C.R.A. EXPLORATION PTY. LIMITED

CONFIDENTIAL

FINAL REPORT OF EXPLORATION TO 21.12.82

GOODPARLA EL 1092

and NAMOONA ML's
79A, 80A, 87A,
88A, 89A, 90A,
91A, 92A, 93A, 94A

submitted by: K.R. Alexander .....

accepted by: W.H. Johnston .....

copy to : N.T. Department of Mines & Energy
CRA Limited - Melbourne

date : March 1983

Mt Evelyn SD53-5

C283/96A.

Report No:12038

CONTENTS

* Note. Plan transparencies stored separately (Plan 7)

1. SUMMARY

Goodparla EL 1092 was granted to CRA Exploration Pty Ltd on December 22nd 1976. The Namoona Leases, ML's 79A, 80A and 87A to 94A inclusive, surrounded by EL 1092, were subsequently acquired by CRAE on July 30th 1981.

Regional mapping at 1:25 000 scale and soil sampling indicated that pyritic carbonaceous shale horizons of the Namoona Formation were prospective for stratabound base metal mineralisation.

Six soil geochemical anomalies were selected for follow up soil and rock chip sampling. The anomalies at Namoona and Minglo South were significantly upgraded and then subjected to further follow up work.

Two styles of mineralisation were identified at Minglo South. Shale-hosted lead and zinc mineralisation is cross-cut by quartz veins containing zinc and copper mineralisation. However, rock and soil geochemistry returned low values and it was concluded that the prospect was of no further interest.

Detailed heliborne and ground radiometric surveying in the vicinity of Minglo South indicated that the potential for economic uranium mineralisation was low.

Reconnaissance soil sampling returned high Pb values at Namoona. Follow-up work including closely spaced 'A' and 'C' horizon surveys was carried out prior to selection of drill sites.

Drilling indicated that lead, zinc, silver mineralisation at Namoona is related to a potassic rhyolite intruding black shales. Base metal mineralisation has limited strike length and width. No economically significant secondary enrichment of silver has occurred in the oxidised zone.

A gravity survey carried out in July 1982 did not indicate the presence of any substantial mineralised body at depth.

2. INTRODUCTION

An option agreement between CRAE and the owner of the Namoona Mining Leases, the late Mr H. Brennan was signed on March 31st 1976. The ten leases, ML's 79A, 80A and 87A to 94A inclusive, were later surrounded by EL 1092 and finally acquired by CRAE on July 30th 1981. The leases occupy a total area of 1.6 km² and are located between 10600N and 12600N on the Namoona grid (see NTd 847).

CRAE was granted title to Exploration Licence 1092 on December 22nd, 1976 (see NTd 1010). EL 1092 originally covered 408.54 km², was reduced to 99.06 km² after three years and finally reduced to 43.68 km² after the fourth year.

Exploration carried out by CRAE during the first year of tenure has been described by Wills (1978) in CRAE Report No.9158. The second year was described by Ikstrums (1979) in CRAE Report No.9526, the third year by Ikstrums and Steemson (1980) in CRAE Report No.9985 and the fourth year by Ikstrums (1981) in CRAE Report No.10509. Exploration carried out in the latter half of 1981 was described by Cook (1981) in CRAE Report No.10965. Work done in 1982 is described by Chalmers in CRAE Report No.11930.

This final report presents a summary of work done by CRAE on EL 1092 and the Namoona Mining Leases.

3. CONCLUSIONS

Drilling at the Namoona Prospect failed to delineate an economic resource of lead, zinc, silver mineralisation. Secondary enrichment of silver in the oxidised zone is erratic and not of economic significance.

4. SUMMARY OF WORK COMPLETED

4.1. 1977 Regional Exploration

Regional exploration for shale-hosted base metal deposits began in the 1977 field season and included regional mapping, gossan/ironstone sampling and soil sampling.

