Australian Government

MURRAY–DARLING BASIN AUTHORITY

Lake Victoria Cultural Landscape Plan of Management

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Acknowledgement of the Traditional Owners of the Murray–Darling Basin

The Murray−Darling Basin Authority pays respect to the Traditional Owners and their Nations of the Murray−Darling Basin. We acknowledge their deep cultural, social, environmental, spiritual and economic connection to their lands and waters.

The guidance and support received from the Murray Lower Darling Rivers Indigenous Nations, the Northern Basin Aboriginal Nations and our many Traditional Owner friends and colleagues is very much valued and appreciated.

Aboriginal people should be aware that this publication may contain images, names or quotations of deceased persons.

Contents

Quick index

This quick index outlines AHIP conditions and the most relevant section to the condition hyperlinked to pages within the Lake Victoria Cultural Landscape Plan of Management.

TOPIC	AHIP conditions (with most relevant section linked)
Commencement and duration of the AHIP	1-2
Proposed works	3
Responsibility for compliance with the conditions of the AHIP	4
Certain Aboriginal objects must not be harmed	8-9
Certain Aboriginal objects may only be moved	10-12
Lake Victoria Advisory Committee	13, 14-20
Barkindji-Maraura Elders Council (BMEC)	21, 22, 23
Lake Victoria Scientific Review Panel	24-26
Lake Victoria Cultural Landscape Plan of Management (CLPoM)	27-29
Strategies – Communication	30, 31
Strategies – Access	32
Strategies – Aboriginal Employment	33
Strategies – Cultural Heritage Conservation	34
Strategies – Lakeshore stability	35
Strategies – Native vegetation regeneration	36
Strategies – Non-native fauna	37
Strategies – Water quality	38
Strategies – Human remains	39
Strategies – Research	40
Lake Victoria Operating Strategy (LVOS)	41-44
Annual reporting	45-47
Provision of Aboriginal site recording form	48
Salvage of objects under this permit and consent	61-75
Actions authorized by this Section 87 Permit	76
Care agreement – temporary storage of certain Aboriginal objects	77, 78, 79
Long term management of certain Aboriginal objects	80

How to read the CLPoM

The Lake Victoria Cultural Landscape Plan of Management (or CLPoM) is used to guide management strategies as required under the Lake Victoria Aboriginal Heritage Impact Permit (AHIP). This plan has seven main sections:

- **Part 1: Context** – outlines the background, context and geographic scope for the development of the CLPoM and the significance of Lake Victoria as per the Burra Charter (including historic, spiritual and social, aesthetic, scientific and economic values).
- **Part 2: Our management considerations** – outlines the nature of each management area, unique characteristics of management areas and important considerations for management actions at Lake Victoria.
- **Part 3: Our committees** – outlines the committees that work independently and also together to provide advice and input into the adaptive management of Lake Victoria.
- **Part 4: Our management strategies** – outlines how we act to manage and protect cultural landscape values at Lake Victoria, to fulfill the Aboriginal Heritage Impact Permit conditions and guide adaptive management of the lake.
- **Part 5: Our management rules, protocols and guidelines**– outlines what rules, protocols and guidelines govern conduct at Lake Victoria relating to management strategies.
- **Part 6: Our management techniques** – outlines specific methods and techniques to enable delivery on on-ground outcomes relating to parts of the management strategies described in Part 3.
- **Part 7: Our reporting –** outlines how we report on compliance with the Aboriginal Heritage Impact Permit for Lake Victoria.

Part 1: Context

1.1 Introduction

Lake Victoria is a very special place. It has been and remains of exceptionally high spiritual and cultural significance to Aboriginal people, particularly the Barkindji and Maraura people. There is extensive evidence of Aboriginal occupation at Lake Victoria spanning at least the past 18,000 years through the presence of large numbers of Aboriginal objects including burials, middens, fireplaces, scarred trees and stone artefacts. These sites and the natural landscape of the Lake and its environs are important components of the spiritual and cultural significance of Lake Victoria.

Lake Victoria is also a key water storage in the River Murray System managed by the Murray-Darling Basin Authority (MDBA) on behalf of the Commonwealth Government and the Governments of South Australia (SA), New South Wales (NSW) and Victoria (VIC) in accordance with the Murray-Darling Basin Agreement 2008 (Schedule 1 of the *Water Act 2007*). Lake Victoria plays a critical role in the conservation and management of water resources in the Murray-Darling Basin and provides significant socio-economic benefits to communities throughout the Murray Valley. An Aboriginal Heritage Impact Permit (AHIP) is required for Lake Victoria because the MDBA acknowledges that the operation of the Lake can cause harm to Aboriginal objects. As such, this area has been covered by an AHIP (previously a Section 90 Consent and Section 87 Permit) since 1998. The original AHIP was revised and reissued in 2002, 2006, 2014 and most recently in 2015. The 2015 AHIP for Lake Victoria remains in force until 4 August 2020 unless otherwise revoked in writing by NSW Department of Planning, Industry and Environment – Biodiversity and Conservation Division.

The ongoing work of preserving the cultural and natural heritage values of Lake Victoria since 1998 represents the collaborative and dedicated efforts of the Barkindji-Maraura Elders Council (BMEC), South Australian Water Corporation (SA Water), NSW Department of Planning, Industry and Environment - Water (NSW DPIE Water), NSW Department of Planning, Industry and Environment – Biodiversity and Conservation Division (NSW DPIE-BCD) and Murray-Darling Basin Authority (MDBA).

The purpose of the Lake Victoria Cultural Landscape Plan of Management (referred to as the 'CLPoM') is to detail the necessary strategies and actions needed to implement the conditions of the 2015 AHIP (a consent under Part 6 Section 90D(5) of the *National Parks and Wildlife Act 1974* (*NPW Act*) issued by the NSW Department of Planning Industry and Environment – Biodiversity and Conservation Division (formerly NSW Office of Environment and Heritage) on August 2015) relating to the Lake Victoria Cultural Landscape Plan of Management The CLPoM also includes strategies and actions for government-owned land immediately adjacent to the Lake which may impact the implementation of the AHIP. As the AHIP holder, MDBA must ensure that all persons involved in actions or works covered by the AHIP (whether employees, contractors, sub-contractors, agents or invitees) are made aware of and comply with the conditions of the AHIP (Condition 4).

"I want protection work done here.. I want to do things for my ancestors, what should be done."

Roddy Smith, Barkindji Elder, 1994

'Our people knew that the burials were there and because now the young kids are coming out and they're working there, they're getting to see something that people used to talk about years ago.. it's very important that they do something about it. I'm hoping when everything is done there'll be some water put back there and our ancestors will be protected by the water, you know?"

Christine Kelly, Barkindji Elder, 1994

"The best thing that ever came out of this, all this mucking around and talking about things, was the protection of the burial sites. It's the best thing that ever happened. We needed the protection very badly [for the burials], and we got it. I'm pleased with that and my people are pleased with it too.'

Roddy Smith, Barkindji Elder, 2003

"The past is the past I suppose. Now all we've got to do is look for the future, I'm sure that things are going to work out great out there at Lake Victoria because I can see it happening. The people are all coming together and there's more children showing interest in Lake Victoria now because they go out on a regular basis and have a look around. That's all that matters to me, it's our kids in the future, you know? There's a big picture out there. We need to work I think it's going to be great, Lake Victoria.'

Christine Kelly, Barkindji Elder, 2003

"Lake Victoria is special to me - it holds many stories from my ancestors, it is the place I want to be when I need to get away and it provides water for my home in South Australia."

Kingsley Abdulla, Maraura Elder and Chair of Barkindji- Maraura Elders Council, 2017

Figure 1 Aerial view of Lake Victoria with the River Murray in the foreground. Source: MDBA, 2012.

1.2 Objective

The key objective for management of the cultural landscape at Lake Victoria is:

> *'the protection of cultural heritage through the maintenance of existing and emerging burial mounds and in-situ Aboriginal objects, alteration of lake operations, reestablishment of vegetation where feasible and shoreline stabilisation.'*

Lake Victoria is an area of competing values in which a balance must be found. The basis of the Lake Victoria AHIP is that damage to Aboriginal burial sites and associated objects in entirety must be prevented and that damage to objects and sites must be minimised – whilst also allowing for the appropriate operation of the lake as a major water storage. Cultural heritage protection can be best achieved in the long term by stabilising the foreshore of the lake and the surrounding landscape. Strategic management of lake water levels can help manage excessive foreshore erosion through supporting native vegetation requirements for growth and recruitment. Re-establishing native vegetation on the foreshore and littoral zone where feasible also contributes to the restoration of the natural values of the lake and constitutes more appropriate management of the lake as a significant place to the Barkindji and Maraura people.

Under the adaptive management framework, measures to achieve these objectives will continue through scientific investigations, operational actions, implementation of on-ground works, and community involvement in management to improve the environment of Lake Victoria.

1.3 Geographic scope of the CLPoM

Lake Victoria is approximately 60 kilometres downstream of the confluence of the Murray and Darling Rivers in south-western New South Wales (NSW) (Figure 2 – Part B). Lake Victoria is owned by the South Australian Government on behalf of a joint venture between the Commonwealth Government and the state Governments of Victoria, NSW, and SA. Lake Victoria is managed by the MDBA as the agent of the joint venture, with the South Australian Water Corporation (SA Water) being responsible for implementing day-to-day maintenance and operations.

Approximately two thirds of the surrounding land adjacent to the area covered by the Lake Victoria AHIP is owned by NSW Government on behalf of the joint-venture program or leased to SA Water. This land includes Noola Station (owned), Nulla Nulla Station (owned) and Duncan's Corner (leased). Although these joint-venture lands are not governed) by the AHIP relating to Lake Victoria, the lands are of importance to managing the landscape environment as a connected and integrated entity. NSW Department of Planning, Industry and Environment - Water (NSW DPIE Water) are responsible for land management activities on Nulla Nulla and Noola Stations whereas SA Water are responsible for activities on Duncan's Corner. The remaining adjacent land to the Lake Victoria AHIP area is privately owned including Dunedin Park, Talgarry and Lake Victoria West Station and Moorna Station.

In accordance with Schedule B of the Variation of AHIP (2015), the CLPoM covers all joint-venture managed areas including the area to which the AHIP applies as follows:

- Lake Victoria below 27m AHD (Australian Height Datum); and
- the cliffed shoreline between 27m AHD and 30m AHD; and
- the section of Frenchmans Creek from the Inlet Regulator to Lake Victoria which is inundated at 27m AHD; and
- the Rufus River channel and cliffed banks between the River Murray and the Outlet regulator.

The geographic location of Lake Victoria is outlined in Figure 2. The geographic scope of which this plan covers is outlined in Figure 3.

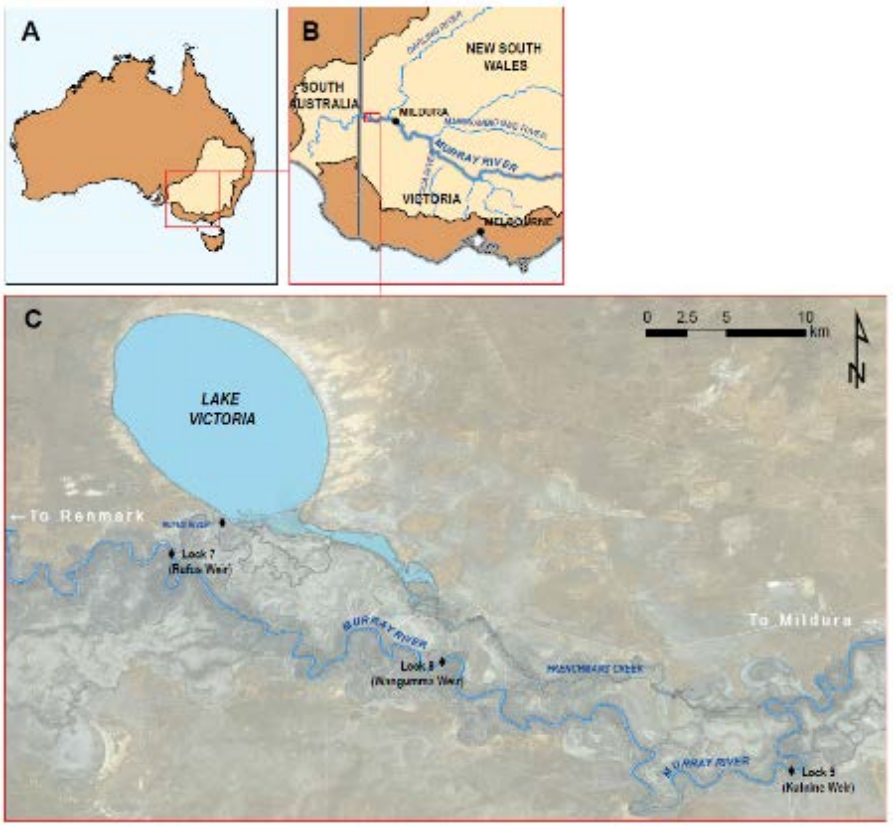

Figure 2 Location of Lake Victoria within context of the Murray-Darling Basin (Part A), state borders (Part B) and River Murray locks and weirs (Part C).

Figure 3 Geographic scope to which this Plan applies at Lake Victoria and surrounds

1.4 Development of the CLPoM

The original Section 87 Permit and Section 90 Consent (1998) under the NSW *NPW Act 1974* required a Plan of Management for the Lake Victoria Cultural Landscape to be developed. There have been two iterations of the CLPoM since the first Section 87 Permit and Section 90 Consent was issued, with the first produced in May 2002 and the second in July 2007. Following a variation to the Aboriginal Heritage Impact Permit (AHIP) in 2015 which encapsulates the intentions of the original Permit and Consent, a review of the 2007 CLPoM was required to ensure that the CLPoM was consistent with the conditions of the AHIP 2015.

This CLPoM builds on the information documented in the 2007 CLPoM. It was prepared by a working group of the LVAC who considered the AHIP, the results from the monitoring programs, technical reports, research projects, local knowledge, advice from Barkindji and Maraura people, landholders and the independent Chair and Deputy Chair of the LVAC. Members of the LVAC who were involved in the development of the CLPoM in 2007 include:

- Evelyn Crawford (BMEC Chair)
- Jane Lennon (LVAC Chair)
- Rob Monteith (NSW EPA)
- Harvey Johnston (NSW NPWS)
- Warren Duncan (LVAC landholder representative)
- Ross Foster (SA Water)
- Mick Greatz (SA Water)
- Michael Gilby (SA Water Lake Victoria Cultural Heritage Supervisor)
- Lyn Barnes (LVAC Secretary)

Since the commencement of the initial Permit and Consent in 1998 and the development of the 2007 CLPoM, significantly more information has been obtained in the light of experience gained through the revised Lake Victoria Operating Strategy implementing burial protection works, monitoring and reporting requirements. The management of the Lake is and will continue to be adaptive, ensuring that all relevant information from monitoring programs, new research, Traditional Owners and the wider community guide future management of cultural heritage, land and water at Lake Victoria.

As more information is collected and the environmental processes which are affecting the Lake and surrounding land continue to be better understood, the operating and management strategies will be reviewed. The CLPoM format allows for these ongoing changes to management actions. 'Part 5: Our management techniques' can operate as a set of stand-alone manuals and reflects adaptive management at Lake Victoria based on local experience and expertise and also technical advice from the Lake Victoria Scientific Review Panel as described by Figure 5.

Figure 4 Ceremonial dance performance at the launch of the 2002 Lake Victoria Cultural Landscape Plan of Management at Lake Victoria. Source: MDBA, 2003.

1.4.1 Requirements and intentions of the CLPoM

As outlined by the AHIP 2015, the CLPoM will:

a. be in accord with the principles of the Burra Charter;
b. operate within an adaptive management framework, ensuring information provided by the LVAC, monitoring programs and research guides future management of the cultural landscape;
c. ensure that the LVAC is consulted on the operation and review of the CLPoM;
d. apply to all of the area described in 'Schedule B: Area to which this AHIP applies';
e. recognise that the management of Lake Victoria is part of a broader range of land and water management planning processes and associated legislative requirements;
f. provide all necessary information about an issue, including appropriate technical advice, in an understandable form to guide management actions;
g. recognise and address the need for a balance between competing values, as well as regional and inter-generational equity and ecologically sustainable development principles; and
h. have any revisions to the CLPoM referred to LVAC for comment and approval from the Secretary of NSW DPIE - BCD prior to implementation.

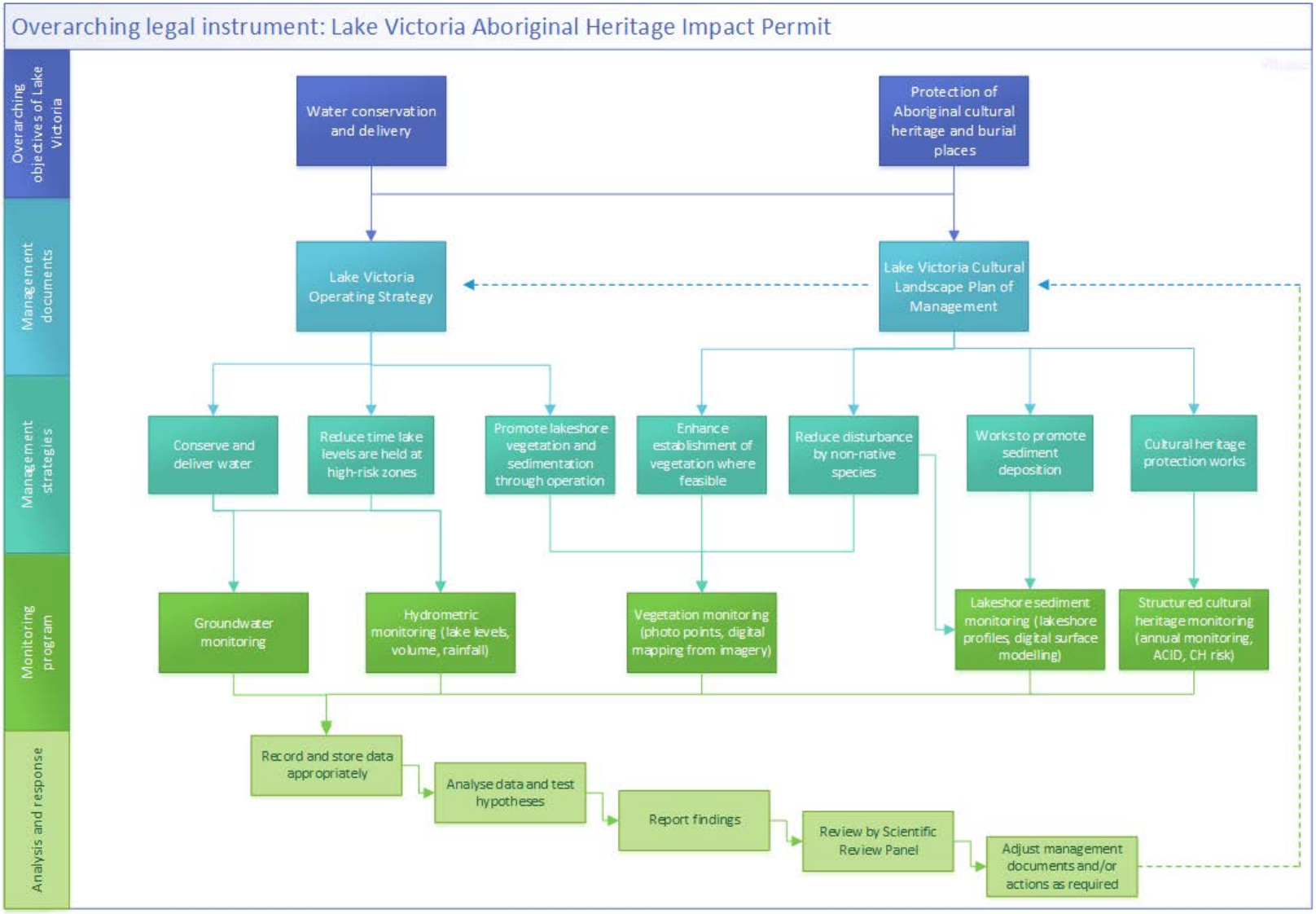

Figure 5 Adaptive management framework for the Lake Victoria Program.

1.5 The significance of Lake Victoria

In order to develop strategies to conserve the cultural landscape, it is important to first understand what natural and cultural heritage values exist at Lake Victoria. Once these values are identified, the subsequent sections of the CLPoM can ensure that the management of the lakeshore conserves those values in accordance with the Lake Victoria AHIP.

The cultural landscape of Lake Victoria is the sum total of all the components of the landscape including biological, ecological, geological and all human-induced changes to those components. It is a significant ancient landscape made up of multiple layers on which humans have left imprints – their changes to the physical and natural environment, their material remains, and their perceptions held in history, stories and memories. Some human-induced changes, such as regulation of the lake, have been detrimental to other cultural landscape values, in particular, Aboriginal heritage and foreshore vegetation and habitat.

1.5.1 The cultural landscape

The Lake Victoria cultural landscape is a highly significant place, preserving the material evidence of both Aboriginal and European history, the patterns of human use of the landscape seen in the camping places and river crossing places, roads and tracks, which have been in use by people for generations, and associations such as spiritual feelings about burial grounds, massacres, past connections and the natural environment.

Lake Victoria is host to extensive Aboriginal sites of both living and burial places. These sites preserve the history of Aboriginal people for at least the last 18,000 years through their association with traditional Aboriginal lore and value as living heritage to Barkindji and Maraura Aboriginal people with connections to the area. The most significant cultural heritage at Lake Victoria is the Aboriginal burial sites, of which Lake Victoria has the largest density of documented sites in Australia.

The landscape itself is the result of human actions. Aboriginal people living along the lakeshore over thousands of years changed the soils and vegetation by creating camp sites and burial grounds, lighting fires, building up shell midden and other debris; and by making walking tracks.

Since European occupation of the area from the mid-nineteenth century, new layers of use – pastoralism, water supply, wartime training, and scientific discovery – have added layers of value for European settlers associated with the area. Europeans also had a major impact on the landscape, first through land clearing and the introduction of stock, feral animals and weeds. These were followed by regulation works which controlled the flow of the River Murray, changing the course and width of the original channels, providing many new wetlands and raising the lake, drowning large areas and providing less regularly fluctuating water levels, resulting in changed patterns of vegetation, erosion and sedimentation.

1.6 Statement of Significance

The Statement of Significance for Lake Victoria is a summary of the heritage values (both natural and cultural) in accordance with the *Australia ICOMOS Charter for the Conservation of Places of Cultural Significance* (known as the 'Burra Charter') and *NSW Heritage Act 1977* criteria as follows:

- Historic values
- Spiritual and social values
- Aesthetic values
- Scientific values (geodiversity and biodiversity); and
- Economic values

The following Statement of Significance for Lake Victoria is based on information found in the '*Lake Victoria Environmental Impact Statement*' (Hope 1998).

1.6.1 Historic values

- Extensive Aboriginal sites (both living and burial places) at Lake Victoria preserve the history of Aboriginal people from at least 18,000 years ago to the 21st century.
- The Lake Victoria area was the main location of Aboriginal resistance to the pastoral expansion along the River Murray into South Australia during the historic wars along the pastoral frontier of south-eastern Australia in the 1830-1840s. Rufus River on the southern lakebed was the location of the conflict between Aboriginal people and Europeans on the Murray, namely the Rufus River Massacre of 27 August 1841.
- The Lake Victoria area is associated with the history of the European exploration of Australia (particularly with Charles Sturt), the development of the colony of South Australia (Joseph Hawdon and the overlanders) and development of pastoralism and the river boat trade.
- Contact historic sites can provide information about Aboriginal-European interaction, both independent of historic documents and providing a link between the very early historic records, up to 1860, and the later oral and family history of the associated Aboriginal families.
- Both the Aboriginal and European history indicate that Lake Victoria was a key place on routes along the Murray and Darling Rivers: traditional Aboriginal storylines, Aboriginal social and trade routes up and down the rivers, European routes of exploration and pastoral expansion, and later routes of communication by river, road and telegraph. Lake Victoria has the potential to provide information about regional and national history.
- The Lake Victoria area is associated with the history of pastoralism in the Western Division of NSW. In particular, it has a long (and continuing) history of involvement of Aboriginal people in the pastoral industry. Historical sites at Lake Victoria, relating to the pastoral industry and the regulation of the lake can provide information about European settlement at Lake Victoria not available in historic records.
- Lake Victoria played a key role in the development of water management in the Murray-Darling Basin, a significant phase in the history of land use and settlement in Australia, and especially in South Australia.

