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SML 405

MYPONGA

PROGRESS AND FINAL REPORTS TO LICENCE SURRENDER FOR THE PERIOD 23/4/1970 TO 28/1/1971

Submitted by
Noranda Australia Ltd
1970

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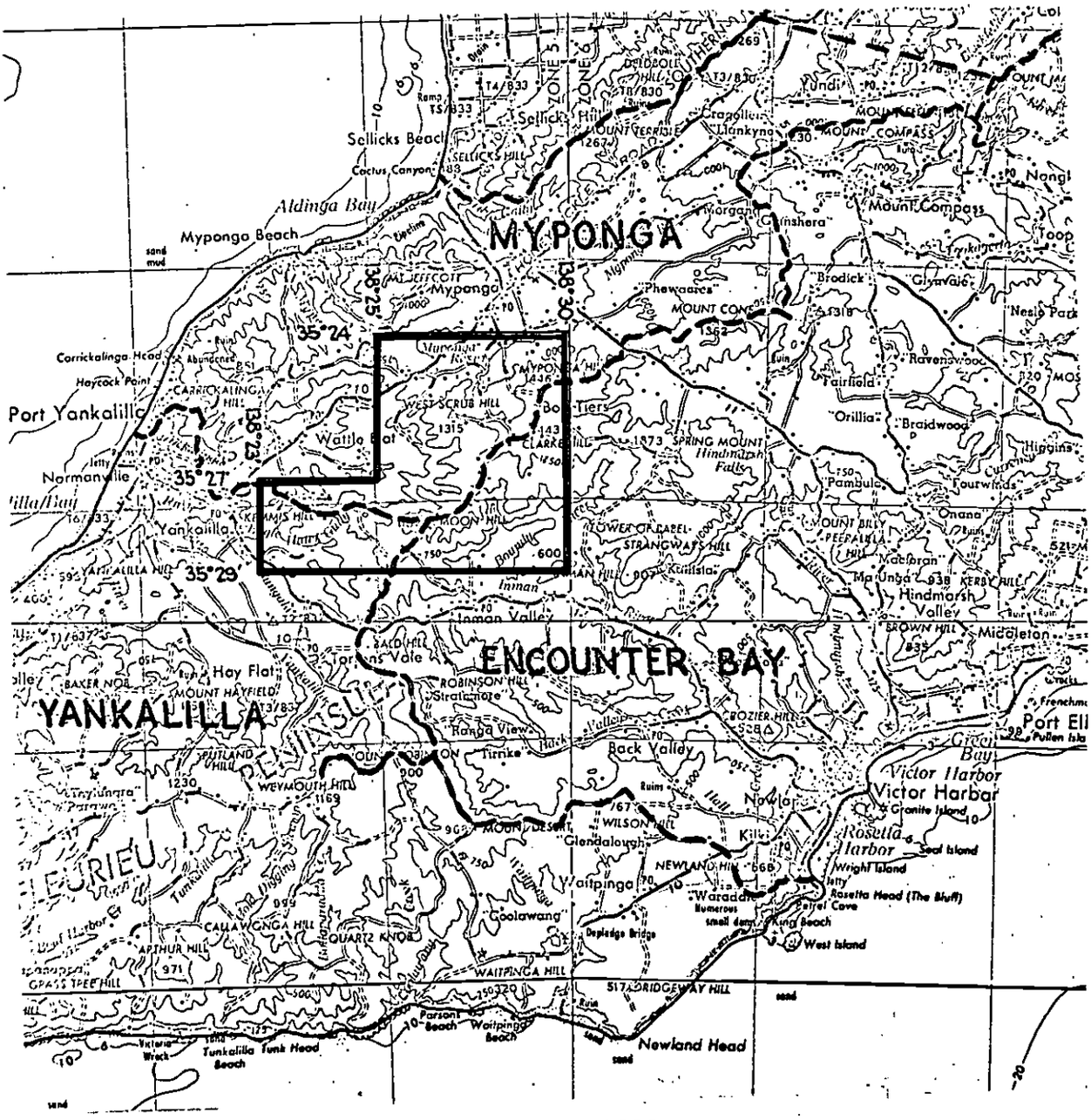

SCALE 1:250000

NORANDA AUSTRALIA LTD.

DOCKET D.M. 444/70 AREA 34 SQ MILES

1:250000 PLANS : BARKER

LOCALITY

S.M.L. No. 405 EXPIRY DATE 22·4·71

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TENEMENT: SPECIAL MINING LEASE. No. 405

TENEMENT HOLDER: NORANDA AUSTRALIA LTD.

