Management Proposals for the Montebello Islands and Surrounding Waters

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Preface

This is not a management plan under the CALM Act 1984. It is a statement of Western Australia's proposals for the Montebello Islands and surrounding waters, resulting from consultation between relevant State and Commonwealth officials.

The islands and surrounding waters are currently under the control of the Commonwealth by being a prohibited area under the Defence (Special Undertakings) Act 1952, following the British nuclear weapons tests there in 1952 and 1956.

The Commonwealth requires this statement of proposals as an assurance from Western Australia that the islands will have satisfactory management when control is returned to the State Government.

Once the area is again under Western Australia's control, and has been vested in the National Parks and Nature Conservation Authority, a management plan will be prepared under the CALM Act.

Contents

Abstract

This paper outlines management proposals for the Montebello Islands and surrounding waters. In 1952 and 1956 British nuclear weapon tests were undertaken on and near the islands, and since that time the area has been under the control of the Commonwealth Government. These management proposals were required by the Commonwealth prior to control of the area being returned to the State.

The islands and their surrounding waters have significant conservation, historic and recreation values, and it is proposed that the area become a Marine Park managed by the Department of Conservation and Land Management. Other interests include commercial fishing and use by the petroleum industry. The management objectives and guidelines reflect these values and interests. A detailed management plan will be prepared once State control has been finalized.

INTRODUCTION

The Montebello Islands comprise a group of over 100 islands off the Pilbara coast of Western Australia, located between 20°21' and 20°32' south and between 115°31' and 115°36' east (Fig. 1). Much of the background information relating to the history, climate, physical environment and flora and fauna of the islands is found in Burbidge (1971).

All of the islands, except Campbell Island (which is vested as a Water Reserve), are vacant Crown land under the Land Act 1933, and two small portions of North West and Trimouille Islands are leased to the Commonwealth for lighthouse purposes. However, the islands and surrounding waters are currently under the control of the Commonwealth by virtue of being a prohibited area under the Defence (Special Undertakings) Act 1952, because the area was used for British nuclear weapon tests in 1952 and 1956. Accounts of these tests are shown in Appendix I. The results of regular radiological surveys of the islands by State and Commonwealth Departments of Health since 1962 have been published (for example, Moroney 1964; AIRAC 1979; Moroney and Cooper 1982).

In 1975, the Environmental Protection Authority recommended to the State Government that Hermite Island be made a nature reserve, vested in the Western Australian Wildlife Authority, and that the remainder of the islands be made a national park, vested in the National Parks Authority (EPA 1975). Those recommendations were endorsed by State Cabinet on 9 February 1976. In 1982, a document 'Management Proposals for the Montebello Islands', detailed the proposed management of Hermite Island and the remaining islands by the Department of Fisheries and Wildlife and the National Parks Authority respectively (DCE 1982). This document also proposed the declaration of a marine reserve.

At this stage, the Commonwealth and State Governments had agreed that the islands would return to State control when the Commonwealth was assured that they would be managed appropriately. The development of mutually agreeable management proposals was delayed to await the findings of the 1984 Royal Commission into British Nuclear Tests in Australia (McClelland 1984). In 1989, the Technical Advisory Group, established following the Royal Commission, advised the Commonwealth that it could see no radiological reason why the Montebello Islands and their surrounding waters should not be returned to State control.

This paper presents the State's management proposals for the Montebello Islands and surrounding waters, and is the result of consultation between relevant State and Commonwealth officials. The earlier proposals (DCE 1982) have been revised and updated in the light of more recent information and Legislation, particularly the Conservation and Land Management Act 1984, which enacted significant changes to the administration of nature conservation in Western Australia. The Act established the Department of Conservation and Land Management, which now includes the former National Parks Authority, the Wildlife Section of the former Department of Fisheries and Wildlife and the Forests Department. The Act also provides for the reservation of waters and land as marine nature reserves and marine parks, and for these areas, as well as national parks and nature reserves, to be vested in the National Parks and Nature Conservation Authority (established under the Act) and managed by the Department.

Amendments to the CALM Act in 1988 clarified the role of the Fisheries Department, establishing the principle that both recreational and commercial fishing in marine parks will be regulated under the powers of the Fisheries Act, 1905.

