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ELA 89/91

MILANG

SUPPORTING DATA TO EXPLORATION LICENCE APPLICATION

Submitted by
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Government of South Australia
Primary Industries and Resources SA

HEAVY MINERAL SAND PROJECT

SOUTHWEST SECTOR - MURRAY BASIN

Preamble

A review of exploration for heavy mineral deposits in the Murray Basin revealed that the extreme southwest sector had not been prospected. Recent work by Belperio and Bluck (SADME RB 88/72) demonstrates that, during Quaternary and Recent times, the dominant swell and wind directions were southwesterly and westerly respectively. This would have applied a maximum gravitational sorting to sands deposited in the southwest sector, with a potential for the heaviest minerals to accumulate close to the Mount Lofty Ranges. Such an event appears to have occurred in Pleistocene times.

Geology

Fossil heavy mineral sand accumulations are being eroded on the Middleton beach; they appear to be concentrated on the shoreward side of fossil calcareous dunes which trend northeast; these dunes probably swing easterly around Goolwa and join the regional trend as shown by Belperio and Bluck (figure 1).

A qualitative sample of these sands, MB1, figure 2, was examined by Central Mineralogical Services and the report, Appendix A, shows ilmenite dominant (c40%) with zircon and garnet (c20%), rutile and magnetite (c6%). As noted on that report, 50ppm tin has also been recorded from Middleton and concentrations of heavy metals are possible.

Examination of SADME water bore records reveals that up to 10m of sands occur below 15-20m of clays in the area between Milang and the Mount Lofty Ranges (figure 2). In general, these sands are recorded as white to yellow close to the ranges and grade progressively to brown, red and then to blue-grey away from the ranges. This colour distribution suggests that the sands were deposited along a shoreline parallel to the fossil dune trend. Such an area of deposition coupled with the favourable position with respect to wind and swell, would enhance the sorting processes; the resultant colour range, white to brown to red to blue-grey, could be expected from a mineral suite of quartz, garnet, rutile, zircon, ilmenite and magnetite.

Summary

Heavy mineral bearing sands occur adjacent to fossil dunes in the extreme southwest of the Murray Basin. Water bore records show that white/red/brown/blue-grey sands occur with progressive colour changes parallel to the dune trend. The dominant westerly/southwesterly wind and swell would have enhanced sorting at this front of deposition such that the sand colours may represent the dominant mineral e.g. quartz/garnet/zircon/ ilmenite. The potential exists for well sorted and significantly enriched heavy mineral accumulations within 25m of surface.

EL Application

Details of the El applied for are given in Appendix B and boundaries as appropriate are marked on project plans.

Ian Youles 22/3/89.

CENTRAL MINERALOGICAL SERVICES

Date 23rd February, 1989

SAMPLE REPORT (Mineralogy, Petrology, Ore Microscopy)

IDENTIFICATION

Job No. CMS 89/2/13 **Date Received:** 13.2.1989

Reference Verbal request - I.P. Youles

Sample No. MB 1

Nature of Sample: Beach Concentrate

DESCRIPTION **SECTION No.**

a. Hand Specimen:

b. Microscopic:

A 50 gm portion of the sample was separated in TBE (S.G. = 2.95) to yield a heavy fraction of 73.65 % by weight.

