ELKEDRA DIAMONDS NL

Altjawarra Craton Diamond Project

Final Relinquishment Report for

EL 22529 (Tarlton)

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Keywords: Northern Territory, Altjawarra Craton, Diamond Exploration, Stream Sediment Sampling, Diamond Indicator Mineral, Geochemistry, Magnetics, Elkedra Survey, Huckitta East Survey.

Map Sheets:
1: 250,000: Tobermory (SF53-12)

1:100,000: Tarlton (6252); Algamba (6253); Marqua (6352)

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1 INTRODUCTION

Exploration License EL 22529 is located on the Tobermory (SF53-12) 1:250,000 sheet in central Northern Territory (Figure 1). This report details all work carried out on the tenement up to August 9, 2004 by Elkedra Diamond NL.

2 CONCLUSION

The northern portion of the Tarlton tenement overlies the southern margins of the Central Craton target area which represents Elkedra's priority regional tectonic target for kimberlite exploration. However, negative stream sediment sample results coupled with aeromagnetic anomaly targeting and ground follow-up did not highlight any drill targets or areas of interest for more detailed follow-up in terms of kimberlite potential. The area therefore ranked low priority with respect to Elkedra's diamond exploration efforts within the Altjawarra Craton.

The tenement was also explored in tandem for base metal and manganese as it is recognized that the tenement is also of interest from the base metal viewpoint as it covers the head of the Toko Syncline. In this tectonic setting it is contemplated that potentially mineralized and ascending basin brines could have been structurally channeled against basement highs, resulting in the emplacement of MVT or Irish style Pb Zn Ag mineralization in carbonate rocks. Base-metal exploration involved soil geochemistry sampling. Results did not justify any further work.

Manganese exploration predominantly involved location of surficial anomalies visible on aerial photography and ground truthing of these with surface (soil and rock chip sampling). Geochemical results were generally disappointing and no further work was deemed justifiable at this point.