REPORTS:

CREMER, P.L. 1970
Special Mining Lease No. 405
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Unimin Report. (pgs. 3-17)

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SPECIAL MINING LEASE NO. 405

MYPONGA AREA, SOUTH AUSTRALIA

UNIMIN REPORT

P.L. Cremer

July, 1970

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1. INTRODUCTION:

The small township of Myponga is situated approximately 38 miles south of Adelaide. S.M.L. 405 is an "L" shaped area of approximately 34 square miles, whose northern boundary passes one mile south of Myponga.

Geology of the lease is dominated by a large Archean inlier overlain by Proterozoic, Cambrian and Permain sedimentary rocks and sediments. Youngest deposits in the area are the Quaternary to Recent alluvium, which appear in the broader more deeply incised valleys, and (?) Quaternary laterite which forms a capping over large areas of the Archean outcrops.

Two uraniferous lodes discovered approximately 5 miles, by road, southwest of Myponga have subsequently been worked by the South Australian Government. These two lodes, known as the Wild Dog Uranium Mine, were discovered in October, 1953 and actively prospected until May, 1955.

A programme of airborne gamma ray spectroscopy was undertaken in 1969 by Geophoto Services Inc., under the supervision of Noranda Australia Ltd. In the latter part of 1969 geologists of Noranda commenced gridding of a number of the anomalies disclosed by the airborne survey. In the first half of 1970 Unimin geologists completed ground inspections of the remaining anomalies and undertook a more detailed study of the Wild Dog Mine area. S.M.L. 405 incorporates the southern part of S.M.L. 182 which was surrendered in April, 1970. The northern part, covered by S.M.L. 406, will be discussed in a later report.

2. GEOLOGY:

The geology of S.M.L. 405 is included in detailed mapping of the South Australian Geological Survey on the Yankalilla 1 mile geological sheet, and in the accompanying notes (Campana et. al., 1954)

Undifferentiated schist, gneiss and foliated granite comprise the Archean inlier. The gneisses range from quartz-mica to sillimanite-garnet types with a strong schistosity and commonly a well-defined foliation. The exposed southern and western edges of the inlier are featured by intense deformation and metasomatism. Microdiorites, amphibolites and bands of epidotised gneiss (similar to the Houghton "Diorite") form horizons which are generally conformable with the enclosing rocks. Pegmatite dykes, generally concentrated in zones of intense deformation intrude both the Archean and Proterozoic rocks. Of the Proterozoic metasedimentary rocks the Torrensian Series crops out most abundantly in the lease area. A small area of Sturtian and Marinoan Series rocks occur in the northwest corner of the lease. The Torrensian Series is featured by basal grits and conglomerates, overlain by slates, phyllites and quartzites. Cambrain greywackes (Kanmantoo Group), phyllites, schists and quartzites crop out in the southeastern corner of the lease. Permian glacial, fluvioglacial, glaciolacustrine (varved) deposits rests unconformably and indescriminately on folded Pre-Cambrian and Cambrian rocks. A (?) Quaternary lateritic crust caps the higher portions of the hills formed by the outcropping Archean metasediments. Relatively large areas of Quaternary and Recent alluvium appear in broad valleys to the north, west and south of the Archean block.

Whereas the Permian, and younger, sediments are relatively flat-lying, the Cambrian and Pre-Cambrian rocks have been strongly deformed by Archean and early ? Proterozoic orogenies. The regional structure is dominated by a major northeast trending anticline, overturned to the west, of which the Archean block forms the core.

3. AIRBORNE GAMMA RAY SPECTROSCOPY & ITS INTERPRETATION:

Digital recording and processing techniques were adopted in an airborne survey by Geophoto Services Inc., using a gamma ray spectrometer developed by Texas Instruments. Isoradioactivity maps were prepared for Bi 214 (U), Tl 208 (Th), K40, Bi 214/ Tl 208, Bi 214/K 40 and Tl 208/K 40, from a flight pattern in which lines were flown at 1000 feet intervals at a mean height of 400 feet. To aid in the surface location of any anomalous radioactive source, a 35 mm strip film photograph was taken at the centre of each counting period. Three sheets were required to cover the original S.M.L., No. 182. Parts of the two southern sheets cover S.M.L. 405.