It is proposed that, when control is returned to the State, the islands and surrounding waters will be reserved as a marine park and vested in the National Parks and Nature Conservation Authority. The extent of the marine boundary beyond the 3 nautical mile State Territorial limit will be determined following proposed marine biological surveys (see Section 6(a)). Declaration as a marine park will provide for the

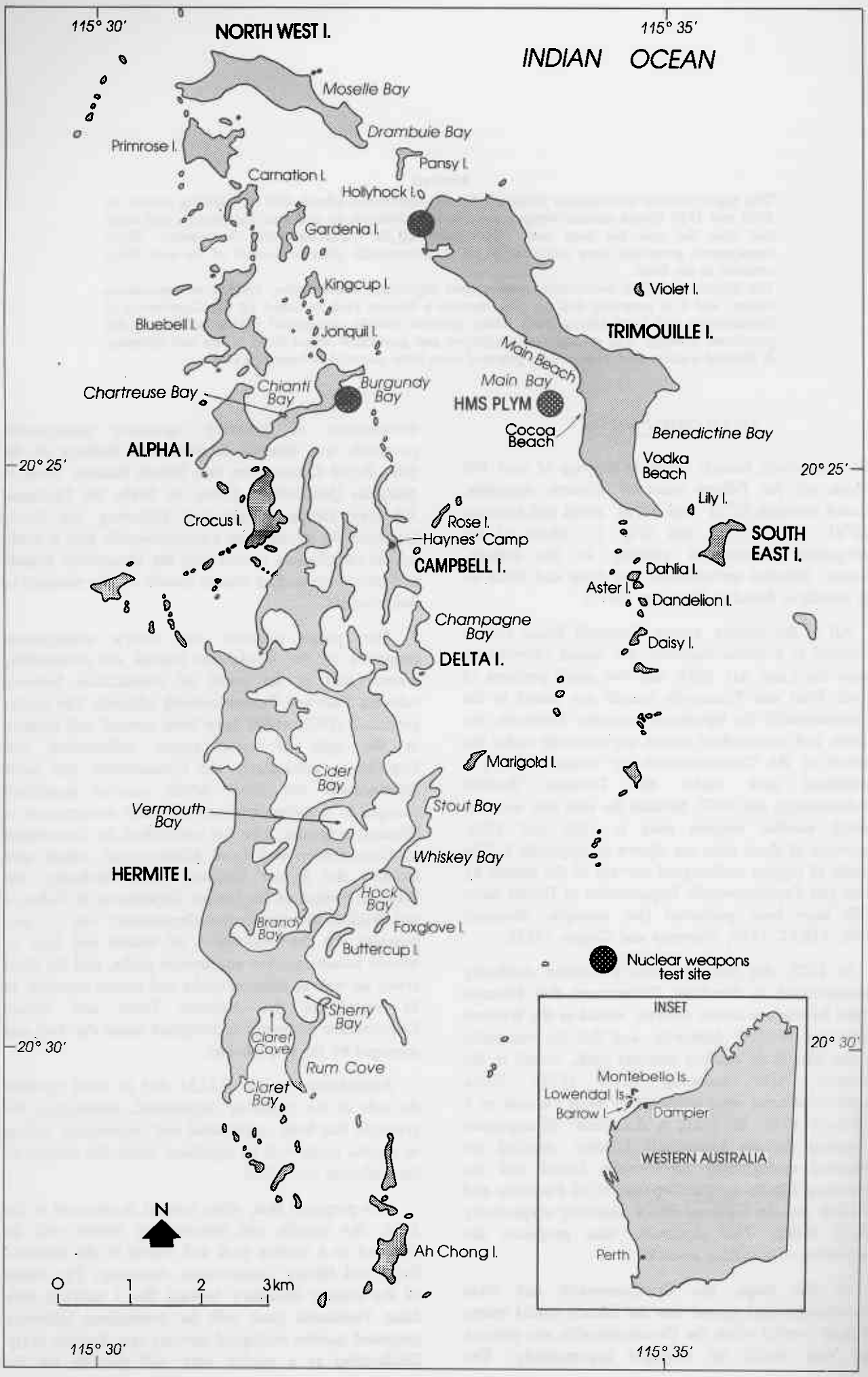

Figure 1. Location of the Montebello Islands.

planning and management of the islands and surrounding waters as a single entity. It is considered to be the appropriate classification for the area, as marine parks are for the dual purposes of nature conservation and public recreation, they also provide for such commercial fishing as may be judged to be consistent with conservation and recreational objectives. The Department of Conservation and Land Management will be responsible for management of the marine park in collaboration with the Fisheries Department in respect of recreational and commercial fishing controls. A management plan for the area is required under the Conservation and Land Management Act 1984, which provides for public participation in the planning process.