3 GEOLOGICAL SETTING

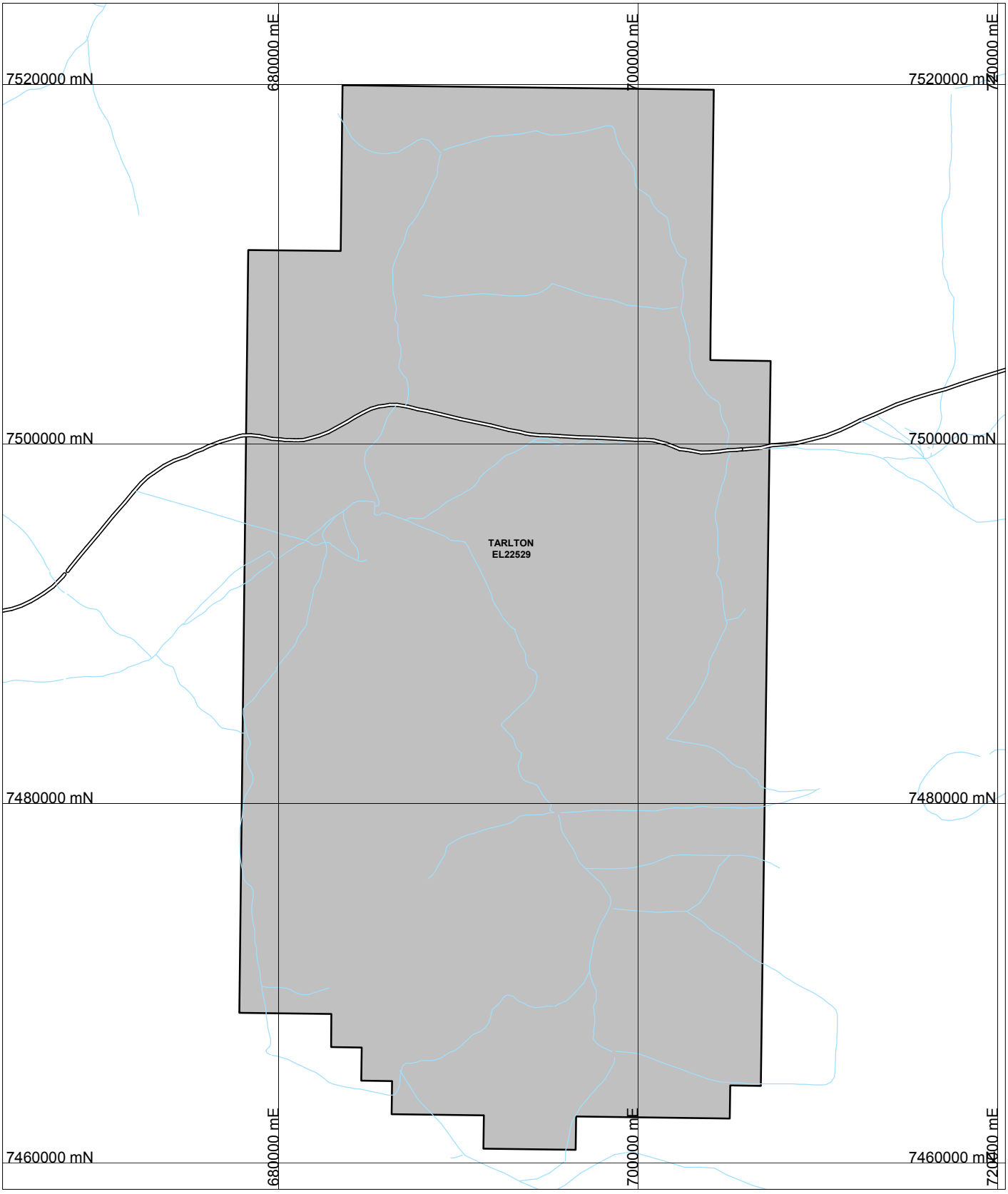
3.1 Regional Geology

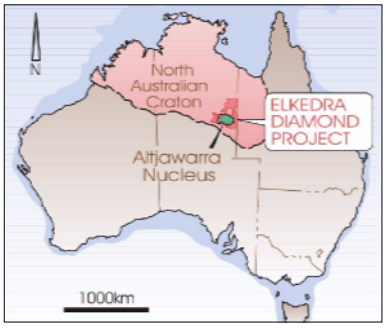
The Altjawarra diamond project is located on the North Australian Craton, which represents an amalgamated terrain that was consolidated around 1,800 Ma. From a diamond exploration perspective, the significance of the North Australian Craton is that it hosts all of Australia's diamond mines to date including the recently discovered diamondiferous Merlin kimberlites located on the eastern portion of the North Australian Craton. Of particular importance is the age of the Merlin pipes, which have been dated as Devonian (~380 Ma). Elkedra Diamonds are targeting this same kimberlite event, or younger, in the southern Georgina Basin located south of the Merlin field.

The project area incorporates several kilometers of Cambro-Ordovician platform sediments of the southern Georgina Basin, which wholly veneer a basement continental block referred to as the Altjawarra Block. The southern Georgina basin and the underlying Altjawarra Block in particular, are associated with a zone of anomalously thick lithosphere extending to at least 200km depth as recognized from recent seismic tomography studies (Kennett, 1997; Van der Hilst *et al.*, 1998; Debayle and Kennett, 2000). The geophysical data highlight the area as highly prospective for the emplacement of diamond-bearing kimberlites.

3.2 Tenement Geology

The tenement is located along the southern margin of the South Georgina Basin. Principal underlying units include the Cambrian-Ordovician Tomahawk and Nimarro Formations





Tenement Area

EL22529
Relinquished Area

Roads

Highway
Minor roads and tracks

N

ELKEDRA DIAMONDS NL

Figure 1
EL22529 TARLTON
Tenement Location Plan
Area of Relinquishment

Date:2/11/2004	
Author: JL	
Office: West Perth	
Drawing: 0150_Fig1	
Scale: 1:300000	Projection: MGA Zone 53 (GDA 94)

0 2.5 5 10
kilometres

composed of intercalated sandstone, limestone, and seams of glaucontic siltstone. The Palaeozoic units are overlain by younger Tertiary to Quaternary lateritic sands.

4 EXPLORATION COMPLETED

Exploration activities undertaken include:

1) Processing and targeting for aeromagnetic anomalies from the 1999 Elkedra and 1983 Huckitta East aeromagnetic surveys.
2) Aerial photography anomaly targeting.
3) Surface sampling with heavy mineral and geochemical analysis.

