Legs 119 and 120 of the Ocean Drilling Program (ODP), from December 1987 to April 1988, were directed at the Kerguelen Plateau and the Antarctic continental margin. The objectives were to study palaeogeography and palaeo-oceanography, and to resolve the origin and evolution of the Plateau. Seven sites were occupied on that part of the Kerguelen Plateau which is under Australian jurisdiction, for a total of 1681 m of core.

Drill sites (Fig. 14) were selected on the basis of seismic reflection data collected by BMR scientists in 1985 (RV Rig Seismic) and by the French research and supply vessel Marion Dufresne in early 1986 (BMR Research Newsletter 5, 12–13).

The program was mounted from the drill ship JOIDES Resolution and was manned by scientists from the 18 ODP member nations and Australia. BMR supported the participation of Dr C. Jenkins of the University of Sydney on Leg 119, and Dr M. Coffin of BMR on Leg 120. Full results will appear in the Proceedings of the Ocean Drilling Program: Initial Results and Proceedings of the Ocean Drilling Program — Scientific Results.

Three of the seven sites (748, 750, 751) were located in the major sedimentary basin (Raggatt Basin) outlined by BMR in 1985; of the others, one was sited to the north of the basin (747), one to the west (749), and two to the south (744 and 738). Sites 748 and 750 were designed to test the lower sedimentary section and basement, and thus were on the margins of the basin where the section is thinnest.

The two holes directed at basement (748, 750), as well as three of the others, bottomed in mid and Late Cretaceous basalt (ages from overlying sediment). The basalt is of ocean-island character and some flows have been subaerially weathered, with development of soils and plants (now charcoal). The overlying marine sediments indicate relatively rapid subsidence of the northeastern margin of the plateau through the Late Cretaceous, while the central spine (748) remained at relatively shallow depths.

Pelagic sedimentation was continuous from the late Maastrichtian to the Middle Eocene and, after a break, from Middle Eocene to Pliocene. Plio–Pleistocene cover is thin and discontinuous.

The high organic carbon content of some of the older sediments enhances the petroleum potential of the Raggatt Basin. However, the basin, because of its remote location and relatively great water depths (1000–2000 m), is unlikely to attract exploration interest in the short term.

The suggested evolution of the southern Kerguelen Plateau is as follows:

1. Basalts were erupted prior to the Cenomanian, subaerially or in shallow water.
2. During the Cenomanian, Turonian, and probably Santonian, open-marine conditions evolved in the eastern part of the Raggatt Basin (Site 750) and the eastern margin of the plateau subsided slowly to about 50 m below sea level. To the west (Site 748) the plateau remained subaerial or at very shallow depth.
3. During the Campanian and late Maastrichtian, the eastern margin rapidly subsided to about 2000 m below sea level, and the western part of the plateau subsided slowly, remaining at about 50–200 m below sea level. At roughly the Campanian–Maastrichtian boundary major normal faulting affected the eastern margin (Site 750). To the west, along the 77 Graben (Site 748), major faulting occurred in the late Maastrichtian.
4. From the late Maastrichtian to the Middle Eocene, sedimentation (mainly nannofossil chalk and ooze with some chert) was essentially continuous over the entire plateau. However, a hiatus of at least 2 Ma occurred during Middle Eocene time at Sites 748 and 750, and at Site 747 a hiatus of 15 Ma is accompanied by subsidence of about 500 m (30 m/Ma).
5. From Middle Eocene to Pliocene time, sediment was continuously deposited over the entire southern plateau.
6. The paucity of Plio–Pleistocene sediment over most of the southern Kerguelen Plateau is probably related to the high-energy Antarctic Circumpolar Current.

As part of BMR’s continuing Continental Margins Program the RV Rig Seismic is scheduled to return to the southern Kerguelen Plateau in early 1989 to better resolve the resource potential of the area under Australian jurisdiction, to acquire geophysical and sampling data complementary to ODP results, to carry out geothermal studies related to hydrocarbon generation and migration, and to investigate the plateau’s deep crustal structure.

For further information on Ocean Drilling Program studies of the Kerguelen Plateau, contact Dr Mike Coffin; for information on the planned 1989 Kerguelen Plateau research cruise, contact Dr Mike Coffin and Dr Hugh Davies, both at BMR (Division of Marine Geosciences & Petroleum Geology).