The Bi 214 sheets were studied carefully and areas with a reduced sum greater than 100 counts per two seconds were noted. After inspection and gridding of a number of these anomalies, Noranda geologists (Dunlop, 1969) devised a system of priorities which indicated a total of a further 47 anomalous zones on the southern sheets of S.M.L. 182. 25 of these "rated" anomalies occur within S.M.L. 405. This system was probably derived after it was seen that the Wild Dog Mine was indicated as only a small low-grade anomaly on the airborne survey data sheets, and since the anomalies investigated were all insignificant. Due to the successful application of similar methods in the Houghton (Cremer and Franklin 1970) and Port Lincoln (Boshier and Cremer, 1970) areas, this latter scheme was overlooked and only anomalous zones enclosed 100 counts per two seconds contours were inspected. 18 of these areas occur within S.M.L. 405, and six of them have been investigated by Noranda. The remaining 12, which incorporate 12 of the "rated" anomalies, have been inspected by Unimin geologists. It was observed that there appears to be a lack of correlation between the significance of an anomaly and its priority rating.

4. PREVIOUS WORK:

The first significant uranium discovery in the Myponga area was made by Mr. W.F. Wenham, a private prospector, in October 1953. A few days later the same prospector uncovered a further deposit approximately a quarter of a mile to the north of the first. These discoveries were subsequently known as Wild Dog No. 1 and No. 2 Lodes, in order of discovery. A £5,000 Government reward paid to Mr. Wenham prompted intensive uranium prospecting in the area, but no further discoveries were made.

Soon after the discovery a programme of trenching, drilling and shaft sinking was commenced by the Department of Mines. The results of these investigations appear in unpublished reports by officers of the South Australian Geological Survey (Parkin, 1953(a), 1953(b), 1953(c), 1954 and 1955; Webb and Hughes 1954; Hughes 1954(a), 1954(b); Rayner 1954). A further published report (Parkin, 1957) summarises the activities of the Department of Mines. The investigations ceased in May 1955, by which time 321-86 long tons of ore at an average grade of 8.25lb U_3O_8/long ton had been removed from No. 1 Lode, and 18.55 long tons at an average of 4.91b U_3O_8/long ton from No. 2 Lode.

Exploration by Noranda (Dunlop) included gridding of eight anomalies in S.M.L. 182. Six of these anomalies occur within S.M.L. 405. The anomalies were traversed at 200 to 400 feet intervals and readings were taken every 50 feet along these lines. All areas were found to contain minor anomalous zones, but, except for the Wild Dog Mine, proved to be insignificant.

5. DETAILED INVESTIGATION OF THE ANOMALIES

5.01 General

The anomalous zones (classified numerically - see accompanying plan) are discussed below. Anomalies 01, 03, 08, 09, 14 and 17 have been gridded by Noranda and so no further investigation of these areas has ensued. Each of the remaining 12 anomalies was randomly traversed using a hand-held B.G.S.1 scintillometer, and notes were made on the geology and radioactivity of each.

It was found that the majority of the anomalies occur within Archean outcrops, or within the lateritic horizons overlying them; one indicated anomaly occurred over Proterozoic outcrops.

5.02 Anomaly 02 (includes 4 small areas of priority 1)

A major part of the anomaly, including one of the point maxima, lies atop a cleared ridge; the other point maximum lies in the adjoining valley to the west. Outcrop along the ridge top is rubbly and sparse. Interlayed quartz gneiss and interlayered quartz-feldspar-mica schist dominates the ridge, with lateritised fragments of schist and iron stained quartz occurring in a red-brown soil at the highest point of the ridge. The general background in this region is 60-70 c.p.s, with a small area (approximately 40 square yards) reaching over 100 c.p.s. and rising to an isolated maximum of 200 c.p.s.

More abundant outcrops of interlayered schist and gneiss occur on the valley slopes to the west of the second point maximum, which occurs on the valley floor; boulders attain a maximum diameter of four feet in this area. Foliated pegmatite and highly weathered aplite occur in a low cutting on the eastern side of the valley. The layering is near horizontal, dipping very gently to the southwest. The general reading in this area is 60 c.p.s., rising to 100 c.p.s. adjacent to the cutting which features the pegmatite outcrops.

5.03 Anomaly 04 (2nd priority area on western extremity)

This small anomaly occurs across a heavily timbered ridge and into the adjoining valley. Sparse outcrops of quartz-feldspar-mica schist strike 035 degrees and dip steeply to the west. Boulders of quartz gneiss and white-mica schist, exhibiting quartz augen up to $\frac{1}{2}$" in diameter, appear on the surface. In the vicinity of the anomaly lateritic material is evident and a small quarry has been operated sometime in the past for a heavily iron-stained quartz-haematite rock. General background over the ridge is 60 cps, rising to several small maxima of 80 cps. Readings of 33 cps over the quartz-haematite outcrops suggest that the anomaly may be caused by the contrast in readings over the latter rock type and the schists and gneisses.

