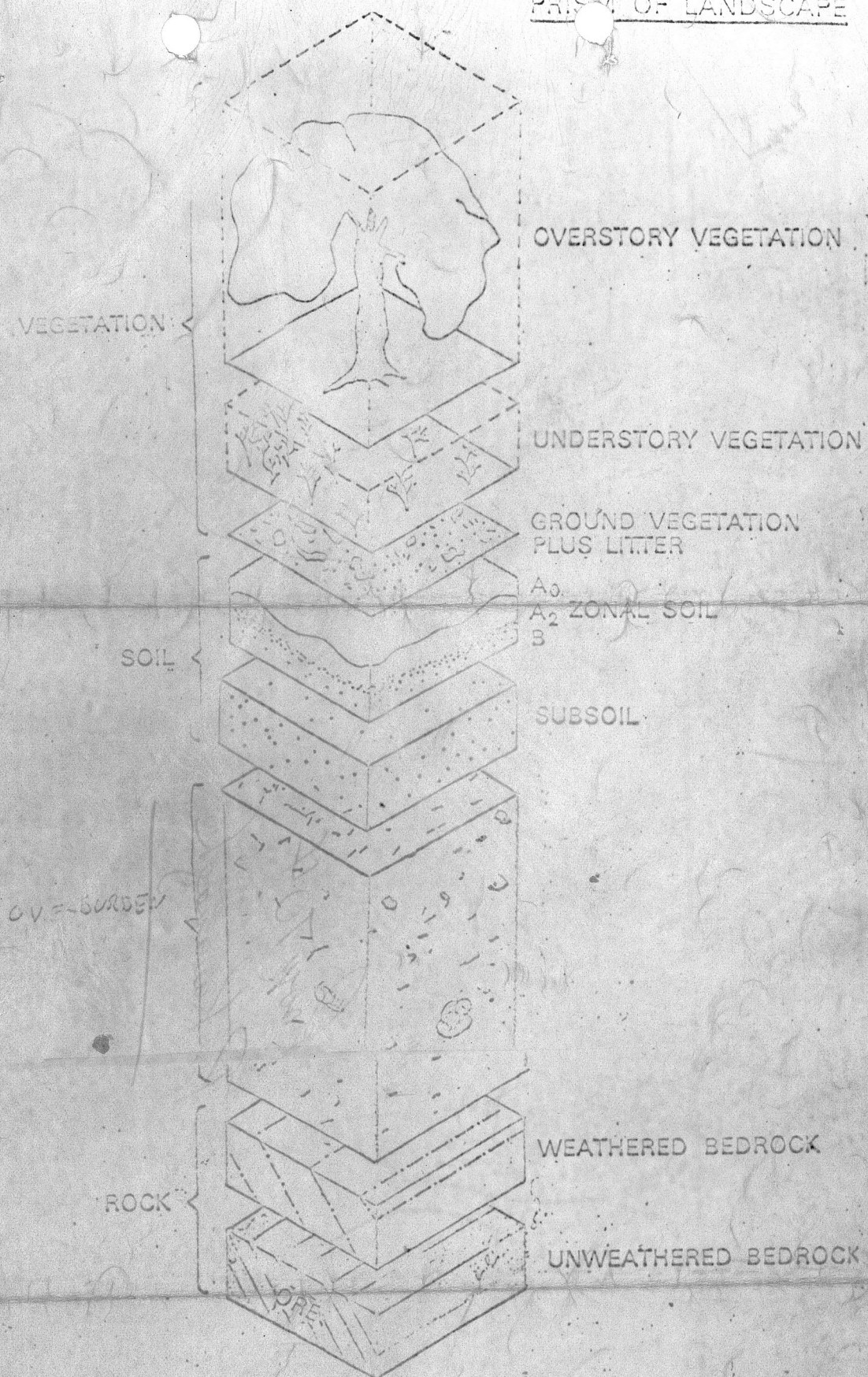
The Pilot Project is carried out in a number of properties within a specific part of Canada (e.g. the Boreal Forest) during the first summer of a two year program. During the second year Main Surveys are carried out in two areas selected on the basis of detailed appraisal of the results of Pilot Projects carried out the previous year. All results obtained are made available to the Company on a confidential basis at the time they are obtained and published within two years of the commencement of field work at the Pilot or Main level. The results of Pilot and Main Surveys carried out during a single summer will be compiled and prepared for publication during the following winter. The data will be published in a series of reports of progress which appear annually.

It is expected that Pilot Projects will be carried out on as many properties each year as staff permits. On the basis of these studies, the property most suitable to our Main Project research will be selected for investigation and, if the company owning it agrees, the Main Project will be carried out on it in the following year. The principal parameters influencing selection of a property for the Main Project are climate, vegetation soil conditions, overburden conditions and bedrock geology. An overriding factor of course is that the property will remain undisturbed long enough for the Main Project to be carried out.

A few properties have been drawn to our attention for possible study at short notice, before stripping commences. In cases where these properties offer circumstances of exceptional value to our research we shall try to make a brief summary examination termed a Quick Project. These Quick Projects will not be undertaken if they will delay Pilot and Main Projects.

It should be stressed that the scope of the projects of this kind does not require a knowledge of the tonnage or grade of the mineral deposits selected for investigation. All that is required is that the deposits give rise to a significant geochemical signal in the landscape of the area, which is picked up by the vegetation. As far as the bedrock geology is concerned we need an idea of the area of the sub outcrop of the mineralized zone and a few hand specimens of typical ore for detailed chemical and mineralogical studies. Owing to the research requirements of the project and the limited staff available the Survey can only study those deposits that most nearly meet its requirements and must do so at times dictated by limitations of staff.

J.A.C. Fortescue



GEOCHEMICAL PROSPECTING METHODS

- 1) Plant geochemistry
- 2) Soil geochemistry
- 3) Bog geochemistry
- 4) Water geochemistry
- 5) Stream sediment geochemistry
- 6) Overburden geochemistry
- 7) Rock geochemistry
- (8) Studies of indicator minerals)
- (9) Boulder tracing)

Figure 1. Specialised geochemical methods which may be used to aid the geologist in prospecting a prism of landscape.