EL6779 "COSMO SW"
PINE CREEK DISTRICT, NT
ANNUAL REPORT TO 8 MAY 1991
YEAR ONE OF TENURE

Distribution:

NTDME, DARWIN
DOMINION MINING LTD, DARWIN
DOMINION MINING LTD, PERTH

N R BURN
JUNE 1991

CR91/411
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<td></td>
<td>2A-B4</td>
</tr>
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<td>40A-Ta3</td>
</tr>
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<td></td>
<td></td>
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<td>1:25,000</td>
<td>40A-Pe2</td>
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</tbody>
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TABLES

1. EARLY PROTEROZOIC STRATIGRAPHY OF THE PINE CREEK/ADELAIDE RIVER AREA.
1. SUMMARY

This report details the 1990/1991 exploration activities completed on EL6779 in Year 1 of tenure, ending 8 May 1991.

The licence, comprising one (1) one minute block, was granted to Dominion Gold Operations Pty Ltd on 9 May 1990 for a period of two (2) years.

Exploration activities during the 1990/91 year consisted of airborne geophysical interpretation and aerial photography interpretation. This interpretative work and previous regional exploration indicate a more structurally and stratigraphically complex region than previously shown by Government mapping.

The field exploration programme (now in progress) includes geological mapping at 1:25,000 scale, stream geochemistry and rock chip sampling.
2. LOCATION AND TENURE

EL6779 is located 160km south of Darwin approximately 2km southwest of the Cosmo Howley Mine and is located on the Fenton 1:50,000 (14/5-1 sheet). The tenement lies between latitudes 13°33'S and 13°34'S and longitudes 131°21'E and 131°22'E. See Figs. 1 and 2.

Access is via the Stuart Highway and the sealed Dorat and Ooloo roads. Climatically, Cosmo SW experiences a wet season (November to April) and a dry season (May to October). Average annual rainfall is 1249mm and the mean temperature is approximately 28°C.

Local relief is moderate ranging from 140 to 160m above sea level, with the distinct topographically high Howley Anticline to the north.

The licence was granted to Dominion Gold Operations Pty Ltd on 9 May 1990 for two (2) years.
3. GEOLOGY

3.1 Regional Geology

The geology of the Pine Creek Basin has been well documented by the BMR [Wallace et al (1985), Needham, et al (1980)].

The Early Proterozoic sequence was deposited by alternating shallow marine and continental environments in an intracratonic basin setting. Following intrusion by conformable sills, a major period of deformation and regional metamorphism, related to granite intrusion, produced a series of tight, upright folds.

Early Proterozoic stratigraphy of the Pine Creek/Adelaide River area is listed in Table 1.

3.2 Local Geology

Within EL6779 outcrop is very poor with a general cover of Quaternary/Cainozoic transported alluvials and residual soils. Basement is interpreted to be folded Mt. Bonnie Formation and Gerowie Tuff sediments located on the western limb of the NW-trending Howley Anticline. See Fig. 3.
**TABLE 1**
EARLY PROTEROZOIC STRATIGRAPHY OF ADELAIDE RIVER/PINE CREEK AREA

<table>
<thead>
<tr>
<th>GROUP</th>
<th>FORMATION</th>
<th>MEMBER</th>
<th>LITHOLOGIES</th>
<th>THICKNESS m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zamu Dolerite</td>
<td></td>
<td></td>
<td>Massive, medium to coarse grained. Quartz actinolite, tourmaline</td>
<td></td>
</tr>
<tr>
<td>Finnis River</td>
<td>Burrell Creek</td>
<td></td>
<td>Greywacke, siltstone, mudstone, rare chert iron formation and conglomerate</td>
<td>3000</td>
</tr>
<tr>
<td>South Alligator</td>
<td>Mt Bonnie</td>
<td>Upper</td>
<td>Mudstone, siltstone, chert, iron formation</td>
<td>100–250</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lower</td>
<td>Greywacke, mudstone, siltstone, chert, carbonaceous mudstone, rare conglomerate</td>
<td>50–150</td>
</tr>
<tr>
<td>Gerowie Tuff</td>
<td></td>
<td></td>
<td>Chert, mudstone, siltstone, minor carbonaceous mudstone</td>
<td>200–400</td>
</tr>
<tr>
<td>Koolpin</td>
<td>Upper</td>
<td></td>
<td>Carbonaceous mudstone, mudstone, siltstone</td>
<td>50–150</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td></td>
<td>Iron formation, mudstone, minor siltstone</td>
<td>130–150</td>
</tr>
<tr>
<td></td>
<td>Lower</td>
<td></td>
<td>Micaceous mudstone, siltstone, minor carbonaceous mudstone</td>
<td>0–250</td>
</tr>
<tr>
<td>Mt. Partridge</td>
<td>Wildman Siltstone</td>
<td></td>
<td>Mudstone, phyllite, siltstone, carbonaceous mudstone, sandstone</td>
<td>200–400</td>
</tr>
<tr>
<td></td>
<td>Mundogie Sandstone</td>
<td></td>
<td>Quartzite, arkose, pebble conglomerate, mudstone, siltstone</td>
<td>500</td>
</tr>
</tbody>
</table>