VALUES OF THE MONTEBELLO ISLANDS AND SURROUNDING WATERS

Nature Conservation

The Montebello Islands are among the most distant of the State's continental islands and, despite the introduction of exotic mammals and the disturbance from nuclear weapons testing, the islands and their surrounding waters support a diverse and interesting array of both terrestrial and marine flora and fauna. Knowledge of the islands' conservation values stems from Montague (1914), Hill (1955) and Burbidge (1971), as well as unpublished accounts of visits by CALM and W.A. Museum staff.

Some of their more important nature conservation values include:

(i) A diverse terrestrial flora (over 100 species) and vegetation which includes substantial mangrove stands. Some species appear to be restricted to only one or a few islands in the group. The two largest islands, Hermite and Trimouille, support very different vegetation associations. These are, in part, a consequence of their differing landscapes.

(ii) The islands provide an opportunity to reintroduce the rare marsupials, the Golden Bandicoot and Spectacled Hare-wallaby, which occurred on the islands prior to the 1920s. The introduced feral cat and Black Rat have been implicated in the extinction of the native mammals on the islands.

(iii) At least 50 species of birds are known, of which ten of the beach and seabird species breed on the islands. Two species of land bird, the Spinifex-bird and Black and White Wren, are thought to have become extinct on the islands in the last 40 years or so.

(iv) The shallow waters around the northern islands provide protected mating areas for Green Turtles and the beaches of these islands are used extensively by Green and Hawksbill Turtles for nesting during the summer months.

(v) A species of legless lizard, *Aprasia rostrata*, is known only from Hermite Island.

(vi) The shallow lagoons and channels provide a wide variety of habitats with silt, sand, rock, coral, sea-grass and algal habitats present. Consequently there is a very rich fish and invertebrate fauna. There is also an extensive barrier reef along the northern and western sides which, although not yet studied, appears from the air to represent one of Western Australia's major coral reef systems. The sheltered waters are used by turtles and dugong as feeding areas. Further, it is thought that the waters around the Montebello Islands are used as refuge breeding sites for molluscs, depleted further inshore as a result of shell collecting.

In addition to these nature conservation values, the islands provide the potential for research into various aspects of marine and terrestrial nature conservation in a semi-arid environment.

Recreation

The waters around Montebello Islands provide excellent sheltered anchorages for vessels of all sizes, and are frequently visited, especially during the winter months, by charter and private vessels. In addition to charter vessels operating from outside the region, marine charter companies operate from Onslow and Dampier, on the Pilbara coast.

The attractions of the islands to the public include their isolation, sandy beaches, and clear waters for diving and fishing. No fresh water is available on the islands. Some visitors are also interested in the nuclear test sites and the remaining relics associated with the tests. Other historic sites, such as those associated with the pearling industry, are relatively unknown to the public.

Hydrocarbon Industry

The islands are presently used for radio positioning base stations for the developing oil and gas industry off the North West Shelf. They are also covered by an oil and gas exploration permit (WA 192-P, Hadson Oil). Support vessels for the Barrow and Varanus

Island (part of the Lowendal Island group) oilfields use the islands for cyclone shelter. The State Government is presently preparing a policy on the use of conservation reserves by the petroleum industry.

Professional Fishing

A pearling lease exists in Faraday Passage and the lessee has recently increased the size of the lease for cultured pearl operations.

Professional wet-line fishermen, mainly from Onslow, operate in the waters around the Montebello Islands and use the islands periodically for shelter.

Aboriginal Sites

Prior to their separation from the mainland between 8000-7500 BC (Crawford 1986), the region which now comprises the Montebello Islands was probably inhabited by Aborigines. It is possible that prehistoric sites will be found, but it is likely that many of the Aboriginal habitation sites are now under water and hence inaccessible. No evidence of more recent visits has been found, but one literary reference suggests that Aborigines continued to use the islands after the rise in sea level (Tindale 1974).

Historic Sites

The English ship, Tryal, was wrecked off the islands in 1622. The wreck has been located and studied by the W.A. Museum.