- Lake Victoria was a training area for the RAAF No. 2 Operational Training Unit based at Mildura during World War II. Several airmen lost their lives in plane crashes into the Lake.
- Lake Victoria is associated with the development of the environmental and archaeological understanding of Australia, as a result of the pioneering environmental assessment studies done for the Chowilla Dam proposal, and with the development of cultural heritage management in Australia.

1.6.2 Spiritual and social values

- Lake Victoria has exceptional spiritual values to associated Aboriginal people as a place of burial.
- Lake Victoria has spiritual values as the locality where Aboriginal and European people were killed in clashes in the 19th century.
- Knowledge of events such as the Rufus River Massacre has been handed down in oral tradition, as has the presence of many burial sites, which many Aboriginal people believe to include those of the massacre victims. This contributes to the spiritual and social values of the Lake and its symbolic role for Aboriginal people as a memorial of both traditional and historic life and events.
- The Lake Victoria area has high social significance to Aboriginal people who have historic associations with the pastoral industry especially when tied to specific places in the landscape and are also part of the associative aspects of cultural landscape.
- Lake Victoria features important traditional Aboriginal stories relating to the Murray and Darling Rivers. The details of these had been lost from the local oral tradition but recorded in historical documents. These have been recovered through the significance assessment process and may now contribute to Aboriginal values of the Lake.
- The landscape of the lake, combining both natural features such water, islands, channels, flora and fauna, and cultural features such as burial grounds, traditional living areas, massacre sites, and also modern burial conservation works, is of high social and spiritual significance to associated Aboriginal people.
- Many local pastoral families have associations with the Lake and the surrounding pastoral leases dating back to the earliest pastoral settlement.
- Lake Victoria has played an important role in the management of the River Murray since the 1920s, and has social significance to associated people such as water management staff employed there over the years, and both local and up and downstream people who depend on the Lake for water.
- Lake Victoria has been used for recreation for picnickers, campers and fishers, as well as for educational field trips by school and university groups.
- The lake was the site of RAAF pilot training during World War II, and of several deaths in plane crashes. The Lake is of social significance to RAAF veterans in a current phase of reunions and commemoration.
- Barkindji Native Title 8 (NT8) won their Native Title Claim for the Determination Area which includes parts of land surrounding Lake Victoria in 2015. The existence of Native Title in this region strengthens the importance of receiving advice from the Barkindji people during development planning and decision making.

1.6.3 Aesthetic values

- Lake Victoria is a landmark feature because of the visual contrast it provides as a very large lake set into a semi-arid landscape. It is also the most substantial and likely the most ancient lake along the central River Murray.
- The combination of natural and cultural aspects, both social and historic, makes Lake Victoria an important cultural landscape which has both aesthetic and social value.
- Associated Aboriginal people feel that the landscape is an important part of the significance of the area. The burial sites and other heritage material can only retain their integrity if the environment remains intact. It is clear that the aesthetic quality of the landscape is part of the spiritual aspects of Lake Victoria, so social and aesthetic significance are closely related.
- Although highly modified, the areas of native vegetation are highly regarded by the Aboriginal and European communities, particularly the stands of river red gum.

1.6.4 Scientific values

- Lake Victoria's sediments and geomorphic features, the associated inlet and outlet channels and the older floodplain are important for understanding the long-term history of the River Murray. Sediments representing the full Murray Basin geological sequence from the late Tertiary to the present are visible at Lake Victoria.
- Lake Victoria is the largest ancient lake associated with the River Murray. Its position in the lowest part of the Murray Basin, and known stratigraphy, suggest that it may extend far back into the Pleistocene. It continued as a functioning lake through the Holocene when other Pleistocene lakes such as Willandra and Menindee were either totally abandoned or only occasionally filled.
- Lake Victoria, uniquely placed on the River Murray and preserving rich, organic sediments rare in semi-arid areas, has the potential to provide understanding of how the environment has changed over the last 10,000 years, for example through pollen analysis to study the past vegetation of the region.
- The Lake Victoria shoreline has a remarkable and possibly continuous Holocene sedimentary sequence, consisting of stratified organic and culturally-rich palaeosols. These accumulated as a distinctive delta floodplain and other shoreline features within the Pleistocene Lake basin.
- Lake Victoria has a remarkable late Holocene sedimentary and archaeological sequence, with the potential to provide understanding of the Aboriginal economy over the last 10,000 years and especially the last 2,000 years.
- Lake Victoria lies at a cultural and environmental boundary between the river and the semi-arid country, and has the potential to show how Aboriginal land use changed at the boundary between riverine and semi-arid environments.
- Lake Victoria is part of the lower Murray cultural area characterised by large cemeteries. It is unique in that the whole life of the Aboriginal community is preserved, the places where people lived as well as their burial grounds. It has the potential to demonstrate when semi-permanent life along the Murray and the use of permanent burial grounds began.
- Lake Victoria has a remarkable density and variety of stone artefacts compared to other places on the Murray; the local area may have been an important raw material source.

- While the vegetation may not be of conservation significance in its own right, it has a value in providing important habitat for fauna. The fauna is of moderate significance with at least 16 species of wildlife recorded of important conservation status; the most significant is the southern bell frog (*Litoria raniformis*), which is considered endangered in NSW.
- A number of waterbird species breed at Lake Victoria including two species of conservation concern, the great cormorant (*Phalacrocorax carbo*) and the darter (*Anhinga novaehollandiae*).
- An understanding of the impact of erosion on cultural heritage at Lake Victoria will produce information that can help protect other places where there are wind and water impacts on cultural heritage.
- The conservation works at Lake Victoria are the largest ever undertaken for Aboriginal heritage site protection in Australia. The lessons learnt here about the best ways to protect heritage will benefit other places.

1.6.5 Economic values

- The regulation of Lake Victoria as part of the management of water in the Murray-Darling Basin, contributes to the provision of a reliable water supply to communities upstream and downstream of the lake and has underwritten the growth of communities and agricultural development in regions along the River Murray since the early 1920s.
- The economic value of Lake Victoria as a water storage varies as a result of the climate. In drought years, Lake Victoria is indispensable and holds water that is now a tradeable resource; in normal, average or wet years, its value as a water storage, while still important, is lessened, although it continues to provide value in terms of re-regulation of water, providing dilution flows following a flood if needed, managing salinity in surface waters and delivering environmental flows to sites downstream.

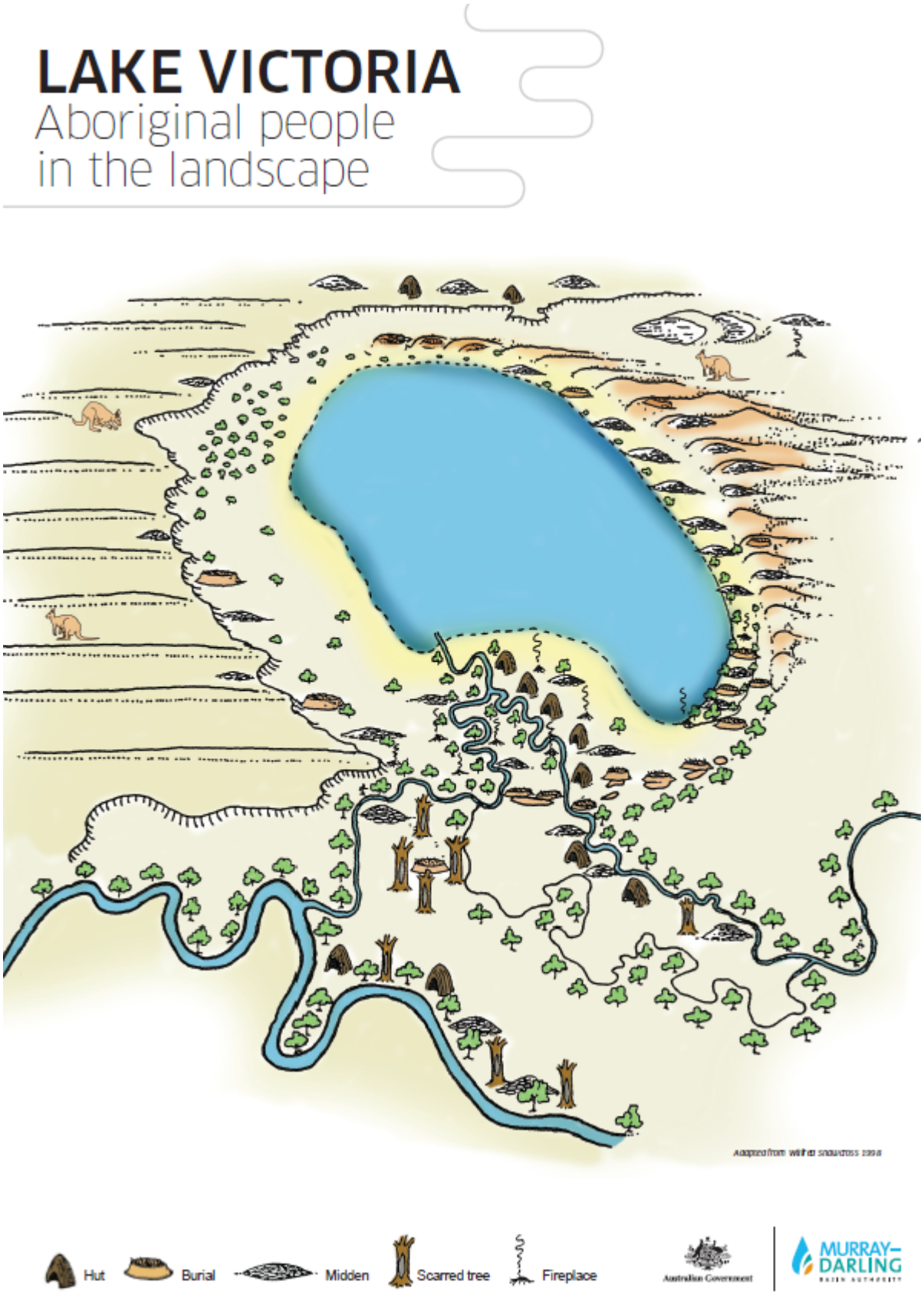

Figure 6 Lake Victoria - Aboriginal people in the landscape (2016 adaptation from F.W. Shawcross 1997)

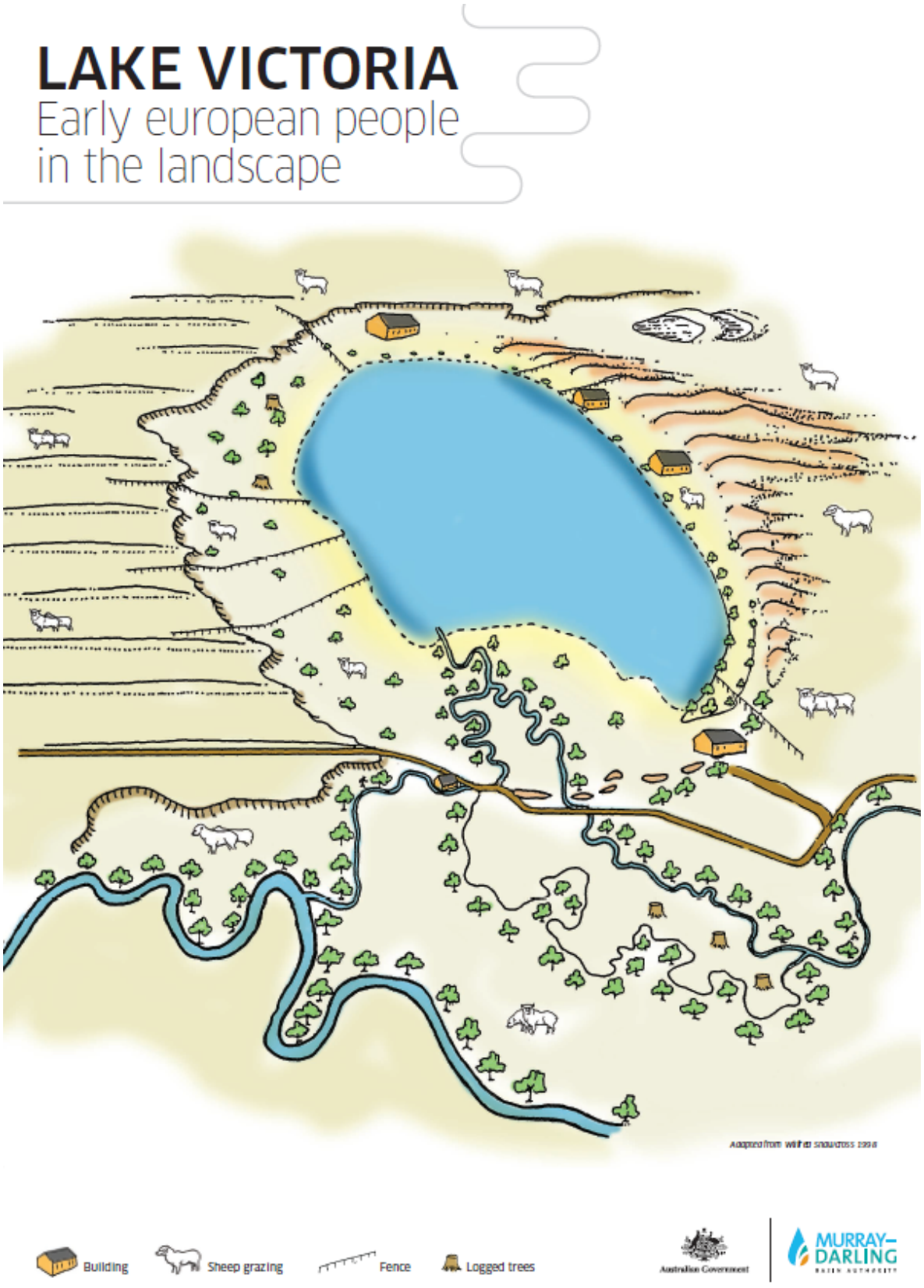

Figure 7 Lake Victoria – Early european people in the landscape (2016 adaptation from F.W. Shawcross 1997)

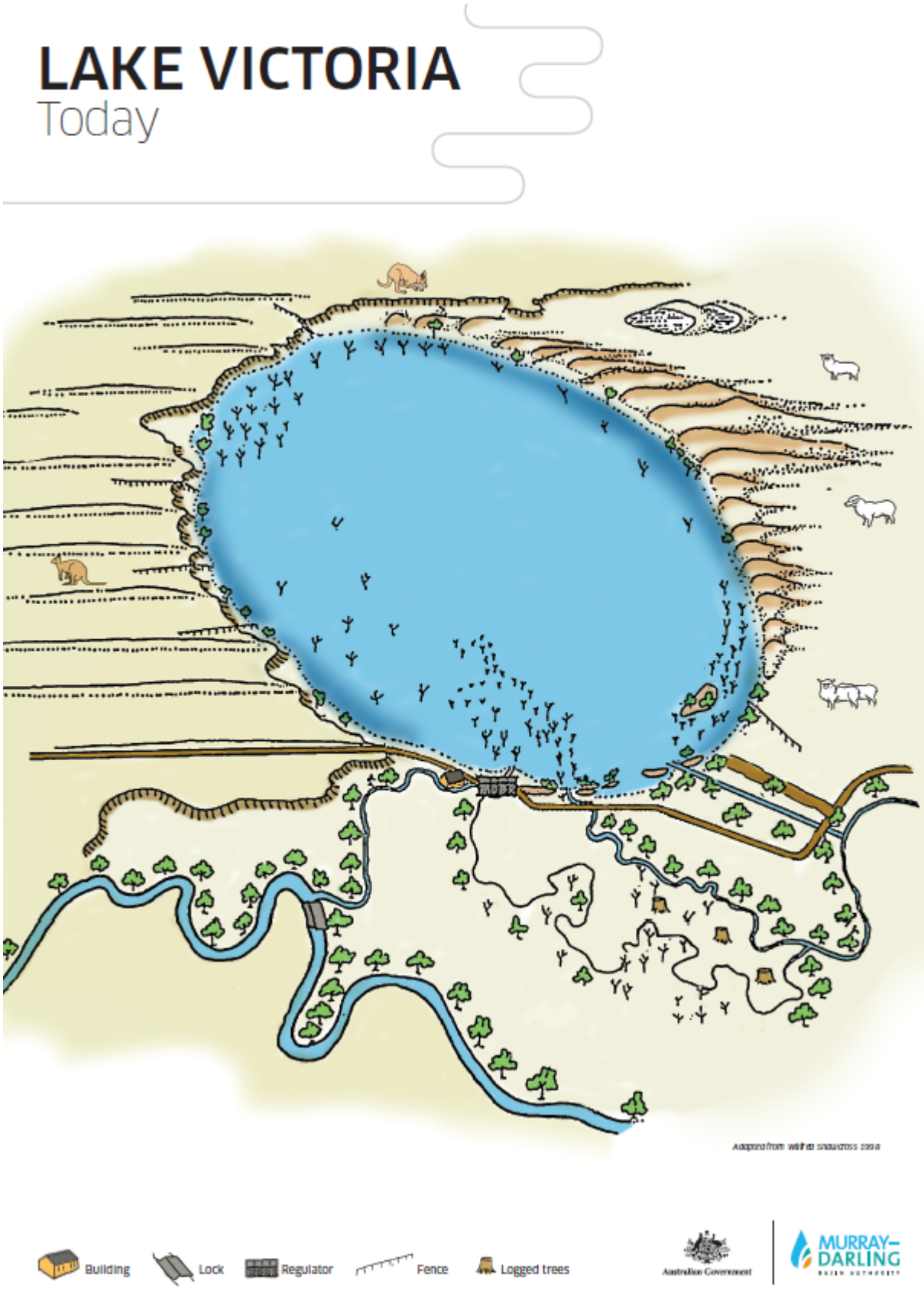

Figure 8 Lake Victoria today (2016 adaptation from F.W. Shawcross 1997)

1.7 Interaction between cultural and natural heritage significance

There is a clear imbalance between the very high heritage significance of the cultural aspects, and the lower heritage significance of much of the natural aspects of the Lake Victoria cultural landscape. The two major reasons for this relate to the uniqueness and integrity of each, as explained below.

1.7.1 Uniqueness and authenticity

The cultural heritage demonstrates a unique conjunction of a number of highly significant aspects: the burial grounds, the extensive preservation of rich Aboriginal heritage material, and the number of significant historic events and processes that have occurred here, from the Rufus River and other massacres to the building of the regulation works. Individually, these aspects are very important, but together they give the Lake outstanding cultural value to the Aboriginal people who have traditional and historic ties, as well as to other Australians. Because of this Lake Victoria is of national cultural significance.

This is not the case for the natural environment. The flora and fauna are characteristic of River Murray wetlands but are not distinctive or unique. Aspects of the geodiversity, such as the Holocene palaeosols, have high natural heritage value. The natural environment has cultural value as a component of the cultural landscape but this is not the determining factor for the cultural heritage significance.

1.7.2 Integrity

Despite the impact of lake regulation, the cultural heritage retains a remarkable degree of integrity. Although burial sites have been exposed and disturbed, the number of in situ burials remaining has made it possible to identify and protect burial grounds in their original location. The spatial integrity of Aboriginal and historic cultural heritage material is so strong that the original patterning of human activities is clear, and it is possible to distinguish this through the superficial disturbance caused by erosion. The integrity of cultural heritage material on the Lake Victoria shore is as good and in some respects better than that of comparable material outside the Lake bed (and throughout the Murray Basin) affected by other erosional forces.

The geodiversity values are high because most of the geological sediments also preserve a great degree of integrity despite the impacts.

In contrast, the vegetation has suffered badly over time and has lost virtually all its original integrity. Whilst vegetation is regenerating in response to the revised hydrology and grazing controls implemented under the CLPoM, the original vegetation communities have been destroyed and species displaced to higher foreshore elevations. Where native vegetation does occur, it consists of extremely modified and disturbed associations, retaining no original natural heritage value. However, the regeneration shows similar characteristics to original foreshore vegetation (albeit at higher elevations).

Hence it is valued by the Aboriginal and European communities, and contributes to maintaining the biodiversity of the region.

Lake Victoria timeline

At least 18,000 BP	Oldest dated human occupation on north-eastern dunes of Lake Victoria
8-9,000 BP	Aboriginal people living on southern lake shore
3,-7,000 BP	Aboriginal people living on eastern beach and Talgarry Island
1838	Joseph Hawdon, overlander, named Lake Victoria; Edward Eyre recorded its Aboriginal name as *Ta-ru* in 1844
1841	Rufus River massacre
1844	At least 230 people living in groups along Rufus River and Frenchmans Creek
1845	George Melrose, first squatter at Lake Victoria, with sheep
1847	Edward Bagot establishes *Moorna* Station
1866	Sydney-Adelaide telegraph line ran up the eastern side of the Lake
1869	James Reid had licence for Lake Victoria Hotel on northern side of the Lake
1860s	Barkindji people work seasonally at wool washing, shearing and 1880s as rabbiters, boundary riders
1884	*Noola,* Resumed Area of Lake Victoria Station acquired by William McL. Thompson
1888	Travelling Stock Route No.7802 notified –crossing *Noola* and then down the eastern side
1912	Present day *Noola* Station homestead built
1913	The establishment of the *Lake Victoria Agreement Act*
1914	*Nulla* Station woolshed built
1917	River Murray Commission established
1920s	Leases covering Lake Victoria resumed and land transferred to SA Government
1923-4	Inlet regulator built on Frenchmans Creek; works village established
1927	Inlet Regulator operational
1930s	Lock 9 regulated water near *Moorna*
1940	RAAF Operational Training Unit used Lake Victoria as training ground
Post 1945	Mildura Anthropological Society, Murray Black collecting Aboriginal artefacts and skeletal material
1969	NSW legislation protecting Aboriginal heritage
1969	Museum of Victoria studies in area for proposed Chowilla Dam impacts

1973	Edmund Gill's work on Lake Victoria burials published
1984	NSW Parliamentary Inquiry recommended a national park for Lake Victoria.
1990s	NSW NPWS initiated studies of nature and distribution of Aboriginal sites
1994	Excavations at Frenchmans Islands discover large burial sites
1996	MDBC established the Lake Victoria Advisory Committee chaired by Rick Farley
1997	Multidisciplinary field surveys undertaken for Lake Victoria Environmental Impact Study
1998	Consent to destroy, deface or damage an Aboriginal relic/place under Section 90 of the NSW *NPW Act 1974* and a permit to disturb relics under Section 87 of the Act granted
2001	SA Water employed Aboriginal man, Jeff Jackson, as first Cultural Heritage Manager at the Lake
2002	Lake Victoria Cultural Landscape Plan of Management and The Lake Victoria Operating Strategy published
2003	MDBC purchased Noola Station and portion of Lake Victoria Station and destocked
2005	MDBC purchased Nulla Nulla Station and destocked
2006	Permit and Consent reissued on 4 August 2006 for a further eight years
2007	Lake Victoria Cultural Landscape Plan of Management reviewed and republished
2008	Lake Victoria Scientific Review Panel established by MDBC to review lakeshore monitoring programs
2014	Application to vary Permit and Consent submitted to NSW OEH
2015	A variation of the Permit and Consent, now called Aboriginal Heritage Impact Permit (AHIP) issued
2015	Lake Victoria Cultural Heritage Monitoring Program major review
2017	Protocol for recording and conserving cultural heritage within the vicinity of Lake Victoria prepared and in action by May 2017
2018	Review of the Lake Victoria Cultural Landscape Plan of Management
2019	Lake Victoria Cultural Landscape Plan of Management republished (*this document*)

Part 2: Our management considerations

2.1 Management areas

The geographical area of Lake Victoria identified in the AHIP has been separated into distinct management areas to help manage the diverse cultural landscape (Figure 9). Each area is based on the associated heritage values and potential threatening processes on those values and is registered as a Potential Archeological Deposit (PAD) within the Aboriginal Heritage Information Management System (AHIMS) managed by NSW DPIE - BCD.