4.1 Aeromagnetic Surveying

The release of the 1999 Elkedra aeromagnetic survey flown for the NTGS has proved critical in this early stage of exploration and forms the basis of all geophysical work undertaken in the tenement. This survey was merged with data obtained from the 1983 Huckittta East survey. All aeromagnetic interpretation and processing were undertaken by Dr. Duncan Cowan of Cowan Geodata Services, Perth.

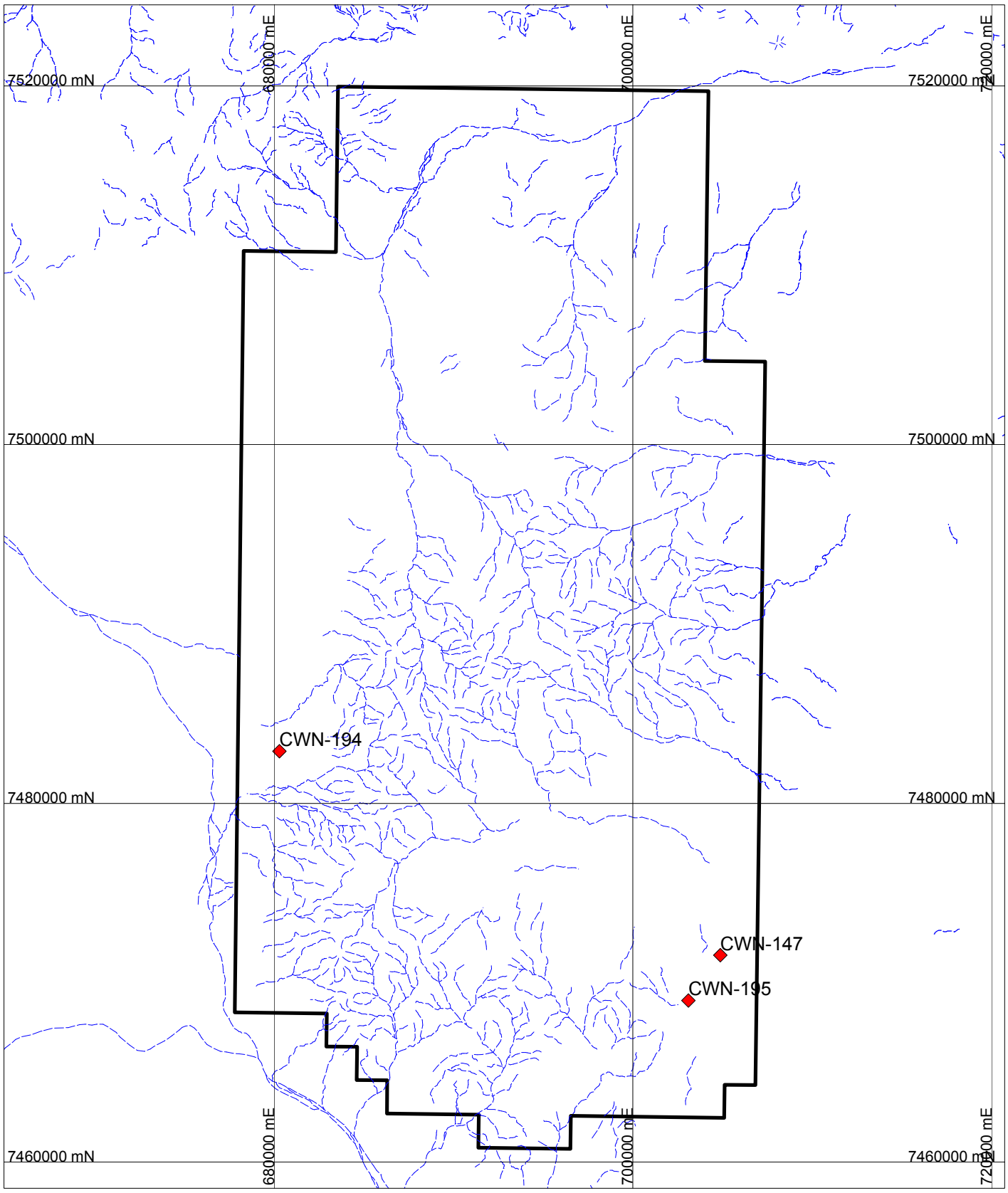
The aeromagnetic, altimetric dtm and radiometric data covering the Central Craton target area were windowed out of the Elkedra NTGS dataset. The windowed area was initially analyzed by running the "Smart" filter program of Cowan Geodata Services. The filter is a simple pattern recognition technique developed by Cowan Geodata Services. The program uses regression analysis between a window of the grid data and a typical model anomaly to identify roughly circular anomalies. The model data calculated is a full 3D vertical cylinder implementation. The method involves various inputs to the program including window size, model cylinder radius, top and bottom depths and amplitude response. In the Central Craton area the filter was run once to test response using a standard 200m diameter cylindrical model with a 30m depth, 400m grid window, and 25-200nT amplitude range.