Mapping was done at 1:25 000 scale as part of a regional programme which also included adjacent EL's 1091, 1093 and 1094. Field traverses were supplemented by colour airphoto interpretation. The stratigraphic sequence obtained is similar to that established by the BMR (Walpole et al 1968, Needham et al, 1977) and covers virtually the whole section developed in the Pine Creek Basin.

Pyritic carbonaceous shale horizons within the Douglas Creek, Koolpin, Maude Creek and Namoona Formations were identified as the most prospective host rocks for base metals mineralisation and these received most attention during the soil sampling programme.

Minus 80 mesh, 'A' horizon samples were collected at 50 metre intervals along traverse lines which averaged 1 km apart along strike. All samples were analysed for copper, lead and zinc.

Ironstones encountered during mapping traverses were sampled and assayed.

4.2. 1978 Data Review and Follow-up Exploration

Statistical analysis of the Pb, Zn and Cu values obtained from 1400 soil samples divided the data into six classes (see Ikstrums, 1979).

All data including stratigraphic position, ironstone assays, extra assays on anomalous samples were then

reviewed and soil anomalies were classified as first, second or third order. Typically, a first order anomaly contained over 120ppm Pb, was more than one sample wide, showed up along strike on more than one regional line, and was thought to be caused by mineralisation. Second order anomalies were thought to be caused by minor mineralisation, while third order anomalies were thought to be unrelated to mineralisation (Ikstrums, 1979).

Six anomalies numbered 4.2, 4.7, 4.11, 4.12, 4.14 and 4.16 (see plan NTd 1010) were selected for follow up testing including close spaced soil traverses, rock chip sampling and magnetic and radiometric measurements. Anomaly 4.2 was not upgraded while 4.11 and 4.12 were upgraded only very marginally. Anomaly 4.14, located over colluvial soils, was further tested by an auger line over the highest soil values. Highest average values over a 25m interval were 727Pb, 3450 Zn, 37 Cu and 165 Mn and further auger drilling was recommended.

4.2.1. Minglo South

Anomaly 4.7 (Minglo South) was considerably upgraded by follow-up soil and rock chip sampling. Further testing then involved geological mapping and systematic soil sampling. 530 minus 80 mesh samples were assayed for Pb, Zn, Mn and Ag. Two types of mineralisation were recognised:-

1. Geochemically anomalous zones over graphitic shale ridges and interpreted to represent

disseminated lead-zinc mineralisation.

2. Cross-cutting quartz veins containing primary and secondary zinc and copper.

However, the interpreted disseminated mineralisation returned only relatively low order anomalous soil values and the cross-cutting mineralisation is sporadic, from which it was concluded that the prospect is of no further interest to CRAE (see Ikstrums, 1979).

Samples taken in July 1978 from a pit at Minglo South 100 metres to the south of the Minglo Mine were anomalous in uranium and an option was signed in October 1978 between CRAE and the lease holders to enable CRAE to conduct exploration over the Minglo lease, ML 105A (see Plan NTd 1317).

4.2.2. Namoona

The Namoona anomaly 4.16 includes the Namoona leases and was identified during reconnaissance sampling by several anomalous soil samples assaying up to 3200ppm Pb. This was followed up with 4300 minus 80 mesh soil collected at 25 metre intervals along grid lines 200 metres apart. All samples were assayed for Pb, Zn, Mn and Ag and three anomalous zones were outlined.

Additional work including 'C' horizon auger sampling, gossan sampling, costeaning, geological mapping, magnetics, self potential, electrical IP, magnetic IP, and sirotem surveys.

A total of fiteen percussion/diamond drill holes were drilled over a fifteen km strike length. The lead, zinc, silver mineralisation was found to be associated with a rhyolitic tuff within the graphitic shale unit. The best intersection obtained was 5.55 metres of 41% Pb equivalent, (combined lead-zinc-silver) in hole 78ND1.