In total, there are 23 management areas that hold an AHIMS PAD registration at Lake Victoria. The management areas (and their associated AHIMS registration number) that reside within the area governed by the AHIP include:

- *Noola Beach* (AHIMS no. 39-4-0265)
- *Nulla Northern Beach* (AHIMS no. 39-4-0266)
- *Nulla Southern Beach* (AHIMS no. 39-4-0267)
- *Talgarry Wells* (AHIMS no. 39-4-0268)
- *Talgarry Beach* (AHIMS no. 39-4-0269)
- *Talgarry Barrier* (AHIMS no. 46-1-0385)
- *South-eastern Beach* (AHIMS no. 46-1-0384)
- *Southern Lakebed* (AHIMS no. 46-1-0382)
- *Snake Island (*AHIMS no. 46-1-0381)
- *East Moon Island* (AHIMS no. 46-1-0374)
- *Yellow Belly Island* (AHIMS no. 46-1-0386)
- *Moon Island* (AHIMS no. 46-1-0380)
- *Gecko Island* (AHIMS no. 46-1-0376)
- *Nanya Islands* (AHIMS no. 46-1-0379)
- *Lakebed Channel* (AHIMS no. 46-1-0378)
- *South-western Beach* (AHIMS no. 46-1-0389)
- *Western Beach* (AHIMS no. 46-1-0387)
- *Frenchmans Creek* (AHIMS no. 46-1-0377)
- *Rufus River* (AHIMS no. 46-1-0383)

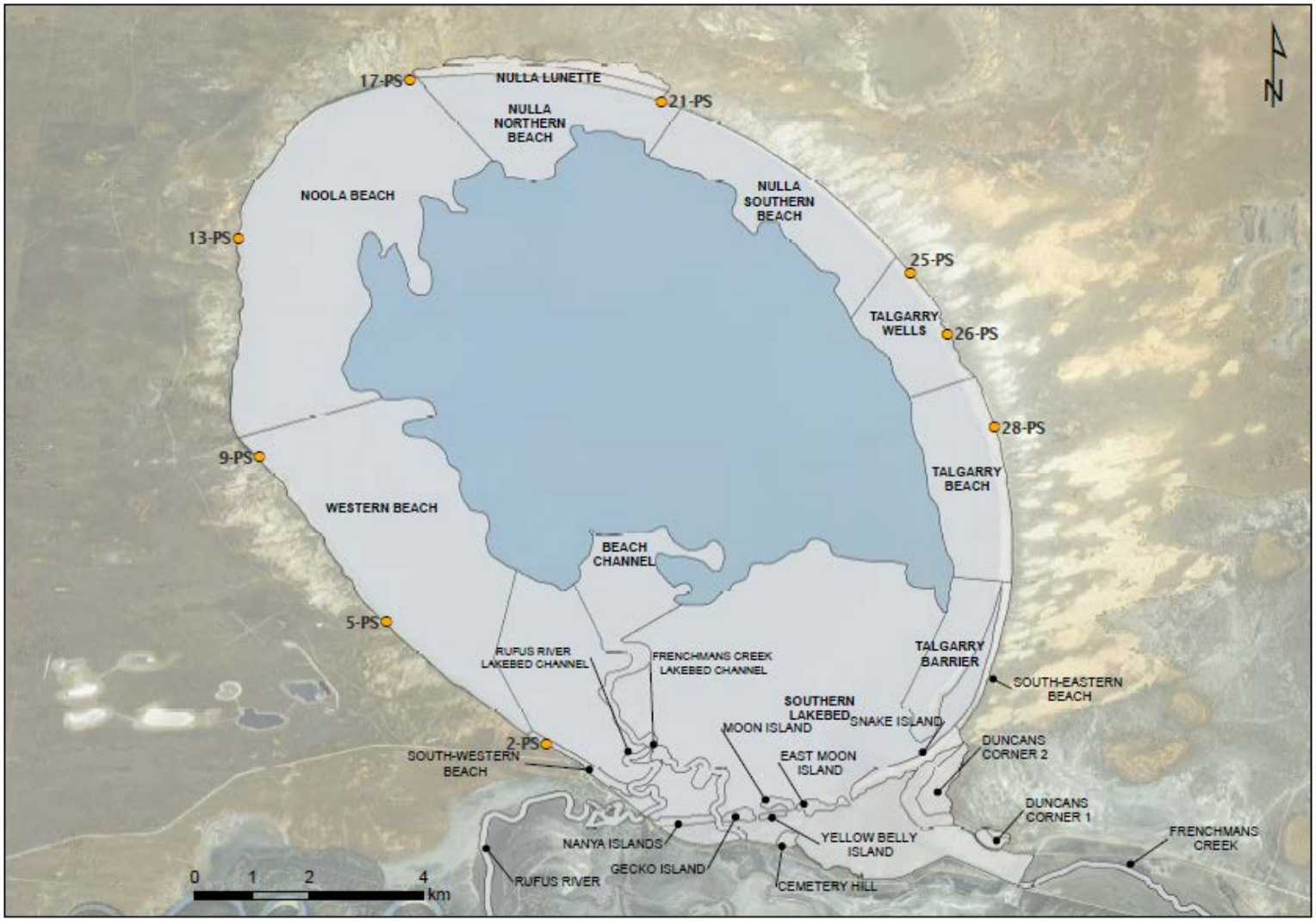

Figure 9 Management areas as registered as Potential Archaeological Deposits (PAD) in AHIMS database at Lake Victoria

It should be noted that, whilst Frenchman's Creek and Rufus River management areas are covered within the AHIP scope, they are not impacted by lake operations in the same manner as lakeshore management areas. The impact of channel regulation on bank stability is the main concern at these two sites.

Management areas that are outside of the area governed by the AHIP but still have a registered PAD entry include:

- *Nulla Lunette* (AHIMS no. 39-4-0264)
- *Duncan's Corner 1* (AHIMS no. 46-1-0388)
- *Duncan's Corner 2* (AHIMS no. 46-1-0375)
- *Cemetery Hill* (AHIMS no. 46-1-0373)
- Murray Black Cemetery

Management areas that are outside of the area governed by the AHIP and assist with management of the riparian zone at Lake Victoria including joint government owned properties include:

- Noola Station
- Nulla Nulla Station

Each management area that is governed by the AHIP (excluding Frenchman's Creek and Rufus River) is designated within a mapsheet for annual landscape monitoring purposes as follows in Table 1.

Table 1 Mapsheet name and corresponding management areas.

Mapsheet	Relevant management area	Relevant perimeter survey number
1 - Noola Beach North	Noola Beach	13-PS, 17-PS
2- Nulla Northern Beach	Nulla Northern Beach	21-PS
3- Nulla Southern Beach	Nulla Southern Beach	-
4 - Talgarry Wells	Talgarry Wells	25-PS, 26-PS
5 - Talgarry Beach	Talgarry Beach	28-PS
6 - Talgarry Barrier	Talgarry Barrier, South Eastern Beach, Southern Lakebed	-
7 - Snake Island	Snake Island, Southern Lakebed, East Moon Island	-
8 - Lake Bed Channel	Southern Lakebed, Moon Island, Yellow Belly Island, Gecko Island, Frenchmans Creek Lakebed Channel, Rufus River Lakebed Channel, Nanya Islands, South-western Beach	2-PS
10 - Western Beach South	Southern Lakebed, Western Beach	5-PS
11 - Western Beach North	Western Beach	9-PS
12 - Noola Beach South	Noola Beach	-

2.3 Guiding principles

The purpose of conservation management of the Cultural Landscape is to protect cultural heritage as outlined in the 2015 AHIP and the objectives above in Section 1.2. The current condition of the cultural landscape at Lake Victoria must to be considered in the context of its impact history. The landscape is a sum total of all the components of the landscape including all human induced changes to the landscape.

However some of these cultural changes to the landscape have been detrimental to heritage values. In particular, the regulation of the Lake has had a damaging effect on the Aboriginal physical cultural heritage such as the burials. In some cases, the original heritage value of some aspects of the landscape, notably the vegetation has been totally lost in some areas because of the degree of disturbance.

In managing Lake Victoria with a view to protect cultural heritage, it is important to follow the guiding principles of management at Lake Victoria as follows:

- All access, land management activities and works at Lake Victoria should be undertaken with the view to be low impact and cause minimal harm to efforts undertaken to conserve cultural and natural heritage values described in Section 1.5 'The significance of Lake Victoria'.
- Aboriginal people would like better environmental management of the lakeshore, so that the shore is vegetated at lower water levels to encourage native wildlife and expansion of cultural plants. This desire for improved environmental amenity is a social value shared by Aboriginal and non-Aboriginal people.
- The policy direction of the CLPoM to reduce the physical impact of natural processes on cultural heritage by stabilizing the lakeshore through encouraging vegetation will also lead to broader improved environmental and land management.

Any requirement under the 2015 AHIP to provide written notice to the DPIE - BCD will be undertaken by;

- faxing the notice to the DPIE - BCD office's fax number; or
- sending by registered post to the DPIE - BCD address.
- sending in electronic form (such as email).

The AHIP does not excuse the MDBA from any obligation to obtain any authorisation required under any other Act. It is also noted that the MDBA is aware of state and commonwealth legislation, such as the *Biodiversity Conservation Act 2016* (NSW) and the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth), and that in operating the Lake the MDBA must not damage any critical habitat, harm or pick any threatened species, population, ecological community or protected fauna, or damage their habitats.

The MDBA will indemnify and keep indemnified, the Crown in right of NSW, the Minister administering the Act, the Secretary of DPIE-BCD, and their employees, agents and contractors, in the absence of any willful misconduct or negligence on their part, from and against all actions, demands, claims, proceedings, losses, damages, costs (including legal costs), charges or expenses suffered or incurred by them resulting from

- any damage or destruction to any real or personal property; and
- injury suffered or sustained (including death) by any persons arising out of or in connection with any actions undertaken pursuant to this AHIP

The MDBA will release to the full extent permitted by law, the Crown in right of NSW, the Minister administering the Act, the Secretary of DPIE - BCD, and their employees, agents and contractors, in the absence of any willful misconduct or negligence on their part, from all suits, actions, demands and claims of every kind resulting from:

- any damage or destruction to any real or personal property; and
- injury suffered or sustained (including death) by any persons arising from or in connection with any actions undertaken pursuant to this AHIP.

It is noted that the terms and conditions of the 2015 AHIP may be varied at any time at the discretion of the DPIE - BCD Secretary.

The AHIP may also be revoked at any time at the discretion of the DPIE - BCD Secretary, with AHIP condition 64 outlining what is required should this occur.

2.4 Characteristics of the management areas

Each management area is characterised by unique interactions between lake operations, existing landscape and cultural heritage features, and key threatening processes. These features and processes work in synergy to indicate the likelihood of impact to cultural heritage in the lake environment and as such, where management effort should be focused.

Table 2 outlines these features and processes including cultural heritage, existing vegetation, existing geomorphology and key threatening processes for each of the management areas indicated. A holistic understanding of how the unique characteristics interact in each management area is important to cater for site-specific management and also to improve physical methods for cultural heritage.

In a broader context, Lake Victoria is situated in a semi-arid environment, where erosion is the dominant process under the current climatic regime. A lakeshore is a dynamic and evolving geomorphological environment influenced by a wide range of interacting factors, only some of which are amenable to human control.

The processes of erosion at Lake Victoria are complex. Changing some or all of these factors will have an effect of potential establishment of vegetation, which will then enter the equation as another factor in causing or minimizing erosion. For example, total grazing pressure on vegetation and direct trampling loosens the ground surface and makes it more vulnerable to the impact from waves, wind rain and runoff. Some threatening process (vehicle tracks, construction, gully runoff) have a heavy localized impact, others (wind, waves) have a broad scale impact.

Historic evidence shows that the lakeshore was an unstable environment, both before Europeans arrived and before the Lake was regulated. Even if all potentially controllable processes were managed, erosion would continue in the lake environment. Further, like any natural system, there will be a lag in environmental response to any management consideration.

Table 2 Existing cultural heritage, vegetation and geomorphology characteristics for each mapsheet with associated threatening processes (adapted from Jeanette Hope's 'Finding the Balance').

Mapsheet	Cultural heritage	Existing vegetation	Existing geomorphological characteristics	Threatening processes for vegetation establishment and cultural heritage
1- Noola Beach North **12- Noola Beach South**	**Aboriginal:** Burial sites in cliff, some ovens, shell middens & stone artefacts present. **Historic:** Old fence lines, campsites, logged trees.	• Dense stands of dead trees in elevations below 24m AHD. • Poorly vegetated upper beach, only some scattered spiny mudgrass and spiny sedge, on northern part of Noola Beach North. • Well vegetated upper beach on Noola South. • Regenerating river red gum fringe at higher elevations up to FSL on Noola Beach South and North between 25-25.5m AHD.	Moderate energy, silty sand beach. Some reworking.	Moderate reworking of lakeshore sediments.
2- Nulla Northern Beach	**Aboriginal:** Numerous ex-situ skeletal fragments and small stone artefacts (loose wash), old soils	• Scattered dead trees on lower beach between 22-24m AHD. • Foreshore between 22-27m	Sandy reflective beach.	Reworking of sandy beach

Mapsheet	Cultural heritage	Existing vegetation	Existing geomorphological characteristics	Threatening processes for vegetation establishment and cultural heritage
	exposed in gullies. **Historic:** Historic clay tobacco pipe found in 2017.	generally devoid of vegetation AHD. • Small patches of pine above 28m AHD. • Some areas of acacia and sandhill canegrass on Nulla lunette.		
3- Nulla Southern Beach	**Aboriginal:** Numerous in-situ Burial sites on beach and loose skeletal fragments, high numbers of stone artefacts. **Historic:** Telegraph posts, old stockyard on Nulla property.	• Foreshore between 22-27m AHD generally devoid of vegetation. • Few scattered dead trees between 23-24m AHD. • Dense areas of sandhill canegrass on lunette.	Relatively high energy location but reasonably stable substrate.	Wave and currents will continue to erode historically undisturbed sediment (HUS) and overlying substrate.
4- Talgarry Wells	**Aboriginal:** Skeletal fragments, burial sites, numerous stone artefacts. **Historic:** Telegraph posts, old wells above FSL.	• Well vegetated beach between 25-27m AHD with mainly spiny sedge. • Wetland complex surrounded by river red gums and reeds. • Small areas of sandhill	Moderate to high energy, transitional zone.	Deflation on sand by wind and erosion of HUS by waves.

Mapsheet	Cultural heritage	Existing vegetation	Existing geomorphological characteristics	Threatening processes for vegetation establishment and cultural heritage
		canegrass above 28m AHD in lunette.		
5- Talgarry Beach	**Aboriginal:** Numerous stone artefacts, some burials and middens. **Historic:** Historic pastoral sites, telegraph posts.	• Well vegetated beach between 25-27m AHD with mainly spiny sedge. • Lower elevations in southern part of this area vegetated with spiny sedge from 24m AHD. • Small areas of sandhill canegrass and stands of river red gum above 28m AHD in lunette.	Moderate to high energy. Thin veneer of loose sand over HUS benches.	Deflation of sand by wind. Ongoing incremental erosion of HUS.
6- Talgarry Barrier	**Aboriginal:** Intact old soils (500-5000 years) contain many in-situ burials, shell middens, stone artefacts. 60+ burial sites protected. **Historic:** None	• Back barrier is mainly well vegetated between 24-25m AHD with spiny sedge and 26-28m AHD with various tree species. • Main barrier is well vegetated in most elevations.	Moderate to high energy, sand and HUS.	Small but incremental erosion occurring.

Mapsheet	Cultural heritage	Existing vegetation	Existing geomorphological characteristics	Threatening processes for vegetation establishment and cultural heritage
7- Snake Island	**Aboriginal:** Burial sites, shell middens on island, beach and cliff to north. **Historic:** House site 'Tara', associated exotic trees	• Main beach in front of island is well vegetated between 25-28m AHD • Island is well vegetated. • Floodplain between Snake Island and Frenchman's Creek inlet channel is well vegetated with river red gum and other tree species.	Foreshore composed of sandy beach overlying silty sand lake bed sediments. Island is remnants of southern lunette.	
N/A - Frenchman's Creek	**Aboriginal:** Several burials, middens, ovens, culturally modified trees and stone artefacts **Historic:** Remains of sawmill on banks.	• Channel is lined with few river red gums and degraded floodplain specie such as lignum and black box.	Significant disturbance during realignment works. Relatively stable river banks. Some erosion on outside bends.	Channel erosion by fluvial scour
N/A - Rufus River	**Aboriginal:** Burial sites, culturally modified trees, stone artefacts. **Historic:**	• Channel is lined with few river red gums and degraded floodplain species such as lignum	Significant disturbance during realignment works. Relatively stable river banks. Some	Channel erosion by fluvial scour

Mapsheet	Cultural heritage	Existing vegetation	Existing geomorphological characteristics	Threatening processes for vegetation establishment and cultural heritage
	Aboriginal massacre site, old pumpsite, old construction village and kiosk until 1960s	and black box.	erosion on outside bends.	
9- Lakebed Channel (Southern Lakebed and Islands)	**Aboriginal:** Major burial grounds on Nanya and Gecko, numerous shell middens, ovens, culturally modified trees and stone artefacts. **Historic:** Nanya bridge, historic material	• The clay flats above 24.5m AHD mainly colonized by spiny sedge, couch grass, spiny mud grass, native liquorice and common reed around islands. • River red gum and river cooba above 28m AHD on outer lake fringe and on islands. •	Low energy, fairly resilient fine sand, silt and clay. Sandy islands are remnants of southern lunette of Holocene period.	Erosion of the old Rufus and Frenchman's channels by fluvial scour Erosion by waves of islands.
10 - Western Beach South **11- Western Beach North**	**Aboriginal:** Burial sites, some shell middens, ovens and stone artefacts present. **Historic:** Sand catchers constructed to build up beach in front of Lake Victoria depot, campsites.	• Impressive regeneration of river red gum and spiny sedge growth between 25 and 27m AHD in southern extent. • Good regeneration of spiny sedge	Sand overlying foreshore. Relatively low energy protects against erosion	Low levels of erosion below deposited sandy upper beach

Mapsheet	Cultural heritage	Existing vegetation	Existing geomorphological characteristics	Threatening processes for vegetation establishment and cultural heritage
		between 25 and 26m AHD and river red gums in higher elevations in northern extent		

2.4.1 Lake Victoria landscapes

Figure 10 Rufus River outlet regulator and Southern lakebed on left of photo (2016) and location of photo (inset). Photo credit: Daniel Haines (SAW).

Figure 11 The old Frenchmans Creek channel inset into the Southern Lakebed area (2016) and location of photo (inset). Photo credit: Daniel Haines (SAW).

Figure 12 Southern Lakebed looking towards Snake Island near Rufus River outlet regulator (2016) and location of photo (inset). Photo credit: Daniel Haines (SAW).

Figure 13 Floodplain forest along the constructed Frenchmans Inlet Channel in flood (2016) and location of photo (inset). Photo credit: Daniel Haines (SAW).

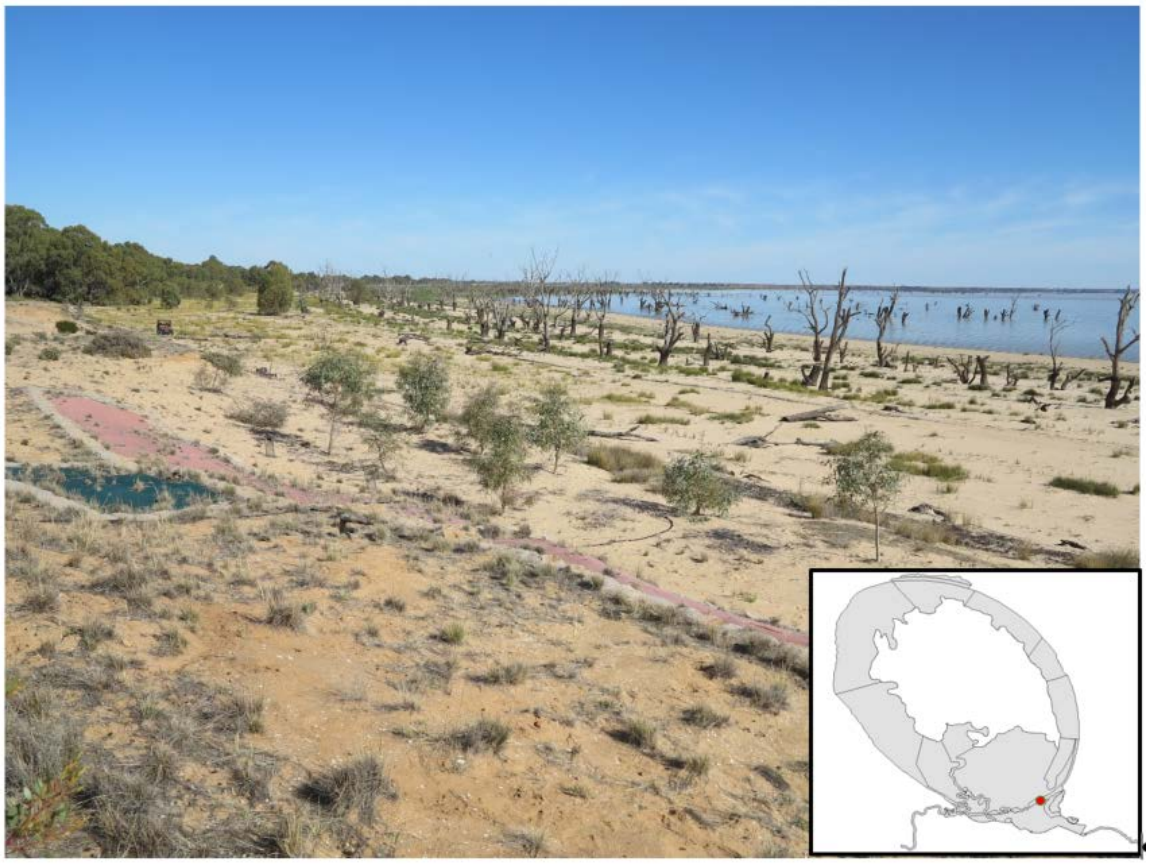

Figure 14 Snake Island foreshore with burial protection works in upper elevations and sand erosion control measures in lower elevations(2014) and location of photo (inset). Photo credit: Daniel Haines (SAW).