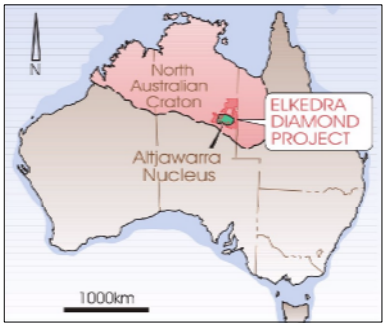
Further data enhancement and preliminary kimberlite target screening was later undertaken in a smaller area referred to as the central craton area using a combination of techniques which included:

- 1D Wavenumber filtering
- 2D Euler deconvolution depth calculation
- 2D Werner deconvolution depth calculation
- Modelling and inversion of individual anomalies

The focus was on identifying possible kimberlite targets in the presence of significant intrasedimentary background noise due to maghemite channels, areas of ferricrete, clay-pans and sinkholes and cultural sources. The altimetric dtm and radiometric data were used to assist in anomaly screening. Identifying possible kimberlite magnetic anomalies in an area of extensive drainage and palaeo-surface related magnetic anomalies is difficult due to a high degree of anomaly overlap as well as interference from anomalies due to shallow basement rocks. The relatively wide line spacing of 400-m limits spatial resolution of small sources as small kimberlites located between flight lines may not be detectable or produce only weak magnetic anomalies with magnetic attributes similar to sinkholes etc.

A total of three low priority aeromagnetic anomalies were identified from the Huckitta East survey data set (Figure 2). A summary of results is presented in Appendix 1.





Aeromagnetic Anomaly

◆ Centre of anomaly

Tenement Area

EL22529
Relinquished area

N

ELKEDRA DIAMONDS NL

Date:2/11/2004	Figure 2 EL22529 TARLTON Aeromagnetic Anomaly Locations
Author: JL	
Office: Bullsbrook	
Drawing: 0150_Fig2	
Scale: 1:300000	Projection: MGA Zone 53 (GDA 94)

0 2.5 5 10
kilometres

4.2 Ground Magnetic Surveying

Aeromagnetic anomaly CWN-147 (also referred to as CWN-196 in the ground magnetic survey data; Figure 3), is a roughly 500 X 400m circular feature comprised of a number of overlapping high-intensity narrow anomalies (Appendix 2). The aeromagnetic anomaly models as a thin sheet but an associated ground geomorphic feature warranted further investigation and a ground magnetic survey was undertaken.

The anomaly corresponds to a large depression surrounded on three sides by ferruginous lag and pisolith covered ridges which themselves give rise to smaller magnetic anomalies. The ground magnetic data indicated a very shallow, near-surface source that is likely caused by magnetic lag eroded from the surrounding ridges and deposited in the depression. No further work was warranted.

4.3 Aerial Photography Anomalies

A photo interpretation study was undertaken by Dr. Nick Lockett of Nick Lockett & Associates Pty Ltd, Perth to identify possible outcropping manganese rocks and any potential geomorphic anomalies that may be related to possible intrusive pipes.

Three low priority sub-circular geomorphic features were identified within the relinquished tenement (Figure 4; Appendix 3). Follow-up stream sediment sampling results did not give sufficient encouragement to warrant any further work on these anomalies.

4.4 Surface Sampling

A total of 100 surface geochemical samples were collected (Table 1) within the relinquished tenement as part of Elkedra's combined kimberlite and base metal exploration initiative as well as follow-up to selected manganese targets. All results are summarized in Appendix 4.

Table 1: Surface sample collection and analysis summary.

