Australian Government

Department of the
Environment and Heritage

The Joint Standing Committee for the National Capital and External Territories Inquiry into the Adequacy of Funding for Australia's Antarctic Programme

Submission by

Department of the Environment and Heritage

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Executive Summary

The Australian Antarctic Division (AAD) is the lead agency for the Australian Antarctic programme. The AAD provides the core strategic, policy, operational and scientific resources to achieve the Government's goals for the programme, which are:

- to maintain the Antarctic Treaty System and enhance Australia's influence within the System;
- to protect the Antarctic environment;
- to understand the role of Antarctica in the global climate system; and
- to undertake scientific work of practical, economic or national significance.

In addition to the Government's Antarctic goals the AAD ensures that Australia's longstanding policy interests in the Antarctic are implemented. These policy interests are:

- to preserve Australia's sovereignty over the AAT, including sovereign rights over the adjacent offshore areas;
- to maintain Antarctica free from strategic and/or political confrontations;
- to protect the Antarctic environment, having regard to its special qualities and effects on our region;
- to take advantage of the special opportunities Antarctica offers for scientific research;
- to be informed about and able to influence developments in a region geographically proximate to Australia; and
- to derive any reasonable economic benefits from the living and non-living resources of the Antarctic (excluding the deriving of such benefits from mining and oil drilling).

There are many different ways that Antarctic programmes are delivered by the various Antarctic nations active in Antarctica. Australia uses a hybrid model which provides a centralised agency (the AAD) to coordinate and provide logistics and science while ensuring broad participation in the programme by universities, agencies and individuals. The AAD also provides centralised policy advice to Government on Antarctica and the Southern Ocean. There is considerable synergy gained from this association of operational, research and policy activities.

AAD staff play important roles in the international forums within the Antarctic Treaty System and work in close collaboration with other Departments with Antarctic policy interests.

The AAD seeks to be at the leading edge of scientific productivity among those nations operating on the Antarctic continent and in the subantarctic.

The AAD has been able to maintain its high standards against a budget that has remained relatively static in real terms. It has been able to achieve this due to flexibility within the AAD to redeploy resources to high priority areas.

Challenges facing the AAD in the short to medium term include:

- the implementation of an air transport system for Antarctica;
- the associated organisational and operational changes that will result from any move from ship-based to air-based logistic infrastructure within Antarctica;
- the increasing importance of understanding and protecting the marine ecosystem, around the Territory of Heard Island and McDonald Islands as well as improving the ability of the AAD to manage this highly sensitive World Heritage area;
- the increasing cost of complying with environmental standards required when operating in sensitive environments;
- the requirement to consistently achieve high standards in occupational health and safety management to meet the needs of operating in an inherently hostile environment;
- the transition from a disciplined based approach to a multi-disciplined priority programme approach to scientific research;
- the need to use technology such as the Internet to bring the Antarctic experience closer to the people of Australia; and
- the provision of high level policy advice on Antarctic and Southern Ocean issues such as environmental protection and Southern Ocean fisheries.

Terms of Reference

The Terms of Reference for the Inquiry by the Joint Standing Committee on The National Capital and External Territories direct the Committee to conduct an inquiry and report on the adequacy of funding for the Australian Antarctic Division to meet the four goals set for advancing Australia's Antarctic interests:

- Enhancing Australia's influence in the Antarctic Treaty system;
- Protecting the Antarctic environment;
- Understanding Antarctica's role in the global climate system; and
- Conducting scientific research of practical, economic or national significance.

This inquiry will also extend to consideration by the Committee of the Annual Report of the Department of the Environment and Heritage for 2002-03, which was presented in the House of Representatives on 4 November 2003 and referred to the Committee for any inquiry it wished to make.

The AAD notes that the first of the goals named in the Terms of Reference, varies from the Government's stated goal of "Maintaining the Antarctic Treaty System and enhancing Australia's influence within the System". In preparing its response the AAD has assumed that the goal as mentioned is intended to embrace the full intent of the Government's first goal for Australia's Antarctic programme.

Introduction

The AAD is the Australian Government agency charged with leadership of the Australian Antarctic programme. As such, it has a crucial role in ensuring that the Australian Government's objectives with respect to Antarctica and Antarctic related science are met.

In regard to the Inquiry's Terms of Reference, this submission will highlight the following:

- Previous reviews have concluded that the AAD is efficient and effective in the delivery of the Australian Antarctic programme.

- The future holds a number of challenges for the AAD that will test its ability to structure its resources to meet the objectives and priorities set by Government.

- The introduction of an air transport system in Antarctica is part of a continuing process to modernise the Australian Antarctic programme and ensure that it remains relevant to, and at the forefront of, Antarctic science.

Background

The Australian Antarctic Territory

Australia's claim to the Australian Antarctic Territory (the AAT) comprises 42% of the Antarctic continent. For comparison this represents a land area equivalent to that of Australia without Queensland. The AAT features the world's highest surface wind speeds, coldest surface air temperature, deepest ice and largest glacier.

Australians have played a key role in the exploration of the Antarctic, particularly the area that now comprises the Australian Antarctic Territory. This history can be traced back to the last years of the 19th century and to Douglas Mawson's expeditions in 1911-14 and 1929-31 in which he claimed parts of Antarctica on behalf of the Crown.

However, it was not until the 1930s that steps were taken to formally acquire the Territory. Australia's sovereignty over the AAT derives from a United Kingdom Order in Council issued in 1933 under which the AAT was placed under the authority of the Commonwealth of Australia. The Order in Council was adopted by the Australian Parliament through the passage of *Australian Antarctic Territory Acceptance Act 1933* (Cth).

Australia has three permanent stations in the AAT. Mawson station, established in 1954, is the oldest continually occupied station south of the Antarctic Circle; and Davis and Casey were established in 1965 and 1968 respectively.[1]

There are Russian, Chinese and a joint French/Italian station within the AAT, operated in accordance with the cooperative nature of the Antarctic Treaty.

The Antarctic Treaty

The Antarctic Treaty applies to the area south of 60° South latitude and therefore applies to the AAT and adjacent marine areas. Australia was one of the original signatories to the Antarctic Treaty, which came into force in 1961.

In acceding to the Antarctic Treaty, Australia agreed to administer the AAT and, more generally, the activities of Australians elsewhere in the Antarctic, in accordance with the political and regulatory framework established by that Treaty.

The Antarctic Treaty established a consultative system of governance for Antarctica. The Antarctic Treaty Parties meet annually to consider policy proposals for regulating human activity in Antarctica. Agreed recommendations or measures are then implemented by each Antarctic Treaty Party domestically, including by the enactment of national legislation.

[1] Further information on each Station and their value to Australian Antarctic science is available on the AAD website at www.aad.gov.au/stations.

A number of conservation and environmental protection agreements have also been adopted by Antarctic Treaty Parties. These include:

- *The Agreed Measures for the Conservation of Antarctic Fauna and Flora* (1964);
- *The Convention for the Conservation of Antarctic Seals* (CCAS);
- *The Convention on the Conservation of Antarctic Marine Living Resources* (CCAMLR); and
- *The Protocol on Environmental Protection on the Antarctic Treaty* ('the Madrid Protocol').

Each of the above has been implemented by Australia domestically through the enactment of domestic legislation.

Further information on the Antarctic Treaty system is available on the AAD's website at www.aad.gov.au.

The Territory of Heard and McDonald Islands

The Territory of Heard Island and McDonald Islands (HIMI) is located in the Southern Ocean, approximately 4500 km southwest of the Australian mainland and 1000 km north of Antarctica. The Territory lies outside the Antarctic Treaty area and the Territory and Australian activities within it are not subject to the Antarctic Treaty, but HIMI and its Exclusive Economic Zone (EEZ) are included in the Convention area of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR). Australia's sovereignty over HIMI drives from the 1947 transfer of the Territory from the United Kingdom to the Commonwealth of Australia.

In recognition of its abundant wildlife and vegetation, its intact ecosystems and unique geophysical attributes (including Australia's only active volcano), Heard Island, together with the nearby McDonald Islands, was inscribed on the World Heritage List in 1997.

