McARTHUR RIVER CATTLE COMPANY

PROSPECTING AUTHORITY 2613

PLAN TO ACCOMPANY REPORT ON REGIONAL

RECONNAISSANCE GEOCHEMICAL SURVEY OF

THE McARTHUR GROUP SEDIMENTS

OPEN FILE

NORTHERN TERRITORY GEOLOGICAL SURVEY

CR72/018
April 24th, 1972.

Reference - AP 2613
BS/KO

Dear Mr. Kay,

Your letter of February 3rd, finally caught up with me, it was evidently sent by surface mail to the United States.

We are enclosing for the records the following photo-copies of our final report for the first year of our operating on AP 2613 (now our 3282).

(A) Summary - 3 pages.

(B) Regional reconnaissance Geochemical survey of the McArthur Group Sediments (10 pages).

(C) Graphs of check assays. Figure 1 (1 page).

(D) Graphical Representation of Lead assays Figure 2 - Cumulative frequency (1 page).

sincerely yours,

(signed)

Douglas Howenstein.

CC U.S Office.
ENC:
1. INTRODUCTION

During July-October, 1970, a regional geochemical reconnaissance survey was planned, organised and carried out over the dolomitic sediments that are located along the Kilgour River and its tributaries.

Previous work had been confined to generalised prospecting and mapping activities by Carpentaria Exploration Company Pty. Ltd. and the Bureau of Mineral Resources, during which no area of interest had been delineated.

The object of this survey was to assess the economic potential of sediments of the McArthur Group with the specific objective of determining the possibility of a stratigraphic orebody similar to those of the Kilgour and Tawallah copper mines. The investigation was limited to the dolomitic units fringing the eastern side of the Abner Range, as the McArthur Group contains known mineralization of this type in other parts of the region.

During the same period, a helicopter borne scintillometer survey was conducted, which was enlarged upon by ground surveys, over the sandstones which dominate the locality.

2. LOCATION AND ACCESS

Prospecting Authority 2613 is in eastern Northern Territory, about 480 miles south east of Darwin (Map 1).

A formed and sealed road connecting Daly Waters on the Stuart Highway to Borroloola provides a good all weather road into the region. Communication from this road to the area investigated is via McArthur River Homestead at Bessie Springs, being limited to the dry season because of the intervening McArthur River.

Tracks diverge from the homestead and are confined to the flood plain of the Kilgour River. An alternate route of entry is gained by an ill-defined track from the old McArthur River Homestead, which is also a dry weather track. The latter track follows the eastern bank of the McArthur upstream until the junction of the Kilgour River, where this track connects with those from the present homestead at Bessie Springs.

3. TENURE

Authority to Prospect 2613 is held by the McArthur River Cattle Company and covers an area of 216 square miles.
4. TOPOGRAPHY

The rocks of the McArthur Group are flat to undulating and extensively covered by alluvium from the Kilgour River. The survey area is confined to a narrow north-south corridor formed by the steep sided slopes of the Abner sandstone to the west and the Bukalara sandstone to the east.

The Kilgour River arises further to the south and flows through sediments of the McArthur Group before entering the Prospecting Authority. Within the survey area minor drainage systems arise in the sandstones on either side of the corridor and enter the valley via deeply incised gorges before joining the Kilgour River.

5. GEOLOGY

The geology is dominated by the Upper proterozoic and Lower Cambrian sandstones which form the Abner Range and Bukalara Plateau respectively.

The Bukalara sandstone outcrops principally to the east but also occurs within the Abner Range where it forms a syncline. The sandstone is generally flat lying and overlies the Proterozoic units to form a plateau. It consists of a buff massive medium grained feldspatic sandstone and quartz sandstone characterised by cross bedding, and a distinctive east-west striking joint system.

The Abner Range is composed of sandstone of the Roper Group and overlies the McArthur units. The group is principally fine to medium grained quartz sandstones, feldspatic sandstone, siltstone with occurrences of glauconitic sandstone and flaggy micaceous sandstone. In places, the sandstone has weathered into groups of pillars, and has developed a strong rectangular joint pattern.

The McArthur Group is confined to the Kilgour Valley as irregularly outcropping rocks of massive dolomite, algal dolomite, dolomitic siltstone, chert and chert breccia, plus quartz sandstone.

The terraced character of algal dolomite and flaggy dolomite, typical of the Tooganinnie Formation is confined to the south, while a minor occurrence of silicified dolomite with bands of small irregular chert nodules which sub-parallel the bedding occurs immediately to the north (Amos Formation?).

A sequence of flaggy laminated buff dolomite and interbedded massive and algal dolomites forming the Emmerugga Dolomite is located in Windy Gully and occurs on either side of the Kilgour River.

Along the Kilgour River are also scattered outcrops of dolomite and chert of the Billengarrah Formation.
6. GEOCHEMISTRY

To assess potential areas of interest within the McArthur Group a programme of regional stream sediment geochemistry was decided on, to be followed up by more detailed geochemical sampling where warranted.

A major problem in the programme was in the interpretation of some of the results. The topography is dominated by the sandstone plateaux to either side, consequently sampling of the dolomitic sediments may not be truly affected along the margins.