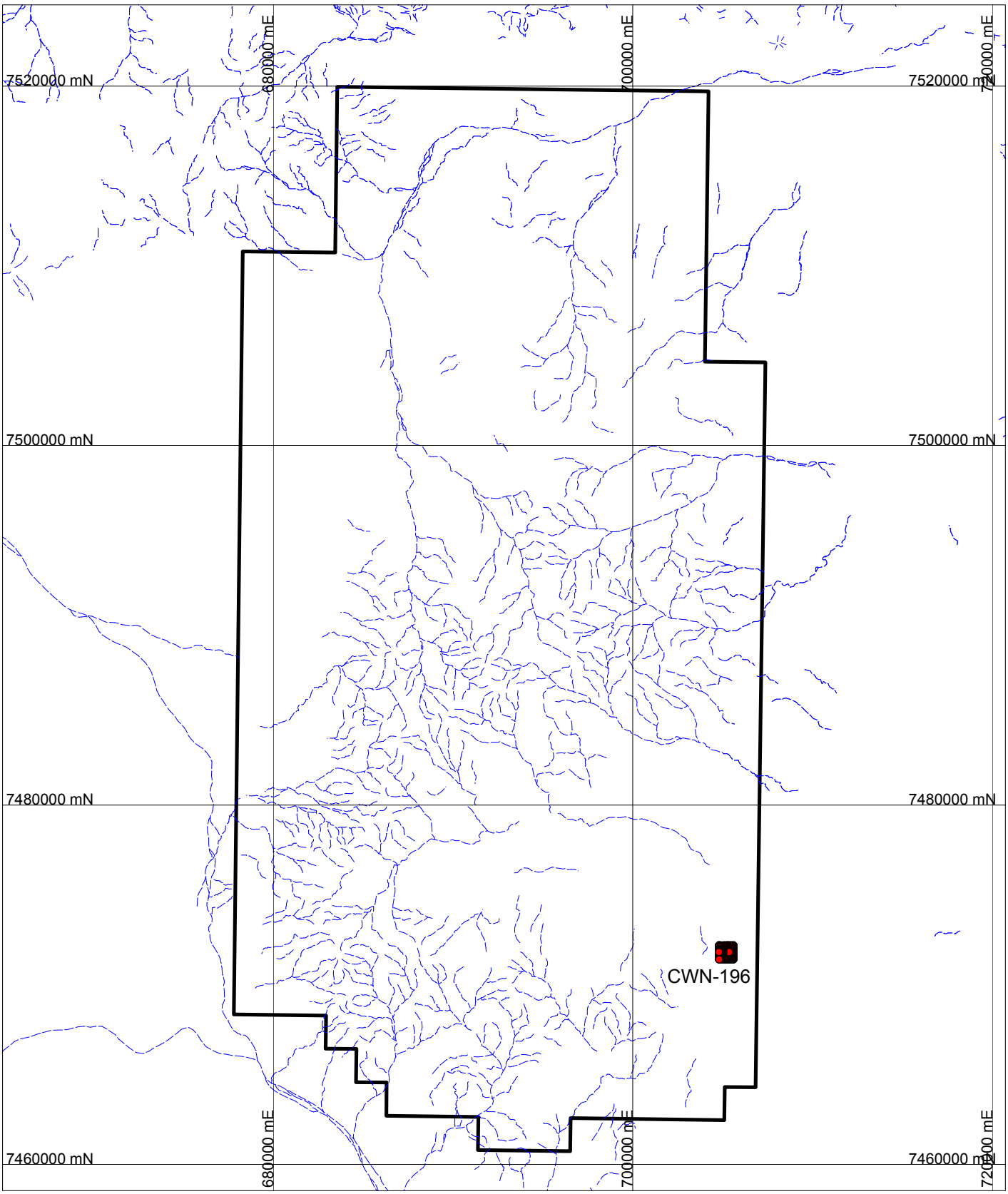
Sample Type	Number of Samples Collected	Heavy Mineral Concentrate Analysis	Sample Geochemistry
Rockchip samples	30	0	22
Soil samples	13	0	13
Stream sediment samples	57	7	50
Total	**100**	**7**	**85**

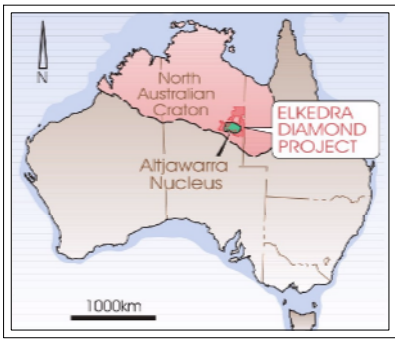
4.4.1 Rock chip Sampling

A total of 30 samples were collected as follow-up to selected manganese and base metal targets (Plan 1 and Plan 2). Twenty-two of these were submitted to Genalysis for geochemical analysis. Results of this work are discussed below.