In October 2002, the *Heard Island and McDonald Islands Marine Reserve* was declared under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). The Reserve includes the islands themselves, the surrounding Territorial Sea and a marine protected area which extends in part to the outer boundary of the 200 nautical mile EEZ around the Territory. The Reserve comprises the world's largest fully protected marine reserve, covering an area of 6.5 million hectares, or 65,000 square kilometres. Classified as an IUCN (the World Conservation Union) Category 1a Strict Nature Reserve, the Reserve is to be managed primarily for scientific research or environmental monitoring.

Since the early 1950's Australia's Antarctic scientific interest has been concentrated on the Antarctic continent and at Macquarie Island with only irregular visits to Heard Island. Interest in research work at Heard Island is increasing. This is due to HIMI being in a CCAMLR area of interest and in being south of the Antarctic Polar Frontal Zone (where

the cold Antarctic waters meet the warmer northern ocean water). Heard Island's very active glaciers are sensitive indicators of climate change and glacial retreat provides excellent opportunities to study colonisation.

Macquarie Island

The AAD currently operates a permanent station on Macquarie Island, which is part of Tasmania. Macquarie Island is 1500 kilometres south east of Tasmania and 1300 kilometres north of the Antarctic continent. The island is 34 kilometres long and 5 kilometres wide at its widest point and it has a total surface area of 128 square kilometres.

Although Macquarie Island is not located within the Antarctic region, Australia's Antarctic programme has a historical link with Mawson's 1911-14 expedition which used the island to relay the first radio signals from Commonwealth Bay in Antarctica to Australia. Australia's first expeditions as the Australian National Antarctic Research Expedition (ANARE) in 1947/48 established stations at Macquarie Island and Heard Island. Heard Island station was closed in 1955 with the establishment of Mawson Station on the Antarctic continent, but the presence at Macquarie Island has continued.

Macquarie Island is a Nature Reserve managed by the Tasmanian Parks and Wildlife Service. The island and its surrounding waters to 12 nm were included on the World Heritage List in 1997.

In order to protect unique and vulnerable marine ecosystems in the area, the Australian Government in 1999 declared part of the EEZ around Macquarie Island to be Marine Reserve under the EPBC Act.

Territory Administration and Legal Regimes

The AAD is the Australian Government agency responsible for the administration of the AAT and HIMI. This includes responsibility for the administration and enforcement of a range of Commonwealth legislation relating to the AAT, HIMI and HIMI's adjacent Marine Reserve.

This Commonwealth legislation includes:

- *Australian Antarctic Territory Acceptance Act 1933*(Cth);
- *Australian Antarctic Territory Act 1954* (Cth);
- *Antarctic Treaty Act 1960* (Cth);
- *Antarctic Treaty (Environment Protection) Act 1980* (Cth), including the following regulations made under that Act,
    - *The Antarctic Treaty (Environment Protection) (Waste Management) Regulations 1994*

  - *The Antarctic Treaty (Environment Protection) Environmental Impact Assessment) Regulations 1993*
  - *The Antarctic Seals Conservation Regulations 1986*;

- *Antarctic Marine Living Resources Conservation Act 1981* (Cth);

- *Heard Island and McDonald Islands Act 1953* (Cth);

- *Environment Protection and Management Ordinance 1987* (HIMI).

The *Antarctic Treaty (Environment Protection) Act 1980* (Cth) (ATEP Act)and the *Antarctic Marine Living Resources Conservation Act 1981* (Cth) are notable in that they are directed primarily at protecting the environment in accordance with international obligations agreed to by Australia within the Antarctic Treaty system. The ATEP Act is the primary means of implementing the Protocol on Environmental Protection to the Antarctic Treaty.

The laws, other than criminal laws, of the Australian Capital Territory have been applied to the AAT and to HIMI. The criminal laws in force from time to time in the Jervis Bay Territory have also been applied to both to the AAT and HIMI.

The AAD has also been delegated responsibilities and powers under the EBPC Act in its application to the AAT and HIMI. This extends to the administration of the Heard Island and McDonald Islands Marine Reserve and the preparation, implementation and the enforcement of the Reserve's Management Plan in accordance with that Act.

As noted above, Macquarie Island is part of the State of Tasmania and is subject to Tasmanian law.

AAD Policy Framework and Goals

As part of the Department of the Environment and Heritage, the AAD must work within the financial and policy priorities and decisions of the Australian Government. The Department of Environment and Heritage has two outcomes to achieve on behalf of the Australian Government:

1. The environment, especially those aspects that are matters of national environmental significance, is protected and conserved; and,
2. Australia's Antarctica interests are advanced.[2]

The AAD is responsible for the achievement of Outcome 2. The Australian Government has set four goals for its Antarctic programme:

[2] Department of the Environment and Heritage Portfolio Budget Statement 2003-04 (http://www.deh.gov.au/about/budget/2003/pbs/index.html)

- to maintain the Antarctic Treaty System and enhance Australia's influence within the system;
- to protect the Antarctic environment;
- to understand the role of Antarctica in the global climate system; and
- to undertake scientific work of practical, economic or national significance.[3]

In addition to the Government's Antarctic goals successive Government's have identified Australia's policy interests in the Antarctic as follows:

- to preserve Australia's sovereignty over the AAT, including sovereign rights over the adjacent offshore areas;
- to maintain Antarctica free from strategic and/or political confrontations;
- to protect the Antarctic environment, having regard to its special qualities and effects on our region;
- to take advantage of the special opportunities Antarctica offers for scientific research;
- to be informed about and able to influence developments in a regions geographically proximate to Australia; and
- to derive any reasonable economic benefits from the living and non-living resources of the Antarctic (excluding the deriving of such benefits from mining and oil drilling).

In respect of the AAT, Governments have consistently taken the view that the Antarctic Treaty system is the best way of advancing our policy interests.

The AAD pursues the Government's four goals through a wide variety of mechanisms including, for example:

Policy issues

- By pursuing a strong role in the Antarctic Treaty system, such as at Antarctic Treaty Consultative Meetings, the Committee for Environmental Protection (the Director of the AAD is currently Chair of the CEP); at meetings of Commission

[3] These goals were set by the Australian Government in its response to the Antarctic Science Advisory Committee's (ASAC) report *"Australia's Antarctic Program Beyond 2000 – a Framework for the Future"* in 1998.

for the Conservation of Antarctic Marine Living Resources; at the International Whaling Commission; and by taking the lead on issues and developing initiatives for international consideration in consultation with other agencies as appropriate.

Environment protection

- by developing ways to minimise human impacts, remediating past work sites and undertaking research designed to ensure that environmental and fisheries management is based on sound scientific information and principles. As mentioned above, the AAD administers and enforces a suite of legislation covering environmental protection.

Conservation of resources

- by playing a key role nationally and internationally in combating illegal, unreported and unregulated (IUU) fishing of subantarctic marine living resources and by proposing new measures to prevent fishing and market access for illegal, unreported and unregulated catches.

Research

- by scientific research which contributes to knowledge of global climate through the study of ice, water and atmosphere and by contributing to the world climate research and meteorological studies. By conducting and coordinating scientific research in Antarctic and the Southern Ocean. The AAD undertakes and supports scientific research of practical, economic and national significance by providing data and support for Australian and international clients and by conducting research in physical, biological and human science. In doing so, the AAD also seeks to build up systematic knowledge of the Antarctic and its environment and, as mentioned above, to understand the role of this region in the global climate system.

Logistic infrastructure

- by chartering ships and aircraft to provide transport between Australia and Antarctica and within the Antarctic continent, by operating permanent stations and by providing infrastructure on the Antarctic continent and in the subantarctic.

The above are reflected the AAD's vision statement of "*Antarctica valued, protected and understood"*. This guiding statement – based on the Antarctic goals and policy interests set by Government – itself reflects view that Antarctica should be: *valued* as an important part of Australia's history, heritage and within Australia's immediate global area; *protected* from environmental damage and degradation; and *understood* in terms of Antarctica's unique position for the conduct of scientific research and the important global role it plays.

