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PRELIMINARY REPORT ON GEOCHEMICAL PROSPECTING FOR LEAD AT NAMOONA, N.T., 1955

by

A. H. Debnam

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INTRODUCTION

The survey was designed to locate possible extensions of the lead mineralization which was discovered at Namoona in September, 1954. It discovered two new large and intense lead anomalies in residual soil cover, as well as several small anomalies of less significance. Costeaning and drilling will be necessary to determine the importance of these discoveries.

PREVIOUS INVESTIGATIONS

Following the discovery of lead-silver-zinc mineralization by a prospector of the Australian Mining and Smelting Company Ltd., geochemical tests were carried out by the Bureau at the prospect in October, 1954 (B.M.R. Records Report 1955/47). The company had had two costeans cut to bedrock by bulldozer, and suboutcropping lead mineralization revealed. The results indicated that the method would be suitable for large scale lead prospecting in the Namoona area.

During the 1954-1955 wet season an extensive costeaning and drilling programme was carried out by the company at the original prospect and at a northwestern extension indicated by outcropping mineralization and positive geochemical results. More than 40 costeans were cut in the area shown on Plate 1. Many holes were put down to shallow depths by wagon drills, and one hole was taken to 400 feet by diamond drill. Only isolated concentrations of lead mineralization were found.

PRESENT INVESTIGATIONS

The 1955 geochemical survey investigated large areas to the north-west of the costeaned section (North Grid) and to the south-east of the original prospect (South Grid), as shown on Plate 1. The North Grid covered an area 20,000 feet by 4,000 feet, and the South Grid an area of 5,000 feet by 4,000 feet.

Samples were collected from the "B" soil horizon, sampling points being 200 feet apart in traverses 400 feet apart (800 feet at the most northerly section). The traverses intersected the main base lines at right angles.

Where anomalous results were obtained the interesting areas were resampled on 200 x 200 foot or 100 x 100 foot grids to establish the anomaly boundaries more exactly.

At the beginning of the survey samples were collected with a mechanical soil auger or with post-hole diggers at depths of 18 to 30 inches. Picks and shovels had to be used to collect samples from depths of 6 to 12 inches in the final weeks, because the soils dried out and became very hard.

Testing procedures were similar to those used in 1954, when cold acid extracts of the samples were treated with dithizone. The results are represented on the plans by figures 0 to 7, according to their value above background (taken as half the value of the lowest positive test, see Legend, Plates 2 and 3).

RESULTS

Two major anomalies were discovered at the North Grid. They are shown on Plate 3 as Anomaly A and Anomaly B on either side of Coirwong Creek. The areas indicated as fourth order anomalies at the sites of these major anomalies are almost continuous and extend for approximately 6,000 feet along the line of mineralization.

At the South Grid only small isolated anomalies were discovered, except for a second order anomaly over the two costeans in the north-western part of the area.

Anomalies A and B.

Each anomaly was resampled on a closer grid, 200 x 200 feet for deep samples, and 100 x 100 feet for shallow samples. The relative marks of deep and shallow sampling will be discussed fully in the final report. In general, it was found that for any individual sampling point similar results were obtained for samples taken between 6 and 30 inches.

Anomaly A.

The first order anomaly at Anomaly A occurs in deep residual soil. A pit was sunk to 6 feet depth without disclosing bedrock. Below the grey surface soil, 4-6 inches deep, a layer of siliceous angular fragments occurs to a depth of 12 to 18 inches. This represents a zone of surface silicification which is common in the Namoona area. The deeper B horizon consists of a lateritic soil which may extend to depths of 6 to 10 feet. The sub-outcropping lead mineralization probably occurs in siltstones or shales.

The factors which make Anomaly A of particular interest are the deep soil cover and the flat terrain in the vicinity. Under these circumstances only high-grade lead mineralization would be represented at the surface by a first order anomaly. Lateral migration of soil would be at a minimum, and the mineralization should be directly beneath the anomaly.

The second and fourth order anomalies disclosed by the 1954 survey are due to down-slope migration of minerals from the sub-outcropping galena. However, they are not as extensive as those at Anomaly A where the fourth order anomaly is 3,000 feet long and up to 800 feet wide.

The southern limit of the second order anomaly overlaps a costean (Plate 3) in which the sub-outcropping shales and siltstones (partly lateritized) are exposed. These rocks have a consistent steep dip (70 to 80 degrees) to the west. This steep dip is also apparent in the costean 600 feet south of Coirwong Creek. If this dip persists between the costeans in the section covered by the high anomaly, it is possible that the lead mineralization is in the form of a vein extending to depth.

Anomaly B.