4.4.2 Soil Sampling

A total of 13 soil samples were collected from the relinquished tenement area. All samples were sieved to -200micron in the field and submitted to Genalysis for geochemical analysis





Ground Magnetic Survey

Survey point

Tenement Area

EL22529
Relinquished area

N

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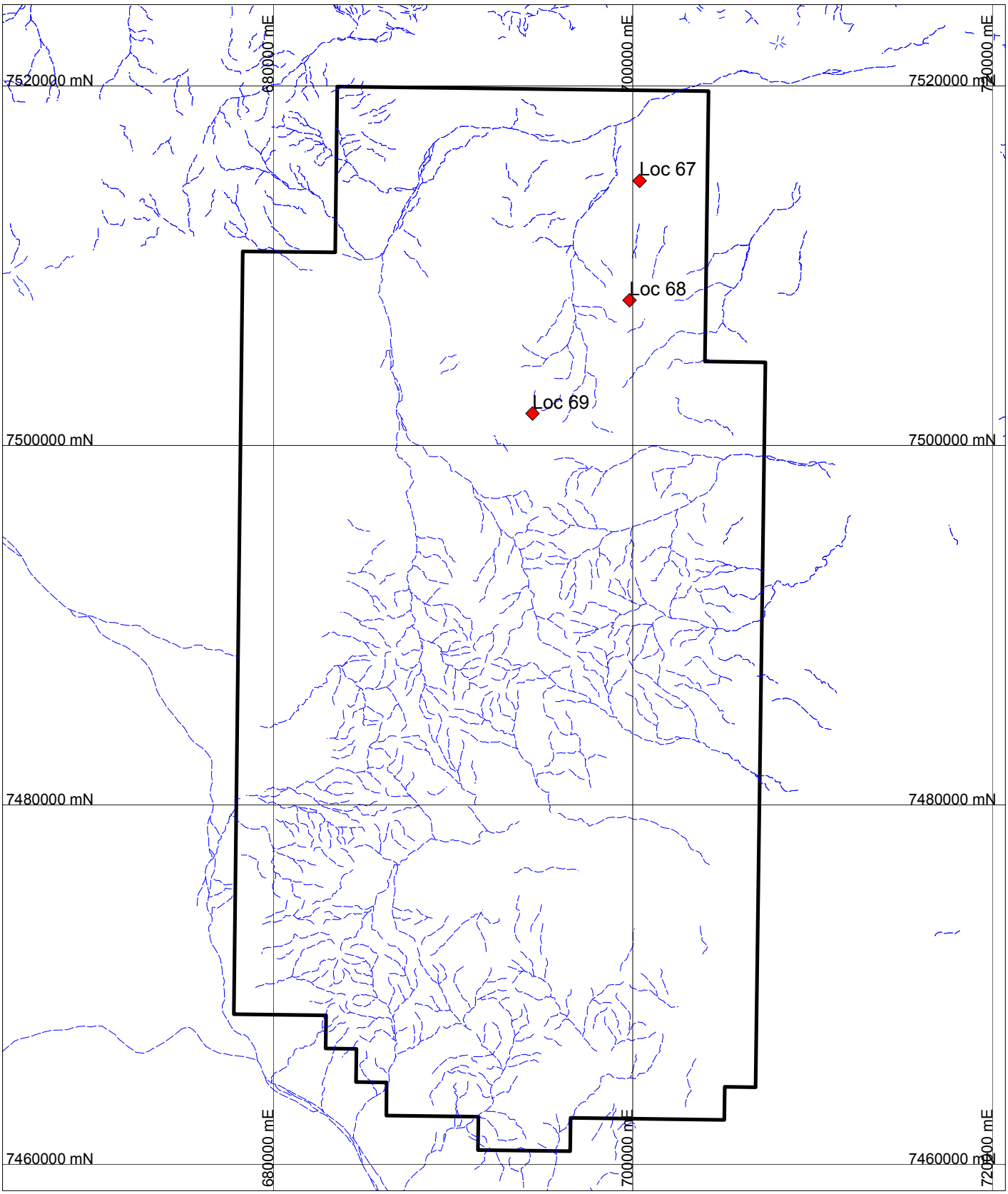
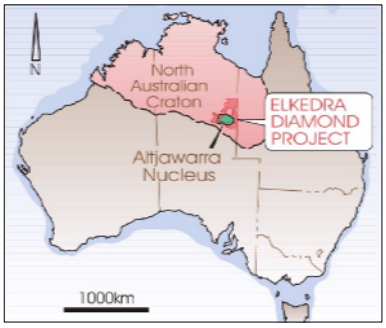
Figure 3
EL22529 TARLTON
Ground Magnetic Survey
Locations