### New waterguns improve seismic resolution aboard Rig Seismic

New 0.245 l (15 cubic inch) and 1.31 l (80 cubic inch) waterguns were recently commissioned on BMR’s RV Rig Seismic, for use in the offshore programs being conducted by the Division of Marine Geosciences & Petroleum Geology. These new seismic sources will complement the large, high-capacity airgun arrays used for lower-resolution, deep-penetration studies (see BMR Research Newsletter 7, 7).
During the past one hundred years the Murray Basin has become one of the most important agricultural regions in Australia. It also contains areas of great natural beauty and historical significance. Unfortunately, clearing of natural vegetation, and irrigation, have been accompanied by rising groundwater-levels and discharge of saline waters to the land surface. In order to develop strategies to combat this problem, an understanding of the controlling processes is essential. In particular, it is fundamental that the relationships between aquifer geometry, recharge, groundwater flow, and distribution of surface discharge features be fully understood.

Against this background, BMR, in co-operation with the State geological and water agencies, initiated a groundwater project to examine the Murray Basin unencumbered by State boundaries. BMR’s role has been to establish a basin-wide geological and hydrogeological framework, and to provide basin-wide perspectives on the groundwater systems and processes that result in surface salinisation. The basinic frameworks are now established and the processes well understood. The project is now entering a new phase in which emphasis has shifted to the development of predictive models to support the management of the water resources. This will facilitate the development of a co-ordinated strategy aimed at minimising the salinity problem.

With the creation of the Murray–Darling Ministerial Council in 1985, the original groundwater project steering committee was formalised as the Groundwater Working Group, reporting to the Council through the Murray–Darling Basin Commission. The scope of the project was also expanded to include reconnaissance investigations of the Darling River drainage basin, to reflect the Council’s Murray–Darling perspective.

The Groundwater Working Group will provide technical advice to the Murray–Darling Basin Commission on groundwater matters and will facilitate the basinwide study of all aspects of groundwater in the Basin.

The Working Group is currently developing a detailed work program aimed at providing technical information to natural resource managers. Some products from the Group have already been made available:

**Murray Basin 88 Conference**

A major conference, organised by the Working Group, titled ‘Murray Basin 88 — Geology, Groundwater and Salinity Management’ was held in Canberra during May 1988. The conference was aimed at identifying the nature and extent of groundwater-related problems in the Murray Basin, communicating this information to non-groundwater people, and canvassing issues in Murray Basin resource management. A 200 page volume of Extended Abstracts was published in BMR’s Division of Continental Geology Groundwater Series (No. 12: BMR Record 1988/7).

**Salinity Map of the Murray Basin**

A shallow groundwater and salinity map of the Murray Basin, at 1:1 000 000 scale, was released at the Murray Basin 88 conference. This map was compiled by BMR from contributions by the various State agencies using BMR’s Intergraph CAD/CAM system. The map was produced in 12 months from conception to release.

**Hydrogeological mapping project**

At the request of the Ministerial Council the Working Group has started a project of hydrogeological mapping for the Murray Basin that will ultimately provide an integrated high-quality groundwater database. The project will make use of all available groundwater expertise in the basin by involving all relevant agencies. Additional funding has been made available for BMR’s contribution to a 6-year program of mapping that will collate and enhance existing computerised databases to generate twenty-seven 1:250 000 scale hydrogeological maps in the Murray Basin. In addition, a series of 1:1 000 000 reconnaiss ance scale maps of the Darling River drainage basin are planned. Each of the participating organisations are obtaining compatible CAD/CAM systems to facilitate exchange and maintenance of databases.

A set of hydrogeological maps, at 1:250 000 scale, will be generated which will: show the influence of groundwater on land salinisation and surface water salinity; delineate usable groundwater resources; highlight the present and potential salinity hazard; enhance community awareness and understanding of groundwater systems; and be used to focus management and research tasks for salinity control.

The 1:1 000 000 scale shallow groundwater and salinity map of the Murray Basin can be obtained from BMR Publication Sales in Canberra, and Australian Government Publishing Service (AGPS) Bookshops in all capital cities, price $29.95 (including postage).

For further information, contact Dr Malcolm Walter, Mr Ray Evans, Mr Campbell Brown, Mr Jim Kellett, or Mr Gerry Jacobson at BMR (Division of Continental Geology).

**New National Resource Information Centre ‘NRIC’**

Sound policy decisions on natural resource management require a comprehensive and reliable information base. A further step towards achieving this was taken in May 1988 when the Federal Minister for Primary Industries & Energy, Mr John Kerin, announced the establishment of a National Resource Information Centre (NRIC) within his Department (DRI).

NRIC will draw upon, expand, and complement the existing data, facilities, and expertise of the Bureau of Rural Resources (BRR) and BMR. The resource data held will be augmented substantially by information supplied by other Commonwealth