The risk of not finding an anomalous zone may occur, but this was minimised by an active prospecting programme in conjunction with sampling.

7. WORK CARRIED OUT

A sampling density of approximately 10 samples per square mile was affected, sieving to -80 mesh on site, analysis of all samples being carried out by Sampey Exploration Services.

Total stream sediment samples collected - 676.

7.1. Reliability of Results

To check on the repeatability of results, random samples were split and submitted for assay, the duplicate samples were then compared.

7.2. Treatment of Data

All results have been sorted for statistical interpretation by graphical representation of the frequency distribution of data, the resulting values being limited by 5 per cent confidence limits.

8. RESULTS AND DISCUSSION

8.1. Repeatability of Results

Twenty-eight duplicated samples were submitted to Sampey Exploration Services for analysis in which the differences between assays have been illustrated on the accompanying frequency curves (Figure 1).

In all cases 82 per cent of the results have a difference equal to or less than 10p.p.m. and in respect to copper this can be increased 97 per cent. The curves for both lead and zinc levelled off after the 10p.p.m. difference due to increased differences with higher values (zinc 50p.p.m. duplicate 15p.p.m., lead 80p.p.m. compared to 50p.p.m.).
8.2. Copper

Background values of 10 p.p.m., with a threshold of 25 p.p.m. in which two anomalous values have been determined. A response of 40 p.p.m. occurs in a small stream with calcareous sediments in the proximity of a fault contact between Cambrian limestone and Proterozoic sandstone (Tatoola sandstone). The second sample of 35 p.p.m. occurs in the Tooganinie Formation in an area with a higher geochemical background, than the calculated background. Apart from the stream carrying dolomitic sediments, there are no significant remarks in field reports (Map 3).

These values are of a low order and of no further interest.

8.3. Lead

With a background of 15 p.p.m. (Figure 2) three anomalies occur, of which two are low order responses. On the south western limb of the Windy Gully anticline a response of 40 p.p.m. occurs in the Emmerugga Dolomite and a stream draining the same unit to the north shows a value of 50 p.p.m., both streams carry dolomitic sediments.

The 40 p.p.m. anomaly is close to an outlier of the Amos Formation, which generally has a background above the norm. The 50 p.p.m. anomaly occurs in an environment of black soil in association with a low order zinc anomaly.

In the latter case the alluvial environment and the isolated instance of both anomalies is not very encouraging, therefore no further work is warranted.

The third anomaly occurs in two adjacent samples, the streams of which drain the Emmerugga and Billengarrah Formations. Both samples are at least twelve times background (175 p.p.m. and 240 p.p.m.) and are worth further investigation because of their magnitude (Map 4).

8.4. Zinc

A background of 15 p.p.m. shows many scattered anomalies, most of which are equal to, or greater than, the threshold of 45 p.p.m. In most cases, these values reflect a low response from a geochemical relief of higher tenor than average.

Within the Emmerugga Dolomite, two anomalies of 95 and 100 p.p.m. are not very encouraging, field reports show that the former is from a sandstone sediment and the latter from a swale. To the north, a 65 p.p.m. anomaly occurs in an environment of black soil in a stream carrying calcareous sediment (Map 5).

The isolated responses of these samples and also experience has shown that zinc anomalies of this order in black soil need not be taken seriously, suggests that no further interest is warranted.
8.5. Cobalt and Nickel

Both elements show a reasonably consistent background value (10 p.p.m.) with minor variations, the character of which suggests local geochemical backgrounds above the norm. (Maps 6 and 7).

One anomalous cobalt value is of no interest because of its isolation and it is possibly associated with a concealed fault.

Strongly anomalous areas are lacking and so the area does not warrant further activity.

8.6. Mineral Associations

Elements that are commonly associated in such geochemical surveys appear to have little, if any, correlation in their anomalous distributions, with one exception (sample 153959). This is a low order lead-zinc response in a black soil environment, otherwise the use of such associations is of no assistance in interpretation.

9. SCINTILLOMETER SURVEY

A helicopter borne scintillometer survey was made over the Roper sandstones and Bukalara sandstone, the units which overlie the McArthur Group.

Flight patterns were concentrated along the vertical sections of units of interest, any positive response being investigated by ground traverses during the program. Instruments used were PUG 1 and BGS - 1S.

The airborne survey was enlarged upon at a later date by ground surveys of a few of the gorges formed in the sandstones (Map 8).

9.1. Results

The sandstone units investigated produced a negative response, therefore the area is of no further interest.

10. CONCLUSION

The geochemical relief of the dolomitic units along the Kilgour River is fairly uniform for all elements analysed, with common local variations in parts of the Tooganinie and Emmerugga Formations.

Mineral associates that are commonly encountered in geochemical surveys are absent, and as far as can be assessed from a regional geochemical reconnaissance survey, the area bears little economic potential with one exception.

This exception is a lead anomaly formed by two adjacent samples, taken from streams which drain the Emmerugga and Billengarrah Formations. This anomaly (175 and 240 p.p.m. in a background of 15 p.p.m.) occurs in two streams approximately 1,000 feet apart. In regard to this anomaly consideration has to be given to the
conclusion that higher results are open to doubt, and this anomaly may not be repeatable.