The Australian Antarctic programme

The Australian Antarctic programme encompasses the activities in mainland Australia and Antarctica of:

- The AAD and other government agencies conducting scientific and observational work in Antarctica and the Southern Ocean, including the Bureau of Meteorology, the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Geosciences Australia and the Ionspheric Prediction Service (Radio and Space Services) of DITR, and some state government agencies.

- Research organisations and individuals who undertake Antarctic research and activities through collaborative arrangements with AAD or otherwise under AAD's auspices. These include Australian universities and other research institutions, in particular the Antarctic Climate and Ecosystems Cooperative Research Centre based at the University of Tasmania as well as foreign scientists.

In addition to both undertaking Antarctic research itself and facilitating research by others, the AAD is responsible for the provision of logistical, operational and organisational support for the Australia's Antarctic programme. As such, it also has a key role in planning and coordination of research and activities undertaken under the auspices of the Australian Antarctic programme.

The Antarctic programme also embraces significant policy and legal responsibilities. The AAD has core responsibility for pursuing Australia's Antarctic interests and provides continuity in policy development, implementation and support to Government. The AAD works closely with other agencies in advising Ministers on Australia's national and international policy positions and obligations — from environmental protection issues to policy and legal issues involved in administering the Antarctic territories. In its policy role the AAD plays a lead role in supporting Australia's participation in a wide range of international forums such as the Antarctic Treaty Consultative Meetings, the Commission for the Conservation of Antarctic Marine Living Resources and the International Whaling Commission.

In terms of legal responsibilities the AAD, in its role as administrator of the Australian Antarctic Territory and the Territory of Heard Island and McDonald Islands, ensures that the Antarctic programme complies with relevant components of the international and domestic legal regime.

Australia's Permanent Stations and Heard Island

To support the Australian Antarctic programme, the AAD operates four permanent stations; Mawson, Davis and Casey on the Antarctic continental and Macquarie Island in the subantarctic. It also conducts operations at field locations within Antarctica, such as Prince Charles Mountains, the Amery Ice Shelf, Law Dome South, Larsemann Hills,

Bunger Hills, and at Heard Island in the subantarctic. The AAD also undertakes a significant ship based marine science research programme in the Southern Ocean.

To maintain the infrastructure of stations and field facilities and carry the researchers to their locations of interest, the AAD currently charters ships from Australian and overseas and hires aircraft for internal Antarctic work. The supply chain is a long one with stations ranging from 1,500Km to 5,500Km distance from Hobart. The harsh environment and isolation make the cost of the operating in Antarctica considerably greater than in Australia.

Since the early 1950s Australia's Antarctic scientific interest has focused on the Antarctic continent and at Macquarie Island with only irregular visits being made to Heard Island.

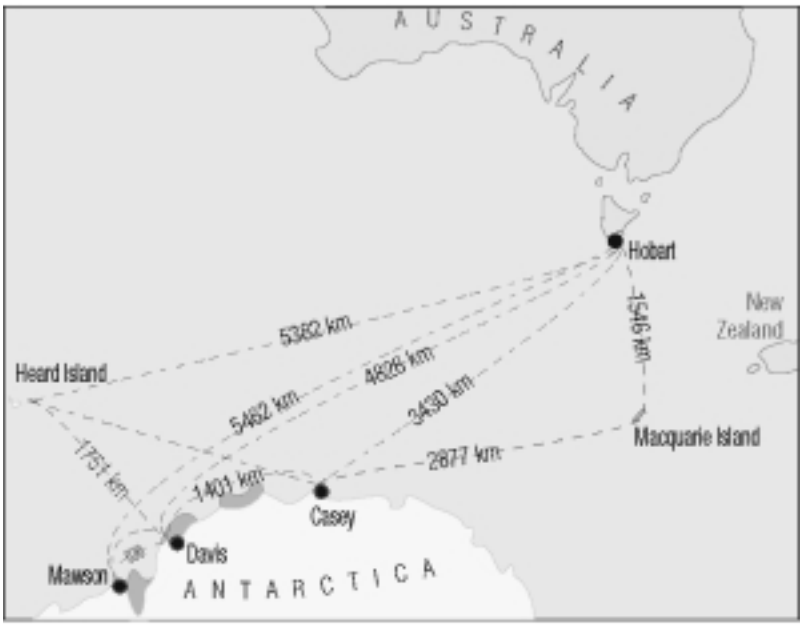

Figure 1 - Location of and distance to Stations and Heard Island

The science programme has recently been examined by the Antarctic Science Advisory Committee (ASAC) which recommended to Government that considerably more attention be paid to scientific research at and around Heard Island. The reason is the increasing importance to the Antarctic science programme of understanding the role of Antarctica in the global climate system; the importance globally of Southern Ocean fisheries and environmental change generally. Heard Island is located south of the Antarctic Polar Frontal Zone. Heard Island possesses a permanent ice cap, which is retreating under the influence of global warming and exposing new land for vegetation colonisation. Australia's Antarctic science programme is measuring the rate of retreat and colonisation as one of its contributions to world understanding of the consequences of global change.

Heard Island also lies at the centre of the HIMI Marine Reserve. Research on seals, penguins and other seabirds is pivotal to the accurate assessment of sustainable finfish harvesting in this important CCAMLR fishery.

Antarctic Science Advisory Committee (ASAC)

The research objectives of Australia's Antarctic science programme are determined by the Australian Government on the advice of the Antarctic Science Advisory Committee (ASAC). Its members, and the Chair are appointed by, and report to the responsible Minister (in this case the Parliamentary Secretary to the Minister for the Environment and Heritage, Dr Sharman Stone). Members are drawn from a wide range of Government and university research institutions whose interests broadly embrace the main facets of the science programme. Its primary role is to advise Government "…on the broad directions of Australia's Antarctic programme, including scientific, operational and logistic support activities; priority areas for scientific research, having regard to the Government goals for Australia's Antarctic programme; and measures to ensure an effective participation in international scientific operational programmes involving the Antarctic." Among its other Terms of Reference are a requirement to "…recommend to the Government … …five-year strategic plans for Australian scientific activities in the Antarctic…" and "…to provide the Government…with regular evaluation of the success of the Antarctic programme in meeting Australia's scientific objectives."

Australian Science in Antarctica

The key component of the Australian Antarctic programme is the large and comprehensive programme of scientific research undertaken by Australia in Antarctica, the subantarctic and the Southern Ocean.

On average 130 separate projects are pursued annually resulting in the publication of about 150 scientific papers in international, peer-reviewed journals. In addition, almost 200 papers are published in non-refereed publications, including conference proceedings, newsletters, magazines and the national media. About 200 scientists participate annually, the majority being employed by Australian universities and research agencies, facilitated through the Australian Antarctic Science Grants scheme. The Antarctic Climate and Ecosystems Co-operative Research Centre (ACE CRC), in which the AAD is the major shareholder, brings a further $23M over 5 years into Australia's Antarctic research programme and provides a solid multi-disciplinary vehicle for integrated marine science research in the Southern Ocean. The other major CRC partners are CSIRO, the University of Tasmania, the Bureau of Meteorology and Silicon Graphics International, as well as a number of international supporting partners.

Approximately fifteen nations contribute to the Australian Antarctic science programme, many through the provisions of semi-formal instruments (such as institution-to-institution Memorandums of Understanding).

All proposals for research support in Antarctica are subject to a rigorous screening and assessment process utilising international peer-review, and scrutiny by one of two

Antarctic Research Assessment Committees (Life sciences and Physical sciences). These committees are chaired by external experts and comprise many university and research agency scientists in addition to the established Science Programme Leaders.

ASAC has recently completed a detailed consultative overview of the directions for the five-year planning period 2004/05-2008/09. The recommendations of this report have been agreed by the Parliamentary Secretary.