Between 1902-1939, several leases were issued by the State Government for pearling and the taking of dugong and turtle. Some of these leases were taken up and relics of these early activities occur on some of the islands, together with associated wrecks. These sites have also been surveyed by the W.A. Museum (Crawford 1986)

In 1952 and 1956, the British detonated three atomic weapons on the Montebello Islands (Appendix 1). The first was on a ship, HMS Plym, moored in the vicinity of Main Beach, Trimouille Island. The others were detonated on Trimouille and Alpha Islands (Fig. 1). Several relics of this period still remain on the islands, particularly on Trimouille, Alpha and Hermite Islands. Most relics are equipment used to monitor the explosions. The building used as the operational headquarters for the tests, located on the south end of Hermite Island, still remains, although it has been vandalised.

As the Montebello Islands were the site of:

- the first nuclear explosion detonated by the UK Government as part of their weapons development program,
- the first nuclear explosion on Australian soil,
- and the first use by the UK Government of 'light elements' to enhance the yield of a nuclear device as part of their thermonuclear weapon development program,

they are an historic monument to the 'cold-war' mentality that so dominated global political thinking through the 1950s and 1960s.

MANAGEMENT OBJECTIVES

The management objectives for the Montebello Islands and surrounding waters will be in accordance with the Conservation and Land Management Act, 1984 and the Fisheries Act, 1905. They include:

(a) to conserve the terrestrial and marine flora and fauna, and their habitats;

(b) to conserve the historic sites on the islands and in the waters;

(c) to provide for the recreational and educational use of the islands and surrounding waters; and

(d) to provide for such commercial and industrial use of the islands and surrounding waters as may be judged to be consistent with the conservation and recreational objectives.

All management objectives will be achieved in a radiologically safe manner.

MANAGEMENT OF THE MARINE PARK

It is proposed that an area encompassing the islands of the Montebello group and adjacent State waters be declared a marine park under the Conservation and Land Management (CALM) Act, 1984 and Land Act, 1933, and vested in the National Parks and Nature Conservation Authority (NPNCA). CALM would assume responsibility for the management of the marine park and prepare a detailed management plan for the area, as required under Section 54 of the CALM Act (1984). The area will be known as the Montebello Marine Park.

The following guidelines indicate the proposed management of the marine park and are subject to further consideration and possible change in the management planning process.

Management Zonings and Regulations

Under Section 62(1) of the CALM Act (1984), land or waters vested in the NPNCA may be classified as:

(a) a prohibited area,

(b) a restricted area,

(c) a limited access area,

(d) an unlimited access area,

(e) a recreational area for specified activities.

Further control of public use of the area will be possible under the CALM Act (1984) using regulations relevant to marine parks. These zones and associated regulations will be used to achieve the management objectives, and allow for multiple use of the marine park and public protection.

There is unlikely to be a permanent management presence on the islands in the near future, and management zones will be related to the public through use of on-site signs and information boards, as well as widely disseminated brochures and media-releases.

Management for Nature Conservation

(i) Terrestrial Environment

All terrestrial flora and fauna will be fully protected by regulations proclaimed under the Wildlife Conservation Act, 1980. Areas of the islands which have important nature conservation values and which are vulnerable to disturbance will be zoned as prohibited or limited access areas. Such areas include Wedge-tailed Shearwater burrow sites, as well as other seabird nesting locations, mangrove communities and turtle nesting beaches.

A program of feral cat and Black Rat eradication will be undertaken, prior to reintroduction of the native mammals referred to in Section 3.1. Because of the number and size of islands involved this will be a major undertaking, and will require significant levels of funding.

Little is known of the effects and behaviour of fire on semi-arid islands. No prescribed burning for management purposes is envisaged and every attempt will be made, within the resources available, to control wildfire on the islands.

(ii) Marine Environment

More information on the marine environment is required before zones can be defined, and it is proposed that funds be sought for the W.A. Museum to undertake a detailed marine survey of the proposed park as soon as possible.

Collecting of marine shells for private study and recreational purposes will be considered when the CALM management plan for the marine park is prepared.

Management for Recreation

Management of the islands and surrounding waters is necessary because of the increasing visitor use and the potential for damaging areas of natural and historic value.

Within the marine park, some islands or parts of islands will be zoned as limited access only (day visits), or recreational areas for specified activities (camping). No permanent tourist accommodation is envisaged at this stage. Areas around the sites of the nuclear explosions on Trimouille and Alpha Islands (ground zero) are posted with signs to advise the public of their radiological status, and to warn that long-term occupation of these areas should not occur. These signs will be maintained or replaced as necessary by CALM. These 'ground zero' areas will be zoned as limited access areas, enabling only short term visits. Advice on the actual extent of these areas will be sought from the Radiation Health Section, Health Department of Western Australia. A radiation monitoring program will be developed and monitoring of the test sites, and other relics of the nuclear explosions, will be continued by officers of the Radiation Health Section.

