STOCKDALE PROSPECTING LIMITED

PROGRESS REPORT TO PNC EXPLORATION

EL 734 & EL 5890

1999 ANNUAL REPORT

M I MILLIKAN

De Beers
A DIAMOND IS FOREVER
PROJECT: WESTERN ARNHEM LAND JV'S

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       1999 Annual Report

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ABSTRACT:  Exploration licences 734 and 5890 lie within the Early Proterozoic Pine Creek Geosyncline and Middle Proterozoic McArthur Basin, which are intracratonic sedimentary basins that have formed over part of the North Australian Orogenic Province.

Exploration conducted over the joint venture licences in 1999 involved the flying of detailed airborne magnetic surveys, the field inspection and check sampling of nine aeromagnetic anomalies and the collection of close interval follow-up stream samples around a reconnaissance sample (BT5422) which contained possible kimberlitic chrome spinels.

Samples collected have been transported to Perth for treatment and results are expected early next year.

COPY TO:  PNC Exploration (Australia), IC, PERTH

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1. Introduction

Three PNC Exploration owned exploration licences (EL 734, EL 5890 & EL 5891) in the King River area of Western Arnhem Land form a farm-in joint venture arrangement with Stockdale whereby Stockdale can earn a 51% interest in diamonds on the EL's. The majority of the work programme in 1999 was confined to EL's 734 & 5890.

The exploration licences lie within the Early Proterozoic Pine Creek Geosyncline and Middle Proterozoic McArthur Basin, which are intracratonic sedimentary basins that have formed over part of the North Australian Orogenic Province. The discovery of diamondiferous rocks by Ashton, Rio Tinto and Stockdale throughout the North Australian Orogenic Province has shown that this geological environment is prospective for economic diamond deposits. Only limited diamond exploration work has been undertaken in Western Arnhem Land and as such the region is considered to be highly prospective.

The work completed over EL 734 & EL 5890 in 1999 consisted of the collection of 11 follow-up stream sediment samples around reconnaissance sample BT5422 that contained chrome spinel grains with possible kimberlite affinities. Twenty aeromagnetic anomalies were followed up with detailed airborne magnetics. Interpretation of the detailed aeromagnetic data produced seven high priority targets and ten low priority targets. Three anomalies were not of sufficient interest to warrant a geophysical rating and were recommended for no further work. Nine of the prioritised targets were investigated in 1999. Each anomaly investigated was sampled with the collection of a combined loam sample and MMI geochemical traverse.

All exploration was conducted from Jabiru. Staff were housed at the ERA guesthouse construction camp, which supplied full meals and accommodation in the form of single man quarters. A Squirrel Helicopter was used for the first two days of the work programme, as a Jet Ranger helicopter was not available. A Jet Ranger Helicopter was used in the proceeding days once one became available.

Samples collected during 1999 have been delivered to the Stockdale Perth treatment facility with results expected in early 2000. This report details the work completed over the joint venture ground in 1999.
2. **Tenure**

Tenure details for the joint venture exploration licences (EL 734, EL 5890 and EL 5891) are outlined in Table 1 and the location of the licence is shown in Map 1. The exploration licences form a joint venture agreement with Cameco Australia and Stockdale Prospecting is PNC’s agent employed to carry out exploration for diamonds.

**Table 1: Tenure Details**

<table>
<thead>
<tr>
<th>Licence</th>
<th>Holder</th>
<th>Date Granted</th>
<th>Area (Blocks)</th>
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<td>PNC Exploration</td>
<td>13/05/96</td>
<td>286</td>
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</table>

3. **Liaison**

All proposed exploration was cleared at a liaison committee meeting at Oenpelli on Thursday 29 April 1999. At the meeting Traditional Owner committee members agreed to the proposed exploration areas and the proposed starting date. Anthropological clearance was approved at the meeting also and an archaeological inspection was proposed prior to the start of the work programme.