5.04 Anomaly 05 (large 8th priority area included)

The anomaly extends across a prominent ridge and into a deep valley to the northeast. A point maximum lies on the ridge top. Lateritic fragments and interlayered schist and gneiss occur along the ridge and outcrops of the latter extend into the valley. Background readings average 50 to 60 cps. Several small areas give readings up to 75 cps.

5.05 Anomaly 06 (2nd priority area over northern lode)

This large anomalous zone extends along a ridge top into the shallow valley, to the north, and across to the ridge top still further north. Laterite and loose boulders of schist and gneiss crop out along the ridge top. The latter rock types are more prominent in the valley. Loose boulders of pegmatite and aplite are less abundant. General readings over the area are 50 to 60 cps. Maximum readings of 80 to 90 cps were generally recorded over areas featuring boulders of pegmatite and aplite.

5.06 Anomaly 07 (no priority indicated)

This is a small anomaly, lacking a point maximum, located about half a mile south of the Wild Dog Mine. It is situated on a small spur. Layered gneisses cropping out along the spur strike almost east-west and dip steeply to the south. Readings of 50 to 60 cps were obtained over the outcrops, falling to about 45 cps adjacent to some loose boulders of amphibolite.

5.07 Anomaly 10 (no priority indicated)

This anomaly, situated on the edge of the area covered by the airborne survey, occurs over Torrensian Series rocks. White and red-brown iron-stained quartzites crop out along the top of a low hill. General reading over the zone is 30 cps, with local fluctuations of up to 10 cps. In fact the area does not appear to be anomalous.

5.08 Anomaly 11 (small 4th priority area on northern extremity)

The southeastern part of the anomaly, situated on a broad spur, occurs over cleared paddocks. Small fragments of lateritised schist and iron-stained quartz in this area give readings up to 60 cps. Iron-stained interlayered schist and gneiss occur over the northwestern part of the anomaly. General background readings over this area are 60-70 cps rising to several local maxima of 80 cps.

5.09 Anomaly 12 (no priority indicated)

The anomaly occurs over a cleared, grassed paddock near the top of a hill. Small fragments of quartzite crop out beside the road to the northeast of the anomaly. Outcrops and loose rubble of laterite and lateritised schist occur over the paddock. General background readings are 50 to 60 cps rising to a small isolated maximum of 85 cps.

5.10 Anomaly 13 (no priority indicated)

Fragments of quartzose gneiss, quartz-feldspar-biotite gneiss and milky quartz have been gathered into small piles on a grassed paddock. General background readings of 75 to 80 cps, about 80 cps over the quartz, rise locally to 100 cps.

A small uncleared area near the centre of the anomaly contains tor-like outcrops of poorly banded pink granitic gneiss. Readings along joint planes in this rock type reach 200 cps.

5.11 Anomaly 15 (7th priority indicated over large part)

The anomaly occurs on a narrow ridge on the contact between the Archean and Proterozoic rocks. Rubbly outcrops of granitic rocks within the Archean block strike 050 degrees and dip almost vertically. Readings of these rocks average 60 to 70 cps and attain 120 cps along joint planes. Within the sparse outcrops of Torrensian Series grits and associated pegmatites readings of 70 cps were average. Up to 100 cps were recorded over pegmatite boulders.

5.12 Anomaly 16 (large 2nd and 5th priority areas included, 1st priority area just to southwest)

The anomaly covers a large area on the northeastern slopes of a broad valley. Most of the area is covered by loose fragments of laterite and iron-stained quartz over which readings of 60 to 70 cps were generally obtained. Isolated point maxima of up to 120 cps were encountered over areas containing fragments and outcrops of interlayered schist and gneiss and pegmatite.

5.13 Anomaly 18 (no priority indicated)

The anomalous zone occurs near the top of Myponga Hill. Fragments of laterite, lateritised schist and heavily iron-stained quartz appear over most of the area, with a few small isolated outcrops of weathered iron-stained schist near the northern extremity. General readings are 50-60 cps but rise locally to 90 cps.

6. WILD DOG URANIUM MINE:

6.01 Geology

As stated above, extensive exploration of the Wild Dog Mine was carried out by the South Australian Geological Survey between 1953 and 1955. Mapping of the area was undertaken at a scale of 1 inch equals 40 feet.

The mine area features highly deformed Archean meta-sediments, intruded and altered in places by later pegmatitic dykes. Four major gneissic rock types were recognised - albite-diopside; biotite-perthite; orthoclase; sillimanite-garnet. Relict bedding foliation was commonly recognised. The area is deformed by a simple regional monoclinal fold (Parkin 1957) outlined by the competent albite-diopside gneiss. The less competent members form a northwest pitching (pitch ranges from 15 to 50 degrees, averages 40 degrees) antiform, complicated by several minor crenulations, and structurally discontinuous against the eastern margin of the competent albite-diopside gneiss. Crushing and shearing of the metasediments comprising the anti-formal structure is common.