Most recreational activities in the proposed marine park are water based and no need is seen for walk trails to be established, at least in the short term. An exception to this may be for walk trails to radiologically safe relics of the nuclear explosions, readily accessible from the beaches. Information boards will also be established at these sites. No vehicles will be permitted on the islands. Collection of relics by the public as souvenirs will also be prohibited.

The former British operational headquarters on the south of Hermite Island will be considered for restoration and use as a visitor centre and museum, to display historic relics from the islands and to inform the public of the park's values.

Marine areas within the marine park will also be zoned for recreational use. At present, biological knowledge is insufficient to clearly define these areas; however, it is envisaged that some areas will be zoned for observation only, and others for amateur or commercial fishing. Underwater trails may be established. Similarly, mooring areas will be defined to limit damage to coral from anchors. The area around the HMS Plym explosion will be a limited access area, with no mooring of vessels permitted.

Management for Commercial and Industrial Purposes

Use of the islands and surrounding waters for the purposes of the petroleum industry will be subject to the West Australian Government's policy and environmental guidelines on access by that industry to national parks and nature reserves. Short-term use of the islands for purposes such as radio positioning stations will be allowed to continue following consultation with CALM, and subject to these policies and guidelines.

Commercial fishing, including the pearling operations in Faraday Passage, will be considered when a management plan for the marine park is prepared following consultation with the Fisheries Department.

Management of Aboriginal and Historic Sites

The Department of CALM will conform with the provisions of the Aboriginal Heritage Act (1972-1980) which protects Aboriginal sites and objects in W.A. If any Aboriginal sites are found on the Montebello Islands, they will be registered with the Aboriginal Sites Department, W.A. Museum. The historic sites and wrecks, especially those associated with the early pearling industry, are being documented and this information will be presented to the public in various forms. Some of the sites, for example Haynes' camp on Hermite Island, will possibly be partly restored for public viewing.

The need for removal or burial of any of the debris associated with the nuclear tests will be considered from both environmental and radiological safety aspects, prior to a management plan being prepared for the island. Any such removal or burial would be undertaken with minimum disturbance to the environment. Some of the more significant relics, such as the neutron-carriers presently on Alpha Island, should be transferred to the operation headquarters building (if it is restored) enabling public access. Some corrosion prevention and removal will be necessary on these relics. Other structures that do not present a hazard to the public, such as the block houses and parts of HMS Plym on Trimouille Island, should be left as they are, and information boards erected for the public.

RESOURCES REQUIRED FOR MANAGEMENT

The remote location of the Montebello Marine Park will contribute significantly to the cost of management. Access will be one of the major difficulties. In the short term, CALM will rely on the co-operation and assistance of the Navy and of the petroleum companies on nearby Barrow and Varanus Islands, for gaining access to the islands. Charter vessels are also available at Dampier. In the long term it is possible that CALM will acquire a vessel capable of servicing the Montebello Islands. Alternatively, island management personnel may be stationed on Barrow or Varanus Islands, and administer the marine park from these bases.

There is an immediate requirement for funds to:

(a) undertake a detailed biological survey of all the islands and waters of the proposed marine park so that appropriate boundaries and use zonings can be developed;

(b) undertake a program for the eradication of the introduced feral cat and Black Rat and subsequent reintroduction of native mammals.

In the future, funds would also be required for the restoration of the operational headquarters on Hermite Island as a visitor information centre, if it is decided to proceed with restoration. Substantial funding would also be required if the need was seen for removal or burial of debris presently on the island.

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Appendix 1

Extracts from the Report of the Royal Commission into the British Nuclear Tests in Australia (1985).

OPERATION HURRICANE

Faced with uncertain prospects for the use of test sites in the USA to test their prototype atomic device, British authorities studied possible sites in British Commonwealth countries. One potential site was considered to be the Montebello Islands, a low-lying, barren, uninhabited group of islands about 120 km off the north-western coast of Australia.

The choice of a site was made on the basis that the United Kingdom had many ports used by international shipping. The view was taken that there should be an assessment of the effects of an atomic explosion in a port or harbour, produced by the firing of a device mounted below the waterline in the hold of a ship.