The sandstones within the Prospecting Authority also are of low or no economic potential.

11. RECOMMENDATIONS

The two streams showing an anomalous lead response be resampled to check on the validity of this anomaly. If warranted, then further sampling be carried out to determine the potential of this locality by ridge and spur soil sampling at 200 foot intervals.

A minimum work load would be two stream samples with a maximum of two stream samples and twenty-eight soil samples.

The remainder of the area is of little potential and no further work is warranted.

12. REFERENCE

Figure 1:

Check Assays.

Copper
Lead
Zinc
SUMMARY

McARTHUR RIVER CATTLE COMPANY

REGIONAL RECONNAISSANCE GEOCHEMICAL SURVEY

OF THE McARTHUR GROUP SEDIMENTS

PROSPECTING AUTHORITY 2613

OBJECT

To assess the economic potential of the dolomitic sediments of the McArthur Group.

LOCATION

Prospecting Authority 2613 is approximately 480 miles south east of Darwin in the Northern Territory.

TENURE

McArthur River Cattle Company holds the Authority which covers an area of 216 square miles.

PRECIS

Previous work had been carried out by Carpentaria Exploration Company Pty. Ltd. and the Bureau of Mineral Resources in the course of generalised prospecting and regional mapping, during which no areas of interest had been delineated.

Present activity has consisted of:

1. A regional reconnaissance geochemical survey over dolomitic units of the McArthur Group. A total of 676 stream sediment samples were collected and sieved to -80 mesh. Samples were analysed by Sampey Exploration Services for copper, lead, zinc, nickel and cobalt.

2. Accuracy of results by testing duplicate samples revealed that higher results are open to question.

3. An airborne and ground scintillometer survey was made over the sandstone groups overlying the McArthur Group using a PUG 1 and BGS-1S.
CONCLUSION

The geochemical relief of the dolomitic units along the Kilgour River is fairly uniform for all elements analysed, with common local variations in parts of the Tooganinie and Emmerugga formations.

Mineral associations that are commonly encountered in geochemical surveys are absent, and as far as can be assessed from a regional geochemical reconnaissance survey, the area bears little economic potential with one exception.

This exception is a lead anomaly formed by two adjacent samples taken from streams which are in the Emmerugga and Billengarrah Formations.

This anomaly (175 and 240 p.p.m. in a background of 15 p.p.m.) occurs in two streams approximately 1,000 feet apart. In regard to this anomaly consideration has to be given to the conclusion that higher results are open to doubt, and this anomaly may not be repeatable.

The sandstones within the Prospecting Authority also are of low or no economic potential.

RECOMMENDATION

The two streams showing an anomalous lead response be re-sampled to check on the validity of this anomaly. If warranted then further sampling be carried out to determine the potential of this locality by ridge and spur soil sampling at 200 foot intervals.

A minimum work load would be two stream samples with a maximum of two stream samples and twenty-eight soil samples.

The remainder of the area is of little potential and no further work is warranted.
2nd January 1970.

The Director,
Mines & Water Resources Branch,
N.T. Administration,
DARWIN  N.T.  5790

Dear Sir,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 6 1969/70
GREENWOOD A to P 2406

In compliance with condition three of our Authority to Prospect we report that for the four weekly period ended 10th December 1969, the following work was done:

Geological reconnaissance of part of the area was made by two geologists in company with a local prospector. Access is a vital matter in regard to this area and work is planned to commence early in the new year.

Expenditure for Period 6 $50.00
Expenditure for year to date $424.00

Yours faithfully,

AUSTRALIAN DEVELOPMENT NO LIABILITY
Exploration Managers for NOBELEX N.L.

L.F. ROACH,
General Manager.

CR1972 0118
3rd February 1970.

The Director,
Mines & Water Resources Branch,
N.T. Administration,
DARWIN N.T. 5790

Dear Sirs,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 7 1969/70

GREENWOOD A to P 2406

In compliance with condition three of our Authority to Prospect we report that for the four weekly period ended 7th January 1970, the following work was done:

Further ground reconnaissance of the area was made with Mr. McLean, a local prospector.

Expenditure for Period 7
(Cost of aerial photography mainly)
Expenditure for year to date

$2405.00
$2829.00

Yours faithfully,

AUSTRALIAN DEVELOPMENT NO LIABILITY
Exploration Managers for NOBELEX N.L.

L. F. ROACH,
General Manager.
6th March 1970

The Director,
Mines & Water Resources Branch,
N.T. Administration,
DARWIN N.T. 2799

Dear Sirs,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 8 1969/70
GREENWOOD A to P 2406

In compliance with condition three of our Authority to Prospect we report that for the four weekly period ended 4th February 1970, the following work was done:-

No work for period.

Expenditure for Period 8 $20.00
Expenditure for year to date $2,849.00

Yours faithfully,

AUSTRALIAN DEVELOPMENT NO LIABILITY Exploration Managers for NOBELEX N.L.

[Signature]
L. F. Roach,
General Manager.
2nd April 1970.

The Director,
Mines & Water Resources Branch,
N.T. Administration,
DARWIN, N.T. 3790.