The new Antarctic Science Strategy aligns with the Government's National Research Priorities (NRP) particularly on "*An environmentally sustainable Australia"* but additionally on *"Safeguarding Australia", "Frontier technologies for building and transforming Australian industries"*, and *"Promoting and maintaining good health"*[4].

The Government has adopted a clear strategic focus for the coming five-year period with priority Antarctic science programmes in the following multi-disciplinary areas:

- Ice, Oceans, Atmosphere and Climate
- Southern Ocean Ecosystems
- Adaptation to Environmental Change
- Impacts of Human Activities in Antarctica

The first three priority programmes focus research effort on global phenomena that influence the quality of life that Australian's enjoy in the 21st century. They contribute to the development of policy regarding climate prediction and change, sustainable use of the Southern Ocean, and measures to protect biodiversity in the face of environmental change. The fourth priority area underpins Australia's leadership position in Antarctic environmental protection and remediation, and supports Australia's robust position in the Committee for Environmental Protection established by the Protocol on Environmental Protection to the Antarctic Treaty.

The main objectives of the priority programmes are as follows:

(a) Ice, Ocean, Atmosphere and Climate

Antarctica and its surrounding ocean are dominated and shaped by the presence of snow and ice which, while themselves controlled by the climatic regime and very sensitive to climate change, also influence and provide major feedbacks to the global climate system. Many globally significant processes are driven by this unique environment including the uptake of carbon dioxide by the ocean; the overturning circulation of the deep ocean; the balance between storage and discharge of fresh water from the Antarctic ice-sheet; modification of surface energy, mass and momentum exchange by ice masses; the ozone 'hole'; and energy transfer between all levels of the atmosphere to space. This programme

[4] Further information on the Australian Government's National Research Priorities is available from the Department of Education, Science and Training website: www.dest.gov.au/priorities/

examines these interactions to better understand how Antarctica creates, drives and influences climate patterns far to its north. Much of the work of this programme will be conducted through the ACE CRC. The programme will contribute directly to Australia's National Research Priorities: *"A sustainable Australia"*, and *"Frontier technologies for building and transforming Australian industry"*.

(b) Southern Ocean Ecosystems

The Southern Ocean is a vast resource to Australia that must be understood in order to be managed effectively. Australia maintains a high profile in the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) which has fisheries management responsibility for waters south of about 60˚. The conservation and fisheries regimes established by CCAMLR are based on the best available scientific information about population sizes, biodiversity and the ecological relationships in the Southern Ocean. A new significant aspect of this programme is a study of whale biology, designed to provide scientific support to Australia's the International Whaling Commission. Much of the research in the Southern Ocean Ecosystems programme focuses on population modelling and future prediction in the light of known pressures. By working with the ACE CRC it will examine the effect of physical variability of the Southern Ocean, including climate change, on its rich biota. The programme will contribute to Australia's National Research Priority *"A sustainable Australia"*.

(c) Adaptation to Environmental Change

The current biological diversity of Earth reflects an evolutionary history of adaptation to environmental change and the selection of adaptations that allow continued existence, or enhanced survival resulting in species proliferation. The Antarctic environment harbours many organisms at the limits of their distribution, and in a rapidly changing environment. The extreme conditions of the Antarctic and Southern Ocean have led to remarkable biochemical, physiological and behavioural adaptations, the study of which is leading to the discovery of interesting and potentially chemicals and gene sequences. Studies in this programme will investigate how biodiversity copes with subtle changes in the environment and will contribute to Australia's National Research Priorities *"A sustainable Australia"* and *"Safeguarding Australia*".

(d) Impact of Human Activities in Antarctica

Although commonly portrayed as the last great wilderness Antarctica is no longer a completely pristine environment. Evidence of past human activity is clear in some areas and, as Antarctic tourism and other activities grow, the pressures on the environment will also grow. The Environmental Protocol to the Antarctic Treaty requires activities in Antarctica to be conducted so as to limit adverse

impacts, and that future activities be planned on the basis of information sufficient to make informed judgements about their impacts. To achieve secure environmental protection for Antarctica, management decisions must be based on ecologically sound principles and be supported by, and show an understanding of, fundamental ecosystem processes. This programme addresses these issues, and supports Australia's high standing in the Antarctic Treaty's Committee for Environmental Protection. The programme will contribute to the Nation Research Priority *"A sustainable Australia"*.

These strategically-orientated priority programmes support the Government's Antarctic goals: "To protect the Antarctic environment", "To understand the role of Antarctica in the global climate system", and "To undertake scientific work of practical, economic and national significance".

The high quality of scientific research undertaken, as has been attested by ASAC's evaluation of the quality of the science programme, plays a critical role in enhancing Australia's influence in the Antarctic Treaty System. Further influence is wrought by the many leadership roles that Australian scientists take in international Antarctic research coordinated by the Scientific Committee on Antarctic Research, the World Climate Research Program, and the International Geosphere-Biosphere Program. Australia's past and ongoing contribution to world knowledge of Antarctic science is widely acknowledged and supports its influential role in the Antarctic Treaty System.

While the priority programmes embrace a wide range of scientific disciplines the interests of scientists in other fields is acknowledged and the values of new avenues of fundamental research recognised. This includes the Human Biology and Medicine research programme, which contributes to the National Research Priority *"Promoting and maintaining good health"*. Fundamental scientific research will continue to be supported by Australia's Antarctic science programme, though researchers who wish to undertake very large projects that require levels of logistics support that might otherwise weaken the strategic focus of the programme are asked to contribute to the costs of that support.

Comparison with other National Antarctic programmes

Antarctic national programmes vary widely in their organisation, responsibilities and approach to Antarctic operations, research and administration. This reflects in part significant differences between programmes in capability and desire to undertake Antarctic activities and research.

Three general approaches to operating Antarctic programmes can, however, be identified.

(a) The Devolved Model

This model provides that responsibility for all aspects of Antarctic research is devolved to non-Government research institutions, universities and various

government agencies. Government directives and indirect funding mechanisms then require agencies to devote an appropriate percentage of their effort (and budget) to Antarctic programs. Research institutions and universities participation is funded through an extended grants programme. Policy responsibility continues to reside with Government.

Examples are the United States and New Zealand Antarctic Programmes (see summary at Appendix A)

(b) The Centralised Model

This model provides that a single central agency is responsible for undertaking, coordinating and supporting all Antarctic science and advising Government on such matters.

Some national programme, such as UK and Germany ran centralised programmes but have recently moved to a hybrid model of operation, following the success of the Australian implementation. Currently there are no significant antarctic nations operating a centralised model.

(c) The Hybrid Model

The third model is a hybrid between the centralised model and the devolved model. That is, the scientific expertise of researchers working in academic and research establishments and in other government agencies is utilised in addition to scientists employed by a central Antarctic agency. Policy responsibility, programme coordination and oversight, undertaking Antarctic research and providing logistical and operational support is maintained in the Government agency. External participation is undertaken through a grants scheme managed by the central agency as well as through collaborative arrangements with the central agency, with the agency also providing logistical and other support to venture partners and funded grant applicants

This hybrid approach is adopted by the Australian Antarctic programme. Adoption of this model was endorsed by ASAC in its 1992 'Way Forward' report and its 1997 'Future Framework' report and agreed to by the Australian Government in its responses to those reports (*see below*).

One important advantage of this model is that it facilitates a close and coordinated relationship between Australian Antarctic policy and the science that underpins it. This relationship has proven to be crucial in that it has meant that Australian Antarctic science and research has informed, supported, and helped secure Australian policy positions and outcomes within the Antarctic Treaty System (eg, at Antarctic Treaty Consultative Meetings, within the Antarctic Treaty's Committee on Environmental Protection and at CCAMLR). In this context, the hybrid model appears to be the one that best equips the Australian Antarctic programme and the AAD in particular, to pursue the Antarctic

policy objectives set by the Australian Government (see the four objectives outlined above).

The other advantages conferred on the Australian Antarctic programme by the hybrid model and the comparative disadvantages of the other two models are detailed in the two ASAC reports mentioned above.