4.3. 1979 Exploration

4.3.1. Namoona

Geological mapping at 1:5 000 was carried out in the discovery zone (10400N to further delineate the rhyolite unit which hosts the silver, lead, zinc mineralisation. Mapping revealed three rhyolite units within a predominatly dolomitic graphitic shale unit. Mineralisation is related to the middle unit.

A ground scintillometer survey delineated the three rhyolite units at 10400N, but south of 10000N only one response was obtained suggesting the rhyolites pinch out along strike or alluvial cover is too deep.

Two diamond drill holes were drilled into the Namoona Prospect during 1979, but discouraging results were obtained in both cases. DD79N23 was sited 400 metres along strike from DD79N19 (see Ikstrums, 1979) which had intersected sub-economic lead, zinc, silver mineralisation. The hole was abandoned at 122.4 metres

with the highest assays being 97Pb, 3200Zn and 98Cu (ppm) over four metres from 116.6m.

DD79N25 was sited on the 10400N zone and designed to test the extent of mineralisation obtained in DD78N1.

A zone of potassic rhyolite was intersected at R.L. 175 metres (see Ikstrums and Steemson, 1980), but no economic base metal mineralisation was encountered in this position. Highest assays returned were 130Pb, 1540Zn and 71Cu (ppm) over 2.6m from 127.10m. This hole was completed at a depth of 223.0 metres.

4.3.2. Minglo South

Detailed helicopter borne radiometric surveying on an orthogonal grid 8km in the east-west direction and 5.5km in the north-south direction around the Minglo lease has shown the area to be devoid of significant uranium channel anomalies while ground radiometric traversing indicated the mineralisation was restricted to a shear exposed in a pit.

Because of its limited width (1 metre) and strike length (100 metres) the shear zone was considered to have too low a potential for economic tonnages.

4.4. 1980 Drilling Programme

Four diamond drill holes were drilled into the Namoona Prospect during the 1980 field season. The essentially lenticular nature of the potassic rhyolite units was

confirmed while base metal values obtained were generally low (see Ikstrums, 1981).

4.5. 1981 Exploration

Previous drilling in the primary zone had failed to intersect viable tonnages of adequate grade mineralisation and the aim of the 1981 programme was to test for secondary enriched silver in the oxide zone.

Holes were drilled at five localities with several holes having to be re-drilled. The silver mineralisation is poddy, narrow in width and generally sub-economic in grade with the best intersection being 1 metre of 245ppm Ag in DD81ND31. The grade of lead and zinc mineralisation is more uniform than silver, but also well below economic extraction levels (Cook 1981).

A rapid reconnaissance magnetic induced polarisation (RRMIP) survey was carried out over the Namoona mineralisation during September 1981 (Cook 1981). An anomalous zone was detected but detailed comparisons between test arrays did not produce consistent conclusions.

4.6. 1982 Gravity Survey

A reinterpretation of the 1981 RRMIP survey indicated the anomalous zone was consistent with a substantial conductive body at 150m depth below grid co-ordinates 10300N, 2700E. To test this anomaly a gravity survey was carried out in July 1982.

Gravity readings were taken at 50m intervals along 1km lines spaced 200m. A negative anomaly over the gossan is consistent with a 40m depth of weathering, but no response indicative of a major body at depth was recorded (see Chalmers, 1982).

K.R. ALEXANDER

5. REFERENCES

Chalmers, J.B.	1982	Annual Report for 1982. Goodparla EL 1092, Pine Creek Basin N.T. CRAE Report No.11930
Cook, I.A.	1981	Annual Report for 1981. Goodparla EL 1092, Pine Creek Basin, N.T. CRAE Report No.10965
Ikstrums, J.P.	1979	Annual Report for the year ending 22.12.78. Goodparla EL 1092, Pine Creek Basin N.T. CRAE Report No.9526.
Ikstrums, J.P.	1981	Annual Report Goodparla EL 1092, Pine Creek Basin, N.T. CRAE Report No.10509.
Ikstrums, J.P.	1980	Annual Report, Goodparla EL 1092, Pine Creek Basin, N.T. CRAE Report No.9985.
Needham, R.S. and others	1977	Pine Creek Geosyncline Project. In B.M.R. Record 1977/45 pp 129-138.
Walpole, B.P. and others	1968	Geology of the Katherine-Darwin Region, N.T. B.M.R. Bull.No.82.
Wills, K.J.	1978	Annual Reports. Moline EL 1091, Goodparla EL 1092, Frances Creek EL 1094, Pine Creek Basin N.T. CRAE Report No.9158.