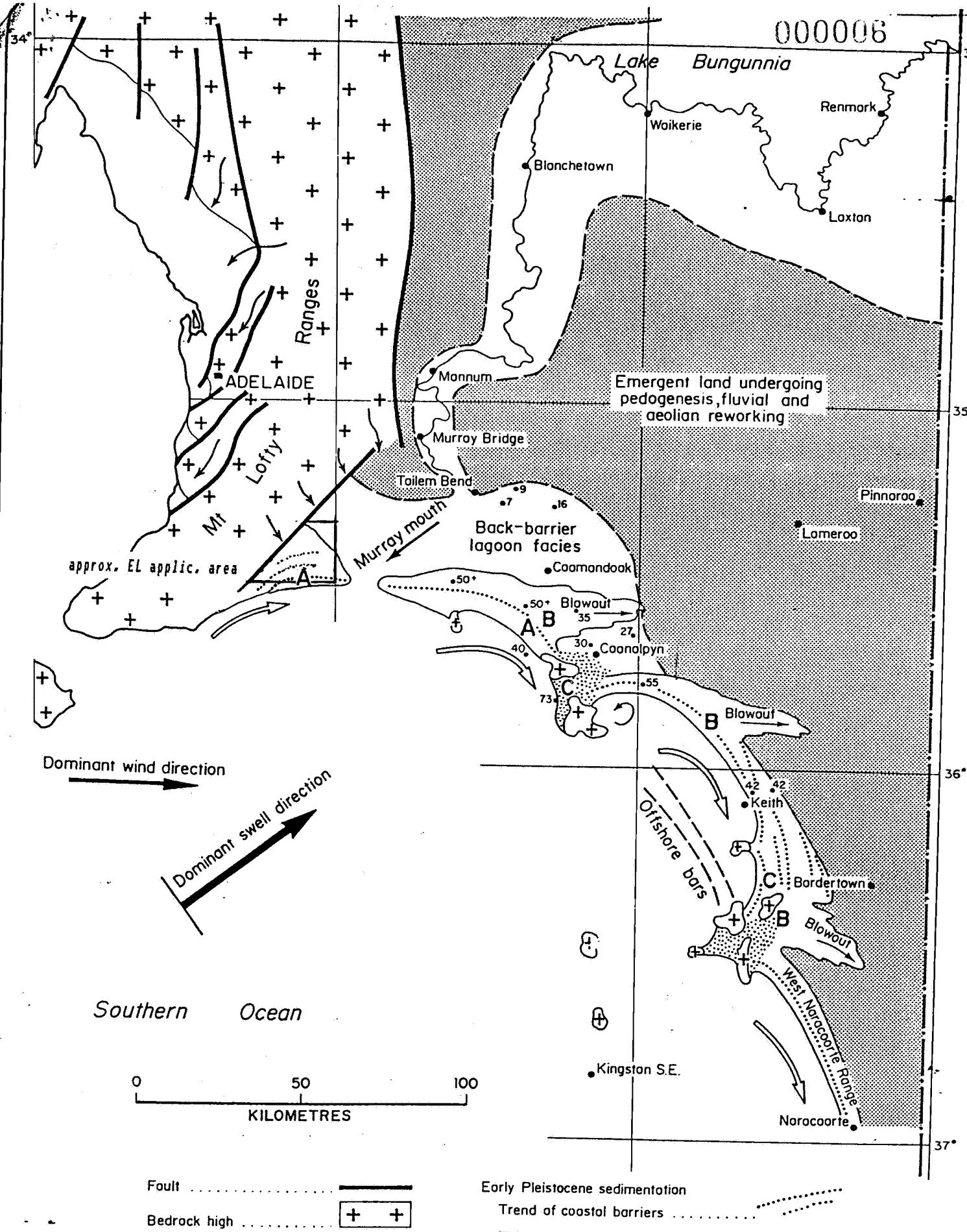
The following minerals were detected in the sink fraction:

Ilmenite	-	44 %
Garnet	-	18 %
Zircon	-	22 %; rounded, clear.
Rutile	-	6 %; dark red.
Magnetite	-	7 %; small grains.
Silicates	-	3 %; (staurolite, tourmaline, others).
Monazite	-	trace
Green Spinel	-	trace

The grains show a fairly wide size range from 0.05 mm to 0.50 mm, and thus the percentages given are approximate.

A previous investigation on a very similar concentrate from Middleton gave 50 ppm Sn, and a check assay for Sn, Nb, Ta and Au may be worthwhile.

H.W. Fander, M. Sc.



SADME S20196

FIGURE 1 EARLY PLEISTOCENE PALAEOGEOGRAPHY, WESTERN MURRAY BASIN (after Belperio & Bluck, 1988)