In September 1950, the British Prime Minister, Attlee, sought approval from the Australian Prime Minister, Menzies, to carry out a survey of the islands, under the code-name Epicure. Menzies agreed to the reconnaissance. A photographic survey of the islands was made by the Royal Australian Air Force in October 1950. Significant Australian assistance was given to the British reconnaissance team through the provision of HMAS Karangi in November 1950.

The report on Epicure submitted to British authorities in January 1951 concluded that the Montebello Islands was a suitable site for an atomic test, but for climatic reasons, in particular because of the prevailing winds, such a test could only be conducted in the month of October. Attlee informed Menzies in March 1951 that suitable sites existed in the Montebello Islands. In seeking the formal agreement of the Australian Government to an atomic weapon test in the Montebello Islands in October 1952, he said that if agreement were given, preparations would begin forthwith.

There was a delay in giving final Australian approval since elections were to be held in May 1951 but authorisation was given nevertheless to a detailed hydrographic survey. The Menzies Government was returned on 11 May 1951. The survey was performed in July and August 1951 using HMAS Warrego. The operation was code-named Hurricane.

Scientific direction of the trial was the responsibility of Dr William Penney, Director of the Atomic Weapons Research Establishment (AWRE), Aldermaston. Scientific staff of the AWRE and the Atomic Energy Research Establishment (AERE) at Harwell were charged with the technical conduct of the trial.

Operation Hurricane was conducted as a military operation. A special Royal Naval Task Force under the command of Rear Admiral Torlesse was assembled, and the Task Force flagship, HMS Campania, led HM Ships Zeebrugge, Narvik, Tracker and Plym to Australia. Radiological safety equipment and decontamination facilities were embarked on HMS Tracker, designated Health Control Ship for the operation.

The Hurricane device was exploded at 0800 hours WAST on 3 October 1952. It had a yield of approximately 25 kt and was exploded eight and a half feet below the waterline in the ageing Royal Navy frigate HMS Plym.

There appears to have been insufficient emphasis placed on the meteorological aspects of the tests conducted at the Montebello Islands and therefore on the potential fallout on the mainland. The records of the time not only indicate that the climatic restrictions were a constraint on when the tests could be held, but also indicated that the planners of the test were aware that fallout would travel in an easterly direction and that it could be monitored not only over the Australian mainland but also further to the east in Fiji and possibly New Zealand.

The contamination of the mainland was one of the matters of concern to Australia. Menzies, on 24 January 1952, raised the problem with the UK High Commissioner in the following terms:

'There is a special consideration which applies to Australia only, namely possible after-effects of this project on the Australian mainland and its inhabitants. The only persons in a position to make an authoritative statement in this regard are United Kingdom scientists who know the precise nature of the experiment and who are now in possession of the necessary meteorological data to estimate its after-effects. From the point of view of the

Australian announcement, some categorical and authoritative statement will be necessary that the effects will be innocuous.'

'... the UK scientists concerned gave a categorical assurance that the explosion will take place only when these conditions are such that there will be no danger from radioactivity to the health of people or animals on the mainland.'

The cloud rose to about 1800 feet after one second and most of the cloud reached a maximum of 10 000 feet after about four minutes where its ascent was substantially stopped by a temperature inversion. A small portion of the cloud continued to rise to 11 600 feet (RC 438, T1/54, p.7). Local fallout began at one minute after firing with most of it falling as contaminated rain as well as solid particles from the crater and parts of HMS Plym. Most of this close-in fallout fell to the north and west of Ground Zero.

OPERATION MOSAIC

With the prospect of testing a thermonuclear weapon in the Pacific in 1957 in mind, British authorities urgently required experimental information on the interaction of light elements (lithium, deuterium and tritium) in the environment of an exploding fission weapon.

On 16 May 1955, Menzies received a personal message from Sir Anthony Eden seeking agreement to two tests of nuclear weapons neither of which would exceed a yield of about two and a half times that of the Hurricane device. They were to be atomic explosions with the inclusion of light elements 'as a boost'. Eden emphasised that the tests would not be thermonuclear in character.

Because the yield of the second test was expected to be in the region of 60 kt, British authorities considered use of the new Maralinga Range would probably be unacceptable to Australian authorities. Furthermore, the Range was unlikely to be completed by April-May 1956.