6. KEYWORDS

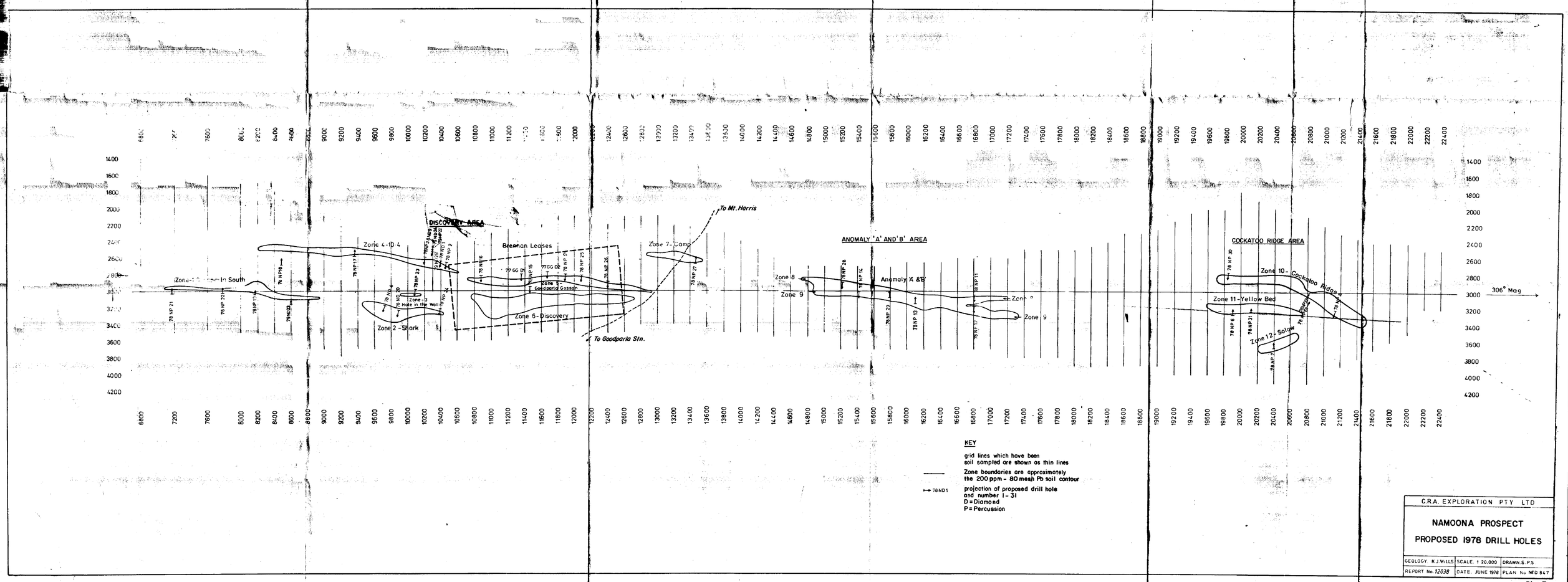
Lead, zinc, silver, black-shale, rhyolite, stratabound, sulphides, Proterozoic-Lr, drill-diamond, drill-reverse circ., drill-logs, geochem-rock, geochem-soil, geophys-IP, geophys-rad.