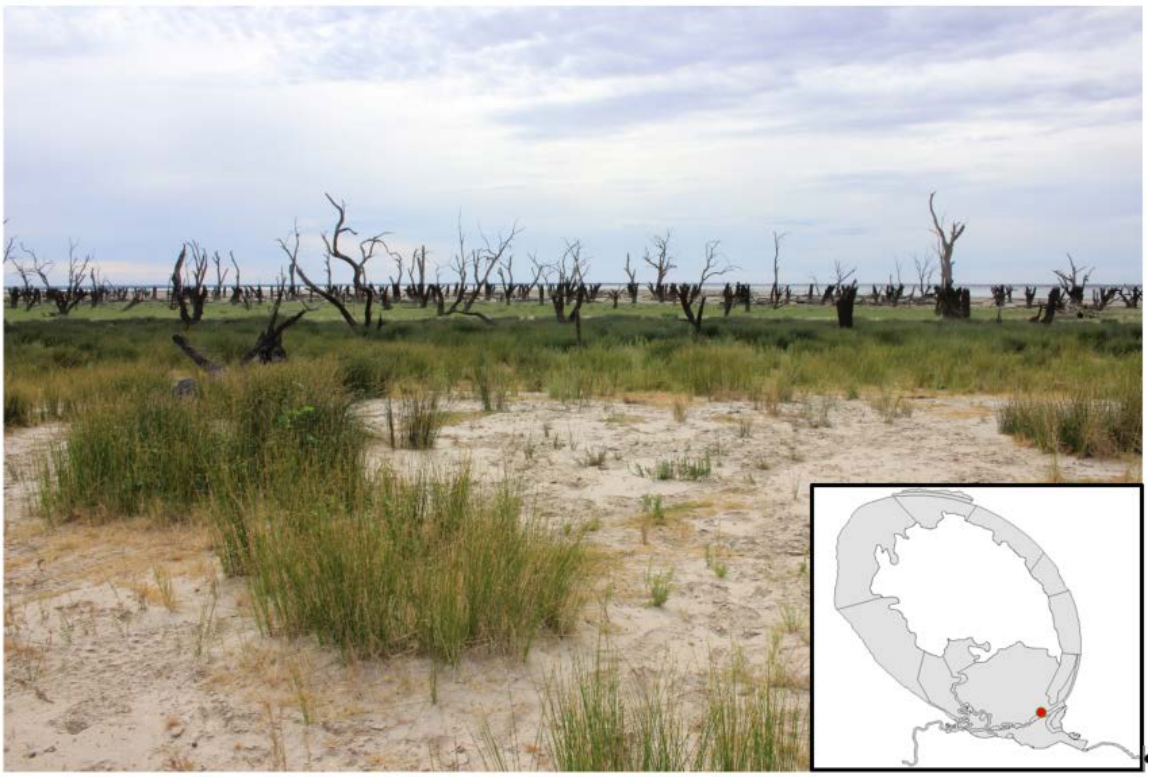

Figure 15 Stands of spiny sedge (Cyperus gymnocaulos) at Snake Island foreshore at SNK1 transect (2016) and location of photo (inset). Photo credit: Daniel Haines (SAW).

Figure 16 Noola Beach from Noola Bluff lookout looking towards the south (2016) and location of photo (inset).

Figure 17 Noola Beach from Noola Bluff lookout looking towards the north (2016) and location of photo (inset).

Figure 18 Flood debris on shoreline on Nulla Northern Beach (2011) and location of photo (inset). Photo credit: Daniel Haines (SAW).

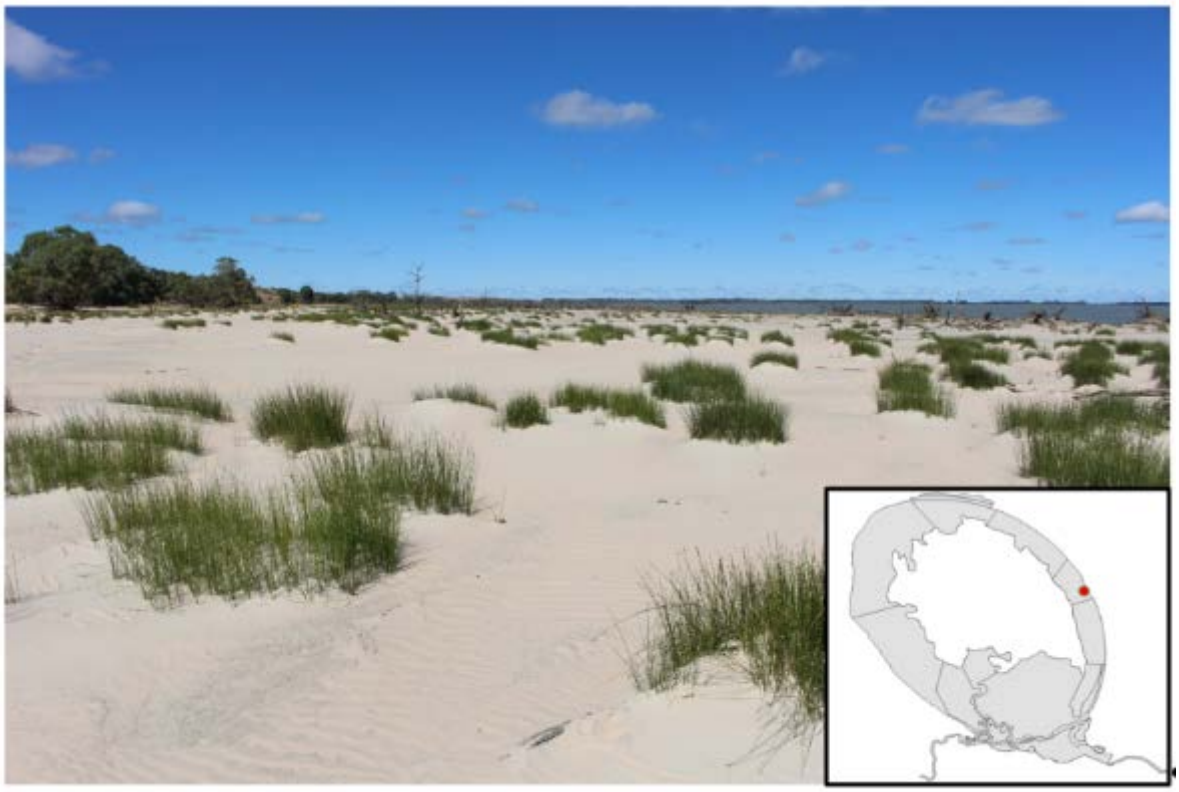

Figure 19 Stands of spiny sedge (*Cyperus gymnocaulos*) capturing sand near Talgarry Wells (2016) and location of photo (inset). Photo credit: Daniel Haines (SAW).

Figure 20 Nulla Southern Beach management area looking towards Nulla Lunette (north) (2016) and location of photo (inset). Photo credit: Daniel Haines (SAW).

Figure 21 Nulla Southern Beach management area looking towards Southern Lakebed (2016) and location of photo (inset). Photo credit: Daniel Haines (SAW).

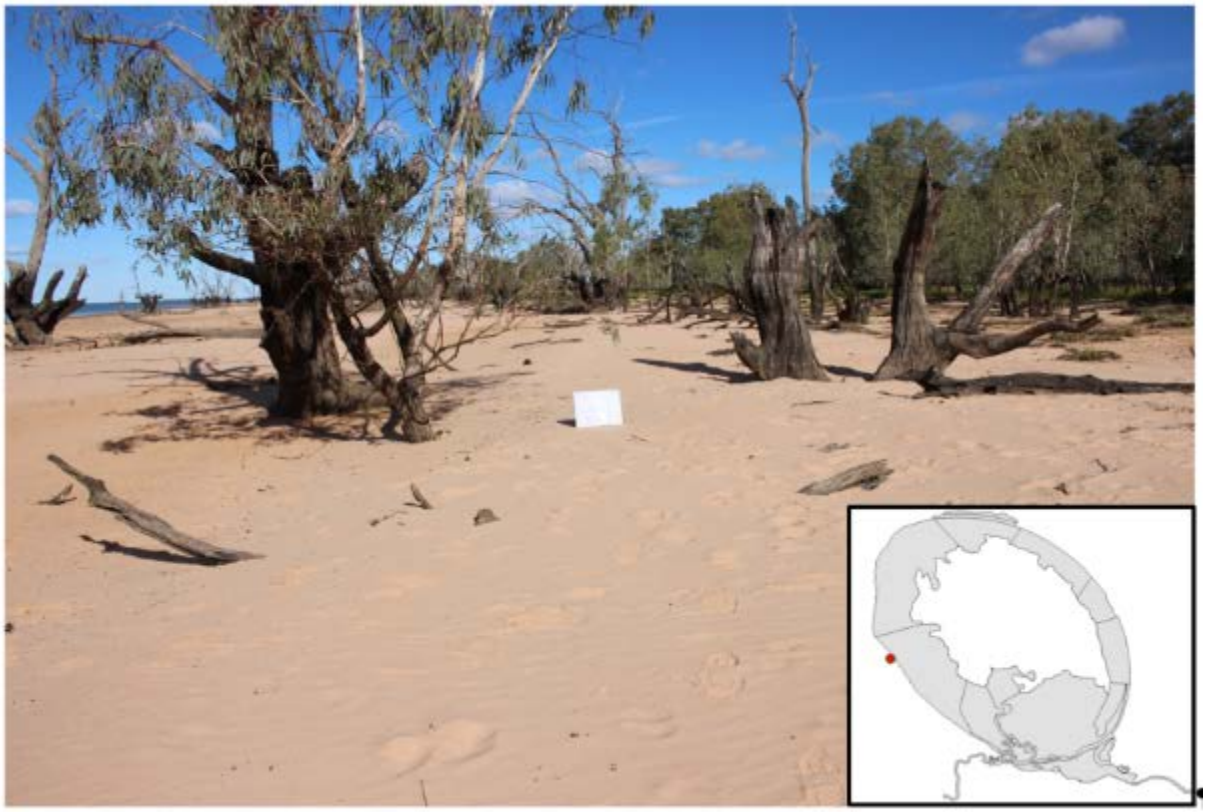

Figure 22 Western foreshore at KVB10 photo monitoring transect (2016) and location of photo (inset). Photo credit: Daniel Haines (SAW).

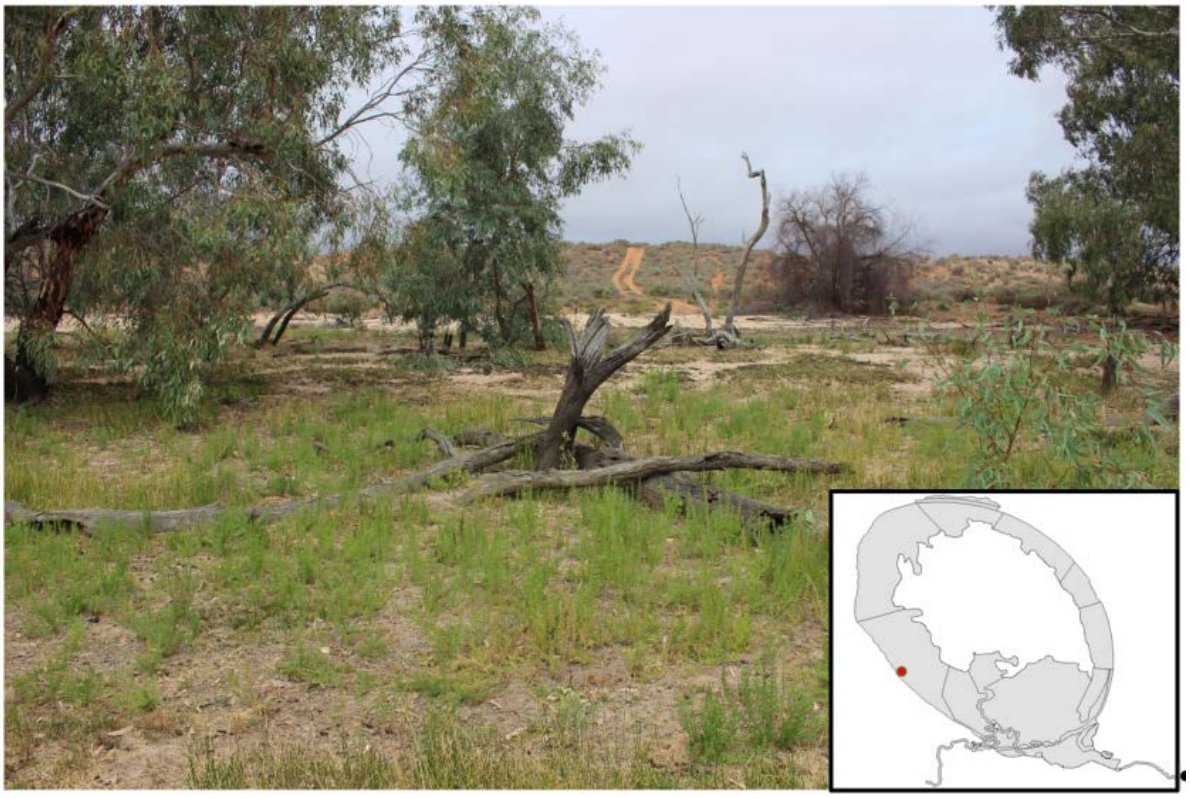

Figure 23 Start of KVW1 survey transect on South-western part of the beach looking towards upper elevations (2016) and location of photo (inset). Photo credit: Daniel Haines (SAW).

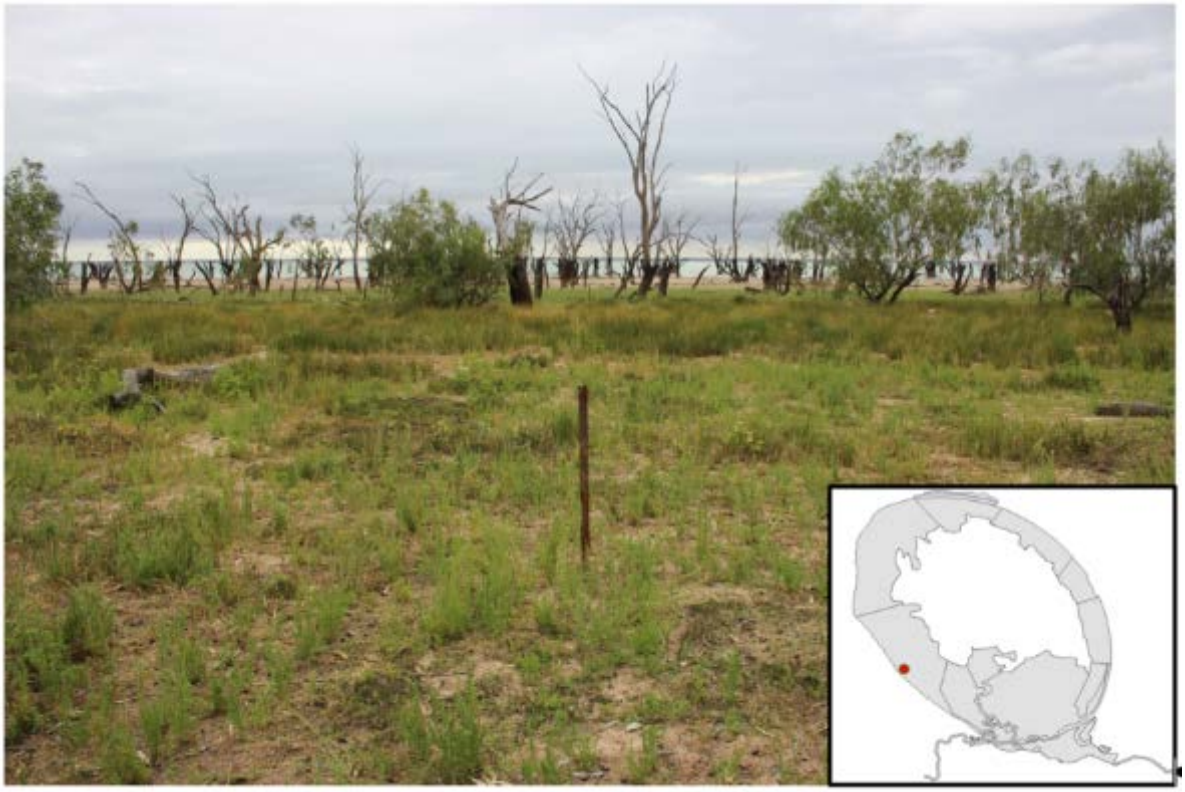

Figure 24 End of KVW1 survey transect on South-western part of the beach looking towards lake (2016) and location of photo (inset). Photo credit: Daniel Haines (SAW).

2.4.2 Changes in the landscape over time

Figure 25 Photo monitoring captures spectacular natural regeneration of native vegetation, in particular spiny sedge (*Cyperus gymnocaulos*) on the lake foreshore over time (top to bottom: 2001, 2006 and 2013 vegetation at Lake Victoria West monitoring site at 25.4m metres). Location of photo monitoring point (right). Photo credits: Ian Sluiter (top, middle), Daniel Haines (bottom).

Figure 26 Photo monitoring at KFM02 captures change in vegetation near Frenchmans Creek channel on the Southern Lakebed (top to bottom: 1998, 2006, 2013). Location of photo monitoring point (right). Photo credits: Ian Sluiter (top, middle, bottom).

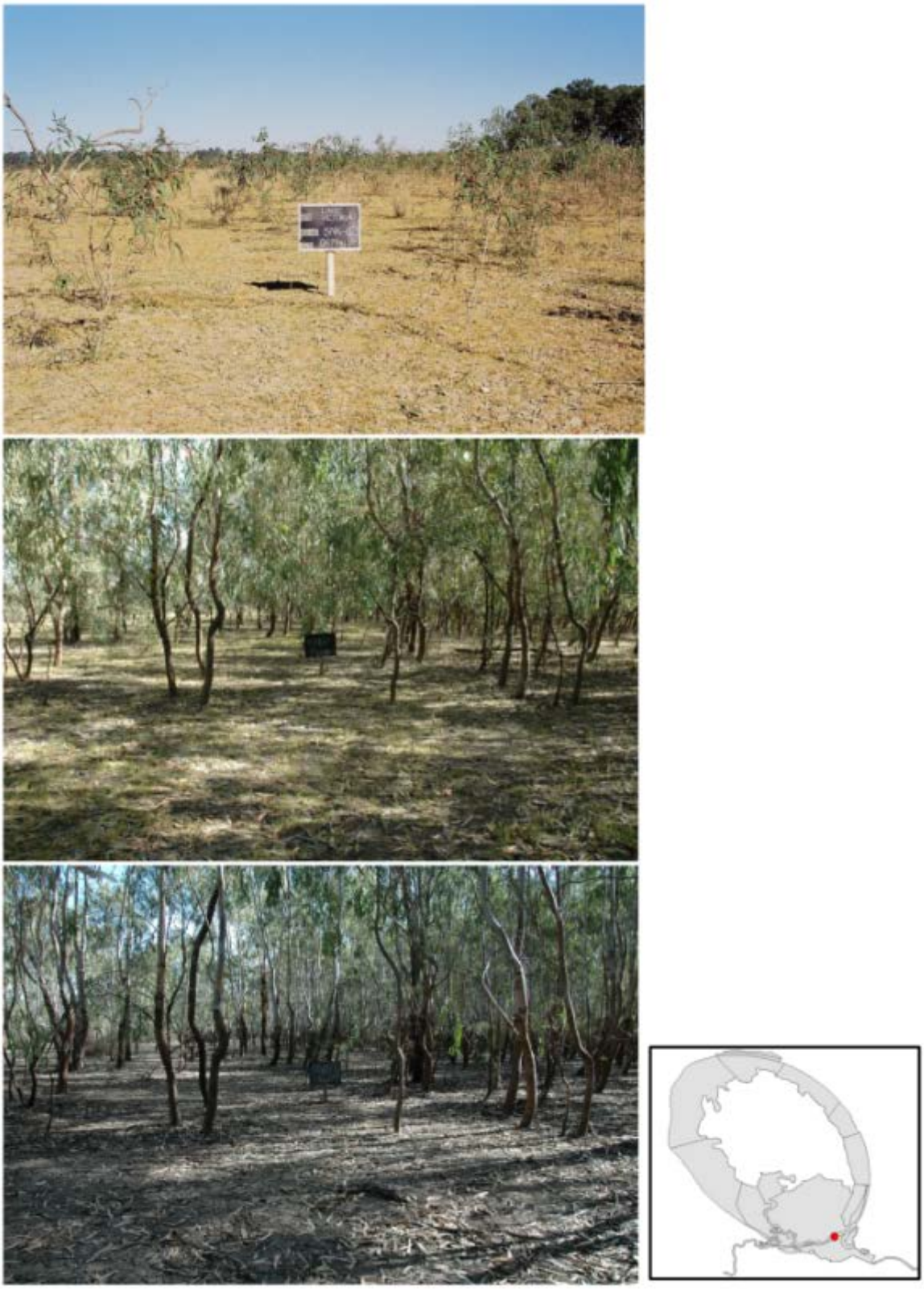

Figure 27 Photo monitoring showing growth of river red gums (*Eucalyptus camaldulensis)* at photo montioring point SNK02 along transect on Snake Island (top to bottom: 1999, 2006, 2013). Location of photo monitoring point (right). Photo credits: Ian Sluiter (top, middle, bottom).

Figure 28 Photo monitoring at KNU05 on Nulla Northern Beach showing lack of regeneration on this beach over the years (top to bottom: 2003, 2009, 2016). Location of photo monitoring point (right). Photo credits: Ian Sluiter (top, middle), Daniel Haines (bottom).

Part 3: Our committees

The effective management of cultural and natural heritage values of Lake Victoria depends on the ongoing and cooperative efforts from a number of agencies and committees including the Barkindji-Maraura Elders Council, SA Water, NSW DPIE Water, MDBA and NSW DPIE - BCD. Additionally, scientific experts and the independent chair of LVAC play a vital role in providing sound cultural heritage and scientific advice for management of cultural and natural heritage values and strategic direction of the Lake Victoria Program.

There are three main committees that provide advice in implementing strategies of the CLPoM and assist with decisions regarding the protection of the cultural and natural heritage values of Lake Victoria as required by the AHIP 2015 including:

- Barkindji-Maraura Elders Council;
- Lake Victoria Advisory Committee; and
- Lake Victoria Scientific Review Panel

3.1 Barkindji-Maraura Elders Council

The Barkindji-Maraura Elders Council (BMEC) is a group in its own right, whose members are Aboriginal people with an interest in, and historic ties to Lake Victoria. The BMEC forms the basis of the Barkindji and Maraura representation on the LVAC. The MDBA provides resources to the BMEC for up to 5 meetings a year when considering issues relating to Lake Victoria (see Section 5.7 and 5.8 for more information).

The main objectives of BMEC involvement in the management of Lake Victoria are:

- to advise the MDBA, on the appropriate management of Aboriginal cultural heritage in the Lake Victoria area, based on consultation with the broader Barkindji-Maraura community.
- to provide a link to the broader Barkindji-Maraura community in order to distribute information about matters of Lake Victoria Aboriginal cultural heritage.

As per Condition 22, MDBA is committed to resourcing and facilitating BMEC meetings to ensure that:

- Aboriginal people are consulted and involved in works with the potential to harm cultural heritage and management of cultural heritage at Lake Victoria;
- key cultural, social and economic aspirations and traditions of the Barkindji and Maraura people are considered;
- an appropriate number of BMEC meetings are convened each year to ensure issues from the BMEC meetings are tabled and discussed at LVAC meetings;
- the BMEC can participate in activities associated with the requirements of the AHIP.

BMEC meetings are facilitated by NSW DPIE Water on behalf of MDBA.

3.2 Lake Victoria Advisory Committee

The role of the Lake Victoria Advisory Committee (LVAC) is to allow stakeholders to provide advice and ongoing input into decisions regarding the management of Lake Victoria in accordance with the AHIP.

The LVAC provides a forum for consultation, review and guidance on matters concerning the operation of Lake Victoria in relation to the management of the cultural landscape. The LVAC allows for representation from the Aboriginal community, landholders, water users, and government agencies, with Barkindji and Maraura Elders forming a majority of the committee.