Prior to the start of exploration, Daryl Guse, contract archaeologist for the NLC, completed clearance work activities with the assistance of local Traditional Owner Wirrdup Nabulwad. Surveys were completed over 21 sites detailed in the work programme, with only one site identified. An isolated quartz fragment, which exhibited signs of flaking and chipping, was discovered. Exploration was conducted at least 50m from the artifact. Work permits were organised by PNC and collected from the NLC office in Jabiru prior to the start of the work programme.
4. 1999 Exploration

4.1 Reconnaissance Heavy Mineral Sampling and Results

Diamond Exploration Consultants was commissioned by PNC Exploration (Australia) to carry out a programme of stream sediment sampling for diamonds and kimberlitic indicator minerals in August 1996. Only 50 samples were collected due to the scarcity of suitable trap sites, and as the drainages were dominantly sand choked. Each sample consisted of the removal of 50kg of material screened at -1.6mm, reaching an overall sample density of 1:50km². Collected samples were treated and examined by a contract laboratory in Perth. The contract laboratory had a few sorting difficulties, due to the high concentrate levels, but nonetheless a few chrome spinel grains of interest were recovered.

PNC Exploration provided sample concentrates to Stockdale Prospecting in March 1998, with the samples assigned numbers BT5401-5450. The large concentrate levels meant for slow examination time with various techniques employed to reduce the amount of concentrate. Chrome spinels were again recovered, with previously negative samples found to contain spinels. Microprobe analyses of some of the recovered chrome spinels were thought to have kimberlite affinities. With sample BT5422 containing a high proportion of the "of interest" grains, with high chromium oxide (Cr₂O₃) and magnesium oxide (MgO) compositions. Figure 1 displays the mineral chemistry compositions of the chrome spinels recovered over the project area during reconnaissance. Map 2 displays the sample locations. Follow-up sampling was proposed around sample BT5422.

(Location data – Stream Sediment, Loam, Geochemical samples)

4.2 Follow-up Heavy Mineral Sampling

Eleven stream sediment samples were collected to follow-up reconnaissance sample BT5422. A repeat sample (BP5055) was collected at the approximate position of BT5422, whereupon a build-up of gravels and cobbles were excavated from in front of a granitic rock-bar. The remaining 10 stream samples (BP5056-5065) were collected upstream of the original site. Sample quality ranged from good to very poor with the majority of the drainages sand choked.

Samples consisted of 100L of excavated material screened at -2mm or collected unscreened in the field. Sample locations are displayed on Map 2.
4.3 Geophysical Investigations

4.3.1 Airborne Magnetic Surveys

In November 1996 Kevron Geophysics was contracted by PNC Australia to fly a regional airborne magnetic/radiometric survey over the exploration licences. The survey was flown in an east-west direction at a 200m flight line spacing. The aeromagnetic data obtained from this survey was interpreted for diatreme-like structures, which magnetically would be distinguishable by dipole signatures. Initial interpretation of the airborne magnetic data over the joint venture exploration licences selected 48 magnetic anomalies. Prioritisation of the selected anomalies reduced the number to 25 priority targets.

Twenty of the priority magnetic anomalies were followed up with detailed airborne magnetic surveys using the UTS Fletcher surveyor during the 1999 field season. The detailed TMI contour plots of each of the 20 anomalies are displayed in Appendix 1. Five anomalies were not flown with detailed magnetics, as anomalies KGR002 & KGR043 were located near sites of significance, KGR001 was found to correspond to a telecommunication tower and KGR038 & KGR039 were located on the northern exploration licence 5891. The surveys were flown at a 50m flight line spacing in a north-south direction, on a one kilometre grid.

Airborne Magnetic Logistics Report by UTS

Interpretation of the detailed magnetic data highlighted 17 of the anomalies as being of further interest. Seven of the targets were highly rated and the main aim of the 1999 work programme was to investigate these anomalies in detail. If time allowed selected lower priority targets were also to be investigated.

4.3.2 Anomaly Investigations

Nine aeromagnetic anomalies (six high priority (HP) and three low priority (LP)) were investigated during the course of the work programme. One HP anomaly (KGR004) was not field inspected or sampled, as the anomaly could not be accessed with the use of a helicopter, i.e., a three kilometre trek through thick vegetation would be required to access the feature. Time constraints and continued difficult access meant that seven of the remaining LP anomalies were also not sampled. Each anomaly was investigated with a single 125 litre loam sample which comprised five individual 25 litre sites. One site was located over the centre of the target with the
other four site positioned at each point of the compass 100 metres distant from the centre. MMI geochemical samples were collected on a west-east traverse collected from the centre and at a standard spacing of 100m east and west of centre and 300m east and west of centre. Table 2 below summarises the anomalies field inspected and sampled during the course of the work cycle.