The cost effectiveness of the Australia's adoption of the hybrid approach was confirmed by the Output Pricing Review carried out in 2001[5].

Funding and Financial Analysis

The appropriation for the AAD comprises the whole of Outcome 2 (Antarctic) of the Department of the Environment and Heritage. As with all other Australian Government departmental agencies, the AAD accounts are prepared and managed on an accrual basis.

AAD revenue in 2003-04 was $84.801m of which $83.882m was appropriated as the 'price of outputs'. This revenue was expensed as follows:

Employee costs	$26.042m
Suppliers, including charter of ships and aircraft	$38.900m
Depreciation & amortisation, mostly on Antarctic Stations	$19.247m
Australian Antarctic Science Research Grants	$0.612m
Total Expenses	$84.801m

Budget for each output (ie against each of the Government's Antarctic goals) is shown in the table below:

Influence in Antarctic Treaty System	$13.332m
Protecting the Antarctic Environment	$33.411m
Understanding Global Climate Change	$20.747m
Undertake Scientific work of Practical, economic or national significance	$17.311m

[5] For further details regarding the Output Pricing Review see section *The Efficiency and Effectiveness of the AAD* commencing on pg 19

The AAD's appropriation has not increased substantially since the introduction of accrual financial management in 1999. The table below shows the AAD revenue since 1999-2000 adjusted to reflect changes in accounting practices.

Financial Year	Appropriation ($'000s)	Capital Use Charge ($'000s)	Supplementation ($'000s)	Adjusted Appropriation ($'000s)	Percentage Change (%)
1999-2000	96,419	17,900		78,519	
2000-2001	98,752	19,716	860	78,176	-0.4
2001-2002	98,279	18,158	860	79,261	1.4
2002-2003	109,893	27,987	860	81,046	2.3
2003-2004	83,882	0	2,649	81,233	0.2

When the AAD budget is viewed by function, it is apparent that the cost of Antarctic operations comprises nearly half of the AAD's budget with logistic support of ships and aircraft making up 29% and Station and field infrastructure and management a further 18%. Depreciation expense, principally for Antarctic buildings and plant and equipment accounts for 20%. Corporate overheads comprise 10% (which is low by Government and industry standards) and the AAD's insurance costs 7% of the budget. Scientific research conducted within the AAD and the direct support services account for another 15%. The table below shows the breakdown of the AAD's budget by function.

Function	%
Antarctic Logistics (Shipping & Aircraft)	29
Depreciation	20
Scientific Research	14
Antarctic Station Infrastructure	12
Corporate Costs	10
Insurance	7
Antarctic Station Management	5
Medical Services	2
Policy development and Territory Administration	1

The AAD has a large asset base of $283m in written down value ($606.6m gross value), mostly consisting of Antarctic buildings and plant and equipment. A further $7m is held in inventories, largely being consumables such as fuel, food and spare parts held on Antarctic stations. The major liabilities are employee provisions of $7m and a recognised but unfunded requirement for the environmental restitution of past activities in Antarctic of $40m. This obligation arises from Australia being a signatory to the Protocol on Environmental Protection to the Antarctic Treaty[6].

The 2002-03 Statements of Financial Performance for the AAD are at Appendix B.

[6] This is discussed further in the *Future Challenges* section commencing on pg 22.

The Efficiency and Effectiveness of the AAD

Independent evaluations of the AAD have concluded that the AAD is efficient and effective in the delivery of its outputs. Recent evaluations include the Output Pricing Review conducted jointly by the AAD and Department of Finance & Administration (March 2001) and the Evaluation of the Antarctic science programme conducted by ASAC (May 2003)[7].

(a) Output Pricing Review

The Output Pricing Review was conducted jointly by the AAD and Department of Finance and Administration as part of the broad government financial management and market testing framework. The review was comprehensive and extensive and included benchmarking against commercial organisations, other government agencies and other national Antarctic agencies. The primary conclusion of the review is that the price of outputs for the Antarctic outcome was reasonable.

As part of the review an evaluation with other national antarctic programmes was conducted by an independent consultant that concluded that the Australian Antarctic science programme provided significantly better value for money science output than comparable nations of the United Kingdom, France, Italy, Japan and New Zealand. For instance, Australia publishes 32% more research papers than the UK at less than half the cost per paper. The cost of operating Australian Antarctic stations was also found to be 22% less than these comparable countries.

(b) ASAC Evaluation of Australia's Antarctic science programme

A thorough and far-reaching evaluation of Australia's Antarctic science programme was undertaken in 2002/03 by independent review teams of internationally recognised scientists from Australia and overseas, none of whom were participants in Australia's Antarctic science programme.

The evaluation noted that 'There is not a scintilla of doubt that Australia is well served by its Antarctic science programme' and that it represents 'a remarkable contribution by Australia to world science'. It concluded that the Australian Antarctic programme successfully meets its scientific goals with an overall high quality of research outputs[8].

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[7] The ASAC report *Evaluation of Australia's Antarctic science program (2003)* is available for download via the AAD website: http://www.aad.gov.au /default.asp?casid=5023

[8] The ASAC report *Evaluation of Australia's Antarctic science program (2003)* is available for download via the AAD website: http://www.aad.gov.au /default.asp?casid=5023

Current Strategic Framework and Direction

The Government's response to the (ASAC) report *"Australia's Antarctic Program Beyond 2000 – a Framework for the Future"*[9] forms the basis for the AAD's strategic direction for the first two to three decades of the 21st century.

As well as setting the four goals for Australia's Antarctic programme outlined above, the Government accepted the following recommendations made by ASAC in the report:

- Australia should develop a more flexible approach to servicing its commitments in the Antarctic and subantarctic, to enable it to quickly respond to changed needs and priorities while maintaining the benefits of past achievements.

- Australia retain a permanent present in Antarctica by maintaining operation of at least one of the existing stations, and move to a flexible logistic infrastructure responsive to scientific requirements capable of supporting existing levels of research in a range of locations, including the use of other stations and temporary field bases as required. In moving towards this arrangement, Australia must continue to fulfill its international obligations under existing arrangements.

- In support of a responsive, productive and versatile Antarctic programme, Australia develop a light aircraft intra-continental air transportation system in support of scientific research and for dispersing scientists and their support within the AAT. This system should operate from a single terminus in the AAT which would be served by an inter-continental air link from Australia. In developing this capability, environmental, heritage and other impacts must be fully evaluated, as must scientific productivity and economic considerations.

- Opportunities for cooperative cost-sharing transportation and ship re-supply arrangements with Australia's Antarctic neighbours should be evaluated and developed.

- To satisfy increased focus on marine research, Australia should charter a dedicated marine research facility, capable of conducting the entire range of components of the marine science programme.

- To allow more flexibility in the use of resources, Australia should develop alternative and fully automated means of conducting current monitoring programmes.

[9] Antarctic Science Advisory Committee (1997) *Australia's Antarctic Program Beyond 2000: A Framework for the Future* Commonwealth of Australia, Hobart.

- That Hobart remain the operational base for Australia's future Antarctic programme.

- The Government encourages additional international research that is in the national interest provided it is supported by additional funding, to be conducted in the Australian Antarctic Territory. It also encourages research conducted for international good, through the development of long-term cost and benefit sharing arrangements. In so doing the Government should maintain its strong support for the Scientific Committee on Antarctic Research (SCAR).

- The Government continues to support a hybrid model for the delivery of the Australian Antarctic scientific programme at a level which recognizes the changed funding environment in which universities and the Government research institutions currently operate.

- The Government and the main agencies in the Australian Antarctic programme examine mechanisms for funding the continuation of inter-agency research into climate change beyond 2003.

This strategic direction was further confirmed in the recent evaluation (2003) of the Antarctic Science programme undertaken by ASAC in which it confirmed the 'hybrid' model of the Australian Antarctic science programme and that the development of a frequent and efficient inter- and intra-continental air transport system would achieve greater participation by Australian and international researchers and by more senior scientists.