Communication with the LVAC requires a broad exchange of information and concepts to achieve a shared understanding of issues. This involves communication of a diverse range of information, dealing with cultural matters, scientific research and monitoring and reporting on physical works. Emphasis is placed on effective communication within the group, recognising the complexity of some of the information and the differing backgrounds of each member.

The LVAC is resourced by the MDBA. As per the AHIP, the MDBA is responsible for maintaining and where appropriate, reviewing the terms of reference and membership with the LVAC. Any recommendation by the LVAC to appoint additional members to the committee as either full members or as observers will be considered by the MDBA.

Membership of the LVAC is outlined by Condition 14 of the Lake Victoria AHIP and is summarised below (Table 3).

The MDBA is supportive of transparent approach to management of Lake Victoria, and regularly welcomes guests to observe the committee meetings.

Table 3 Membership of the Lake Victoria Advisory Committee and required number of representatives for each organisation

Organisation	Number of representatives
Independent Chair	1
Independent Deputy Chair	1
Barkindji-Maraura Elders Council (BMEC)	14
Dareton Local Aboriginal Land Council	1
NSW Aboriginal Land Council	1
Landholders	2
Western Local Lands Services (WLLS)	1
SA Water Corporation (SAW)	1
NSW Department of Planning, Industry and Environment – Water (NSW DPIE -Water)	1

Organisation	Number of representatives
Murray-Darling Basin Authority (MDBA)	1
NSW Department of Planning, Industry and Environment – Biodiversity and Conservation Division (NSW DPIE - BCD)	1

The Lake Victoria Advisory Committee Terms of Reference are updated from time to time and available from the MDBA.

3.3 Lake Victoria Scientific Review Panel

The Scientific Review Panel (SRP) is established under the auspices of LVAC and resourced by the MDBA to undertake peer review of research and monitoring programs regarding Lake Victoria. The SRP provides technical advice to the LVAC regarding the following, in the context of conserving the cultural landscape of the area:

- requests to undertake research at Lake Victoria;
- identification of relevant research needs;
- reviewing as requested, relevant monitoring and research;
    (i) rationales,
    (ii) objectives,
    (iii) methods,
    (iv) interpretation,
    (v) recommendations; and
    (vi) conclusions.

The SRP is chaired by an MDBA representative and meets on an as required basis. The MDBA appoints members with collective expertise and experience in the following, considering advice from the LVAC and the SRP:

- cultural heritage significance, management and protection particularly Aboriginal heritage;
- wetland ecology (predominantly vegetation);
- geomorphology;
- hydrogeology; and
- natural resource management.

The SRP meets twice a year, generally in Canberra, and will seek to hold a meeting at Lake Victoria every second year to ensure connection to the site and on ground activities.

The review panel may also seek other expertise as required. The Lake Victoria Scientific Review Panel Terms of Reference are updated from time to time and available from the MDBA.

Part 4: Our management strategies

The management strategies which are used to conserve the values of Lake Victoria identified in the Statement of Significance, in accordance with the Lake Victoria AHIP and the primary objective of the CLPoM are explained in this section.

The CLPoM needs to be consistent with relevant state and Commonwealth legislation, policies and practices. Agency partners implementing the CLPoM need to ensure that their actions, policies and procedures are consistent and compliant with those. Where state and Commonwealth policies and practices suggest a management technique that may be considered harsh in the environment of Lake Victoria, a culturally sensitive alternative should be considered and adopted to align with guiding principles of low impact and minimal harm.

The Lake Victoria Operating Strategy is a companion document to the Lake Victoria Cultural Landscape Plan of Management. The LVOS describes how the water storage functions of Lake Victoria will be managed in meeting the requirements of the AHIP.

In summary, the LVOS aims to enhance opportunities for drying the lake bed and limit the time that the water levels in the lake are high, whilst meeting existing water supply and environmental flow obligations. The LVOS is based on the premise that native vegetation will stabilize the lake foreshore and aims to simulate a natural hydrological regime at a high elevation than occurred under natural conditions.

The LVOS contains a set of general operating rules that will apply most of the time. In developing these rules, consideration was given the impact on security of existing water entitlements in New South Wales, Victoria and South Australia. Consideration was also given to water quality (particularly salinity) impacts in the River Murray system. In addition, the LVOS describes circumstances such as emergency operations, or operations for environmental benefit in the Lower Murray River downstream of Lake Victoria, where operations may need to be altered from the general operating rules.

As per the Lake Victoria AHIP, the Lake Victoria Cultural Landscape Plan of Management must include a series of strategies pertaining to the following:

- Operating Lake Victoria (Section 4.1)
- Access to Lake Victoria (Section 4.2)
- Conserving cultural heritage (Section 4.3)
- Monitoring cultural heritage (Section 4.4)
- Conserving lakeshore vegetation and stability (Section 4.5)
- Monitoring lakeshore vegetation and stability (Section 4.6)
- Managing impact of non-native fauna (Section 4.7)
- Monitoring water quality (Section 4.8)
- Communicating with the broader community (Section 4.9)
- Conducting research (Section 4.10)

It is noted that the regulator may at any time examine work done to protect cultural heritage or any cultural heritage objects recovered under the current AHIP.

4.1 Operating Lake Victoria

Background

In the 1920s, Lake Victoria was modified and regulated to become a vital water storage on the River Murray System that it is today. Under historic operations, lake levels were held abnormally high for extended periods resulting in degradation of riparian vegetation cover, erosion of shoreline sediment and ultimately impact on cultural heritage material. In response, MDBC (now MDBA) designed the Lake Victoria Operating Strategy to balance competing needs in operating Lake Victoria and plays an important role in conserving the cultural landscape. The Lake Victoria Operating Strategy (LVOS) is a companion document to the CLPoM that was developed in 2002.

Noting the historic impact on cultural heritage material and the ongoing operation and management of the Lake, the MDBA has in place an Aboriginal Heritage Impact Permit No. 2471, most recently varied in 2015. This permit acknowledges that there may be impacts to heritage associated with the operation of Lake, and through permit conditions provides measures to avoid, minimise and offset impacts.

The LVOS describes how the water storage function of Lake Victoria shall be managed in order to achieve the objectives of the s90 Consent (now the 2015 AHIP).

Table 4 Strategies relating to Lake operations

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
41	1. Operate Lake Victoria according to Lake Victoria Operating Strategy (LVOS): MDBC technical report no. 2002/01 or approved revisions thereof. 2. Maintain implementation of the LVOS for the life of the Aboriginal Heritage Impact Permit (AHIP) and any variations thereof.	Lake Victoria Operating Strategy: MDBC Technical report no. 2002/01
42	3. Provide regular updates of compliance to the LVOS to the LVAC and summarise annual operations in the Lake Victoria Annual Report.	
43	4. Review and update the LVOS at any time by agreement between MDBA and NSW DPIE - BCD with advice from LVAC. Any revision to the LVOS must be approved by the Secretary of NSW DPIE - BCD prior to implementation.	
44	5. Notify the LVAC, the Chairperson of the BMEC and the Secretary of DPIE - BCD as soon as reasonably practical if the MDBA plans to deviate from the LVOS and is only permissible if:	

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
	• it is consistent with the CLPoM and this AHIP, or • if it is required in an emergency situation or for significant maintenance or upgrading of the Lake Victoria regulating structures or embankments; or • under extreme environmental conditions outside of the range forecast in the LVOS, such as a very large flood event, or an extended drought; or • if required to achieve downstream environmental outcomes, provided that the proposed operation is not detrimental to lakeshore vegetation or the cultural heritage.	

4.2 Access to Lake Victoria

Background

Lake Victoria is a cultural landscape that is rich in cultural heritage of the Barkindji and Maraura people as well as European cultural heritage. All access to the waters and foreshore of Lake Victoria is controlled to safeguard these cultural heritage values at Lake Victoria from disturbance as far as is possible under the 2015 AHIP, to ensure that appropriate workplace health and safety standards are met in this remote environment and to limit disturbance to private landholders.

Table 5 Strategies for Lake access

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
32	1. Ensure all visitors follow the 'Access to Lake Victoria' protocol which outlines a series of steps to be followed for any visitor to Lake Victoria including Barkindji and Maraura Elders on the LVAC, Aboriginal people, local landowners, education groups, research groups and all government agencies.	Section 5.1 - Access to Lake Victoria
	2. Ensure all visitors and workers to Lake Victoria follow the 'Code of Conduct' protocol.	Section 5.2 - Code of Conduct

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
	3. Limit recreational use of the Lake and restrict vehicle access by visitors and workers to formed tracks and established roads to minimise soil disturbance on the lakeshore.	-
	4. Consult with other government agencies with jurisdiction over activities at the Lake such as NSW Roads and Maritime Services and NSW Fisheries to determine how to limit activities which may be detrimental to cultural heritage.	-
4	5. Use appropriate induction materials for all visitors and workers for SA Water and NSW DPIE Water managed lands at Lake Victoria before commencing a visit or work.	Lake Victoria AHIP Induction NSW DPIE Induction Pack SA Water Induction Pack

4.3 Conserving cultural heritage

Background

Protecting and conserving cultural heritage is paramount to the management of Lake Victoria in particular human burials. Cultural heritage consists of the changes people have made to the physical and natural environment, the material remains they have left behind, as well as human perception of the landscape, held in history, stories, and memories.

It is primarily the burial grounds that give the lake its spiritual and sacred connotations. The burial grounds are of extremely high spiritual and social value because they contain the remains of Aboriginal people. Knowledge about the existence of burial grounds was handed down within the Aboriginal community even through the social disruptions of European occupation. Barkindji-Maraura mortuary beliefs are complex, and involve the concept of the dangerous nature of burial places. The large number of people buried at the lake reinforces the feeling that the remains should not be disturbed and is a highly visible reminder to generations of Aboriginal people of European contact and dispossession.

Table 6 Strategies for cultural heritage protection

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
33	1. Maintain positions for Aboriginal people to undertake cultural heritage protection and monitoring work at Lake Victoria within the AHIP area where possible.	Section 5.7 – Engagement of BMEC for cultural heritage monitoring and management advice Section 5.8 - Sitting fees for LVAC members and cultural heritage monitors
34	2. Recognise that the protection of Aboriginal human remains and burial sites are the highest priority of all cultural heritage management actions at Lake Victoria as outlined in Condition 8 and Part E (S87 Permit) of the AHIP.	Section 5.5 – Discovery and protection of human remains at Lake Victoria
39	3. Upon discovery of newly exposed Aboriginal human remains or burial site within the AHIP, follow protocol outlined in Section 5.5 'Discovery and protection of human remains at Lake Victoria'.	Section 5.5 – Discovery and protection of human remains at Lake Victoria

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
	4. Upon discovery of newly exposed Aboriginal human remains or burial site outside the AHIP on joint-venture lands, follow protocol outlined in Section 5.6 'Recording and conservation of Aboriginal cultural heritage within the vicinity of Lake Victoria, NSW'.	Section 5.6 -Recording and conservation of cultural heritage within the vicinity of Lake Victoria, NSW
	5. Protect newly exposed Aboriginal human remains and burial sites and maintain existing burial protection works using small-scale soft-engineering techniques as approved by BMEC and outlined in 'Cultural Heritage Manual - Burial Protection Works, salvage and repatriation'.	Lake Victoria Cultural Heritage Manual – Burial Protection Works, Salvage and Repatriation
34	6. Trial new human remains or burial protection techniques (including techniques with different vegetation and depositional properties) in low risk areas for cultural heritage with BMEC approval to continue developing a best-practice approach.	-
	7. Consult with BMEC on monitoring burial protection works as detailed in Section 5.7 – 'Engagement of BMEC for cultural heritage monitoring and management advice at Lake Victoria'.	Section 5.7 – Engagement of BMEC for cultural heritage monitoring and management advice at Lake Victoria
	8. Ensure all burial (in-situ, salvage or repatriation of human remains) sites are recorded in the Aboriginal Cultural Information Database (ACID) and the Aboriginal Heritage Information Management Systems (AHIMS).	-
	9. Where in-situ protection cannot be applied or is not appropriate, consult with BMEC on appropriate salvage and reburial of exposed Aboriginal human remains as per Schedule E of the Section 87 Permit.	-
	10. Consult with BMEC and NSW DPIE - BCD regarding the repatriation of Aboriginal cultural material to Lake Victoria and where appropriate, assist with the repatriation of cultural material.	-

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
75	11. The MDBA shall provide the AHIP regulator with a final report at the completion of any salvage work or expiry of the permit or any renewal thereof, or as specified in the guidelines, whichever occurs first. Such a report shall include: • a complete list of all material recovered; • a detailed description of the methods of excavation/collection and analysis used; • a detailed plan of the site, including the location of collection areas, all trenches, auger holes and spoil heaps; • summary of consultation undertaken with relevant Local Aboriginal Land Councils or relevant Aboriginal Community Groups; and • any other records or materials, relevant to the permit, including any field notes, site plans, section drawings and relevant photographs.	-

4.4 Monitoring cultural heritage

Background

The shore of Lake Victoria preserves a rich record of the way people, both Aboriginal and non-Aboriginal, have and continue to live in and make changes to the landscape. The campsites, fireplaces, stone artefacts, scarred trees, extensive shell middens, organic rich soils and burial grounds of Aboriginal people who lived here over many thousands of years and the house sites, fences, ruins, roads and water regulation works of European people, and, importantly, the major burial protection works built jointly by Aboriginal and Europeans over the last few years.

Changing lake levels and environmental conditions at the lake have the potential to impact on cultural heritage over time. In order to understand the impacts of these changes and fulfil statutory reporting requirements under the AHIP, Lake Victoria Program requires a Cultural Heritage Monitoring Program to monitor change of condition in burials, scarred trees, aboriginal objects (such as flaked or ground stone), ovens, hearths and middens.

Table 7 Strategies for cultural heritage monitoring

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
33	1. Maintain positions for Aboriginal people to undertake cultural heritage protection and monitoring work at Lake Victoria within the AHIP area where possible.	Section 5.4 – Aboriginal Employment Section 5.8 – Sitting fees for LVAC members and cultural heritage monitors
	2. Engage Barkindji and Maraura Elders in monitoring and maintenance of burial protection works where practical as outlined in Section 5.7 'Engagement of BMEC for cultural heritage monitoring and management advice at Lake Victoria'.	Section 5.7- Engagement of BMEC for cultural heritage monitoring and management advice at Lake Victoria.
34	3. Undertake and maintain regular monitoring for cultural heritage material to inform management actions at Lake Victoria by collecting data on physical changes to cultural heritage material including: • all new and existing burial (in-situ, salvage or repatriation of human remains) sites (highest priority); • all culturally modified trees; • a subset of ovens;	Cultural Heritage Manual – Guide to Monitoring Program

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
	• a subset of stone artefacts; and • a subset of middens	
	4. Link monitoring of burial and cultural heritage sites with on-ground and remote sensing landscape monitoring (e.g. vegetation, erosion, groundwater).	
	5. Undertake inspection of lakeshore as soon as practical after strong wind or storm events to respond to possible damage to cultural heritage in impacted areas.	
	6. Undertake an annual lakeshore survey of targeted management areas to record any newly exposed cultural heritage material. The survey group should be accompanied by two BMEC members, LVAC or SRP cultural heritage expert, SA Water Cultural Heritage Team Leader and relevant DPIE - BCD personnel.	
	7. Update and maintain burial and cultural heritage records in the Aboriginal Cultural Information Database (ACID) and the AHIMS with: • location; • date recorded; • composition; • description; • condition; • works undertaken; • AHIMS status of new and existing burials, subset of monitored cultural heritage artefacts and sites and ACID site card information as required.	
	8. Ensure BMEC are made aware of the results of monitoring activities in a timely manner.	
	9. Advise BMEC of changes which might influence assessment of significance for Lake Victoria.	

4.5 Conserving lakeshore native vegetation and stability

Background

Prior to European settlement, the vegetation of the southern lake bed was a natural zonation of four lakeshore floodplain communities: river red gum woodland along the channels of the Rufus River and Frenchman's Creek, and blackbox woodland, sedgeland and grassland on the floodplain. Local and regional historic records indicate that the original flora and fauna of this area were severely affected by sheep and rabbits since their introduction as anywhere else in western NSW. Lake regulation also had a substantial impact on the lakeshore flora. Lake regulation drowned the stands of river red gums and black box along the pre-regulation lakeshore and Rufus and Frenchman's channels on the southern lake bed.

Promoting foreshore sediment stability and native vegetation establishment are intricately linked in terms of conserving the cultural landscape at Lake Victoria. Lake Victoria is situated in a semi-arid environment, where erosion is a dominant natural process. Characteristically, any lakeshore is a dynamic and evolving geomorphological environment influenced by a wide range of interacting factors, only some of which are able to be managed through human control. Changing any of these factors will have an effect on other processes and areas around the lake. Some processes like vehicle tracks, construction and gully runoff, have a heavy localised impact, where other processes such as wind and waves can have a broad-scale impact.

Table 8 Strategies relating to the conservation of lakeshore vegetation and stability

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
35-36	1. Recognise the important role that native vegetation - in particular, spiny sedge (*Cyperus gymnocaulos*) - has in stabilising the lakeshore and in turn protecting cultural heritage in the AHIP area.	-
	2. Maintain and expand vegetation cover where feasible in priority areas (e.g. areas with high density of cultural heritage or where there is a specific management issue such as erosion) within the AHIP area to stabilise lakeshore sediment for cultural heritage protection by: • operating the Lake according to Lake Victoria Operating Strategy (LVOS) (See Section 4.1 'Operating Lake Victoria'). • controlling grazing pressure by non-native pest animals (e.g. rabbits, pigs)	Revegetating Lake Victoria – A field guide Lake Victoria Erosion Management Manual Lake Victoria Operating Strategy

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
	by fencing off and destocking management areas and managing populations of rabbits, pigs and feral goats. (See Section 4.7 - 'Managing impact of non-native fauna') • when necessary, controlling grazing pressure by native animals (e.g. kangaroos) when populations are deemed unsustainable. (See Section 4.7 – 'Managing impact of non-native fauna'). • where natural regeneration is not working, implement supplementary stability or vegetation measures as outlined in relevant manuals.	
	3. Trial new techniques and use up-to-date knowledge on lakeshore stability and native vegetation conservation to continue to develop best-practice approach under an adaptive management methodology with the approval of LVAC and SRP.	-
	4. Where vegetation is unlikely to establish, implement approved, supplementary 'soft' intervention measures such as sand sausages or sand nourishment where necessary to manage erosion based on the nature of the area to be protected (e.g. scale and extent of erosion, proximity to cultural heritage, gradient and soil type etc.) within the AHIP area.	Lake Victoria Erosion Management Manual
	5. Assess and document the relative success of each supplementary 'soft' intervention measures to manage erosion in differing scenarios to inform future works.	
	6. Where vegetation is not naturally regenerating and there is a management issue such as erosion or protection of cultural heritage, supplement the lakeshore vegetation with seed harvesting and dispersal using appropriate native plant species.	Revegetating Lake Victoria – A field guide

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
	7. Only use direct planting on a small scale as it is resource-intensive and has had limited success in the past. It may be suitable: • for dust suppression around depot; • as an education opportunity for cultural heritage trainees or; • where other revegetation methods are not working and there is a significant management issue such as erosion. If this method is used then only plant appropriate riparian species on foreshore within AHIP area.	
	8. Assess and document the success of each supplementary revegetation measure in differing scenarios to inform future revegetation projects.	
	9. Reduce presence and spread of non-native vegetation (weeds) using low impact management activities to reduce impact on the recruitment and establishment of native vegetation within the AHIP area and outside the AHIP area on joint-venture lands.	-

4.6 Monitoring lakeshore native vegetation and stability

Background

Monitoring change in lakeshore stability and native vegetation establishment guides management actions to better manage the protection of cultural heritage at Lake Victoria. The monitoring program includes monitoring lakeshore stability, change in specific lakeshore profiles, native vegetation cover and non-native vegetation cover. Monitoring aims to assess whether management actions are improving native vegetation cover and sediment stability and determine:

- extent of vegetation's ability to stabilise foreshore sediment,
- vegetation cover and recruitment over time,
- the impact of lake regulation and other significant factors such as grazing and weeds on native vegetation communities,
- extent of sediment erosion and accretion, and

- areas for management intervention can be prioritised based on;
  - cultural sensitivity,
  - rate of erosion, and then
  - existing vegetation cover (if any).

Along with on-ground surveys and photo monitoring to monitor rates of erosion and health of vegetation, drone imagery is used to remotely monitor vegetation and its role in stabilising the foreshore at Lake Victoria.

Table 9 Strategies for monitoring lakeshore vegetation and stability

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
35-36	1. Recognise that monitoring lakeshore vegetation and stability is important to understand current and future threats to protecting cultural heritage within the AHIP area.	-
	2. Ensure monitoring adequately captures information required to track change in lakeshore vegetation and sediment over time and prioritise areas for on-ground management such as cultural heritage protection, revegetation and erosion works within the AHIP area in the annual works program.	Lake Victoria Monitoring Program Redesign Document – in prep. Lake Victoria Remote Sensing and Mapping Methods- in prep.
	3. Utilise aerial imagery or other remote sensing to monitor change in vegetation cover and sediment within the AHIP area to understand the potential risk of damage to cultural heritage and to monitor the effectiveness of works.	
	4. Undertake on-ground monitoring annually to understand change in distribution and condition over time within the AHIP area and provide field data to validate aerial imagery or other remote sensing techniques, including: • lakeshore profile surveys • vegetation photo monitoring • non-native vegetation (weeds) monitoring	

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
	5. If the results for the monitoring show a long-term trend of a reduction in the extent of key species or a long-term trend of increased erosion in priority areas within the AHIP area, the MDBA will report to the Director-General DPIE - BCD on the likely causes of the changes and if appropriate, indicate any mitigation measures proposed.	-
	6. Trial new techniques and, where practical, use best practice monitoring of lakeshore stability and native vegetation.	-
	7. Undertake specific monitoring to assess condition of burial protection works in relation to vegetation cover and sediment as outlined in 'Section 4.4 – Monitoring Cultural Heritage'.	Lake Victoria Cultural Heritage Manual –Guide to Monitoring Program
24	8. Engage the Scientific Review Panel (SRP) to assess results of the monitoring program and provide expert advice on improvements to the program.	-

4.7 Managing impact of non-native fauna

Background

Along with historic lake operations before the implementation of LVOS, the introduction of non-native fauna to the cultural landscape has been detrimental to the surrounding vegetation and sediment. Pest animals can outcompete native species, graze native vegetation causing erosion and impact on the diversity of native animals, reducing the cultural and ecological significance of the area. Wild rabbits, wild dogs, feral pigs, foxes, feral camels and locust species are all declared pests under the NSW *Rural Lands Protection Act 1998,* and are required by law to be controlled by landholders. Feral cats and goats also pose a significant threat to the cultural landscape and as such, are also controlled within the AHIP area and outside the AHIP area on joint-venture lands.

The objective of pest animal management at Lake Victoria is to reduce the presence and abundance of pest animals. Each pest animal species requires different management techniques to best reduce its presence and abundance. The objectives of the strategies for non-native fauna are intrinsically linked to strategies for 'Conserving lakeshore native vegetation and stability' outlined in Section 4.5 and ultimately determine the success of the strategies for lakeshore native vegetation and stability.