Dear Sir,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 9 1969/70

GREENWOOD A. TO F. 2406

In compliance with condition three of our authority to Prospect we report that for the four weekly period ended 4th March 1970, the following work was done:

Compilation of an uncontrolled base plan using the Bonney Well photo series is in progress. Low level aeromagnetic survey expected to commence mid-April.

Expenditure for Period 9 $165.00
Expenditure for year to date $3,014.00

Yours faithfully,

AUSTRALIAN DEVELOPMENT NO LIABILITY,
Exploration Managers for NOBELEX N.L.

L. F. Roach
General Manager.
20th April, 1970.

The Director,
Mines & Water Resources Branch,
N.T. Administration,
DARWIN N.T. 5790

Dear Sir,

NOBBLEX N.L. EXPLORATION REPORT - PERIOD 10 1969/70
GREENWOOD A. TO P. 2496

In compliance with condition three of our Authority to Prospect we report that for the four weekly period ended 1st April 1970, the following work was done:

Compilation of uncontrolled base plan of area in progress. Continued appraisal and planning.

Expenditure for Period 10 $36.00
Expenditure for year to date $3,050.00

Yours faithfully,

AUSTRALIAN DEVELOPMENT NO LIABILITY,
Exploration Managers for NOBBLEX N.L.,

L.F. ROACH,
General Manager.
27th May, 1970

The Director,
Mines & Water Resources Branch,
N.T. Administration,
DARWIN N.T. 5790

Dear Sir,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 11 1969/70
GREENWOOD A. TO P. 2406

In compliance with condition three of our Authority to Prospect we report that for the four weekly period ended 29th April 1970, the following work was done:-

Compilation of uncontrolled base plan of area in progress. Continued appraisal and planning.

Expenditure for Period 11 $126
Expenditure for year to date $3,176

Yours faithfully,

AUSTRALIAN DEVELOPMENT NO LIABILITY,
Exploration Managers for NOBELEX N.L.,

L.F. ROACH,
General Manager.
6th July, 1970

The Director,
Mines & Water Resources Branch,
N.T. Administration,
DARWIN N.T. 5790

Dear Sir,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 12 1969/70
GREENWOOD A. TO P. 2406

In compliance with condition three of our Authority to Prospect we report that for the four weekly period ended 27th May 1970, the following work was done:

Continued appraisal and planning.
Expenditure for Period 12 $39
Expenditure for year to date $3,215

Yours faithfully,

AUSTRALIAN DEVELOPMENT NO LIABILITY,
Exploration Managers for NOBELEX N.L.,

[Signature]

L.F. ROACH,
General Manager.
31st July, 1970

The Director,
Mines & Water Resources Branch,
N.T. Administration,
DARWIN   N.T.   5790

Dear Sir,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 13 1969/70
GREENWOOD A. TO P. 2406

In compliance with condition three of our Authority to Prospect we report that for the four weekly period ended 24th June 1970, the following work was done:

Continued geological assessment of area. Still awaiting commencement of low-level aeromagnetometry.

Expenditure for Period 13 $155
Expenditure for year to date $3370

Yours faithfully,

AUSTRALIAN DEVELOPMENT NO LIABILITY,
Exploration Managers for NOBELEX N.L.,

L.F. Roach
L.F. ROACH,
General Manager.

The Director,
Mines & Water Resources Branch,
N.T. Administration,
DARWIN N.T. 5790

Dear Sir,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 1 1970/71
GREENWOOD A. TO P. 2406

In compliance with condition three of our Authority to Prospect we report that for the four weekly period ended 22nd July 1970, the following work was done:-

B.M.R. 3 Area - A review of data from this area is progressing.

Still awaiting commencement of low level aeromagnetometry. Application for renewal was made in July.

<table>
<thead>
<tr>
<th>Expenditure for Period 1</th>
<th>$1,153</th>
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<tbody>
<tr>
<td>Expenditure for year to date</td>
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<tr>
<td>Expenditure for A. to P. to date</td>
<td>$4,523</td>
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</tbody>
</table>

Yours faithfully,

AUSTRALIAN DEVELOPMENT NO LIABILITY,
Exploration Managers for NOBELEX N.L.,

L.F. ROACH
General Manager.
11th September, 1970.

The Director,
Mines & Water Resources Branch,
N.T. Administration,
DARWIN N.T. 5790

Dear Sir,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 2 1970/71

GREENWOOD A. TO P. 2406

In compliance with condition three of our Authority to Prospect we report that for the four weekly period ended 19th August 1970, the following work was done:-

An aerial reconnaissance of the entire area was made by Company geologists and Company Associates.
Low level aeromagnetometry commenced.
An application for renewal of this lease to P. for a further twelve months from its expiry date (7.10.70) was submitted in July, 1970.

Review of B.M.R. 3 area progressing.

Expenditure for Period 2  $12,352
Expenditure for year to date  $13,505
Expenditure on A. to P. to date  $16,875

Yours faithfully,

AUSTRALIAN DEVELOPMENT NO LIABILITY
Exploration Managers for NOBELEX N.L.,

[Signature]

L.F. ROACH,
General Manager.
2nd October, 1970.