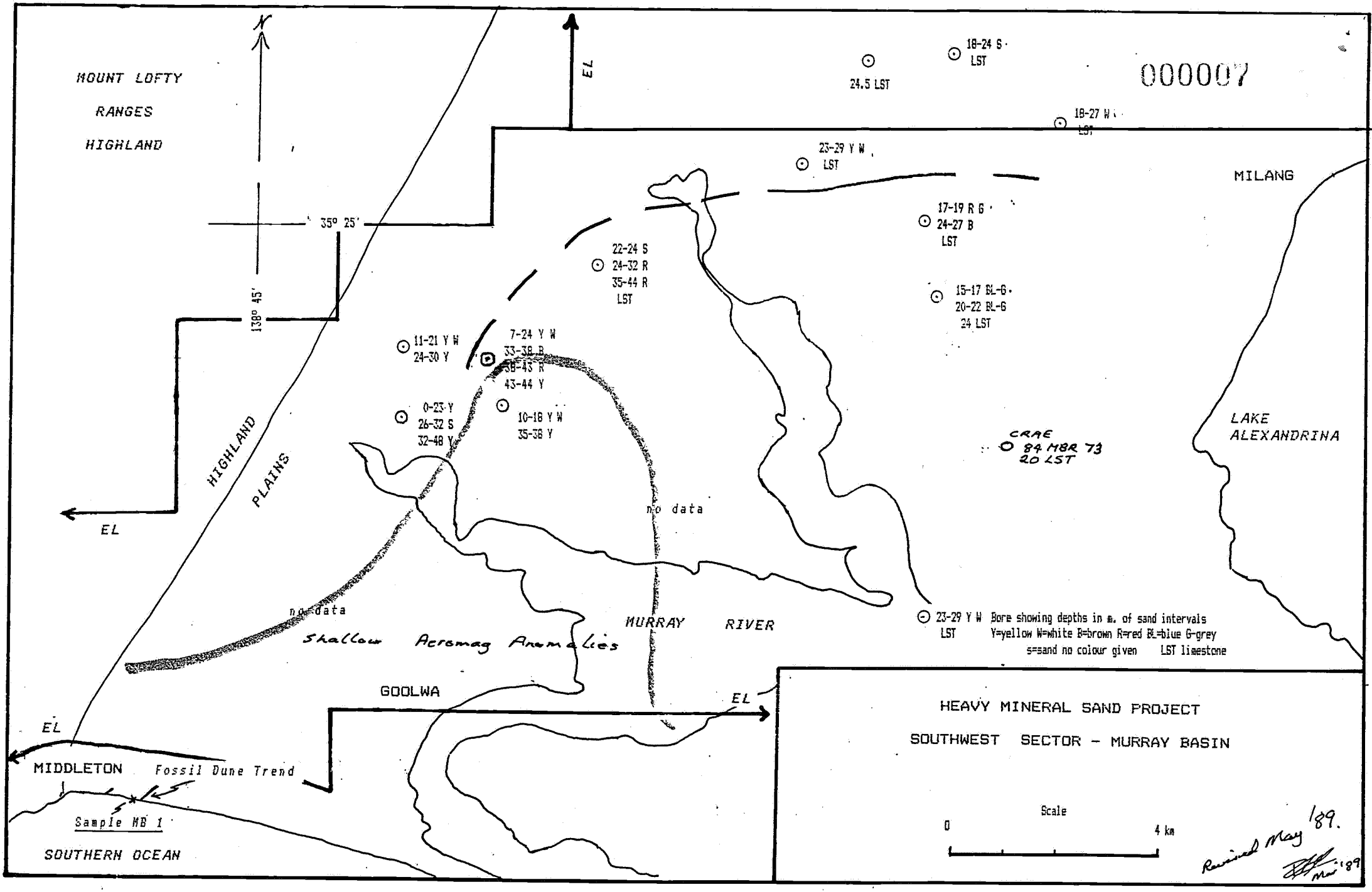

MOUNT LOFTY
RANGES
HIGHLAND
EL
18-24 S
LST
24.5 LST
000007
18-27 W
LST
23-29 Y W
LST
MILANG
35° 25'
138° 45'
17-19 R G
24-27 B
LST
22-24 S
24-32 R
35-44 R
LST
15-17 BL-G
20-22 BL-G
24 LST
11-21 Y W
24-30 Y
7-24 Y W
33-38 R
38-43 R
43-44 Y
0-23 Y
26-32 S
32-48 Y
10-18 Y W
35-38 Y
CRAE
84 MBR 73
20 LST
LAKE
ALEXANDRINA
HIGHLAND
PLAINS
EL
no data
no data
Shallow Aeromag Anomalies
MURRAY RIVER
23-29 Y W Bore showing depths in m. of sand intervals
LST Y=yellow W=white B=brown R=red BL=blue G=grey
s=sand no colour given LST limestone
GOOLWA
EL
EL
MIDDLETON
Fossil Dune Trend
Sample MB 1
SOUTHERN OCEAN
HEAVY MINERAL SAND PROJECT
SOUTHWEST SECTOR - MURRAY BASIN
Scale
0
4 km
Revised May '89.

FIGURE 2