6.02 No. 1 Lode

The No. 1 Lode exhibiting a general west-northwest plunge, crops out at the crest of a spur. Secondary uranium minerals occur along foliation and joint surfaces in a biotite-perthite gneiss. Surface trenching and open cutting has revealed a northerly pitching minor fold in the gneiss. Mineralisation (pitchblende, uranophane, gummite, and meta-autunite) appears in the crest of the fold, which has an average pitch of 40 degrees. At the surface the mineralised zone was 12 feet wide from limb to limb and six feet in vertical dimension.

The lode was tested with 16 diamond drill holes (totalling 1769 feet 8 inches; 3 subsurface - one horizontal, two inclined; 13 surface - six vertical, seven inclined) and 100 wagon drill holes (totalling 6937 feet).

Following removal of surface ore, an inclined shaft was sunk along the apparent pitch of the mineralised structure to an inclined depth of 126 feet. 55 feet from the portal an eastward drive was taken for 22 feet. Further horizontal and vertical exploration was also carried out from the main shaft. In all, 321.86 long tons of ore, at an average grade of 8.25lb U_3O_8/long ton (0.37%) was removed.

As shown in the accompanying cross-sections, the drilling has indicated that the orebody lenses out just north of the mine workings. This is possibly due to the attenuation of the mineralised structure.

6.03 No. 2 Lode

In this area secondary uranium mineralisation follows a 100 feet long northwest trending shear zone. Massive pitchblende was identified in near surface residual boulders. Exploration of the lode was undertaken with seven trenches, six inclined diamond drill holes (totalling 539 feet 7 inches) and 12 wagon drill holes (totalling 464 feet).

A prospecting shaft was sunk on a 50 feet long, two to three feet wide shear dipping 40 degrees to the west. This lode lensed out at 19 feet. The shaft was continued to 27 feet. A second shaft, 60 feet north of the first, followed a shear zone dipping 50 degrees to the west, and was extended to 37 feet 6 inches. The shear carried spotty uranium-bearing material present both as fragments in the clay gouge and as small lenses.

The drill failed to prove extensions of the mineralisation. 18.55 long tons of ore, averaging 4.9 lb U_3O_8/long ton (0.22%) were removed.

7. CONCLUSIONS & RECOMMENDATIONS:

It appears that the anomalies indicated by the airborne scintillometer survey are associated with outcrops of Archean metasediments and/or the laterites overlying them. No significant anomalies were encountered during the ground inspections and so no further work is recommended on these areas.

It was at first thought that the Wild Dog Mine area might warrant further exploration by a deep diamond drill hole. However, a critical examination of the work undertaken by the Geological Survey indicates that the mineralisation does not extend far beyond the old workings, apparently due to attenuation of the subordinate mineralised antiformal structure. Thus it is recommended that no further work be undertaken in the mine area, or in fact over any part of S.M.L. 405.

P.Cremer

July, 1970

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NORANDA AUSTRALIA LIMITED

SPECIAL MINING LEASE NO. 405 - MYPONGA

REPORT FOR THREE MONTHS ENDED OCTOBER 23, 1970.

On April 11, 1968, Noranda Australia Limited was granted a Special Mining Lease No. 182 covering approximately 170 square miles in the Myponga area situated some 38 miles south of Adelaide. A programme of airborne gamma ray spectroscopy was carried out by Geophoto Services Inc., with a view to locating further uranium mineralisation in this district. A number of anomalies were located and during the period, January to April, 1969, the most promising of these were examined in the field by two Noranda geologists. The results of this work were presented in our report No. 129 dated November, 1969.

Application was made for special mining leases for two areas covering a part of Special Mining Lease No. 182. On April 23, 1970, Noranda Australia Limited was granted Special Mining Lease No. 405 in the Myponga area and Special Mining Lease No. 406 in the Mt. Compass area. A report on the detailed investigation of the remaining anomalies in the Myponga area was included in the report for the quarter period ended July 23, 1970.

During the past three months no further field work has been done on Special Mining Lease No. 405 as field work has been concentrated on the remaining two Special Mining Leases.

It appears that the anomalies indicated by the airborne scintillometer survey are associated with outcrops of Archean metasediments and/or the laterites overlying them. No further significant anomalies were encountered during the ground inspection. There appears no

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