The Director,
Mines & Water Resources Branch,
N.T. Administration,
DARWIN N.T. 5790

Dear Sir,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 3 1970/71
GREENWOOD A. TO P. 2406

In compliance with condition three of our Authority to Prospect we report that for the four weekly period ended 16th September 1970, the following work was done:-

Low level aeromagnetometry of entire area nearing completion.

Expenditure for Period 3 $46
Expenditure for year to date $13,551
Expenditure on A. to P. to date $16,921

Yours faithfully,

AUSTRALIAN DEVELOPMENT NO LIABILITY,
Exploration Managers for NOBELEX N.L.,

L.F. ROACH,
General Manager.
12th November, 1970.

The Director,
Mines & Water Resources Branch,
N.T. Administration,
DARWIN  N.T.    5790

Dear Sir,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 4 1970/71
GREENWOOD A. TO P. 2406

In compliance with condition three of our Authority to Prospect we report that for the four weekly period ended 14th October 1970, the following work was done:-

Low level aeromagnetometry of entire area complete.
Awaiting the magnetic contour sheets.

Expenditure for Period 4

Expenditure for year to date $13,551
Expenditure on A. to P. to date $16,921

Yours faithfully,

AUSTRALIAN DEVELOPMENT NO LIABILITY,
Exploration Managers for NOBELEX N.L.,

L. F. ROACH

L.F. ROACH,
General Manager.
2nd December, 1970.

The Director,
Mines & Water Resources Branch,
N.T. Administration,
DARWIN N.T. 5790

Dear Sir,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 5 1970/71
GREENWOOD A. TO P. 2406

In compliance with condition three of our Authority to Prospect we report that for the four weekly period ended 11th November 1970, the following work was done:-

Processing of low level aeromagnetometry continuing.

Expenditure for Period 5. $700
Expenditure for year to date. $14,251
Expenditure on A. to P. to date. $17,621

Yours faithfully,

AUSTRALIAN DEVELOPMENT NO LIABILITY,
Exploration Managers for NOBELEX N.L.,

L.F. ROACH
General Manager.

The Director,
Mines & Water Resources Branch,
N.T. Administration,
DARWIN N.T. 5790

Dear Sir,

NOBBLEX N.L. EXPLORATION REPORT - PERIOD 6 1970/71
GREENWOOD A, TO P. 2406

In compliance with condition three of our Authority to Prospect we report that for the four weekly period ended 9th December, 1970, the following work was done:

The processing of low level aeromagnetometry results is continuing.

- Expenditure for Period 6. Nil
- Expenditure for year to date. $14,251
- Expenditure on A. to P. to date. $17,621

Yours faithfully,

AUSTRALIAN DEVELOPMENT NO LIABILITY,
Exploration Managers for NOBBLEX N.L.,

L.F. ROACH,
General Manager.

The Director,
Mines & Water Resources Branch,
N.T. Administration,
DARWIN  N.T.  5790

Dear Sir,

NOBBLEX N.L. EXPLORATION REPORT - PERIOD 7 1970/71
GREENWOOD A. TO F. 2406

In compliance with condition three of our Authority to Prospect we report that for the four weekly period ended 6th January 1971, the following work was done:-

A reconnaissance field trip was made to the Authority to Prospect to (a) determine access, (b) contact the owner of McLaren Creek property, (c) determine whether any of the magnetic disturbances found on the low level aeromagnetometry could be attributed to high grade metamorphics (Archaen?). The only high grade metamorphics seen were those already known in the B.M.R. 3 Area.

...2...
All other outcrops were unmetamorphosed Warramunga (?) equivalents or the younger Hatches Creek formation. Access through the entire Authority to Prospect is generally good.

Expenditure for Period 7. $504
Expenditure for year to date. $14,743
Expenditure on A. to P. to date. $18,125

Yours faithfully,

AUSTRALIAN DEVELOPMENT LIMITED,
Exploration Managers for NOBELEX N.L.,

L. F. Roach

L.F. ROACH,
General Manager.

The Director,
Mines & Water Resources Branch,
Northern Territory Administration,
DARWIN,    N.T.    5790.

Dear Sir,

NOBELEX N.L. EXPLORATION - PERIOD 8 1970/71
GREENWOOD A. TO P. 2406

In compliance with condition three of our Authority to Prospect we report that for the four weekly period ended 3rd February, 1971, the following work was done:

Preparations for a ground follow-up of airborne magnetometry are in progress.

Expenditure for Period 8  $21,427
Expenditure for year to date $36,170
Expenditure on A. to P. to date $39,552

Yours faithfully,
AUSTRALIAN DEVELOPMENT LIMITED
Exploration Managers for NOBELEX N.L.

L. F. Roach

L. F. ROACH,
General Manager.

RHW:JS:2/4
The Director,
Mines & Water Resources Branch,
Northern Territory Administration,
DARWIN, N.T. 5790.

Dear Sir,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 9 1970/71
GREENWOOD A. TO P. 2406

In compliance with condition three of our Authority to Prospect we report that for the four weekly period ended 3rd March, 1971, the following work was done:

Planning for follow-up ground magnetics is well advanced.

Expenditure for Period 9 $296
Expenditure for year to date $36,466
Expenditure on A. to P. to date $39,848

Yours faithfully,
AUSTRALIAN DEVELOPMENT LIMITED
Exploration Managers for NOBELEX N.L.