Date: 2/11/2004	
Author: JL	
Office: West Perth	
Drawing: 0150_Fig3	
Scale: 1:300000	Projection: MGA Zone 53 (GDA 94)

0 2.5 5 10
kilometres





Aerial Photography Anomaly

◆ Centre of anomaly

Tenement Area

EL22529
Relinquished area

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ELKEDRA DIAMONDS NL

Figure 4
EL22529 TARLTON
Aerial Photography
Anomaly Locations

Date: 2/11/2004	
Author: JL	
Office: West Perth	
Drawing: 0150_Fig4	
Scale: 1:300000	Projection: MGA Zone 53 (GDA 94)

0 2.5 5 10
kilometres

4.4.3 Stream Sediment Sampling

Two programmes of stream sediment sampling were carried out over the relinquished area.

In October 2002, 14 stream sediment samples were collected as pairs over seven locations, targeted for diamond exploration. One sample from each site was screened onsite to -250um + 100um and submitted for heavy mineral concentrate analysis. The other sample was screened onsite to -425um and submitted for geochemical analysis.

In May 2003, 43 stream sediment samples were collected over areas interpreted to be structurally complex and therefore of interest for base metal exploration. All samples were screened onsite to -200um and submitted for geochemical analysis.

4.5 Heavy Mineral Concentrate Analysis

4.5.1 Stream Sediment Sampling

A total of seven stream sediment samples were collected for heavy mineral concentrate analysis. All field samples were processed at the Diatech Laboratory in Perth. Material is screened at $^{-}$0.8mm and heavy mineral concentrate is routinely observed down to $^{+}$0.3mm size fraction. The $^{-}$0.3 to $^{+}$0.1mm fraction is sent to Kimberley Diamonds Laboratory in Perth for fusion for microdiamond recovery. The $^{-}$0.1mm slimes are discarded. Indicator mineral results are summarized in Appendix 4.

All seven samples reported negative for both diamond indicator minerals and diamonds.

4.6 Geochemistry

All samples were analysed at Ultratrace or Genalysis laboratories in Perth for a large suite of elements. Results are presented in Appendix 4.

4.6.1 Rock chip Sampling

Rock chip samples collected in 2002 were analysed at Ultratrace Laboratories. Elements were typically analysed by four acid digest with either an MS or OES finish, while oxides were analysed by XRF.

The 2003 sampling was sent to Genalysis, Perth and analysed for an extensive multi-element suite using 4 acid digest and OES or MS finishes. Gold and precious metals were not assayed.

Of the 22 rock chip samples collected, ten returned MnO values over 30%. Of note were D0143 and D0137 with 69.1% and 61.5% MnO, respectively.

4.6.2 Soil Sampling

Thirteen soil samples were submitted to Genalysis, Perth for analysis. These were analysed for an extensive multi-element suite via four acid digest with either an MS or OES finish. Precious metals were analysed via BLEG.

Results were generally disappointing.

4.6.3 Stream Sediment Sampling

As with the rock chip samples, the 2002 field season samples were sent to Ultratrace, and the 2003 samples to Genalysis.

With no obvious high level anomalism, the project was downgraded and no immediate further work was considered warranted.

5 REFERENCES

Debayle, E. and Kennett, B.L.N. (2000) The Australian continental upper mantle: Structure and deformation inferred from surface waves. *Journal of Geophysical Research*, 105B11, 25423-25450.

Kennett, B.L.N. (1997) The mantle beneath Australia. *AGSO Journal of Australian Geology & Geophysics*, 17(1), 49-54.

Van der Hilst, R.D., Kennett, B.L.N. and Shibutani, T (1998) Upper mantle structure beneath Australia from portable array deployment. In: J. Braun et al, editors. *Structure and Evolution of the Australian Continent*. 39-57.