Table 10 Stategies for pest management

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
37	1. Manage the presence of feral animals causing impacts including rabbits, feral pigs, goats, wild dogs and foxes within the AHIP and outside the AHIP area on joint-venture lands which may compromise the ability to protect cultural heritage and natural environment by the following: • carry out simple periodic or seasonal pest animal (e.g. rabbits, pigs and goats) monitoring by documenting presence or absence, number of sightings or extent of damage, both before and after control programs to determine success and inform future management programs. • coordinate pest animal management in the AHIP and Big Lake area and in conjunction with neighbouring landholders to better achieve landscape scale outcomes. • utilise low impact pest control management strategies which are humane and appropriate for culturally sensitive areas. • liaise with neighbouring landholders to reduce the impacts of sheep and cattle grazing pressure on the foreshore of the Lake, Rufus River and Frenchmans Creek.	Regional Pest Management Strategy 2012-17: Far West Region Biology, ecology and management of vertebrate pests in NSW NSW Vertebrate pesticide manual. www.dpi.nsw.gov.au
	2. Use most up-to-date knowledge on pest animal control in line with NSW state legislation, national codes of practice and standard operating procedures.	

4.8 Monitoring water quality

Background

Water quality monitoring is undertaken at Lake Victoria in order to monitor potential impacts of water quality on the surrounding cultural landscape. Monitoring at Lake Victoria is a part of MDBA's wider River Murray water quality monitoring program which collects a range of indicative water quality parameters.

Water NSW undertakes annual monitoring of groundwater around Lake Victoria, on behalf of the MDBA. The majority of the monitoring sites are nested; screening across aquifers at different depths. Most of the monitoring sites have their water levels logged continuously giving a detailed insight into aquifer responses to lake operations and climate. This groundwater monitoring is undertaken to enable changes in Salinity to be identified, reported on and actioned if required.

Table 11 Strategies for water quality monitoring

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
38	1. Remain aware of decline in water quality which may impact shoreline vegetation or cultural heritage by: • monitoring water quality in the lake as part of the long-term River Murray system water quality sampling program including salinity • additional monitoring may be required when levels have been held low for extended periods. • summary results from the Monitoring Program are to be detailed in the Annual Report.	*Water Act 2007* - Basin Plan 2012 – Chapter 9: 'Water quality and salinity management plan'
53	2. If any known Aboriginal objects (not included in the current AHIP) are likely to be damaged, destroyed or defaced by salinisation due to changes to groundwater resulting from operation of Lake Victoria, then the MDBA will immediately notify the regulators of the AHIP. • It is also noted that there are many other influences on ground water and salinity, and if groundwater monitoring indicates any changes of concern, not associated with the operation of the Lake, the regulators will also be informed.	-

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
54	3. If salinisation impacts on fauna or faunal habitat is identified to have been contributed to by the operation of Lake Victoria, then the MDBA will either, where appropriate, implement a strategy, agreed to by the MDBA and the AHIP regulator to prevent or mitigate the impact of such salinisation or seek an appropriate licence to cover the impact.	

4.9 Communicating with the broader community

MDBA is committed to ensuring that a major voice is given to the Barkindji-Maraura Elders Committee in the management of cultural heritage at Lake Victoria. It is important to continue communicating with the wider community regarding the diversity of interests involved in Lake Victoria, particularly the cultural heritage significance of the Lake and the role of Lake Victoria in water management as a place of national significance.

Table 12 Strategies for community communication

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
30-31	1. Promote awareness of, and make information available to the broader public regarding the importance of finding the balance between the diversity of interests involved in Lake Victoria. Awareness can be generated through appropriate media (Lake Victoria Annual Report, websites, brochures, posters, videos etc.) such as: • forward copies of appropriate publications to the Australian Institute of Aboriginal and Torres Strait Islander Studies, Canberra and the Australian Museum; • assist with coordination and funding of Rufus River Memorial Day activities as a part of the broader strategy to promote awareness of the history of Lake Victoria; and • maintain the on-site information bay with relevant information for visitors.	Lake Victoria Advisory Committee Terms of Reference Section 5.4 - Aboriginal Employment Section 5.7 - Engagement of BMEC for cultural heritage management advice and monitoring Section 5.9 – The Keeping Place Section 5.8 – Sitting fees for LVAC

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
33	2. Maintain positions for Aboriginal people to consult with BMEC and wider Aboriginal community about the importance and significance of Lake Victoria where possible.	members and cultural heritage monitors
30	3. Seek advice from the Barkindji and Maraura Elders Committee prior to the release of culturally sensitive information to the wider community.	
	4. Encourage, support and provide sufficient opportunity for Elders to provide informed advice to and from the broader Aboriginal community on relevant issues.	
	5. Maintain and resource the LVAC, allowing for representatives from a wide range of stakeholders as specified in Condition 14 of the AHIP.	
	6. Ensure that LVAC members are made aware of current activities at the Lake through LVAC and other appropriate mediums such as: • produce a community newsletter describing activities at the Lake on an as needs basis.	
	7. Provide all necessary information about any issues in an understandable form, including technical advice, fit for audience.	
	8. Provide sufficient time and opportunity for all LVAC members to fully understand and consider matters relating to cultural heritage management at the Lake.	
	9. Interact in a culturally appropriate manner within the LVAC and the wider Aboriginal community.	
	10. Encourage knowledge exchange at the Keeping Place and campground between Barkindji and Maraura Elders and younger generations.	
	11. Provide cross-cultural awareness training to all staff involved at the Lake Victoria Program as appropriate.	

4.10 Conducting research

Background

The cultural heritage and land management practices at Lake Victoria are based in 'adaptive management' framework outlined in Section 1.4 'Development of the CLPoM'. This framework relies on up-to-date and improved research and information regarding the interaction between environmental processes, lake operations and impacts on cultural heritage to improve management decisions and actions over time. Additionally, research which relates to increasing our understanding of the nature or significance of the cultural and/or natural heritage values at the Lake are important to continue to the importance of Lake Victoria nationally and globally.

Table 13 Strategies for conducting research

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
24	1. Maintain the Scientific Review Panel membership with collective expertise and experience in Aboriginal cultural heritage significance, management and protection, wetland vegetation ecology, geomorphology, hydrogeology and natural resource management.	Lake Victoria SRP Terms of Reference
28	2. Actively encourage research aimed at improving knowledge of cultural heritage protection, increasing awareness of cultural heritage values or improving on-ground management outcomes in the cultural landscape at Lake Victoria.	-
40	3. Review, consider and approve (if deemed appropriate) proposed research or investigative work at the Lake by the SRP and LVAC. Any research to be conducted must have a Research Plan which contains the following: • links to cultural heritage and cultural heritage protection (if applicable); • the need for the research; • the objectives of the research; • the proposed methodology including how risks to cultural heritage will be minimized; • the detail of the proposed consultation processes with the wider Aboriginal community (if required); • the relationship of the research to the strategies of the Lake Victoria Cultural	-

AHIP conditions (what is required)	Strategies (what we do)	Relevant documents (where to find more information)
	Landscape Plan of Management (if applicable); • how the results will be reported; • any potential management outcomes; • WHS considerations and legal permits; and • the timing of the research and any requests for assistance from Elders or agency staff.	
	4. Ensure proposed changes in management practices or guidelines resulting from research outcomes are considered by the Scientific Review Panel and agreed by LVAC, BMEC, NSW DPIE - BCD and MDBA.	-
	5. If Aboriginal cultural material is uncovered in the course of the research, advise research proponent of reporting and archiving requirements of the AHIP, particularly the intellectual property rights of the Barkindji and Maraura people.	-

Part 5: Our management protocols and guidelines

Our management rules for Lake Victoria have been developed to further clarify some aspects of the management strategies outlined in Part 3. In some cases, specific guidelines are required to understand how management strategies will be implemented at Lake Victoria to ensure that all agencies, departments and community members are aware of these requirements.

This section includes:

- Access to Lake Victoria (Section 5.1)
- Code of Conduct (Section 5.2)
- Campground use (Section 5.3)
- Aboriginal employment (Section 5.4)
- Discovery and protection of human remains and burial sites at Lake Victoria (Section 5.5)
- Recording and conservation of Aboriginal cultural heritage in the vicinity of Lake Victoria, NSW (Section 5.6)
- Engagement of BMEC for cultural heritage monitoring and management advice at Lake Victoria (Section 5.7)
- Sitting fees for LVAC members and cultural heritage monitors (Section 5.8)
- The Keeping Place (Section 5.9)

5.1 Access to Lake Victoria

This protocol outlines steps for visiting individuals and groups to take to act respectfully towards the Aboriginal heritage of Lake Victoria and the rights, equipment and facilities of the landholders. While the traditional owners and landholders at Lake Victoria will co-operate within the spirit of this protocol wherever possible, they retain the right to refuse admission to individuals who do not follow requirements below.

This protocol exists so:

- the BMEC and neighbours are confident that SA Water and NSW DPIE Water effectively control access to Lake Victoria and ensure protection of cultural heritage
- that potential visitors know of the access restrictions that exist to protect cultural heritage and know the process for seeking access depending on activities to be undertaken at the Lake.
- SA Water and NSW DPIE Water understand and manage the process for allowing access to Lake Victoria, this includes, but is not limited to:
    - timeframes and obtaining permission;
    - restricted areas and activities;
    - reporting observations and incidents; and
    - emergencies and risk management.

Geographic scope of this protocol

This protocol applies to the management areas within the AHIP area and outside the AHIP on joint-venture lands as outlined in Section 1.3 – 'Geographic scope of the CLPoM'.

Some areas around the lake are also privately owned and permission must be sought prior to accessing such properties. Agreements have been put in place by SA Water where access to private properties is required as part of lake operations or management. This has been developed to document the arrangements of the access agreed to with landholders.

Access to Lake Victoria

When visiting Lake Victoria, all visitors must be made aware and comply with requirements of the Lake Victoria AHIP. It is NSW DPIE Water and SA Water responsibility on behalf of MDBA to ensure that all visitors are made aware of all requirements of accessing and visiting Lake Victoria.

Given varying activities and associated levels of risk with different visitors visiting and accessing the Lake, different approval processes exist for groups of visitors including:

- Barkindji and Maraura Elders on Lake Victoria Advisory Committee
- Aboriginal people with traditional and historic ties to the Lake
- Staff, contractors or researchers (including all employees from government departments and agencies)
- Educational groups
- Members of the general public

Table 14 outlines the process in which each visitor should take to request access to Lake Victoria and the likely timeframe for the process. Timeframes given are to be used only as a guide and may be longer or shorter depending on current management requirements at the Lake.Table 14 Visitor activity approval process for visitors to Lake Victoria

If you are...	and you wish to access areas...	and cultural heritage will be...	You must request access from...	It is likely to take up to...
Aboriginal community member	inside AHIP	likely disturbed	RESTRICTED – BMEC via NSW DPIE Water, *and* DPIE - BCD via CHS	3 months
		not disturbed	CHS	14 days
	outside AHIP	likely disturbed	RESTRICTED – BMEC via NSW DPIE Water, *and* DPIE - BCD via LVPM/MDBA	3 months
		not disturbed	LVPM/MDBA	14 days

If you are...	and you wish to access areas...	and cultural heritage will be...	You must request access from...	It is likely to take up to...
Staff or contractor researcher	inside AHIP	likely disturbed	RESTRICTED – BMEC via NSW DPIE Water/CHS *and* LVAC via CHS	3 months
		not disturbed	CHS	14 days
	outside AHIP	likely disturbed	RESTRICTED – BMEC via NSW DPIE Water *and* DPIE - BCD via LVPM/MDBA	3 months
		not disturbed	LVPM/MDBA	14 days
Education group	inside AHIP	likely disturbed	NOT PERMITTED	not applicable
		not disturbed	LVAC and BMEC via CHS/NSW DPIE Water	3 months
	outside AHIP	likely disturbed	NOT PERMITTED	not applicable
		not disturbed	LVPM/MDBA	14 days
General member of the public	inside AHIP	likely disturbed	NOT PERMITTED	not applicable
		not disturbed	RESTRICTED – CHS	14 days
	outside AHIP	likely disturbed	NOT PERMITTED	not applicable
		not disturbed	RESTRICTED – LVPM/MDBA	14 days

NOTE: Access to some areas around Lake Victoria is only through private property. Permission for access through privately owned land outside of the AHIP will need to be sought from the landowner prior to accessing the property.

Key steps each visitor must take to ensure protection of cultural heritage and personal safety:

1. Request access from relevant approval body listed in the above table, including private landholders if relevant.

    - Provide detailed purpose, participants, locations and itinerary. Request contact details of affected stakeholders.

2. Permission will be formally suppled or denied by approval body.

    - Any permission for access will note any restrictions.
    - Reasons for denial will be advised.

3. Once permission is granted, confirm arrival date and time with approval body, relevant landholders and staff.
4. Sign in at Lake Victoria SA Water Depot.

    - This will involve a site induction which will cover:
        - Main information about conduct to protect Aboriginal cultural heritage at Lake Victoria consistent with the AHIP;
        - Work, health and safety requirements for site access;
        - Respectful behavior; and
        - Emergencies

5. Access areas

    - Leave everything as you found it. Only existing access tracks and roads are to be used. In some instances, an escort may be required.

6. Sign out from Lake Victoria SA Water Depot or inform SA Water of intention to leave prior to travel.

    - Report sightings such as cultural heritage material, exposed burials and damaged fences.

5.2 Code of Conduct

Aboriginal cultural heritage at Lake Victoria are protected under the NSW *NPW Act 1974* and the 2015 Aboriginal Heritage Impact Permit. All other historical heritage at Lake Victoria is protected under the *Heritage Act 1977*. As the agency responsible for legal obligations under the AHIP, MDBA requires all parties to act in accordance with the Code of Conduct to ensure that AHIP conditions are complied with by visitors and employees. As outlined in Section 2.3, all access, land management activities and works at Lake Victoria should be undertaken with the view to be low impact and cause minimal harm to the efforts to conserve cultural and natural heritage values described in Section 1.5 'The Significance of Lake Victoria'.

This protocol exists to:

- ensure that all persons visiting or working at Lake Victoria understand the legal obligations regarding Aboriginal cultural heritage under the Aboriginal Heritage Impact Permit 2015 and more broadly the NSW *NPW Act 1974* and all other historic heritage under the *Heritage Act 1977.*
- ensure that all persons visiting or working at Lake Victoria behave in ways respectful to the significance of the cultural heritage.
- ensure that no Aboriginal or historic objects are damaged either by visitors, fieldwork, monitoring or protection works.

- ensure that Aboriginal and historic objects are not removed from their locations expect in accordance with procedures set out in this protocol. Ensure that participants in the Lake Victoria Advisory Committee meeting behave in a polite and considerate manner

Relevant legislation regarding harm and protection of Aboriginal objects

Under the NSW *NPW Act 1974*, it is an offence to harm an Aboriginal object without an Aboriginal Heritage Impact Permit or a valid exemption. 'Harm' in this case means any act or omission that:

- destroy, deface or damages the object
- moves the object from the land on which it had been situated
- causes or permits the object to be harmed.

'Harm' does not include something that is trivial or negligible. Examples of what might be a trivial or negligible act are "picking up and replacing a small stone artefact, breaking a small Aboriginal object below the surface when you are gardening, crushing a small Aboriginal object when you walk on or off a track, picnicking camping or other similar recreational activities." (see Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales, DECCW).

The purpose of the NSW NPWS Section 90 and 87 Permits that are included in the AHIP are to:

- authorise actions (i.e. the use of Lake Victoria as a water storage) that may cause damage or destruction or defacement of Aboriginal objects (but not burials) and to allow for disturbance and movement of certain Aboriginal objects for the purposes of salvage.

NSW NPW Section 87 provides a defense from prosecution if:

- an Aboriginal object was harmed and the Due Diligence Code of Practice was followed, or the harm was caused while carrying out a prescribed 'low impact' activity.

Protection of Aboriginal objects

- All Aboriginal objects, including Aboriginal burials and fragments of human bones, stone artefacts, shell midden and fireplaces and animal bones associated with shell middens and hearths, and scarred trees are protected under the NSW *NPW Act 1974* (as outlined in Schedule A of the AHIP 2015).
- No Aboriginal objects are to be removed from the lakeshore by any person except where authorised as part of the burial protection program or a specific research project, in accordance with the NSW *NPW Act 1974* Section 87 Permit outlined in Section E of the AHIP 2015.
- No Aboriginal objects should be relocated at Lake Victoria except where authorised as part of the burial protection program or a specific research project in accordance with the NSW *NPW Act 1974* Section 87 Permit outlined in Section 3 of the AHIP 2015.
- In special cases, it may be appropriate under Aboriginal tradition to relocate Aboriginal objects e.g. for safe-keeping or for spiritual reasons. This can only be done by the SA Water Cultural Heritage Team Leader with the authorisation of the BMEC.
- All material items on the lakeshore (e.g. pieces of flaked stone, bone) should be assumed to be Aboriginal or historic objects. No items are to be collected. The location should be recorded and the SA Water Cultural Heritage Team Leader advised.

- Any Aboriginal cultural material known to be removed from the lakeshore previously should be returned to the SA Water Cultural Heritage Team Leader for recording in the Aboriginal Cultural Information Database and safekeeping, and if possible, for return to its original location.

Protection of historic objects

- Historic objects are protected under the *Heritage Act 1977*. This includes all material around the lakeshore at Lake Victoria, including all material at the old house sites (bricks, glass, ceramics etc.), old bottles, the telegraph posts and aircraft fragments and shells.
- No historic objects are to be removed from the lakeshore by any person except where authorised as part of a conservation program or a specific research project, in accordance with a permit from the NSW DPIE - BCD (this cannot be authorised by NSW DPIE - BCD under a Section 87 Permit).
- No historic objects should be relocated at Lake Victoria unless authorised as part of the burial protection program or a specific research project, in accordance with a permit from the NSW DPIE - BCD (this cannot be authorised by NSW DPIE - BCD in the section 87 Permit).
- In special cases, it may be appropriate to remove historic objects from the lakeshore e.g. if they are in danger of immediate physical damage or theft (this would apply to coins, and other collectable items and to very fragile items). This can only be done with the authorisation of the SA Water Cultural Heritage Team Leader.

Minimising risk of damage to cultural heritage at Lake Victoria

Vehicles and access tracks

- No vehicles are to be driven on the lakeshore below 27m AHD except for approved 4WD ATVs in the following cases:
    - government agency workers, in pursuit of their normal operations such as burial protection and monitoring works, pest animal and weed monitoring and control, maintenance of fences or monitoring piezometers.
- Vehicles must be appropriate to the task at hand, and individuals should exercise caution and observe the guidelines outlined below.
    - All vehicles must remain on the formed roads and parking bays when accessing the Frenchman's Islands.
    - During major construction of protection works, larger vehicles such as bobcats, dump trucks and excavators may be permitted in certain areas. Use of such vehicles will be restricted to specific programs and must be approved prior to works commencing.
    - Vehicle use on the Nulla lunette should be avoided where possible.
    - When 4WD ATVs are required to be used on the lakeshore, lunette or riparian zones where cultural heritage is known to exist, care must be taken to avoid driving on any exposures of cultural material (palaeosols, shell middens, stone artefact scatters and historic sites)
    - Vehicles must follow pre-existing wheel tracks to minimise the number of tracks across the beach. However, if after repeated traffic, a track is found to be disturbing

heritage material, the SA Water Cultural Heritage Team Leader should be advised so that an alternate route can be found or protection works undertaken.

Monitoring and research programs

- Projects that require excavation in any form must be approved by Lake Victoria Advisory Committee and may require application for an AHIP before commencement.
- No fences, posts, pegs, flags, signs or other markers around the lakeshore are to be removed or shifted unless instructed to do so by the NSW DPIE Water Lake Victoria Program Coordinator, SA Water Cultural Heritage Team Leader, or scientists involved in the monitoring programs.
- A map and register of all markers etc. will be held in the Aboriginal Cultural Information Database (ACID) at the SA Water Depot to identify the purpose (survey, monitoring or research) of any particular fences, posts, pegs, or flags.
- The proposed location of any approved fences, posts, pegs, holes etc. must not be placed on the lakeshore unless they are part of an approved monitoring or research program and approved by the SA Water Cultural Heritage Team Leader.
- Do not enter, walk or drive on any enclosures marked or enclosed by a fence, posts, pegs or flags, except for the purposes of recording or surveying the areas and weed control.
- Do not remove any vegetation in or near fenced or marked transects and exclosures.

Other

- Lunch or rest camps must not be set up on or near areas where there are surface exposures of heritage material or on burial grounds even where these have been covered with sand.

5.3 Campground use

The campground site and infrastructure has been provided to allow Barkindji and Maraura people with historic ties to the area to have respectful and quiet enjoyment of Lake Victoria. The site will serve as an area for education and to continue cultural practices.

This protocol exists so:

- all parties are informed of their roles and responsibilities in using and managing this site.
- potential users of the campground know how the campground can be used
- all activities at the campground abide by the requirements established through the Lake Victoria Cultural Landscape Plan of Management (2018).

Access

Access is organised by contacting the Cultural Heritage Team at the Lake Victoria SA Water Depot on (03) 5027 8218 within business hours (8.00am to 4.00pm, Monday to Friday). Bookings are to be made 7 days in advance to ensure SA Water staff can ensure safety of users and accommodate all the requirements of the protocol. All enquiries made to mobile numbers will be asked to forward enquiries onto the SA Water landline number.

All booking must be made by a **Barkindji-Maraura Elders Council (BMEC)** member, who must be present on site during the duration of the visit to ensure cultural knowledge sharing. The Elder will also be responsible for ensuring all protocol conditions understood and respected. Campground users will notify the Lake Victoria depot on their departure.

Use of the campground will not prevent maintenance and other works from being undertaken.

Is an induction required?

- Yes, all bookings will require an induction which will be carried out at the Lake Victoria Depot during business hours. The induction will consist of:
    - review of this campground protocol;
    - campground users will be alerted to areas which are deemed dangerous and asked to keep clear of those areas;
    - SA Water staff will make campground users aware of the location of the public phone situated at the depot in case of emergencies;
    - combination code for gate lock will be given to Campground users, which is also written on the induction sheet; and
    - signing of the induction sheet.
- A member of the cultural heritage team will escort the campground users to the site. The staff member will unlock the facilities and notify users of any relevant safety matters.

Special conditions

- SA Water staff have the right to ask disrespectful campground users to leave the premises. Campground users not complying with the request to vacate will be reported to the NSW Police.
- No pets – including dogs or cats are permitted on site.
- All campground users when exiting and entering the site are to ensure that the gate is securely locked at all times.
- No firearms or weapons – are permitted on site at any time.
- No motorised vehicles – are allowed on the shore of the lake outside of the access tracks and parking area.
- Bookings are limited to 25 people.
- Maximum duration of a campground booking is 7 days.

5.4 Aboriginal employment

MDBA, SA Water and NSW DPIE Water have committed to a partnership to enhance Aboriginal employment opportunities within the Lake Victoria region via implementation of this protocol and consideration of, at the inception of any new project, the NSW and South Australian government policies related to employment diversity and Aboriginal participation (within budgetary considerations).

This protocol aims to establish an agreed procedure for the employment of Aboriginal people for work associated with the management of cultural heritage, land management and River Murray

Operations within the Lake Victoria region. It also outlines steps to take in providing training and employment opportunities to Aboriginal people at Lake Victoria that consist of quality training with sufficient scope to provide the best opportunity for Aboriginal employees to be employed thereafter.

This protocol exists to:

- ensure that responsibilities of partner agencies, potential employees and community members are clear;
- ensure that management agencies are clear about their commitment to facilitate the employment of Aboriginal people; and
- ensure that potential employees understand what opportunities are available to them.

Types of employment

There are three main employment opportunities supported through this program:

- full-time positions (3 positions)
- traineeship positions (2 x 24-month positions)
- casual employment for cultural heritage monitoring and burial works and replenishment.

NOTE: The availability of these positions is subject to change.