L. F. ROACH,
General Manager.
22nd April, 1971.

The Director,
Mines & Water Resources Branch,
Northern Territory Administration,
DARWIN, N.T. 5790.

Dear Sir,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 10 1970/71
GREENWOOD A. TO P. 2406

In compliance with condition three of our Authority to Prospect we report that for the four weekly period ended 31st March, 1971, the following work was done:

Preparation of a final quote for ground follow-up by contractors is nearing completion

- Expenditure for Period 10: $11,097
- Expenditure for year to date: $47,563
- Expenditure on A.P. to date: $50,945

Yours faithfully,
AUSTRALIAN DEVELOPMENT LIMITED
Exploration Managers for NOBELEX N.L.

L. F. ROACH
General Manager.

The Director,
Mines & Water Resources Branch,
Northern Territory Administration,
DARWIN, N.T. 5794.

Dear Sir,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 11 1970/71
GREENWOOD A. TO P., 2406

In compliance with condition three of our Authority to Prospect we report that for the four weekly period ended 28th April, 1971, the following work was done:

No field work carried out during the period.

A contract was let to McPhar Geophysics to carry out ground follow-up magnetics on approximately 35 anomalies. The contract was let on 8th April, and it is expected that work will commence on about 20th May.

Expenditure for Period 11 $181
Expenditure for year to date $47,744
Expenditure on A. to P. to date $51,126

Yours faithfully,

AUSTRALIAN DEVELOPMENT LIMITED
MANAGING AGENTS FOR NOBELEX N.L.

L. F. ROACH
General Manager.

RHW:JS:2/4
The Director,
Mines & Water Resources Branch,
Northern Territory Administration,
DARWIN, N.T. 5790.

Dear Sir,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 13 1970/71
GREENWOOD A. TO P. 2406

In compliance with condition three of our Authority to Prospect we report that for the five week period ended 30th June, 1971, the following work was done:-

All the anomalies selected for initial follow-up on Greenwood A. to P. have been located and gridding is almost complete. Detailing will be commenced when Gosse River is completed.

Mapping of the A. to P. at photo scale is completed.

Further detail round the gridding areas remains to be completed.

It has been found that while the anomalies in area 1 are within Warramunga type sediments, they are largely associated with a banded jasper-hematite rock. This is thought to be a deep water equivalent of the hematite shale, but it has not yet been conclusively demonstrated. Warramunga sediments are also known in Areas 2, 4 and 5, either from outcrop or from drilling. No banded jasper hematite has been found in these areas to date.

Expenditure for Period 13  $9,020
Expenditure for year to date  $59,659
Expenditure on A. to P. to date  $63,040

Yours faithfully,
AUSTRALIAN DEVELOPMENT LIMITED
Managing Agents for NOBELEX N.L.

L. F. ROACH, General Manager.

RHN:JS:2/4

The Director,
Mines & Water Resources Branch,
Northern Territory Administration,
DARWIN, N.T. 5790.

Dear Sir,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 1 1971/72
GREENWOOD A. TO P. 2406

In compliance with condition three of our Authority to Prospect, we report that for the four week period ended 28th July, 1971, the following work was done:

Location of the grids, and further detailed mapping at photo scale have been commenced during the period.

<table>
<thead>
<tr>
<th>Expenditure</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expenditure for Period 1</td>
<td>$9,894</td>
</tr>
<tr>
<td>Expenditure for year to date</td>
<td>$9,894</td>
</tr>
<tr>
<td>Expenditure on A. to P. to date</td>
<td>$72,934</td>
</tr>
</tbody>
</table>

Yours faithfully,

AUSTRALIAN DEVELOPMENT LIMITED
Managing Agents for NOBELEX N.L.

L. F. ROACH,
General Manager.
10th September, 1971.

The Director,
Mines & Water Resources Branch,
Northern Territory Administration,
DARWIN.  N.T.  5790.

Dear Sir,

MOBELEX N.L. EXPLORATION REPORT - PERIOD 2 1971/72
GREENWOOD A. TO P. 2406

In compliance with condition three of our Authority to
Prospect, we report that for the four week period ended 25th
August, 1971, the following work was done:

<table>
<thead>
<tr>
<th>Footage Summary:</th>
<th>Period 2:</th>
<th>Year to Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anomalies Located</td>
<td>N11</td>
<td>N11</td>
</tr>
<tr>
<td>&quot; Gridded</td>
<td>N11</td>
<td>N11</td>
</tr>
<tr>
<td>&quot; Detailed</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>&quot; Contoured</td>
<td>N11</td>
<td>N11</td>
</tr>
</tbody>
</table>

Work commenced on detailing the 22 grids completed last year.
Detailing has been completed on eight grids.

Expenditure for Period 2  $771
Expenditure for year to date $1,076
Expenditure on A. to P. to date $73,705

Yours faithfully,
AUSTRALIAN DEVELOPMENT LIMITED
Managing Agents for MOBELEX N.L.

L. F. Roach
L. F. ROACH,
General Manager.

The Director,
Mines & Water Resources Branch,
Northern Territory Administration,
DARWIN, N.T. 5750.