**Table 2: King River Anomalies Investigated In 1999**

<table>
<thead>
<tr>
<th>ANOMALY</th>
<th>100K SHEET</th>
<th>CO-ORDINATE</th>
<th>PRIORITY</th>
<th>COMMENTS</th>
<th>SAMPLES</th>
</tr>
</thead>
</table>
| KGR006  | Goomadeer  | 337446mE 8651391mN | HP       | No o/c sand covered open woodlands | HM = BP5019
|         |            |             |          |          | MMI = BP5020-5024 |
| KGR010  | Goomadeer  | 338832mE 8655370mN | LP       | Sand covered, tall tree canopy | HM = BP5013
|         |            |             |          |          | MMI = BP5014-5018 |
| KGR011  | Oenpelli   | 300612mE 8655458mN | HP       | Ferricrete laterite | HM = BP5043
|         |            |             |          |          | MMI = BP5044-5048 |
| KGR012  | Oenpelli   | 326362mE 8655485mN | HP       | Sandy gravels, pisolites | HM = BP5049
|         |            |             |          |          | MMI = BP5050-5054 |
| KGR013  | Goomadeer  | 339676mE 8656029mN | LP       | Red sandy soils | HM = BP5007
|         |            |             |          |          | MMI = BP 5008-5012 |
| KGR014  | Oenpelli   | 283689mE 8656503mN | HP       | Loamy with fine sandy gravels | HM = BP5031
|         |            |             |          |          | MMI = BP5032-5036 |
| KGR017  | Oenpelli   | 296146mE 8656872mN | HP       | Laterite development, ferricrete gravels | HM = BP5037
|         |            |             |          |          | MMI = BP5038-5042 |
| KGR027  | Goomadeer  | 345782ME 8666491mN | HP       | Sand covered | HM = BP5001
|         |            |             |          |          | MMI = BP 5002-5006 |
| KGR059  | Oenpelli   | 333169mE 8651274MN | LP       | No surface explanation for anomaly, sand covered | HM = BP5025
|         |            |             |          |          | MMI = BP5026-5030 |

**TOTALS 6HP, 3LP**

HM = 9
MMI = 45

Sampling alone over some the anomalies will not be a definitive test due to Cretaceous cover. Cretaceous sediments sporadically crop out in the western portions of the project area and typically mark areas of heavy vegetation. Anomaly KGR027 is located close to mapped Cretaceous and anomalies KGR004, 006, 010, 013 and KGR059 are located over Cainozoic sediments that may be underlain by Cretaceous.
Cretaceous thickness over the licence area is variable ranging from 1.0 - 1.5m, to greater than 100m in channel infill sequences. The other anomalies investigated are situated over Proterozoic units and as such sampling should be effective.

4.4 MMI Geochemical Sampling

A standard procedure of collecting five MMI geochemical samples over each anomaly was employed. Three soil samples were collected directly over the anomaly and two background or contrast samples were collected off each feature. Spacing of each sample was dependent on the size of each anomaly but the standard collection entailed that the two background geochem samples were at least 200m west and east of the centre of the targets. Solum material for each geochem was taken from a depth of between 5 and 10cm (A horizon). The material was collected unscreened and consisted of a size fraction less than 5mm.

The geochemical samples collected over the nine targets were sent to Australian Laboratory Services (ALS) in Perth for Mobile Metal Ions (MMI) analyses. The MMI-D leachant is used to detach the weakly adsorbed and unbounded metals collected from the soil samples. The kimberlite "core element suite" (Ni, Co, Pd, Cr, Nd & Mg) is extracted. The extractant is then separated and analysed using extremely low detection (ppb) limits on Inductively Coupled Plasma Mass Spectrometry (ICPMS) equipment.

MMI geochemistry does not work in all terrains however it has produced results where conventional geochemistry has failed. The usefulness of MMI geochemical sampling in the King River project area for kimberlite detection is unknown and the samples collected during 1999 were to some degree experimental. It is simply another exploration tool being considered.