Full-time positions

Currently, the MDBA has committed to supporting 2 full-time positions which are managed through either SA Water or NSW DPIE as follows:

- *Cultural Heritage team leader* (permanent)—is responsible for supervising the Cultural Heritage Team at Lake Victoria. The position is based at the Lake Victoria Depot and resides on-site. This position is managed by SA Water.
- *Cultural Heritage Field Officer* (permanent)—supports the Cultural Heritage Supervisor. The position is based at the Lake Victoria Depot and resides on-site. This position is managed by SA Water.

Additionally, MDBA supports a Lake Victoria Program Support Officer on a contractual basis under the *Government Sector Employment Act 2013* as follows:

- *Lake Victoria Program Support Officer* (contract)—links the BMEC and Aboriginal communities to the Lake Victoria Program. The position is based at Buronga in NSW and is managed by the NSW DPIE.

Traineeship positions

Two Aboriginal trainee field staff positions are offered each year. These positions (employed by SA Water) are based at the Lake Victoria Depot.

Accredited training is offered in Conservation and Land Management (Certificate 2) and cultural heritage site identification and protection as a minimum. Additional training may be provided in machinery operations, water industry (Certificate 2), administration and Geographical Information Systems.

Positions are generally offered for a 24 month fixed term. Fixed term positions create more opportunities for new community members to be involved. Consideration will be given to:

- Offering longer term appointments to trainees who have successfully complete their traineeship – depending on resources,
- Appointing two trainees at the same time to provide a two-way supportive team environment for new staff.

It is encouraged that Trainees receive mentoring and support provided by the Barkindji and Maraura Elders.

Casual employment

Opportunities may arise for casual employment in land management activities such as burial protection works, cultural heritage monitoring, weed control, revegetation etc. The engagement of BMEC for cultural heritage monitoring will be conducted as per Part 4.7 'Engagement of BMEC for cultural heritage monitoring and management advice at Lake Victoria'.

Selection committee

A selection committee for full time and traineeship positions will typically comprise at least:

- 2 BMEC members
- 2 agency representatives (two from either SA Water, NSW DPIE Water or MDBA)

Agency strategies which support Aboriginal employment

- see MDBA Indigenous Employment Strategy 2010-2015
- see SA Water Aboriginal Employment Strategy
- see NSW Aboriginal Employment Action Plan – 2009-2012

5.5 Discovery and protection of human remains and burial sites at Lake Victoria

This protocol ensures that the location of cultural objects are recorded so that monitoring and protection plans take into account known cultural material in the landscape, and protection measures, if necessary are conducted in consultation with key stakeholders.

- This protocol exists to:
- Ensure that cultural heritage objects are protected as per the Lake Victoria Aboriginal Heritage Impact Permit 2015
- Be followed where a site inspection raises a concern about the impacts to or exposure of Aboriginal objects in the landscape.

Procedure – Discovery of human remains or burial site within the AHIP area

Protection of burial sites is the highest priority in the cultural heritage protection program at Lake Victoria. All known Aboriginal human remains at Lake Victoria are protected by an extensive sand

nourishment and protection works program underway since 1998. The following flowchart (Figure 29) outlines the main steps to be followed upon discovery of human remains or burial sites within the AHIP:

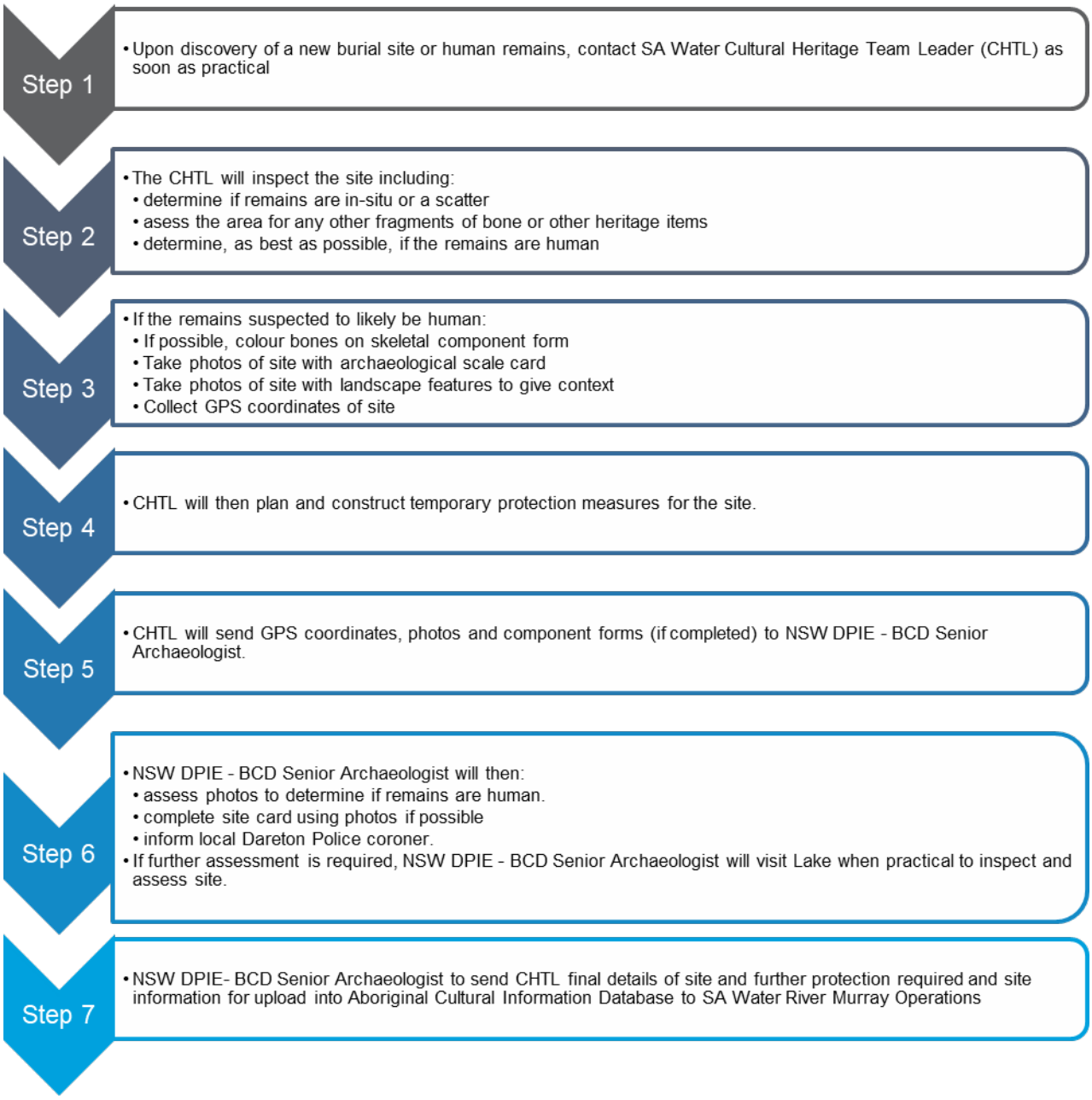

Figure 29 Process for discovery and protection of human remains and burial sites at Lake Victoria within the AHIP area

Procedure – Protection of human remains or burial site within the AHIP area

- The SA Water Cultural Heritage Team Leader is required to have an accurate understanding of the location of previously recorded cultural material to assess impacts to these areas caused by lake operations, storm events or any other activity through the use of a PDA or other GIS-enabled device.

- If there is impact to any areas where cultural Aboriginal objects are known to occur, the SA Water Cultural Heritage Team Leader, Lake Victoria Project Support Officer, SA Water Operations manager, Lake Victoria Program Manager and NSW DPIE - BCD archaeologist are to be consulted. If it is decided that protection works are required, a works program for the area in question will be planned.
- A report will be provided to LVAC about the impacts and actions undertaken.
- LVAC shall determine whether the report should be referred to the Scientific Review Panel for further consideration.
- If protection works are carried out, photographs shall be taken prior to works being undertaken and after completion, and records of procedures undertaken shall be kept.
- Maintenance inspections will be undertaken as part of the scheduled cultural heritage monitoring program and if repairs to the protection works are required works will be undertaken under the supervision of the SA Water Cultural Heritage Team Leader.
- The location of and details about all works undertaken will be stored in the Aboriginal Cultural Information Database.

Employment requirements

- If the SA Water Cultural Heritage Team Leader needs assistance to construct new or repair existing cultural heritage protection works, the matter should be discussed with the Lake Victoria Storage Manager and the River Murray Operations manager to determine the level of practical support and resources required. If it is agreed that BMEC members or local Aboriginal people are need to be employed for the works, this is to be done in accordance with Section 5.4 'Aboriginal Employment' protocol.

5.6 Recording and conservation of Aboriginal cultural heritage in the vicinity of Lake Victoria, NSW

A 'Protocol for the recording and conservation of Aboriginal cultural heritage in the vicinity of Lake Victoria, NSW' outlines the procedural steps and responsibilities following the discovery of Aboriginal cultural heritage outside of the AHIP area at Lake Victoria and within the Big Lake area.

The protocol extends the skills and the enabling roles of partners under the implementation arrangements of the Lake Victoria AHIP to the Big Lake area as defined in Figure 2 of the Lake Victoria and Surrounding Lands Management Agreement, therefore including riparian and lunette areas currently immediately outside the AHIP that subtend the lake foreshore.

The MDBA is aware that the current consent is granted to cover only the operation of Lake Victoria as conditioned by the current AHIP. The big lake protocol enables conservation works on burials (only) outside of the consent area, particularly interim measures. It does not provide for activities, or harm, outside of this. Any other activities, outside of the current AHIP consent area, but concerned with land management, and affiliated with Lake Operation i.e. track maintenance, construction of fences require a separate AHIP to harm Aboriginal Cultural Heritage.

The ‘Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales’ (https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Aboriginal-cultural-heritage/due-diligence-code-of-practice-aboriginal-objects-protection-100798.pdf) should be used when considering undertaking activities that could harm Aboriginal objects for land management activities outside of the current AHP consent area

Although the following summary is not the legal instrument or agreement for protection works outside of the AHIP, this section shows the flowchart to follow after discovery of Aboriginal burials in the Big Lake area.

Principles for burial protection works outside of the AHIP

- Access protocol procedures apply to all areas requiring cultural site recording and conservation activities outside of the AHIP.
- Site recording, conservation and monitoring procedures that are current for the Lake Victoria AHIP and this Plan of Management are appropriate for sites found outside of the AHIP.
- A request for oversight and supervision of works from the principal consultees (BMEC) with preference to nominees outside of the existing AHIP boundary (such as Barkandji Traditional Owners #8 Native Title holders (NT8), Tar-ru Aboriginal Group, Dareton Local Aboriginal Land Council) where possible.

Sitting fees for cultural heritage monitoring and management advice will be made at rates as agreed in Section 5.8 ‘Sitting fees for LVAC members and cultural heritage monitors’.

Procedure – Discovery of human remains or burial site outside the AHIP area

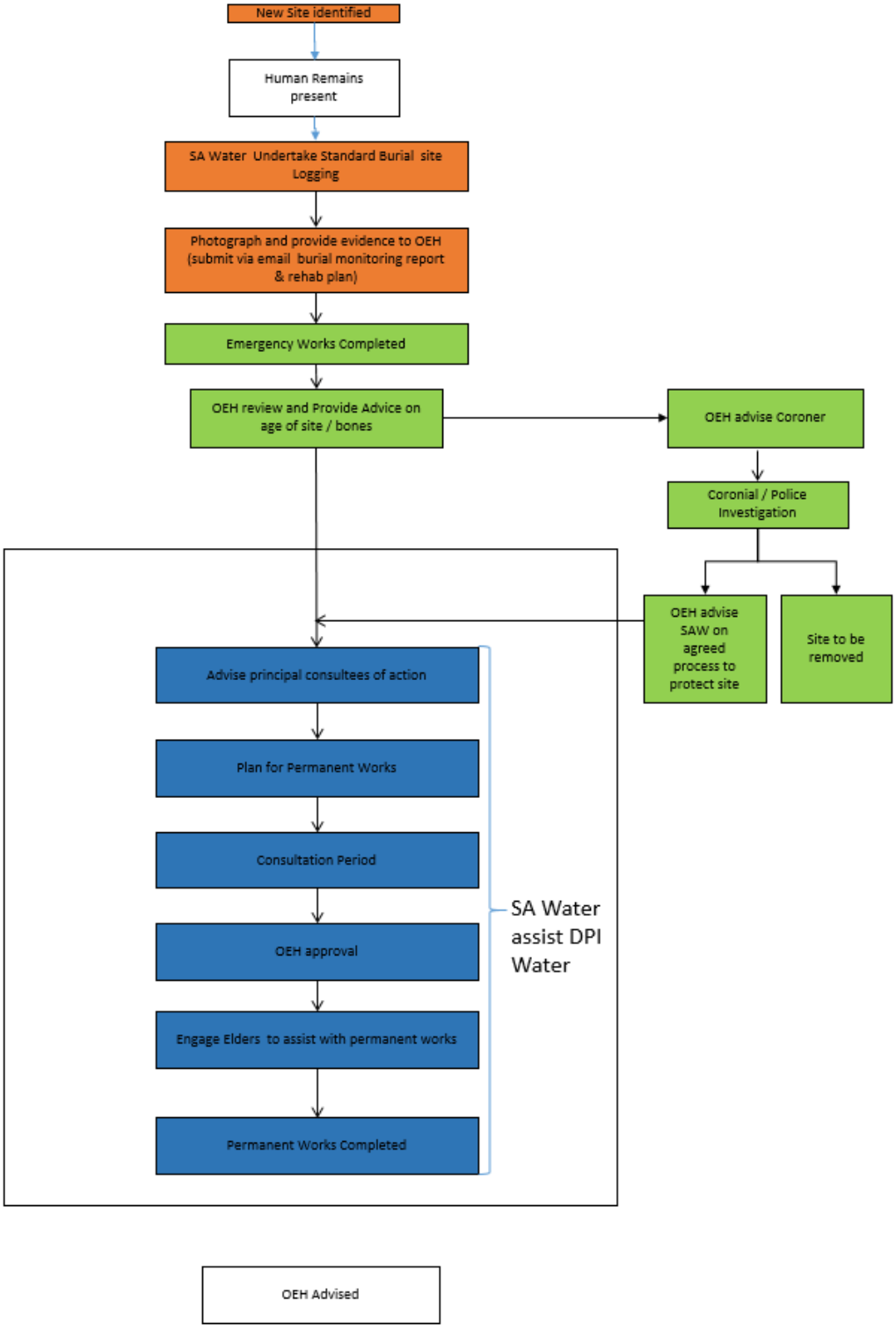

Figure 30 Process for discovery and protection of human remains and burial sites outside of the AHIP.

5.7 Engagement of BMEC for cultural heritage monitoring and management advice at Lake Victoria

This protocol outlines how BMEC and other community members are engaged to provide cultural heritage management advice and undertake cultural heritage work within the AHIP area and on surrounding lands at Lake Victoria.

This protocol exists to:

- guide actions listed within 'Section 4.3 – Conserving cultural heritage', ' Section 4.4 – Monitoring cultural heritage' and 'Section 4.9 – Communicating with the broader community'
- improve communication and understanding between stakeholders about how AHIP conditions 13, 21 and 22 which relate to monitoring and conserving cultural heritage and communicating with the broader community will be achieved.
- ensure communication and understanding between stakeholders about standard required under the *NPWS Act* to ensure that 'due diligence' for cultural heritage protection is achieved

Engagement of BMEC for cultural heritage monitoring

Aboriginal cultural heritage monitors will be engaged to oversee work within the CLPoM at Lake Victoria that has the potential to disturb cultural heritage material such as burial protection construction work, research, fencing and other works relating to protection of cultural heritage as required.

Procedure – engagement of BMEC members for cultural heritage monitoring

If the work has the potential to disturb cultural heritage within the AHIP area, cultural heritage monitors from Barkindji-Maraura Elders Council are to monitor the work.

1. Proponents of an activity will contact the Lake Victoria Operations Coordinator (SA Water) and the Cultural Heritage Team Leader (SA Water) in writing well in advance of the proposed activity to advise of their location, timing and nature including the potential need for monitors.
2. Proposals will be assessed to decide if the activities require the attendance of monitors.
3. Proponents of the work will be advised if monitors are required, and if so, the following staff will also be copied into all further correspondence relating to cultural heritage monitors:

    - Lake Victoria Operations Coordinator (SA Water)
    - Cultural Heritage Team Leader (SA Water)
    - Lake Victoria Program Coordinator (NSW DPIE Water)
    - Lake Victoria Program Support Officer (NSW DPIE Water)

4. If monitors are required, the chosen employment service provider (as of April 2019 this is MADEC Australia, Mildura) will consult with and organise the monitors' site attendance in coordination with NSW DPIE Water on behalf of the party conducting the works. Where possible, a minimum of 7 days' notice is required for each request.
5. The party conducting works must induct the Monitors' to the site and meet their legal responsibility of ensuring that all participants are equipped with the required personal protective equipment (PPE).

The monitoring work will be offered to BMEC members and approved community members based on a rotational basis through the BMEC member list.

For works outside of the AHIP on joint-venture lands, BMEC or other Aboriginal groups (such as Tar-ru) will be approached to undertake works as per Section 5.6 ' Recording and conservation of Aboriginal heritage within the vicinity of Lake Victoria, NSW'.

Payment

The procedure for payment of sitting fees is outlined in Section 5.8 – 'Sitting fees for LVAC members and cultural heritage monitors'.

Procedures – BMEC Annual General Meetings and other meetings

- The NSW DPIE Water Lake Victoria Program team will organise and facilitate up to 5 BMEC meetings per year (4 quarterly and one AGM) in liaison with the BMEC Chairperson and the MDBA.
- Additional meetings must be approved by the MDBA (via NSW DPIE Water Lake Victoria Program team prior to arrangements being undertaken.
- The BMEC and agency members will communicate with NSW DPIE Water Lake Victoria Program team in the first instance over meeting arrangements and facilitation. NSW DPIE Water Lake Victoria Program team will then ensure other parties are notified as appropriate.
- Agenda items will be provided by BMEC members and agency staff to the NSW DPIE Water Lake Victoria Program team, who will then provide the items to the BMEC Chairperson for placement on the agenda.
- Agenda items will consist of Lake Victoria management business.
- The MDBA will be provided a copy of the final BMEC agenda prior to any BMEC meeting being held.
- If staff from the NSW DPIE Water Lake Victoria Program team are not available to arrange meetings, alternate arrangements will be provided by the BMEC Chairperson in association with the MDBA.
- For more information about the BMEC procedures, follow 'Barkindji Maraura Elders Council Membership Rule Book – August 2017'.

Procedures – BMEC involvement in LVAC meetings

- The NSW DPIE Lake Victoria Program team will facilitate BMEC member attendance at three LVAC meetings per year in liaison with the BMEC chairperson and the MDBA.
- The MDBA is fully supportive of the active attendance of proxy members at all meetings.

5.8 Sitting fees for LVAC members and cultural heritage monitors

This protocol contains the policy, process and procedures for the payment of sitting fees and cultural heritage monitoring directly associated with Lake Victoria and joint-venture properties.

This protocol exists so:

- Recipients of sitting fees and the government officials responsible for the management of the payments are clearly informed of the criteria required and under what circumstance sitting fees are remunerated.

Eligibility of sitting fee payment

Eligible recipients of sitting fee payments include members of the BMEC, approved proxy members of the BMEC, landholders and non-BMEC members engaged in cultural heritage monitoring work. The MDBA is fully supportive of the active attendance of proxy members at all meetings; however proxy members will only be entitled to remuneration in the absence of their nominated member.

Eligible activities for sitting fee payment and remuneration rates

Sitting fee payment and travel reimbursement will be paid for the following activities:

- BMEC meetings for up to 20 members and proxy members only in the absence of their representative member.
- LVAC meetings for BMEC members that are nominated at the BMEC meeting prior to the LVAC meeting (up to 14), proxy members present only in the absence of their representative member nominated at BMEC meeting and landholders nominated as LVAC members.
- Cultural heritage monitoring at Lake Victoria and joint-venture managed properties that are pre-arranged with Lake Victoria Cultural Heritage Leader utilizing a rotational roster.

Sitting fee rates are determined by the NSW Premiers Department Guidelines '*Classification and Remuneration Framework for NSW Boards and Committees – Policy and Guidelines*' (see: https://www.psc.nsw.gov.au/legislation-and-policy/nsw-government-boards-and-committees). All sitting fees and travel are paid in amount outstanding and are subject to confirmation by signing the official attendance sheet for both meetings and monitoring.

Timing

As the Agency responsible for payment, MDBA requires sitting fee claims to be submitted by NSW DPIE Water Lake Victoria Program Coordinator or SA Water Cultural Heritage Team Leader **before or on** Tuesday week before the pay run day (which occurs on a Thursday). Any claims that have no supporting documentation for new members (i.e. banking, superannuation and taxation information) at time of submission will not be processed until information is made available.

As the agencies responsible for claim submissions, NSW DPIE Water Lake Victoria Program Coordinator or SA Water Cultural Heritage Team Leader will indicate when payments will be made to individuals who have undertaken works at Lake Victoria.

5.9 The Keeping Place

The Keeping Place houses Aboriginal artefacts of significant cultural value, to aid in the sharing of cultural knowledge for Barkindji and Maraura people with historic ties to the area and their families. The Keeping Place site and infrastructure has been provided by SA Water and NSW DPIE Water on behalf of the MDBA.

The Keeping Place is to provide a structure for use by the BMEC, to house important cultural items that are at risk of harm, and may also house significant materials returned to the BMEC traditional owners from museum and other collections. The Keeping Place is also to serve as a place of education and learning. The Keeping Place is not a museum and is not open to the general public.

This protocol exists so:

- All parties are informed of their roles and responsibilities in managing and using this space for protection, education and sharing of Barkindji and Maraura cultural heritage material.
- Potential users of the Keeping Place know how the Keeping Place can be used.
- Site managers can use the follow process when facilitating access and maintaining the Keeping Place and its buildings including:
    - timeframes and facilitation of access
    - available areas and permitted activities
    - reporting observations and incidents
    - emergencies and workplace health and safety management.
- Any activities at the Keeping Place abide by the requirements established through the Cultural Landscape Plan of Management.

Protection and care of Aboriginal objects in the Keeping Place

All Aboriginal objects that are transferred to the Keeping Place for safekeeping are cared for following the requirements outlined in the Care Agreement C0002346. This outlines the long-term management requirements of the Aboriginal objects collected under the Lake Victoria AHIP as per Section 85A(1)(c) of the *National Parks and Wildlife Act 1974* (NPW Act).

Long-term management of any Aboriginal objects originally collected under the s87 component of previous iterations of the AHIP (e.g. 1981 Kefous Collection and 1997 Hope Collection) will be undertaken in accord with conditions of Care Agreement 000199.

When any Aboriginal Objects are deposited with the BMEC or the Australian Museum, a copy of each of the reports applying to the permit, field notes, site plans, section drawings and relevant photographs, shall be deposited with the Objects.

Access to the Keeping Place

All visits must be with a made in the presence of a Barkindji or Maraura elder with historic ties to the lake, who must be present during the site visit to ensure cultural knowledge sharing and will be responsible for ensuring all protocols are abided by and enforced.

Access is organised by contacting the SA Water Cultural Heritage Team Leader at the Lake Victoria Depot in advance on (03) 5027 8218.

Notification in advance ensures that Keeping Place users are made aware of any safety matters—construction works etc., and allows SA Water staff to schedule in adequate time to unlock site and assess any current safety matters.

Keeping Place users will sign in on arrival at the Lake Victoria Depot. A member of the cultural heritage team will escort the Keeping Place users to the site. The staff member will unlock the facilities and notify users of any relevant safety matters. Keeping Place users will then notify the Lake Victoria depot on their departure.

Part 6: Our management and monitoring techniques – guides

All guides, as updated and amended (following review and support by the Lake Victoria Scientific Review Panel), are available from the MDBA on request.