Dear Sir,

NOBELEX N.L. EXPLORATION REPORTS - PERIOD 3 1971/72
GREENWOOD A. TO P. 2406

In compliance with condition three of our Authority to
Prospect, we report that for the four week period ended 22nd
September, 1971, the following work was done:-

<table>
<thead>
<tr>
<th>Footage Summary</th>
<th>Period 3:</th>
<th>Year to Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anomalies located</td>
<td>N11</td>
<td>N11</td>
</tr>
<tr>
<td>Anomalies gridded</td>
<td>N11</td>
<td>N11</td>
</tr>
<tr>
<td>&quot; detailed</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>&quot; contoured</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

Location of all grids is complete and mapping of gridded
areas on outcrop at 1" = 200' is continuing.

Expenditure for period 3  $1,606
Expenditure for year to date $2,682
Expenditure on A. to P. to Date $75,311

Yours faithfully,
AUSTRALIAN DEVELOPMENT LIMITED
Managing Agents for NOBELEX N.L.

L. F. Roach
General Manager.
The Director of Mines,
Mines Branch,
Northern Territory Administration,
DARWIN, N.T. 5790.

Dear Sir,

MOBELEX N.L. EXPLORATION REPORT - PERIOD 4 1971/72
GREENWOOD A. TO P. 2406

In compliance with condition three of our Authority to Prospect, we report that for the four week period ended 20th October, 1971, the following work was done:

**Footage Summary:**

<table>
<thead>
<tr>
<th>Anomalies Located</th>
<th>Period 4:</th>
<th>Year to Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gridded</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Detailed</td>
<td>7</td>
<td>23</td>
</tr>
<tr>
<td>Contoured</td>
<td>7</td>
<td>23</td>
</tr>
</tbody>
</table>

Our consultants have completed their contract for the 36 anomalies and the contoured results have been presented. Of the 36 anomalies seven have been selected for immediate follow-up.

Geological mapping complete and drafting in progress.

Expenditure for Period 4: $16,256
Expenditure for year to date: $18,938
Expenditure on A. to P. to date: $91,567

Yours faithfully,
AUSTRALIAN DEVELOPMENT LIMITED
Managing Agents for MOBELEX N.L.

L. F. ROACH,
General Manager.
7th December, 1971.

The Director,
Mines Branch,
Northern Territory Administration,
DARWIN, N.T. 5790.

Dear Sir,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 5 1971/72
GREENWOOD A. TO P. 2406

In compliance with condition three of our Authority to Prospect, we report that for the four week period ended 17th November, 1971, the following work was done:

Footage Summary:

<table>
<thead>
<tr>
<th>Footage Summary</th>
<th>Period 5</th>
<th>Year to Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anomalies located</td>
<td>N11</td>
<td>1</td>
</tr>
<tr>
<td>&quot; gridded</td>
<td>N11</td>
<td>1</td>
</tr>
<tr>
<td>&quot; detailed</td>
<td>N11</td>
<td>23</td>
</tr>
<tr>
<td>&quot; contoured</td>
<td>N11</td>
<td>23</td>
</tr>
</tbody>
</table>

Geology and drafting complete on all 1" = 200' geological plans.

Expenditure for Period 5     $9,359
Expenditure for year to date $28,297
Expenditure on A. to P. to date $100,926

Yours faithfully,

AUSTRALIAN DEVELOPMENT LIMITED
Managing Agents for NOBELEX N.L.

L. F. ROACH,
General Manager.
The Director,
Mines Branch,
Northern Territory Administration,
DARWIN, N.T. 5790.

Dear Sir,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 6 1971/72
GREENWOOD A. TO P. 2406

In compliance with condition three of our Authority to Prospect, we report that for the four week period ended 15th December, 1971, the following work was done:

<table>
<thead>
<tr>
<th>Footage Summary</th>
<th>Period 6</th>
<th>Year to Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gridding</td>
<td>20,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Magnetometry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gridding</td>
<td>NIL</td>
<td>NIL</td>
</tr>
<tr>
<td>Profiling</td>
<td>NIL</td>
<td>NIL</td>
</tr>
</tbody>
</table>

GW 601 602: Principal profiles have been pegged over the three anomalies covered by these two grids.

Expenditure for Period 6: $2,328
Expenditure for Year to date: $30,625
Expenditure on A. to P. to date: $103,254

Yours faithfully,

AUSTRALIAN DEVELOPMENT LIMITED
Managing Agents for NOBELEX N.L.

L. F. ROACH,
General Manager.

RHM:JS:2/4
17th February, 1972.

The Director,
Mines Branch,
Northern Territory Administration,
DARWIN, N.T. 5790.

Dear Sir,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 7 1971/72
GREENWOOD A. TO P. 2406

In compliance with condition three of our Authority to PROspect, we report that for the four week period ended 12th January, 1972, the following work was done:

<table>
<thead>
<tr>
<th>Footage Summary:</th>
<th>Period 7:</th>
<th>Year to Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gridding</td>
<td>63,300</td>
<td>83,300</td>
</tr>
<tr>
<td>Magnetometry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gridding</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Profiling</td>
<td>72,000</td>
<td>72,000</td>
</tr>
</tbody>
</table>

**GN601, 602, 610:** Principle profiles have been completed and the data forwarded to our consultants.

- Expenditure for Period 7: $1,323
- Expenditure for year to date: $31,948
- Expenditure on A. to P. to date: $104,577

Yours faithfully,

AUSTRALIAN DEVELOPMENT LIMITED
Managing Agents for NOBELEX N.L.