The UK turned once again to the Monte Bellos for two further tests in May and June of 1956. The operation was code-named Mosaic.

As with Operation Hurricane, Mosaic was mounted as a military operation. Commodore H. Martell, RN, was appointed Operational Commander. The Scientific Director was C.A. Adams, and the technical conduct of the trials was the responsibility of the Scientific Superintendent, I. Maddock.

7.0.6 For the first time, an official Australian Atomic Weapons Tests Safety Committee (AWTSC) was set up to monitor the safety of the tests on behalf of the Australian Government. The Safety Committee had the power to veto a proposed firing if, in the opinion of its members, safety criteria were not fully met.

Mosaic G1 was tower-mounted on Trimouille Island. It was exploded at 1150 hours WAST on 16 May 1956, and had an approximate yield of 15 kt. The cloud from the explosion rose to 21 000 feet rather than the maximum predicted height of 17 000 feet, and radioactivity was detected on the mainland from Onslow to Broome at 0600 hours the next day and during the next 24 hours, although the level was well below that set by the AWTSC for public safety. Nevertheless, some problems were suggested in articles in the press.

Mosaic G2, also tower-mounted, was exploded on Alpha Island at 1014 hours WAST on 19 June 1956 (Figure 5.0.1). It produced a yield of 60 kt, making it the largest device exploded by the UK in Australia. The cloud rose to 47 000 feet, considerably higher than the maximum predicted height of 37 000 feet. Again there was some low level radioactive deposition on the mainland. The AWTSC reported, however, that the Mosaic safety measures were completely adequate and that the Mosaic tests posed no hazard to persons nor damaged livestock or other property. Claims were made that the main cloud had passed over the mainland and that something had gone radically wrong with the test.

The Choice of the Montebello Islands

The primary reason for using the Montebello Islands for the Mosaic tests appears to have been the push ahead as quickly as possible with the development of a hydrogen weapon. Maralinga was not ready and any attempt to use Maralinga before completion would have set back the preparation for the Buffalo series of tests. The UK authorities also considered it vital that the Mosaic tests take place in May-June 1956 in order not to hold up their thermonuclear program.

Penney also suggested that the UK was doubtful if the Australians would have allowed a 60 kt explosion at Maralinga. He was asked why the Montebellos were chosen since it was known that the meteorological conditions were far from ideal. He replied:

'Cook was running this weapons development committee. The top priority job was thermonuclear. We wanted to see if we could make a few fast neutrons; and we wanted to do it in yields of 40, 50, 60 kilotons. Cook as the Chairman said where can this be fired? I heard all this later from him because he was doing the running job. Maralinga was not going to be possible; it was too early; and if we had said to the Australians 50 kilotons at Maralinga I think they would have said no. So we could not go there. The other possibility was to ask the Americans. Well, we had been through that hoop; and therefore it was either Montebello or wait - not to do it.' (Trans., p.7059)

The Montebello Islands had already been contaminated by the Hurricane test, the Montebello land and sea areas had been extensively surveyed and were subject to limited access restrictions under Australian law, the naval support facilities necessary for further tests at Montebello had already been tried and proved at Hurricane, and finally the remoteness of the Montebellos made the Islands attractive to the UK authorities, particularly when testing components which would be used in the controversial hydrogen atomic weapon.

As was indicated in relation to the Hurricane test, the major difficulty with the use of the Montebello Islands was the limited periods in which the weather would be suitable to enable the tests to be carried out safely. The Australians had been informed in 1951 that for climatic reasons atomic test trials could only be carried out at the Montebellos during October. Hurricane was fired in October. Even then the meteorological conditions were difficult to predict and were subject to rapid change.

In May and June, the general flow of air was westerly in the tropical zone of north-west Australia. Westerly winds were clearly unfavourable because the fallout would be blown directly to the mainland. However there were short-lived changes which took the winds towards the north, and led to a more favourable configuration. The difficulty was to predict the favourable occasions and also the length of time before the winds returned to the westerly flow (Trans., p.5492).

The Royal Commission was told of several analyses of the meteorological conditions at the Montebello Islands at that time of the year. Dwyer estimated that there would be two to four satisfactory or nearly satisfactory opportunities between April and July (RC 556). Adams looked at the data and concluded that there could be two or three occasions in both May and June (RC 558, p.1696). Fotheringham and Phillpot also carried out a study in January 1956 and concluded that there would only be one suitable day in three months.