Results from the geochemical sampling of nine geophysical anomalies are now available and are somewhat inconclusive. Pattern recognition and the identification of anomalism is the key interpretation method employed. Response Ratios have been calculated and provide for useful comparison between anomalies. Calculated Response Ratios have been presented along with raw geochemical data in Appendix 2.

Anomaly KGR027 displays elevated Nd over the anomaly and a "rabbit ears" response for Mg & Cr, which may be of interest. The remaining anomalies show little, conclusive anomalism.
4.5 Follow-up Heavy Mineral Sampling Results

The samples collected during the course of the 1999 work programme have been delivered to the Perth treatment plant and are currently awaiting treatment. Results are expected early in 2000.
Figure 1: Mineral Chemistry Plots of Reconnaissance Spinels
5. **Expenditure**

Expenditure for diamond exploration in 1999 totaled $48,569, as allocated in the Table 3.

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<th>EXPENDITURE</th>
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6. **Summary**

The work completed over PNC Exploration joint venture licences' (EL 734 & EL 5890) in 1999 consisted of the collection of 11 close interval stream sediment samples around reconnaissance sample BT5422 that contained high interest spinel grains. Twenty aeromagnetic anomalies were followed up with detailed airborne magnetics. Nine aeromagnetic anomalies were field inspected and sampled with the collection of combined loam samples and MMI geochemical traverses.

Samples collected during 1999 have been delivered to the Stockdale Perth treatment facility with results expected in early 2000.

MICHAEL I MILLIKAN
Project Geologist
Perth, WA
12th May 2000

Mr J Marlatt
Cameco Australia
PO Box 35921
WINNELLIE NT 0821

Dear Jim,

**PROGRESS REPORT FOR WESTERN ARNHEM LAND JOINT VENTURE**
**EL 734, EL 5890 & EL 5891- KING RIVER**

A report on the progress of diamond exploration conducted over the King River project area was forwarded to PNC Exploration (Australia) in December 1999. This report provided full details of the exploration conducted in 1999, but did not include full results at the time of reporting, as they were not available. Full results are now available and they give little encouragement for further work.

Exploration conducted over the King River joint venture licences in 1999 involved the flying of detailed airborne magnetic surveys, the field inspection and check sampling of nine aeromagnetic anomalies and the collection of close interval follow-up stream samples around a reconnaissance sample (BT5422) which contained possible kimberlitic chrome spinels. The location of the samples collected and magnetic anomalies investigated in 1999 are shown as [Figure 1].

Full results are now available for all samples collected in 1999. Heavy Mineral loam samples collected over magnetic anomalies KGRO 10, 011, 012, 013, 014, 027 & 059 did not contain kimberlitic indicator minerals. Low counts of chrome spinel grains were recovered over magnetic anomalies KGRO06 and KGR017. These spinels are not believed to be released by kimberlites. Coupled with the negative sampling results and poor mobile metal ions (MMI) geochemical signatures, the anomalies are unlikely to be caused by kimberlite intrusion(s).

Eleven stream samples were also collected to follow-up reconnaissance sample BT5422. The examination of these samples identified only two samples that contained chrome spinel grains. The chrome spinel grains
recovered have similar mineral chemistry compositions to the grains recovered in BT5422. These grains do not have surface textures or morphologies that are considered to be diagnostic of a kimberlitic source. The larger population of spinel now available suggests a non kimberlitic source. No other diagnostic kimberlitic indicator minerals, such as diamonds, kimberlitic garnets or ilmenites were recovered. Consequently, it is likely that a low diamond potential rock source is releasing the chrome spinel grains. Results are provided in Table 1 and plots of mineral chemistry of the chrome spinel grains are provided as Figure 2.

The letter agreement for the King River tenements has not been signed, but believe it appropriate that we give formal notification of our withdrawal from the area. Expenditure details were provided in the December 1999 Progress Report therefore the costs incurred since this date are detailed in Table 2.

I regret that the outcome was not more favorable

Yours sincerely

Stuart Vercoe
Exploration Manager-Australia

Ref: scv904 1
### TABLE 1: SAMPLING DETAILS EL 734 & EL 5890

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<th>SAMPLE</th>
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### TABLE 2: EXPENDITURE DETAILS EL 734 & EL 5890

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