[Signature]
L. F. ROACH,
General Manager.

The Director,
Mines Branch,
Northern Territory Administration,
DARWIN, N.T. 5790.

Dear Sir,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 8 1971/72
GREENWOOD A. TO F. 2406

In compliance with condition three of our Authority to Prospect, we report that for the four week period ended 9th February, 1972, the following work was done:

<table>
<thead>
<tr>
<th>Footage Summary</th>
<th>Period 8</th>
<th>Year to Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gridding</td>
<td>39,300</td>
<td>122,600</td>
</tr>
<tr>
<td>Magnetometry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gridding</td>
<td>36,500</td>
<td>36,500</td>
</tr>
<tr>
<td>Profiling</td>
<td>62,000</td>
<td>134,000</td>
</tr>
<tr>
<td>Auger Drilling</td>
<td>398</td>
<td>398</td>
</tr>
</tbody>
</table>

GW502: Data collection is complete and results have been forwarded to our consultants.

GW606, 101, 104, 301, 307: Data collection in various stages of completion.

GW602: Auger drilling commenced.

Expenditure for Period 8 $1,550
Expenditure for year to date $33,498
Expenditure on A. to F. to date $106,127

Yours faithfully,
AUSTRALIAN DEVELOPMENT LIMITED
Managing Agents for NOBELEX N.L.

L. F. ROACH, General Manager.
30th March, 1972.

The Director,
Mines Branch,
Northern Territory Administration,
DARWIN, N.T. 5790.

Dear Sir,

NOBELEX N.L. EXPLORATION REPORT - PERIOD 9 1971/72
GREENWOOD A. TO P. 2406

In compliance with condition three of our Authority to Prospect, we report that for the four week period ended 8th March, 1972, the following work was done:

Activity: Per. 9 Year to Date:
Profile Gridding Nil 92,500ft.
Detail Gridding 32,100ft. 89,100ft.
Profile Magnetometry 30,500ft. 233,700ft.
Detail Magnetometry 18,000ft. 54,500ft.
Regional Magnetometry 6,000ft. 6,000ft.
Auger Drilling 441ft. 839ft.
Assays Submitted Nil 100.7 acres
Detail Mapping Nil 91
Contract Magnetometry Nil 1,104,000ft.
Contract Gridding Nil 48,000ft.
Expenditure for Period 9 $2,728
Expenditure for year to date $36,226
Expenditure on A. to P. to date $108,855

Yours faithfully,
AUSTRALIAN DEVELOPMENT LIMITED
Managing Agents for NOBELEX N.L.

L. F. ROACH,
General Manager.
Applicant: NOBELEX, N.L.

Area: 985 square miles

Area Granted: 985 square miles

Approved: 8th October 1969

Perio: Twelve (12) months to 1st October 1970

Location: Kelly West

Mine Area: All

Goldfield: Warramunga

All that piece or parcel of land in the Northern Territory of Australia containing an area of 985 square miles more or less, the boundaries of which are described as follows:

Commencing at the intersection of latitude 19 degrees 40 minutes 00 seconds with longitude 133 degrees 50 minutes 00 seconds thence proceeding to the intersection of latitude 19 degrees 41 minutes 50 seconds with longitude 133 degrees 59 minutes 40 seconds thence proceeding to the intersection of latitude 19 degrees 42 minutes 00 seconds with longitude 133 degrees 59 minutes 40 seconds thence proceeding to the intersection of latitude 19 degrees 43 minutes 00 seconds with longitude 134 degrees 05 minutes 00 seconds thence proceeding to the intersection of latitude 19 degrees 44 minutes 40 seconds with longitude 134 degrees 05 minutes 00 seconds thence proceeding to the intersection of latitude 19 degrees 45 minutes 40 seconds with longitude 134 degrees 12 minutes 20 seconds thence proceeding to the intersection of latitude 19 degrees 54 minutes 40 seconds with longitude 134 degrees 12 minutes 20 seconds thence proceeding to the intersection of latitude 20 degrees 00 minutes 00 seconds with longitude 134 degrees 12 minutes 50 seconds thence proceeding to the intersection of latitude 20 degrees 10 minutes 00 seconds with longitude 134 degrees 14 minutes 00 seconds thence proceeding to the intersection of latitude 20 degrees 20 minutes 00 seconds with longitude 134 degrees 14 minutes 00 seconds thence proceeding to the intersection of latitude 20 degrees 30 minutes 00 seconds with longitude 134 degrees 15 minutes 00 seconds thence proceeding to the intersection of latitude 20 degrees 30 minutes 00 seconds with longitude 134 degrees 05 minutes 00 seconds thence proceeding to the intersection of latitude 20 degrees 30 minutes 00 seconds with longitude 133 degrees 50 minutes 00 seconds thence proceeding to the intersection of latitude 19 degrees 44 minutes 40 seconds with longitude 133 degrees 49 minutes 00 seconds thence to the point of commencement excluding therefrom all reserves, all