Future Challenges

Air Transport

In 1997 the Government accepted ASAC's recommendation that an Antarctic air transport system (AATS) between Australia and Antarctica would increase the quality and quantity of research conducted by Australia's Antarctic science programme. ASAC's recent evaluation of the science programme notes that the air link should be put into place as soon as possible for access to the Antarctic for both Antarctic priority programmes and fundamental research by as wide a group of Australia scientists as possible. It noted in 2001 that an air link from Australia to Antarctica would significantly increase Australia's collaborative research with international partners.

ASAC noted that an air link would strengthen Australia's ability to generate cross-disciplinary projects, including international projects on a cost-sharing basis. Rapid deployment to remote field sites would enable Australia to better understand the AAT and enhance its ability to protect it. ASAC also argued that the quality of scientific output would increase if the current disincentive inhibition for senior scientists to participate in the science programme, i.e. long sea-borne transit time, were eliminated.

Other key Antarctic nations and several of the minor players have switched to air transport. Countries using aircraft for personnel transfer include the USA, UK, New Zealand, Italy, Argentina, Chile, Norway, Sweden and Russia.

The AAD is introducing, utilising existing resources, an air system within Antarctica in 2004-05 and has proven the feasibility for an Australia-Antarctica air link with the trial construction of an airstrip near Casey and selection of a preferred service provider after a competitive selection process.

It is anticipated that the AATS would encompass both an intra-continental system and an inter-continental system and would become the primary mechanism for the delivery of people to, from and within the Australian Antarctic Territory. Such a system would revolutionise the way that Australia conducts its operations in the AAT. It would mean that Australians would be able to effectively and efficiently explore the entirety of the AAT (parts of which have seldom or never been visited) as well as undertake research elsewhere in Antarctica.

The intra-continental system is due to commence operations during the 2004/05 summer season. The AAD has funded this by an internal reallocation of funds and priorities, designed to ensure continued delivery on the AAD's key policy objectives.

Overheads imposed by the Antarctic Treaty System

A unique set of overheads are imposed on the AAD by the international nature of Antarctic governance and these must be funded and managed. At the same time, the leadership role taken by Australia within the Antarctic Treaty system on environmental and other issues and Antarctic's importance as a wilderness and as a global laboratory mean that such overheads are not negotiable. Some examples are:

- The requirement for AAD to engage effectively in a range of international forums (political, environmental and scientific) in order to manage the Australian Antarctic Territory and effectively pursue Australia's broader policy interests in the Antarctic.

- The requirement to initiate and respond to developments within the Antarctic Treaty System.

  One example is the recent decision to establish an Antarctic Treaty Secretariat and the onus now on Antarctic Treaty Parties, including Australia, to staff and fund the Secretariat.

  Another is the development by Antarctic Treaty Parties of an Environmental Liability Annex to the Madrid Protocol. Article 16 of the Protocol requires Antarctic Treaty Parties – including Australia - to develop rules and procedures for liability for environmental damage in the Antarctic (i.e., obligations to

respond, contain, and remediate environmental damage and /or to pay compensation). The consequences are unknown at this stage as negotiations within the Antarctic Treaty System on the Annex are still under way.

Developments within the Antarctic Treaty System are also prompted by new activities and circumstances within the Antarctic. The growing increase in tourism in the Antarctic, for example, has meant that Antarctic Treaty Parties are now actively considering the need for greater regulation of Antarctic tourism and the options available. Similar discussions have been prompted by the increasing national and international interest in the biotechnological potential of Antarctic organisms, with research currently being undertaken or proposed by overseas as well as Australian researchers involved in the Australian Antarctic programme. As explained below, the outcome of such discussions may have regulatory and therefore financial implications for AAD.

Environmental Challenges

Antarctica is one of the most protected environments in the world and is deservedly so. Our operations in the Antarctic and subantarctic must meet high environmental standards. Achieving compliance with standards and ensuring Australia remains a leader among Antarctic nations in areas of environmental management and protection has required significant resources. This expenditure has been borne within AAD's static budget allocation, which has necessitated resources being diverted from other areas.

Examples of emerging and ongoing environmental pressures and needs being faced by the AAD include:

New Environmental Standards

Developments in our understanding of environmental risks and impacts and mechanisms for avoiding or overcoming these has resulted in a trend towards increasingly stringent standards being applied to activities in the Antarctic and subantarctic. Such changes have flow on effects for the AAD. Recent examples include:

- Stringent new requirements to avoid the introduction of alien species into Antarctica, compliance meant modifying AAD's processing of cargo and people prior to and returning from Antarctica, at considerable expense
- Proposed new standards for waste management in Antarctica which will require upgrading AAD's waste treatment plants, at significant cost.

Site Remediation

Past operational practices have left in some cases a 30 year legacy of environmental impacts. Remediation of these is presenting a significant long term financial burden for the AAD. For example, total cost to remediate Antarctic sites is estimated at approximately $52 million. This remediation activity is unfunded and while the AAD

has commenced some of this work within its current resources it cannot continue this work while maintaining its on-going programme at the same level.

Alternative Energy

The AAD is also looking at more cost efficient and environmentally sustainable ways of powering its stations utilising alternative energy sources. Projects like the Mawson wind turbine farm will reduce AAD's reliance on and usage of fossil fuels - the project has already resulted in a 26% fuel reduction. However such projects also involve significant establishment costs.

Environmental Management System (EMS)

To ensure efficient implementation of its environmental policies and practices, consistent with national and international requirements, the AAD has implemented an environmental management system (EMS), which has been certified to meet the requirements of the Australian / New Zealand Standard AS/NZS ISO 14001. The rigour of the international standard - with its focus on continual improvement and its external verification requirements - has already significantly increased environmental roles and responsibilities and environmental expenditure on implementing identified improvements. Ongoing expenditure will be required to maintain the EMS to certification standards.

Environmental Impact Assessment

The ATS requires that all activities in the Antarctic must be subject to an environmental impact assessment to ensure potential environmental issues are identified and can either be avoided or minimised.

Science programme challenges

As has been mentioned above, Australia's Antarctic science programme is held in high regard, both nationally and internationally. This has been recognised, *inter alia*, by the Australian Government's decision to fund a new Co-operative Research Centre (CRC) for Antarctic Climate and Ecosystems. The work of the CRC focuses on strategic issues of great importance and value to the Australia's future.

Much of the research is conducted at sea, and the AAD provides the logistic support and participated in Australia's Antarctic marine science research effort. Such research in Antarctic waters is very costly as it requires specialised research vessels. ACE CRC is contributing significantly to Australia's Antarctic science programme and to Australia's commitment to the Climate Action Partnership agreement it has with the USA. A limitation to the amount of work it is able to achieve, and the influence it is able to exert, is the amount of ship-time it can devote to these activities.

A recent transfer of Departmental functions has seen the AAD take responsibility for Australia's Southern Ocean whale research programme. Data from this research programme will underpin Australia's strong position in the International Whaling Commission. Absorption of the costs of this activity will inevitably divert resources currently available elsewhere in the Antarctic programme.

New enforcement and compliance challenges

Growing commercial interests in the Antarctic and Southern Oceans continues to bring a range of new regulatory and management responsibilities to the AAD. These include:

- Responding to the growth in illegal fishing in the Southern Ocean, especially in the vicinity of HIMI;

- Addressing the growing interest in Antarctic tourism and in bio-prospecting in Antarctica.[10] As mentioned above, management of such issues are currently under discussion within the Antarctic Treaty system.

- Managing and implementing regulatory responses with respect to increasing interest.

Administration of the Territory of Heard and McDonald Islands

As mentioned above, the Territory of Heard and McDonald Islands and surrounding marine areas have been declared a Commonwealth Reserve under the EPBC Act. Responsibility for administration and protection of the Reserve in accordance with the EPBC Act has been delegated to the AAD.

The AAD is currently preparing a management plan for the Reserve, as required by the EPBC Act. Effective implementation of the management plan will require to the AAD to develop and maintain effective partnerships with other agencies, organisations and groups having a presence or responsibility for activities in the region to counter the Reserve's isolation.

