REPORT ON INVESTIGATIONS
AT THE BLACK CAT PROSPECT, TENNANT CREEK
NORTHERN TERRITORY

ADELAIDE PETROLEUM NL
SABMINCO NL JOINT VENTURE

ADELAIDE PETROLEUM NL
APRIL 1988

c.c. J. McMahon and L. Constable
Sabminco NL
1. **INTRODUCTION**

During December 1987 a reverse circulation (RC) drilling program was carried out on six prospects which are included in the Adelaide Petroleum - Sabminco joint venture for the Tennant Creek region of the Northern Territory. This report details the findings at one of the prospects namely Black Cat.

This RC drilling program was planned as a follow-up to geological mapping and sampling of the more prospective areas investigated and reported by Forrest in mid-1987.

Drilling was contracted to Rockdril of Brisbane, Queensland who provided a SCHRAM 2000 reverse circulation rig in the first period of drilling from December 13th to 19th, 1987. A second period of drilling went from 4th January to 7th February 1988, using a Versatile 1000 rig. Drill cuttings and dust, samples of each metre drilled, were collected by the cyclone, then split and bagged in plastic bags. Composite two metre samples were then collected and sent for gold analysis by the fire assay method to ALS Brisbane Qld.

Airborne magnetometer surveys were flown over all five prospect areas in November 1987, however the timing of data processing was such that no data was available to assist in siting drill holes etc.

Interpretation of the airborne magnetic data was in progress at the time of preparation of this report, and a supplement to the information provided here will be prepared.

2. **BLACK CAT**

2.1 **Location/Access/Title**

The Black Cat mine is located 20 kilometres ENE of Tennant Creek town and is accessible by a two wheel drive graded track via Lone Star and the Mammoth mines. Topography is gently undulating with prominent mesas and scarps in areas of silicified ironstone cappings.

Title to the Black Cat prospect is held by J. McMahon and L. Constable and is subject to an option deed with Quadric Pty Ltd (Adelaide Petroleum NL).

2.2 **Previous Work**

Gold was mined on a small scale from the Black Cat prior to 1936 and then more consistently in the period 1937-42
for a total recorded production of 1023 ounces. Grades varied from 8 to 18 grams per tonne.

Previous exploration is reported by Forrest to have consisted of ground magnetic surveys and geological mapping. Further mapping, an electromagnetic survey and drilling of 16 wagon drill holes were completed by Australian Development NL in 1959. Results of this drilling were not considered encouraging, however, intercepts in six of the holes ranged from 3.65 metres of 2.5 g/t Au to 1.23 metres of 5.4 g/t Au (refer Figure 2).

In 1987 National Gold NL completed a limited sampling program of the main workings and dumps of the Black Cat reported by Forrest. Results of this work indicated potential for gold lodes to continue below existing workings in a shear zone.

2.3 Geology/Mineralisation

The lease area lies within the Mammoth - New Moon area as described by Crohn and Oldershaw (1965) where the Lower Proterozoic Warramunga Group consists of interbedded shale and greywacke. The hematitic shale horizon of this Group crops out as finely laminated banded hematitic shale at the Black Cat, and extends discontinuously east-west across the area from Mammoth to New Moon. At Black Cat and all the other mines in this zone, gold is associated with ironstones consisting of hematite + quartz + jasper + magnetite; the ironstones being emplaced close to hematitic shale, and localised near steeply dipping shears. Lenses of prominent blood red jasper occur in association with the ironstone at Black Cat.

Workings at the Black Cat consist of three shafts and an adit leading to a stopeed out area beneath the silicified ironstone capping. Ore occurs in highly weathered and friable fine grained clay rich sediments that have been brecciated. The workings occur to depths of 10 to 15 metres below the ironstone at surface and it is presumed that enrichment of gold bearing lithologies has occurred during the weathering process. The main target of the current drilling investigation was to test the inferred shear zone below workings and test the continuation of the ironstones to the west of the workings.

2.4 Drilling Results

A total of 11 RC drill holes were completed at Black Cat, out of a total of 21 which were originally planned to be drilled (refer Figure 2).
Drill holes SABC 1 to 9 inclusive, and SABC 11 were all drilled towards the north east and sited to test the main ironstone body and/or the associated shear zone below the old workings. Drill hole SABC 10 was sited approximately 100 metres south west of the main workings and drilled towards the south west to follow up a previously defined and anomalous zone drilled by ADL.

West of the workings all holes intersected the hematitic shale unit at hole depths of less than 30 metres, also ironstone of thickness 2 to 5 metres was drilled in SABC 1, 2, 3, 4, 5 and 6. The ironstone thins to the west and is apparently conformable with bedding, dipping to the south. Red jasper with ironstone was intersected in SABC 4 overlying hematitic shale.

Drill holes SAMS 7 and 9 drilled intervals of green chloritic sediments with some ferruginous zones which may be indicative of the occurrence of deeper sourced chlorite-ironstone bodies. Also the nearby SAMS 8 contained the only weakly anomalous gold assay of 0.19 g/t gold in a 2 metre composite sample.

The hole sited to the south west of the workings, SAMS 10, intersected massive specular hematite and ferruginous chloritic sediments, but assay results did not provide any encouragement for further testing of this reported anomalous zone.

In late January, one additional hole, SAMS 11, was sited below the ironstone outcrop to test the continuity of the gold bearing shear zone which was described in the stope out area. Although approximately 15 metres of ironstone were drilled and 20 metres of hematitic shales occurred below the ironstone, no significant gold assays resulted from this hole.

2.5 Conclusions and Recommendations

Results of the 11 hole reverse circulation drilling program at Black Cat were not encouraging and the potential for discovery of a high grade ironstone related gold deposit is now downgraded.

By inference from the drilling, the ironstone thins markedly to the west and at depth below the silicified ironstone capping. Also the extent and width of the gold bearing shear zone is now known, but can be deduced to be fairly limited in view of the fact that four holes were drilled near or below the stope area.

Some potential may exist for the development of chlorite rich-hematite bodies at depth which may host gold mineralisation. The presence of pervasive hematization and chloritization in drill holes SAMS 7 and 9 may
warrant follow up by deeper drilling, but this is beyond the scope of the present program of testing.
## EXPENDITURE STATEMENT

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**Total:** $4,164.58