DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

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PALYNOLOGICAL DATING AND CORRELATION OF TERTIARY SEDIMENTS IN THE FREELING AREA

GEOLOGICAL SURVEY

by

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TITLE: PALYNOLOGICAL DATING AND CORRELATION OF TERTIARY SEDIMENTS IN THE FREELING AREA

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LOCALITY BOREHOLE: Freeling 4, 5, 8, 9 and 13 wells

SAMPLE DATA:

Branch No: S6607, S6610, S6611, S6612, S6613, S6614
Depth (metres): 53-54, 54-59.5, 28-32, 52-56, 36-38, 22-24
Type of sample: Cuttings
Lithology: Carbonaceous clay, silt and sand
Submitter: D.C. Scott, Mineral Resources Branch

LOCATION:

General location: East of Freeling
Mapsheet: ADELAIDE 250 000

STRATIGRAPHIC INFORMATION:

Stratigraphic unit: Unnamed Tertiary clastics
Geological Province: Barossa Basin
Rock sample (RS) no.: 6629 RS numbers, 88,92,93,94,95,96

ANALYTICAL DATA:

Laboratory Technique: Standard with acetolysis and 10 um and 129 um sieves.
Microscope used: Zeiss Photomicroscope III
Palynomorphs counted: 200-400; no count for S6612 because of poor preservation; S6613 and S6614 produced no palynomorphs.

RESULTS:

Main components of microfossil assemblage (% in brackets):

. Pollen/spores:

Haloragacidites harrisii (5-27), *Laevigatosproites major* (7-13), *Lygistepollenites florinii* (4-6), *Nothofagidites spp.* (11-29), *Phyllocladidites mawsonii* (4-36); taxa significant in a single sample include *Proteacidites rectomarginis* (10), *P. tuberculatus* (5), *Parvisaccites catastus* (13), *Tricolporites adelaidensis* (8).

. Microplankton:

Very rare dinoflagellates occur in S6610

Zonation: *Proteacidites tuberculatus* Zone of Stover and Partridge (1973)

Zonal Species and Associates Present or Absent: *Foveosporites crater, F. palaequetrus, Kuylisporites waterbolkii* and *Dryadopollis retequetrus* present; *Triporopollenites bellus* and *Symplocoipollenites austellus* absent.

Age: Early Oligocene to Early Miocene.

Palaeoenvironment: Mainly fluvial with very weak marine influence (possibly uppermost estuarine).

Other Comments: The lithology, the very weak marine influence and the date indicate that the sediments are correlative with the older facies of the Rowland Flat Sands in the Barossa Basin (Alley, in prep.). The sediments in the Barossa Basin are also lithologically similar to, and appear

stratigraphically continuous with, sediments in the Lyndoch, Sandy Creek, Cockatoo and possibly Stockport areas (Alley, 1973 and in prep.). For these reasons the definition of the Barossa Basin is extended to include the Tertiary clastics in all these areas.

REFERENCES:

Alley, N.F., 1973. Landsurface development in the Mid North of South Australia. Transactions of the Royal Society of South Australia, 97: 1-17.

Alley, N.F., in prep. The palynostratigraphy of Tertiary sediments in the Barossa Valley.

Stover, L.E. and Partridge, A.D., 1973. Tertiary and Late Cretaceous spores and pollen from the Gippsland Basin, southeastern Australia. Proceedings of the Royal Society of Victoria, 85: 237-286.

Dated: 4 August 1989