COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS

RECORDS

1948/68A

WALLAROO - MOONTA INVESTIGATION
GEOCHEMICAL, PROJECT NOTES.

By

V.P. SOKOLOFF

WALLAROO - MOONTA

WALLAROO - MOONTA INVESTIGATION.

GEOCHEMICAL PROJECT NOTES.

Remarks on proposed reconnaissance in South Australia.
V.M. June 18 '48.

(These are highly tentative remarks, by way of questions rather than of suggestions. I have not a slightest knowledge of the area. Plans for the reconnaissance probably will have to be made in place, in consultation with the team.)

OBJECTIVES:

A major purpose of the study, as it appears to me at this time, is to ascertain presence of geochemical anomalies in the area of (copper) mineralization. Such anomalies, if established, may be correlated with the dispersion train phenomena and with the dispersion halo of the ore, in an area of known mineralization. A comparable study may be undertaken then, depending on advice of the team, in an area of suspected but not known, mineralization. Further investigations, beyond the reconnaissance stage, may be projected, in consultation with the team, on completion of the orientation study.

BACKGROUND:

Geo-chemical reconnaissance is contingent practically on certain basic data of geology and geophysics. The type of data here desired may be enumerated as follows:

(1) A topographic map, reasonably detailed.
(2) A geologic map, reasonably detailed.
(3) A map of geophysical anomalies.
(4) A soil map, if available (in some areas, e.g. Union Copper Mine, North Carolina and the Tennessee Zinc District, the soil maps were fully as valuable as geologic maps; elsewhere the soil maps seemed to be of little use; much depends on the area and on the type of soil surveys conducted there).
(5) A report or reports on the area in question, covering, if possible, the following items:
    (a) geologic, mineralogic, petrologic, and related features;
    (b) mining and exploration;
    (c) hydrology;
    (d) climate (chiefly rainfall, temperatures, humidity, and kind and directions of prevailing winds);
    (e) vegetation (if any); an ecologic map may (or may not) be of considerable aid to a prospecting geochemist.
(6) Access to and consultation with geologists, geophysicists, and mining engineers familiar with the area.

WORK:

As previously stated, the exact plan of operations is to be determined in place. Purely in the order of discussion, the following operations may be considered:

(7) A study of available background materials, in consultation with the available team.
(8) Determination of the "norm", i.e. the "blank", in reference to the distribution of metals in the overburden. This is an important step that may save considerable time in the subsequent study. (The type of work is outlined in "Geochemical Anomalies in Georgeville Silt Loam", my file report).
(9) Study of the dispersion train phenomena (as in my Kokomo report, on file).

(10) Determination of representative geochemical profiles (in an ideal case, roughly perpendicular to the geophysical anomalies; in an ideal case, a series of at least 3 geochemical profiles, properly oriented).
(11) Depending on the preceding, series of tests, on the grid, in an endeavour to ascertain presence (if any) or absence of the dispersion halo, in soil, rock, or other materials, according to need and judgement, in an area/known mineralization.
(12) Repetition, if necessary, of 8 through 11, for an area of suspected, but not known, mineralization.

RECORD:

Sampling points and other pertinent information, I believe, could be recorded best on a base map (depending on other consideration, the base map may be chosen from the available ones or prepared, e.g. from the geologic and geophysical maps, by transfer and combination. My feeling is that a topographic map with some transfers from the others, may be well suited for the purpose).

A field note book is to be used for a record of tests, description of materials, and other pertinent information.

A progress report, at the conclusion of the reconnaissance, will provide a basis for more detailed studies, if required.

METHOD:

The dithizone reagent, in the field, may be relied upon for semi-quantitative (and qualitative) presumptive tests, e.g. for copper. I propose to use essentially the same procedure as in the Tintic Studies I and II (file reports), except the pH level is to be maintained in the vicinity of 2; (it may be desirable so to diminish somewhat the sensitivity of the reagent, non-selective as it is, without the use of the complexing ions and other aids).

Depending on results of the reconnaissance, a more accurate analyses of some of the critical samples may be indicated. This subject may be best considered on completion of the reconnaissance report.

FACILITIES:

A list of materials, apparatus, and equipment desired for the reconnaissance study has been submitted. It would be desirable also to secure a friendly co-operation of an established soils or chemical laboratory, permitting a short-term use of a small amount of working space and of the common laboratory facilities, according to need and discretion, in the studies here projected.

PERSONNEL:

Consultation with the team, now in the area, is indeed a prerequisite for the geochemical study here proposed. In addition, the interest of a colleague assistant would be appreciated heartily, both in the sampling and in the testing operations.

TIME:

Although exact estimates of the required time cannot be undertaken in advance, it is my feeling that, by analogy with some other reconnaissance projects, the required period is not likely to exceed 10 days of field time. Supplementary work, including possible laboratory tests and preparation of the

project report, is not likely to consume more than 5 days. The total tentatively estimated time, accordingly, is not likely to exceed 15 working days.

(Sgd.) V.P. Sokoloff

BROKEN HILL.
18th June, 1948.