4.1 **Aerial Photography**

During May 1989, Airesearch Mapping Pty Ltd of Darwin, flew the Woolwonga-Cosmo Howley tenements held by Dominion and produced set of 1:25,000 and 1:10,000 scale air photos.

The relevant air photo run is AM 521, Run 7 (No. 99–101).

Air photo interpretation shows the tenement to be predominantly obscured by soils and alluvium shedding from the Howley anticline.

Minor topographic rises within the licence are interpreted to be residual soil profiles related to folded Mt. Bonnie Fm/Gerowie Tuff sediments. In the southeast corner of the licence, sub-cropping Mt. Bonnie Formation (?) sediments lie on the SW limb of the Howley anticline.

To the west, distinct ridges with flat lying Cretaceous cap rocks strike NW, sub-parallel to the interpreted fold axes direction.

4.2 **Geophysics**

In 1987 and 1988 Aerodata flew a large portion of the Western Pine Creek Basin.

The survey of 22,663 line kilometres was originally commissioned by Golden Plateau NL and completed in May 1988. It was subsequently made available for general sale and Dominion acquired the data in late 1988.
Specifications for the survey were:

Aircraft
Rockwell Shrike Commander 500S

Magnetometer
Scintrex V201 split beam cesium vapour
Resolution: 0.04 nano Tesla
Cycle rate: 0.2 seconds
Sample interval: 14 metres

Spectrometer
256 channel geometrics exploranium GR800B
Processed channels:
Total count 0.40 – 3.01 MeV
Kα 1.37 – 1.56 MeV
B1214 1.67 – 1.88 MeV
Th232 3.02 – 6.00 MeV
Volume: 33.56 litres
Cycle rate: 1.0 second
Sample interval: 70 metres

Data Acquisition
Hewlett Packard 9000 series computer
Aerodata digital acquisition system

Flight Line Spacing
 Traverse lines: 200 metres
 Tie lines: 5000 metres

Flight Line Direction
 Traverse lines: 090 – 270 degrees
 Tie lines: 000– 180 degrees

Survey Height
70 metres – mean terrain clearance

Navigation
Syledis UHF positioning system

Aerodata supplied Dominion with three sets of aeromagnetic contour maps at scales of 1:10000, 1:25000 and 1:100000. Magnetic contours over EL 6779 are shown in Fig 4.
5. CONCLUSIONS AND RECOMMENDATIONS

During the 1990/91 year of tenure, interpretation of airborne magnetic data and 1:25,000 scale aerial photography has indicated that this area is more intensely folded and structurally complex than previously thought.

The Dominion exploration programme, now in progress, includes re-mapping at 1:25,000 photo scale, stream sediment geochemistry and soil sampling over areas with a residual soil profile. A commitment to expend $7,500 in Year 2 of Tenure is envisaged.
6. EXPENDITURE

Expenditure covenant for Year 1 was $5,000.

Expenditure for EL6779, recorded for the 12 months ending 31 May 1991 as given below, is $5,900. Note that as the exploration program for this tenement is now in progress, some expenditure items (e.g. assays) have not been included in these figures. These will be included next year with Year 2 expenditure.

**EL6779 EXPENDITURE YEAR 1 TO 31 MAY 1991**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Aerial Photography</td>
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<tr>
<td>Aircraft Support</td>
<td>193</td>
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<td>Geophysics</td>
<td>953</td>
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<tr>
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<td></td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>$5,145</strong></td>
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<tr>
<td>Administration</td>
<td>755</td>
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<tr>
<td></td>
<td><strong>$5,900</strong></td>
</tr>
</tbody>
</table>
7. REFERENCES


"The Geology of the McKinlay River Area, Northern Territory, Australia". Bureau of Mineral Resources. 1:100,000 Geological Sheet 5271.