Public Interest in Antarctica

The AAD plays an important role in highlighting the national and international value of the Australian Antarctic programme and responding to the considerable public interest in

[10] Australian Government policy with respect to bio-prospecting in 'Commonwealth areas' (such as the AAT and HIMI) is that the federal agencies concerned should seek to share in - or preserve the option of the Government sharing in - any long term potential commercial benefits, subject to any constraints imposed under international law. This policy is reflected in the regulations to be issued under section 301 of the EPBC Act to regulate bioprospecting in Commonwealth Areas, including those in the Antarctic. These will require the issue of access permits and the negotiation and endorsement of benefit sharing contracts covering commercial and other aspects with the provider of the biological resources, which is the Commonwealth in the case of the AAT and HIMI.

the Antarctic experience. It delivers this through the AAD's online services[11] and its public display centre located at the AAD's Headquarters in Tasmania (which is currently being redeveloped).

The AAD acknowledges the importance of all the people of Australia being able to access and appreciate this special part of their nation. The recent demise of Antarctic Adventure (a tourist destination) in Hobart has meant that the AAD's display centre is one of the very few publicly accessible permanent Antarctic displays in Australia. The AAD has limited space and resources to develop this important area further, but there may be public pressure to do.

Recruitment

The AAD is experiencing increasing difficulty in attracting suitably qualified and experienced personnel to undertake Antarctic service. While difficulties have been experienced throughout the organisation, from general Head Office staff through to Science and Policy staff, particular difficulties are being experienced in attracting certain expedition support staff.

The full reasons for this down turn in interest appear to be quite complex, however a key issue appears to be the competitiveness of the labour market and the relatively lower salary packages on offer by the AAD compared to private sector employees and many other Government agencies. In addition, with respect to Head office staff, there is less mobility in the Tasmanian workforce which reduces the attractiveness of the AAD to employees seeking rapid career advancement.

The impact of these difficulties has seen large increases in the lead time and costs associated with recruitment.

The challenge for the AAD will be to address the underlying reasons for the downturn in interest and to consider remedies to foster renewed interest in the AAD and Australia's Antarctic programme and to implement alternate schemes to address critical skill shortages. Another significant recruitment challenge is achieving diversity, particularly gender balance in Antarctic programmes.

Occupational Health & Safety

The AAD is bound by occupational health and safety laws and must seeks to comply with all relevant OH&S standards. The AAD is currently introducing a Safety Management System (SMS) which will focus on continual improvement. The implementation of this

[11] The AAD's website and online services reflect the standards and guidelines required under the Australian Government's Online Strategy. The Strategy was launched in April 2000 as a means of embracing quality of service to the public and more generally to specific departmental clients.

system, together with ongoing legislative reform affecting current organisational practices, and current litigation and common law trends (within and outside the organisation) is likely to demand greater resources. The introduction of the air transport system would also have implications for current organisational practices.

Insurance

The AAD's insurance costs continue to rise. Its insurance costs, currently at 7% of its annual appropriation ($5.9 m), are very significant and recent premium increases have placed a significant additional financial burden on the AAD. The AAD has been supplemented for some of the increase but the remaining $507,000 has been absorbed within AAD's budget through the reallocation of resources.

National Border Protection

The need to comply with national border protection policy and initiatives can also result in significant financial and administrative impost on the AAD, which moves personnel and cargo to and from Antarctica in support of Australian Government programs.

Australian Customs legislation, for example, deems the AAT and HIMI not to be part of Australia for Customs purposes. As such, the AAD is required to comply fully with that legislation, including the reporting regime implemented by the *Customs Legislation Amendment and Repeal (International Trade Modernisation) Act 2001*. Although the new reporting requirements' principal concern is with commercial trade activities, they have implications for the AAD's preparation of manifests and reports of cargo carried on AAD ships and aircraft.

Appendix A

Comparison with other National Programmes

United States (devolved)

The United States operates the largest national programme in Antarctica, based around three year-round research stations as well as manned summer research camps and unmanned year-round observatories located throughout the continent. The United States has not made a formal claim to Antarctic territory to date.

The United States Antarctic Programme is managed by the independent National Science Foundation (NSF). The Programme is government funded, involves approximately 3000 personnel and has an annual budget of several hundred million dollars. This is allocated by the NSF through:

- grants to institutions (mainly universities), whose scientists undertake research at the institutions in the United States or in the Antarctic; and
- cooperative agreements and contracts with private sector service providers, other government agencies and the U.S. military to provide the logistical and other support necessary for such research.

Specifically, the NSF is responsible for:

- the preparation of the Antarctic Programme's plans and budget for consideration by Government and for review and appropriation by the Congress;
- the development of scientific goals for Antarctica;
- assessment and approval of funding proposals for research projects received from universities, other research institutions and federal agencies;
- management of funded grant projects;
- planning logistical requirements and allocating funding to the agencies and contractors that provide logistical support;
- development and management of contractual arrangements with commercial providers for logistical, construction, and other services.
- development and implementation of safety, environment, and health programmes for U.S. Antarctic activities; and
- arranging of cooperative scientific and logistics programs with other Antarctic Treaty nations.

The Defence Department undertakes planning, maintenance and conduct of logistics as requested and reimbursed by the NSF (eg, provision of staging facilities in New Zealand,

communications, sea and air transport and bases). Assistance is also provided by the Department of Transportation.

The State Department retains responsibility for the formulation of foreign policy and the provision of foreign policy direction relating to the development and implementation of an integrated U.S. program for Antarctica; for the conduct of international relations regarding Antarctica; and for legal matters relating to the interpretation and implementation of the Antarctic Treaty.

Environmental agencies such as the Environment Protection Agency also provide environmental advice and input.

Policy coordination and guidance across government is provided by an Interagency Policy Coordinating Committee including representatives from the Department of State (chair), the NSF, and the Department of Defence.

Other government agencies do fund and undertake directed Antarctic projects. However, it is understood that these are generally short term and are coordinated within the overall framework of NSF planning and logistics support

United Kingdom (was centralised now hybrid)

The United Kingdom has a well established Antarctic programme based around five Antarctic research stations, four of which operate all year round. The United Kingdom is a claimant Treaty Party.

The British Antarctic Survey (BAS) is the organization responsible for the United Kingdom's Antarctic scientific research programme. BAS' mission is to undertake a programme of science in the Antarctic and related regions and to develop and maintain the facilities and infrastructure required to support such research. To this end, in addition to actually undertaken research itself, BAS also provides logistic support (ships, aircraft and bases), and operates offices, laboratories and workshops in the United Kingdom. It has around 400 staff, approximately 50 of whom winter in the Antarctic.

BAS comes under the auspices of through Natural Environment Research Council (NERC) which receives dedicated funding for BAS from the UK Government. As BAS' parent organization, the NERC audits and reviews BAS activities and also provides the link to government.

Responsibility for policy or administrative matters remains with other government agencies. BAS must therefore liaise closely with other UK government agencies such as the Department of Education and Science, the Department of Trade and Industry and the

Foreign and Commonwealth Office, the latter being responsible for Antarctic policy and relations and for Territory administration.

The NERC recently established a new funding initiative, called the Antarctic Funding Initiative, which is aimed at promoting wider participation in the United Kingdom's Antarctic research programme by universities and other research organisations. This is to be achieved via a competitive research grants scheme with BAS providing logistical and other support to successful grant applicants.

Japan (was centralised becoming hybrid)

Japan operates a wintering station in the Antarctic.

The Japanese Antarctic Research Expedition (JARE) is a cooperative research project involving scientists from a number of Japanese Government agencies. JARE approves all Japanese Antarctic Research projects, which are then carried out through Japan's National Institute of Polar Research, which is the national coordinating agency.

The Institute has two major tasks. The first is to promote and conduct comprehensive scientific research in various disciplines in the polar regions. To this end, it employs permanent research staff in a range of scientific disciplines. The Institute also cooperates with domestic and foreign universities and research organizations. The second task is to administer the scientific programs of JARE and provide logistic to JARE Antarctic activities. Other support activities include collecting, processing and utilizing data and samples obtained by JARE Antarctic investigations and the operation of national Antarctic data centres. The Institute also maintains four research stations in the Antarctic.