The first order anomaly covers outcrops in which lead mineralization is obvious in the hand specimen. The fourth order anomaly which extends both to the north-west and to the south-east may be a surface expression of similar mineralization which sub-outcrops beneath the residual soils.

RECOMMENDATIONS

The first and second order anomalies at Anomaly A

should be investigated by costeaning, waggon drilling, and possibly diamond drilling.

CONCLUSIONS

The following information has been obtained from the geochemical survey at Namoona.

(a) A grid spacing of 800 feet between traverses and 200 feet between sampling points in the traverses would be satisfactory for indicating lead anomalies in reconnaissance prospecting over flat terrain. The spacing could possibly be extended to 1000 x 250 feet.

(b) A sampling depth of 6 inches gives a representative result for any sampling point in residual soil.

(c) With two men sampling and two working in the laboratory, 80 samples can be tested per day i.e. 20 per man day. This represents a coverage of ¼ square mile per day.

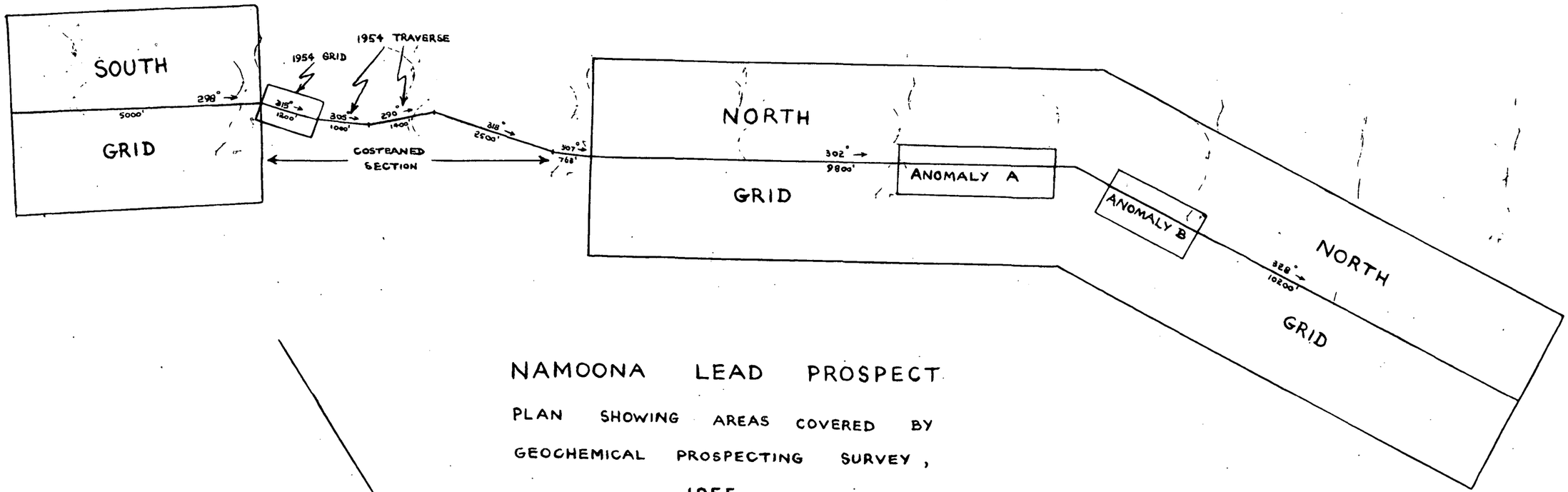
(d) Including cook, mechanic, and party leader the labour cost per square mile would be about £120 and cost per sample 10/-. The cost of administration equipment, vehicle hire, and setting up camp has not been taken into account. The present survey was more expensive due to the experimental nature of the work. (e.g. testing sampling depths and grid spacings, and training assistants.

(e) The two anomalies discovered at the North Grid warrant further investigation, particularly Anomaly A.

A. H. DEBNAM.

19th September, 1955.

PLATE.I.