7. LOCALITY

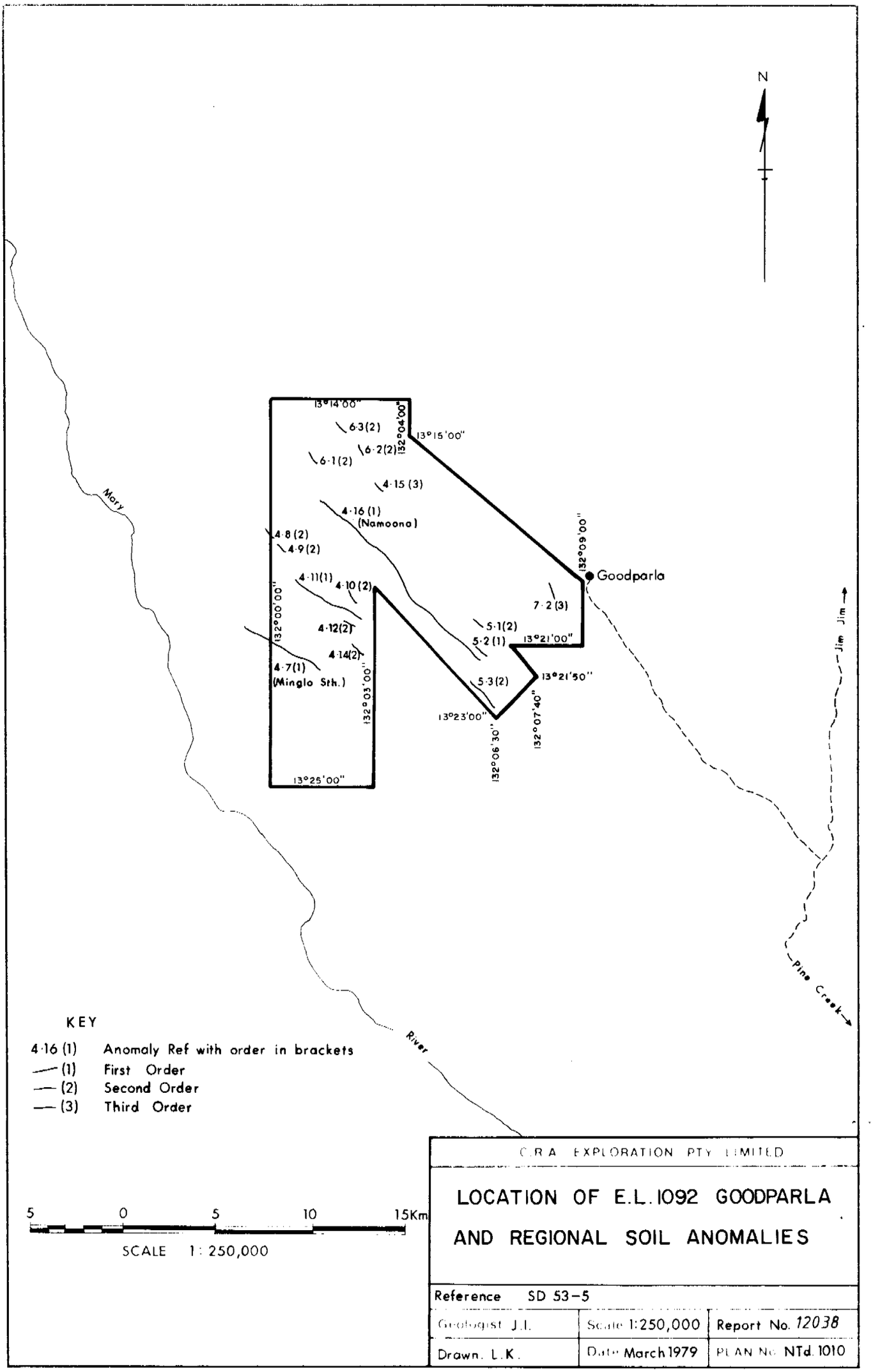
Mt Evelyn SD53-5 1:250 000 geological map sheet