New Zealand (devolved)

The coordinating agency for the New Zealand Antarctic Programme is Antarctica New Zealand – an independent institute.

Through a purchase agreement with the New Zealand Government, Antarctica New Zealand provides operational and logistic support for research projects in Antarctica.

New Zealand Antarctic science is currently concentrated in the McMurdo Sound area, within helicopter range of Scott Base (~200 km radius). Opportunities to do continental based research outside this region depend on logistic support from other nations with internal airlift capacity – predominantly the United States but with occasional support

from other nations such as Italy, Germany and the UK. In addition, other international collaborative projects have allowed New Zealand scientists to work in remote parts of Antarctica. Logistics is also provided by the New Zealand Defence Force

Antarctica New Zealand manages a science review process for all science providers (ie, government research facilities, departments, universities, private research companies or individuals) requiring logistics support in Antarctica. Once a provider receives Antarctica New Zealand approval, it can negotiate with funding providers on the basis that if funding is gained Antarctica New Zealand will provide logistics support in Antarctica.

Funding of New Zealand Antarctic research is accomplished by two different means; direct funding from the Government and from other sources. Direct Government funding comes from the Public Good Science Fund, which is run by the Foundation for Research, Science and Technology, and the Marsden Fund, which is run by the Royal Society. Both can fund Government Research Institutes, other government entities and private organisations. Universities currently fund their research internally or through proposals supported by the Marsden Fund.

The New Zealand Government spends about NZ$15-million (US$8-million) on Antarctic activities. This is comprised of operational support by Antarctica New Zealand, logistics by the New Zealand Defence Force, and science funding predominantly through the Public Good Science Fund, and Government funding mechanisms for university-based research.

Germany (was centralised becoming hybrid)

Germany undertakes a substantial Artic research programme and a relatively more modest Antarctic programme. It operate one wintering stations in the Antarctic. It has not made any formal claims to Antarctic Territory to date.

The Alfred Wegener Institute for Polar and Marine Research (AWI) is the central German research facility in the polar areas. It has the following tasks:

1. To conduct research in both polar regions, mainly in the area of multidisciplinary environmental research
2. To support other German polar researchers
3. To coordinate all German polar research activities
4. To advise the German government in matters concerning the polar regions

The AWI coordinates Polar research in Germany and provides both the necessary equipment and the essential logistic back up for polar expeditions, including the operation of research and supply vessel, research aircraft and research stations in Antarctica.

The AWI has a staff of approximately 450 people, among them 250 scientists. The annual government sponsored budget is the equivalent of US$78-million. http://www.awi-bremerhaven.de/AWI/Pics/bildinstitut1-e.htmlIt is a multidisciplinary institute research organised into four Sections: Climate System, Pelagic Ecosystems, Benthic Ecosystems and Geosystem. These are supported by Administration, Logistics, Public Relations and other corporate departments.

South Africa (was centralised now hybrid)

South Africa has a well established Antarctic programme and operates a number of Antarctic stations. It has not made any formal claims to Antarctic Territory to date.

The South African National Antarctic Program (SANAP) is managed under the auspices of the Antarctic and Islands Directorate of South Africa's Department of Environmental Affairs and Tourism.

Research is undertaken in the fields of physical, oceanographic, earth, and biological sciences. SANAP also provides required support, including logistics, air and sea transport, stations and field operations. It has a budget of approximately R3.5 million

Italy (devolved)

In 1985 the Italian Parliament approved a law establishing the Italian Antarctic Research Program. Every 5 years, a revised program and corresponding funding are approved. Yearly funding for the program is on the order of US$35-million.

The program is implemented under the authority of the Minister for Research, assisted by a Scientific Commission. The main agencies involved are ENEA (Agency for New Technology, Energy, and Environment) which is responsible for implementing the program, the CNR (National Research Council), and a group of universities and of research institutes. Scientific research is carried out by scientists belonging to those organizations. Considerable emphasis is placed on cooperative international research. The law establishing the program explicitly requires that at least 20 % of the budget be used in international cooperation projects.

The Italian programme relies on the Italian military or cooperation with the USA and New Zealand programmes for its logistics.

Italy has not made any formal claims to Antarctic Territory to date. It does not operate a wintering station in the Antarctic.

France (devolved)

France is an Antarctic claimant and has a well established Antarctic programme with one wintering Station on the continent.

France's Antarctic research programme is organised through the Institut Paul Emile Victor (IPEV). It provides support to French Antarctic Research, including logistics, stations and field operations.

There are no research facilities directly linked with IPEV. Instead the French programme relies on cooperative ventures with French academic and private sector scientific system. IPEV dedicates around US$9 million a year to Antarctic research operations. The rest of IPEV's budget, around US$15 million, is devoted to oceanography, science in the French subantarctic islands and administration.

Appendix B

FINANCIAL STATEMENT INPUT SCHEDULES - ANTARCTIC OUTCOME
STATEMENT OF FINANCIAL PERFORMANCE
for the year ended 30 June 2003

		2003	2002
		$'000	$'000
Revenues from ordinary activities			
Revenues from Government	*1*	**112,170**	98,327
Sales of goods and services		**4,146**	4,494
Interest		**326**	1,190
Revenue from sale of assets		**441**	213
Other		**3,025**	48,098
Revenues from ordinary activities		**120,108**	152,322
Expenses from ordinary activities (excluding borrowing costs expense)			
Employees		**27,862**	22,049
Suppliers		**38,910**	43,440
Grants		**655**	621
Depreciation and amortisation		**22,721**	19,411
Write-down of assets		**0**	4,427
Value of assets disposed		**1,130**	358
Other		**210**	36,788
Expenses from ordinary activities (excluding borrowing costs expense)		**91,488**	127,094
Borrowing costs expense		**0**	0
Net surplus (deficit)		**28,620**	25,228
Net credit (debit) to asset revaluation reserve		**0**	91,489
Total changes in equity other than those resulting from		**28,620**	116,717

Notes

1 Includes Capital Use Charge

FINANCIAL STATEMENT INPUT SCHEDULES - ANTARCTIC OUTCOME
STATEMENT OF FINANCIAL POSITION
as at 30 June 2003

		2003	2002
		$'000	$'000
ASSETS			
Financial assets			
Cash		**1,178**	23,078
Receivables		**6,649**	329
Accrued revenues		**2,696**	4,042
Capital use charge		**0**	0
Other		**0**	0
Total financial assets		**10,523**	27,449
Non-financial assets			
Land and buildings	*1*	**198,054**	191,454
Infrastructure, plant and equipment		**93,340**	77,011
Inventories		**7,259**	6,932
Intangibles		**1,373**	1,058
Other		**1,834**	119
Total non-financial assets		**301,860**	276,574
TOTAL ASSETS		**312,383**	304,023
LIABILITIES			
Interest bearing liabilities			
Loans		**0**	0
Leases		**0**	0
Other		**0**	0
Total interest bearing liabilities		**0**	0
Provisions			
Employees	*2*	**7,752**	6,968
Capital use charge		**0**	(5,647)
Other	*3*	**42,997**	46,807
Total provisions		**50,749**	48,128
Payables			
Suppliers		**1,678**	3,995
Grants		**0**	0
Other		**190**	21
Total payables		**1,868**	4,016
TOTAL LIABILITIES		**52,617**	52,144
NET ASSETS		**259,766**	251,879
EQUITY			
Contributed equity		**1,196**	1,196
Reserves		**126,973**	126,973
Retained accumulated surplus (deficit)		**122,774**	123,710
TOTAL EQUITY		**250,943**	251,879
Current assets		**16,714**	31,727
Non-current assets		**286,846**	272,296
Current liabilities		**7,714**	(563)
Non-current liabilities		**44,903**	52,707

Notes

1 Written Down Value of Station Infrastructure
2 Employee leave entitlements
3 Provision for Environmental Remediation