NAMOONA LEAD PROSPECT

PLAN SHOWING AREAS COVERED BY GEOCHEMICAL PROSPECTING SURVEY,

1955

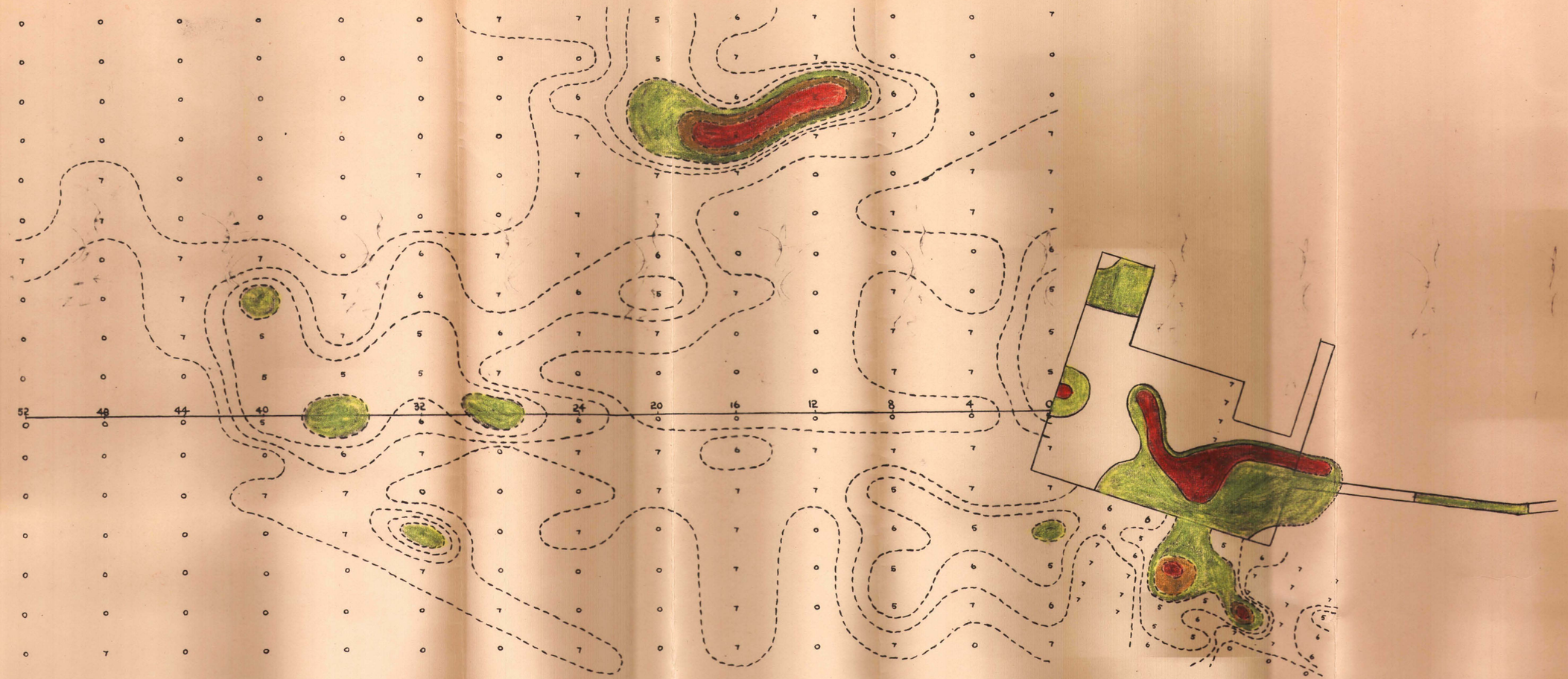
Scale

feet

0 1000 2000 4000 6000

A.H.D

12-9-55



SOUTH GRID

NAMOONA LEAD PROSPECT

GEOCHEMICAL SURVEY

1955

Scale
feet

0 100 200 300 400 600 800 1200

A. H. D.
12 - 9 - 55

LEGEND

- 1st Order Anomaly ; over 3000 times background
- 2nd Order Anomaly ; 1000 – 2999 times background
- 3rd Order Anomaly ; 300 – 999 times background
- 4th Order Anomaly ; 100 – 299 times background
- 5 — 5th Order Anomaly ; 30 – 99 times background
- 6 — 6th Order Anomaly ; 10 – 29 times background
- 7 — 7th Order Anomaly ; 3 – 9 times background
- 0 — No Anomaly ; 1 – 2 times background
- 12 8 — Base Line
- 5 / 0 — Sampling points, with anomaly grading
- Section tested in 1954 preliminary survey

PLATE. 3.

NORTH GRID

NAMOONA LEAD PROSPECT

GEOCHEMICAL SURVEY

1955

LEGEND

	1st Order Anomaly	:	Over 3000 times background
	2nd Order Anomaly	:	1000 – 2999 times background
	3rd Order Anomaly	:	300 – 999 times background
	4th Order Anomaly	:	100 – 299 times background
5	5th Order Anomaly	:	30 – 99 times background
6	6th Order Anomaly	:	10 – 29 times background
7	7th Order Anomaly	:	3 – 9 times background
0	No Anomaly	:	1 – 2 times background

52 56 Base Line.

5 Sampling points, with anomaly grading.

Ridge

Track

Costean

Section resampled with closer grid.

Scale

feet

0 100 200 400 600 800 1000

A.M.D. 18-9-55