8. LIST OF PLANS

Plan No.	Title	scale
NTd 847	Namoona Prospect, Proposed 1978 Drill Holes	1: 20 000
NTd 1010	Location of EL 1092, Goodparla and Regional Soil Anomalies	1:250 000
NTd 1317	Locality Map ML 105A,EL1092 & EL1094,Pine Creek Basin,N.T.	1:250 000


DISCOVERY AREA
Brennan Leases
To Mt. Harris
To Goodparla Stn.
Zone 4-10 4
Zone 7 - Camp
Zone 2 - Shark
Zone 6 - Discovery
Zone 5 - Goodparla Gossan
Zone 8
Zone 9
ANOMALY 'A' AND 'B' AREA
Anomaly A &B
COCKATOO RIDGE AREA
Zone 10 - Cockatoo Ridge
Zone 11 - Yellow Bed
Zone 12 - Solow
306° Mag
KEY
grid lines which have been soil sampled are shown as thin lines
Zone boundaries are approximately the 200 ppm - 80 mesh Pb soil contour
78ND1 projection of proposed drill hole and number 1 - 31
D = Diamond
P = Percussion
C.R.A. EXPLORATION PTY LTD
NAMOONA PROSPECT
PROPOSED 1978 DRILL HOLES
GEOLOGY K.J.WILLS
SCALE 1:20,000
DRAWN S.P.S
REPORT No. 12038
DATE JUNE 1978
PLAN No. NFD 847

Plan 7.


N
13°14'00"
6·3(2)
6·2(2)
6·1(2)
132°04'00"
13°15'00"
4·15 (3)
4·16 (1)
(Namoona)
4·8 (2)
4·9 (2)
4·11(1)
4·10 (2)
4·12(2)
4·14(2)
4·7(1)
(Minglo Sth.)
132°00'00"
132°03'00"
13°25'00"
132°09'00"
Goodparla
7·2 (3)
5·1(2)
5·2 (1)
13°21'00"
5·3(2)
13°21'50"
13°23'00"
132°07'40"
132°06'30"
Mary
River
Jim Jim
Pine Creek
KEY
4·16 (1) Anomaly Ref with order in brackets
(1) First Order
(2) Second Order
(3) Third Order
5 0 5 10 15Km
SCALE 1: 250,000
C.R.A. EXPLORATION PTY. LIMITED
LOCATION OF E.L.1092 GOODPARLA AND REGIONAL SOIL ANOMALIES
Reference SD 53–5
Geologist J.L.
Scale 1:250,000
Report No. 12038
Drawn. L.K.
Date March 1979
PLAN No. NTd. 1010

MR473

George Creek
17·24 Sq. miles

MR563

LEGEND

AREA OF EXPLORATION LICENCES TO BE RELINQUISHED

AREA UNDER APPLICATION FOR RENEWAL

13° 13' 00"

131° 56' 00"

EL1094

132° 00' 00"

13° 16' 00"

MT HARRIS

13° 15' 50"

Mary

MR 275

131° 59' 30"

Goodparla
38·26 Sq miles

132° 05' 00"

13° 18' 00"
132° 01' 40"

13° 19' 00"

GOODPARLA

EL1092

132° 06' 00"

13° 20' 00"

ML105A

13° 21' 00"

13° 21' 50"

132° 03' 00"

132° 07' 40"

13° 23' 00"

132° 06' 30"

JIM JIM

MR 563

MOUNT WELLS

POLICY RESERVE

MR564

5 0 5 10 15 20 Km

SCALE 1:250,000

13° 46' 20"
132° 42' 20"

EL Sherana

River

MOLINE

PINE CREEK

C R A EXPLORATION PTY LIMITED

LOCALITY MAP
ML105A, EL1092 & EL1094
PINE CK BASIN
N.T.

Reference SD 52-8 SD 53-5		
Geologist J.I.	Scale 1 250,000	12038
Drawn W.S.P	Date March, 1980	Fig. No. NT81317