6.1 Cultural Heritage Monitoring Program at Lake Victoria – Part 3 – ***A guide to rock types, artefacts and sites*** (C. Pardoe & H. Bowman) Murray Darling Basin Authority 2015 (MDBA Trim Ref. D15/899)

6.2 Restoring vegetation at Lake Victoria, A Reference Guide, Murray Darling Basin Authority 2013 (MDBA Trim Ref. D11/2913)

6.3 Lake Victoria Inspection Gully Erosion Advice, (K Laboyrie) NSW Soil Conservation Service 2016 (MDBA Trim Ref. D19/47975)

6.4 River Murray Operations, Operations and Maintenance Manual, Volume 3, ***Burial Protection Management*,** SA Water 2018 (Issued for comment) (MDBA Trim Reference D19/44759)

6.5 River Murray Operations, Operations and Maintenance Manual, Volume 3, **Artefact Monitoring & Management**, SA Water 2018 (Issued for comment) (MDBA Trim Reference D19/44762)

6.6 River Murray Operations, Operations and Maintenance Manual, Volume 3, **Vegetation Management**, SA Water 2015 (Issued for comment) (MDBA Trim Reference D19/44761)

6.7 River Murray Operations, Operations and Maintenance Manual, Volume 3, **Erosion Management,** SA Water 2015 (Issued for comment) (MDBA Trim Reference D19/44763)

6.8 River Murray Operations, Operations and Maintenance Manual, Volume 3, **Feral Fauna Management**, SA Water 2015 (Issued for comment) (MDBA Trim Reference D19/44761)

Part 7: Our reporting

The NSW Department of Planning, Industry and Environment – Biodiversity and Conservation Division (DPIE - BCD) determines if MDBA has satisfactorily complied with the AHIP. To assess compliance, the AHIP requires the MDBA to publish a report annually to be considered by NSW DPIE - BCD that details:

- compliance with the conditions of the AHIP;
- activities relating to the operation of Lake Victoria;
- activities relating to the conservation and management of the cultural landscape at Lake Victoria including a summary of results from all relevant research and monitoring activities undertaken during the year;
- results and recommendations of all monitoring activities conducted at Lake Victoria; and
- any recommended changes to the CLPoM.

The Lake Victoria Annual Compliance Report discusses the abovementioned activities conducted over a full calendar year and is prepared according to the following timetable:

- persons responsible for contributing content for the annual report (Table 4) will provide their contributions to the coordinator of the report by the end of January each year. Further information regarding the Annual Compliance Report responsibilities can be found in the Lake Victoria Annual Compliance Report Responsibilities document.
- the draft report will be collated in February/March with the draft for comment circulated to the LVAC two weeks prior to its next meeting to allow for informed discussion on the draft at the meeting.
- comments from the LVAC will be considered in the final draft which is submitted to the NSW legislative body, NSW DPIE - BCD, by 30 April each year.

The report is then published on the MDBA website by the end of June each year. Hardcopies will also be provided to LVAC members and the Australian Institute of Aboriginal and Torres Strait Islanders Studies, Canberra and the Australian Museum, Sydney once published.

In accordance with Conditions 5, 6 and 7 of the AHIP the Authority must notify DPIE - BCD of changes to the nominated project manager, which will be undertaken as required. It is noted that:

- the MDBA's Executive Director River Management, oversees on behalf of the Authority, all the actions relating to the AHIP and
- Ongoing project management is the responsibility of the MDBA's Director Riparian Program.

Note regarding reporting against AHIP Condition 49:

The MDBA, on behalf of the joint venture governments, is committed to working with landowners of neighbouring properties in relation to the operation and management of Lake Victoria.

Any enduring agreements entered into may be subject to terms and/or conditions and must respect privacy and confidentiality of any such agreement.

The annual compliance report for the AHIP includes an update for this condition, however as it is a public document, the details will be limited, respecting the parties involved.

Table 15 Information required in the Lake Victoria Annual Report and parties responsbile for drafting.

Party Responsible	Information required
Lake Victoria Advisory Committee Chair	**Statement of the Cultural Heritage Conditions for the reporting period at Lake Victoria**
Lake Victoria Program Manager (with assistance from MDBA Riparian Team)	**Snapshot of the reporting period at Lake Victoria** **Advisory and Review group reporting:** • Conditions 13-20: Lake Victoria Advisory Committee, Lake Victoria Working Group and community relations • Conditions 20-23: BMEC meetings and BMEC involvement at Lake Victoria
	Lake Victoria Cultural Landscape Plan of Management reporting: • Conditions 30, 31, 64(b), 68 & 69: Summary of communication with LVAC and broader community • Conditions 32 & 67: Summary of access to Lake Victoria • Conditions 21-23: Aboriginal employment and Aboriginal community consultation in regards to cultural heritage work (for any NSW DPIE Water work) • Condition 37: Summary of managing non-native fauna (outside the AHIP area on joint-venture lands).
Cultural Heritage Team Leader	**Lake Victoria Cultural Landscape Plan of Management reporting:** • Conditions 21-23: Aboriginal employment and Aboriginal community consultation in regards to cultural heritage work (for SA Water work) • Condition 34, 39, 56 and 76: Summary of cultural heritage protection and disturbance monitoring implementation (within the AHIP) • Conditions 34& 48: Summary of changes, updates and status of Aboriginal Cultural Information Database (ACID) (within the AHIP), and quarterly cross-checking and updating in AHIMS. • Condition 36: Summary of weed management on the lakeshore (within the AHIP area)

Party Responsible	Information required
	• Condition 37: Summary of non-native fauna management (within the AHIP area)
	Section 87 Permit to Salvage reporting: • Conditions 73-75: Summary of salvage of Aboriginal objects under this AHIP or repatriation of Aboriginal objects. • Condition 64: Notice to cease or restrict salvage activities • Condition 60: Notification of fieldwork
Director Riparian Program	**Advisory and review group conditions:** • Conditions 24-26: Summary of Lake Victoria Scientific Review Panel activities • Conditions 40: Summary of research activities undertaken at the Lake
	Lake Victoria Cultural Landscape Plan of Management reporting: • Condition 35, 72 & 76: Summary of lakeshore stability conservation and monitoring strategy implementation • Condition 36: Summary of native vegetation regeneration, conservation and monitoring strategy implementation • Condition 38: Summary of water quality monitoring for Lake Victoria • Condition 41-44: Summary of lake operations with respect to requirements outlined in the Lake Victoria Operating Strategy
	Impact on areas outside the lake reporting: • Condition 50: Outline steps taken to maintain awareness of regional planning processes. • Condition 51: Summary of groundwater monitoring for surrounding lands. • Conditions 52, 54, 55 &72: Summary of changes to the cultural heritage and natural heritage inventory • Conditions 52, 54 & 72: Summary of impact of salinization on fauna and faunal habitat (if any)

Party Responsible	Information required
	• Condition 63: Outline any variation to conditions within the AHIP. • Conditions 5, 62: Outline that suitably skilled staff continue to be employed to undertake works for the AHIP. • Conditions 65 & 66: Outline whether access for officer of DPIE - BCD to Lake Victoria was maintained.
	Administrative, general and notification reporting: • Condition 1-2 & 64: Commencement, duration and revocation of the AHIP • Condition 3: Summary of lake operations (proposed works) • Condition 4: Outline the steps taken to ensure that the MDBA was responsible for the compliance with the AHIP • Condition 5, 6 & 7: the Authority must notify DPIE- BCD of changes to the nominated project manager, which will be undertaken as required.. • Conditions 45-57: Annual reporting • Conditions 58-59: Indemnity and release
Non-reportable conditions	Conditions 48-51, 55, 58-60, 63-67, 71, 76

Glossary

Aboriginal Cultural Heritage Database (ACID) – a collection of information and data pertaining specifically to cultural heritage at Lake Victoria, which is to be controlled and used by the Barkindji Elders Council and SA Water Corporation to assist the Aboriginal community and field staff protect the cultural landscape and to transfer knowledge to younger generations.

AHD – Australian Height Datum – the datum used for the determination of elevations in Australia. The determination used a national network of bench marks and tide gauges, and set mean sea level as zero elevation.

AIATSIS – Australian Institute of Aboriginal and Torres Strait Islander Studies.

Amenity purposes – for the purpose of being pleasant and comfortable.

Artefact - any object made, modified, or used by people.

Australian Natural Heritage Charter – The Charter is a distillation of 'best practice' conservation principles for Australia, based on the consensus of a broad range of experts and aims to assist everyone with an interest in natural places to establish their natural heritage values and manage them.

BMEC – Barkindji-Maraura Elders Council.

Belt transects (also see transects, cross shore profiles) – this is similar to a line transect method of monitoring but includes information on abundance as well as presence or absence of species. It may be considered as a widening of the line transect to form a continuous belt, or series of quadrants.

Biodiversity - biodiversity is the variation of life forms within a given ecosystem, biome or for the entire Earth. Biodiversity is often used as a measure of the health of biological systems.

Cross shore profiles – (also refer to transect) monitoring lines that dissect the shoreline, with one end located close to the water and the other end at the end of a straight line further away from the shoreline.

Cultural Landscape – A cultural landscape is a physical area with natural features modified by human activity resulting in patterns of evidence layered in the landscape. These layers give a place its distinctive spatial, historical, aesthetic, symbolic and memorable character. Within cultural landscapes there are areas where human impact is more obvious. These places '…may include components, contents, spaces and views'.

Best practice management – proven activities or processes that have been successfully used by multiple organisations to conserve the environment.

Dilution flows – in the Lake Victoria context it implies water flows that are used to improve water quality by mixing better quality water with lesser, and usually relates to reducing salinity levels via this mixing process.

Dynamics of the Lakeshore – in the Lake Victoria context it refers to the effects of forces (eg wind and waves) on the motion of objects such as cultural objects and sediments.

Environmental Impact Statement – whenever government takes a major action significantly affecting the quality of the human and natural environment, it must first consider the environmental impact in a document called an Environmental Impact Statement (EIS).

Environmental amenity – (See also `Amenity purposes'), but in this place it refers to

comfort provided by environmental values such as large and shady trees.

Exclusion zone – a restricted area which may or may not be fenced off.

Foreshore – the part of the shore between the ordinary high water mark and the low water mark.

Full capacity or full supply level (FSL) – when Lake Victoria's water level is held at 27 metres AHD.

Geodiversity - the diversity of minerals, rocks (whether 'solid' or 'drift'), fossils, soils, land forms and geological processes that constitute the topography, landscape and the underlying structure of the Earth.

Geology - the science and study of the solid matter that constitutes the Earth.

Geomorphology - the study of landforms, including their origin and evolution, and the processes that shape them.

Geotextile – an artificially produced non biodegradable material/mat that is used to provide protection from erosion, and to help establish vegetative cover. It is also referred to as geofabric.

GPS - the Global Positioning System is the only fully functional Global Navigation Satellite System. GPS has become a widely used aid to navigation worldwide, and is used for map-making, land surveying, commerce, and scientific uses.

Groundwater discharge – where an underground `aquifer' or water body meets the upper surface of the ground.

Holocene - geologic time following the Pleistocene Epoch, from the present to about 10 to 12 thousand years ago.

Hydrogeology - hydro- meaning water, and -geology meaning the study of the Earth, is the part of hydrology that deals with the distribution and movement of groundwater in the soil and rocks of the Earth's crust, (commonly in aquifers).

In situ – remaining in the original place.

Inlet regulator – an engineering structure located on Frenchmans Creek, which is used to control water flow into Lake Victoria from the River Murray via the creek.

Intellectual property rights – an umbrella term for various legal entitlements which attach to certain names, written and recorded media, and inventions. The holders of these legal entitlements may exercise various exclusive rights in relation to the subject matter of the IP. The term' intellectual property' reflects the idea that this subject matter is the product of the mind or the intellect. The term implies that intellectual works are analogous to physical property.

Inventory – in the Lake Victoria context, it is a list of the natural and resource values.

Littoral zone - the littoral zone is defined as the area between the high water and low water levels.

LVAC – Lake Victoria Advisory Committee.

Lake Victoria Cultural Landscape Plan of Management (the Plan, or CLPoM) – terminology used to describe this document.

LVOS (also refer to Operating Strategy) – Lake Victoria Operating Strategy.

Lunette – a broad, low-lying, typically crescent- shaped mound of sandy or clayey sediments that is formed by the wind on the leeward side of a lake basin.

Midden – `deposits of shells from meals of shell fish'.

Monitoring plot – an identified and established area that is periodically monitored to collect new data for assessment of change/ status of variables studied, such as vegetation.

Murray Darling Basin Agreement, 1992 - The Murray-Darling Basin Agreement replaced the earlier River Murray Waters Agreement which had been in place since 1915. The Murray Darling Basin Agreement provides the process and substance for the integrated management of the Murray-Darling Basin.

Palaeosols – a former soil preserved by burial underneath sediments.

Pest animal – an animal, whether introduced or native that in sufficient numbers can cause major economic, environmental and social impacts, and therefore needs to be controlled.

Photo points and photo monitoring – a point in the landscape from which photographs are taken to record change in the landscape over time.

Physical processes – the result of forces in the environment that cause change to the landscape such as wind, waves and water.

Piezometer - a small diameter water well used to measure the hydraulic head of groundwater in aquifers.

Pleistocene – on the geologic timescale it is the time period that spans from 1.8 million to ~10,000 years ago.

Post-regulation – the period of time after the 1920's when engineering works such as regulators and levee banks were used to artificially control water flow, and the Lake environs became known as the Lake Victoria storage.

Regulation – refers to the creation of artificial structures along the River Murray and at Lake Victoria to artificially regulate River Murray Water flows for conservation of water to be used for urban, industrial and agricultural use.

Regulator – a structure designed to hold back water, which is located within the Frenchmans Creek causeway on the southern side of Lake Victoria.

Repatriate – admit or receive back an object or remains into the country.

Scientific Review Panel – the panel consists of a group of scientists who are qualified in various areas of natural resource management, who have been engaged by the MDBA to undertake peer review of the monitoring programs at Lake Victoria under the auspices of the Lake Victoria Advisory Committee.

Riverine – the environment associated with a river or creek.

River Murray Operations (RMO) – a river operations management team who manage from Lock 9 downstream, and who are based in Berri, South Australia.

River Murray Water (RMW) – a statutory organisation within the Murray Darling Basin Commission structure.

SA Water – South Australian Water Corporation.

Salinisation – the build-up of salt within the soil.

Sand sausage – in the Lake Victoria context this refers to an engineering works consisting of a tube of geotextile filled with sand and positioned along the south eastern foreshore of the Lake to offer protection from the impacts of wave and wind action.

Section 90 Consent – a consent to `destroy, deface or damage an Aboriginal object' under section 90 of the *National Parks and Wildlife Act 1974.*

Section 87 Permit – a permit to disturb objects under the section 87 of the *National Parks and Wildlife Act 1974.*

Sediment - any particulate matter that can be transported by fluid flow, and which eventually is deposited as a layer of solid particles.

Scar tree – a tree with a scar caused by the removal of a sheet of bark by Aboriginal people for use in the making of canoes, for shelters, serving food and for swaddling babies.

Stratigraphy and stratified old soils - the layered deposits in archaeological sites and natural sediments that are buried over time, forming strata.

The Living Murray project (TLM) - which was established in 2002 in response to evidence that the health of the River Murray is in decline. The TLM first stage focuses on improving the environment at six `icon' sites along the river.

Transects – a transect is a path along which one records and counts occurrences of the phenomenon of study (e.g. plants).

Lake Victoria Operating Strategy (LVOS) – a strategy which describes how the water storage function of Lake Victoria shall be managed in order to achieve the objectives of the S.90 Consent; and in particular, to encourage regeneration of native vegetation to protect cultural heritage, while at the same time allowing for water storage objectives. The Strategy forms a component of the LVCLPoM.

NSW DPIE - Water – NSW Department of Planning, Industry and Environment – Water

NSW DPIE – BCD – NSW Department of Planning, Industry and Environment – Biodiversity and Conservation Division

OEH – NSW Office of Environment and Heritage, now known as NSW DPIE – BCD.

Outlet regulator – a regulator used to control the flow of water from Lake Victoria into the Rufus River at the point where the river channel leaves the lakebed in the south western corner of the Lake.

Understorey – the structural layer below the upper storey of a vegetation community and above the ground layer. It is likely to be made up of shrubs, tree seedlings, low trees, grasses, other herbs, vines, ferns and mosses.

Historically undisturbed sediments (HUS) – a deposited layer of solid particles that have not been disturbed since the time of deposition.

Water entitlement – a fixed right for a share of the total valley resource. A percentage of this entitlement is allocated annually pending on water availability.

Woodland – biologically, a woodland is a treed area differentiated from a forest. In these terms, a forest has a largely-closed canopy; the branches and foliage of trees interlock overhead to provide extensive and nearly continuous shade. A woodland, on the other hand, allows sunlight to penetrate between the trees, limiting shade.

Works procedures – specification of a series of actions, acts or operations which have to be executed in the same manner to obtain the desired result, such as the successful protection of burial mounds and weed control action.

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SA Water 2017, SA Water Stretch Reconciliation Action Plan 2017-2020, SA Water, Adelaide.

Appendices

Lake Victoria Aboriginal Heritage Impact Permit (variation) 4th August 2015

Variation of Aboriginal Heritage Impact Permit

National Parks and Wildlife Act 1974

Office of Environment & Heritage

Your reference:	D15/60527
Our reference:	AHIMS No. 2471/C0000772
Notice number:	C0001221
Contact:	John Gilding 02 6966 8112

Murray Darling Basin Authority
GPO Box 1801
CANBERRA ACT 2601

NOTICE OF VARIATION OF ABORIGINAL HERITAGE IMPACT PERMIT NO. 2471

Issued pursuant to section 90D(5) *National Parks and Wildlife Act 1974* (NPW Act)

BACKGROUND

A. Murray Darling Basin Authority (the applicant) applied to the Office of Environment and Heritage (OEH) to vary Aboriginal Heritage Impact Permit No. 2471 (the AHIP) granted under section 90D of the NPW Act. The AHIP authorises the carrying out of Harm to Aboriginal Objects.

B. OEH received the application on 10th July 2015.

C. OEH has considered the matters set out in section 90K of the NPW Act.

VARIATION OF ABORIGINAL HERITAGE IMPACT PERMIT

1. OEH has decided to grant this variation. By this notice OEH varies AHIP No. 2471.
2. The new variation instrument is presented as Attachment A.
3. You must provide a copy of this AHIP variation notice to each Registered Aboriginal Party referenced in AHIP number 2471, within 14 days.

P.E

.....

Peter Ewin

Senior Team Leader Planning

Albury

(by Delegation)

Date: 4th August 2015

INFORMATION ABOUT THIS VARIATION NOTICE

- Details provided in this notice will be available on OEH's Public Register in accordance with section 188F of the NPW Act.

- You should read this Variation Notice carefully and ensure that you continue to comply with **all** conditions of AHIP 2471 issued on 4th August 2006, **as amended** by this Variation Notice. The format of this Variation Notice requires that it must be read in conjunction with the original AHIP.

When this notice begins to operate

- The variations to the AHIP specified in this notice begin to operate immediately from the date of this Variation Notice, unless another date is specified in this notice.

Variation of this notice

- This Variation Notice may only be varied by subsequent notices issued by OEH.

Appeals against this decision

- You can appeal against this decision to the Land and Environment Court. The deadline for lodging the appeal is 21 days after the date that this notice was issued.

ATTACHMENT A: LAKE VICTORIA AHIP VARIATION INSTRUMENT 2015

Variation of Aboriginal Heritage Impact Permit

National Parks and Wildlife Act 1974

NSW GOVERNMENT | Office of Environment & Heritage

Your reference: D14/4902
Our reference: AHIMS No. 2471 /EF14/6637
Notice number: C0001221
Contact: John Gilding 02 6966 8112

Murray Darling Basin Authority
GPO Box 1801
CANBERRA
ACT 2601

APPENDIX A

CONTENTS

DICTIONARY

In this AHIP, unless the contrary is indicated, the terms below have the following meanings:

24.5 metres, 27 metres	and other heights referred to in these conditions are elevations above the Australian Height Datum.
Aboriginal object	has the same meaning as in the Act.
ACID	means the Aboriginal Cultural Information Database. A database managed by SA Water on behalf of the MDBA to record the location, condition and other characteristics of cultural heritage sites and artefacts around Lake Victoria.
Act	means the *National Parks and Wildlife Act 1974* (NSW).
Agreement	means the Murray-Darling Basin Agreement 2008.
AHIMS	means the Aboriginal Heritage Information Management System maintained by OEH, as defined in s.90Q of the Act.
AHIP	means Aboriginal Heritage Impact Permit.
AHIP holder	means the entity or person listed on the cover page under the heading AHIP issued to.
Application	means the completed application form and all other documents in written or electronic form which accompanied the application when it was lodged or which were subsequently submitted in support of the application.
Annual Compliance Report	means the report prepared pursuant to section 'Annual Reporting'.
BMEC	means the Barkindji-Maraura Elders Council. BMEC is a group in its own right, whose members are Barkindji and Maraura people who are descendants of Lake Victoria Aboriginal people, or have an interest in and historic ties to the Lake Victoria area. The BMEC forms the basis of the Barkindji and Maraura representation on the LVAC and provides a link to the broader Barkindji and Maraura community to communicate information about what is happening at Lake Victoria, as well as providing informed advice to the LVAC and the MDBA.
Burra Charter	means The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance, 2013.
Chief Executive	means the Chief Executive, Office of Environment and Heritage (NSW).
CLPoM	means the Lake Victoria Cultural Landscape Plan of Management. A plan required under this AHIP that provides the detailed actions needed to deliver the AHIP.
cultural heritage significance	means aesthetic, historic, scientific or social value for past, present or future generations (as described in the Burra Charter).

Cultural landscape	means the combination of the cultural and natural aspects of the landscape that contribute to the significance of an area. Cultural and natural aspects can include; cultural sites and places and natural habitat and landforms.
DPI Water	means NSW Department of Primary Industry Water. DPI Water performs roles in land management and community liaison at Lake Victoria.
EP & A Act	means the *Environmental Planning and Assessment Act 1979* (NSW).
Harm	has the same meaning as in the Act. In relation to Aboriginal objects, harm means the movement, damage, defacement and/or destruction of Aboriginal objects. In relation to an Aboriginal place, harm means the damage, defacement and/or destruction of the Aboriginal place.
fauna	means any mammal, bird, reptile or amphibian.
flora	means any plant.
full supply level	means the water being held in Lake Victoria at a height of 27 metres.
Human remains	means Aboriginal ancestral human remains.
Lakeshore	means the bed of the Lake below 27 metres elevation and above the current water level in the Lake.
Land	means the land described under the heading Schedule B.
LVAC	means the Lake Victoria Advisory Committee. The LVAC provides advice to the MDBA, partner government agencies and relevant stakeholders about the management of Lake Victoria in accordance with the AHIP.
LVOS	means the Lake Victoria Operating Strategy (2002). Published by the Murray Darling Basin Commission (LVOS, ISBN 1 876830 36 0). The LVOS describes how the water storage function of Lake Victoria shall be managed in order to achieve the objectives of the AHIP.
MDBA	means the Murray-Darling Basin Authority. A Federal Government agency with responsibilities including managing and directing the operation of the River Murray Assets.
native	describes flora or fauna refers to those species that occur naturally in the local area of Lake Victoria.
Natural heritage significance	means the importance of ecosystems, biological diversity and geodiversity for their existence value, or for present or future generations in terms of their scientific, social, aesthetic and life-support value (as referred to in the Australian Natural Heritage Charter).
NP & W Act	means the *National Parks and Wildlife Act 1974* (NSW).
Objects	means any archaeological relic or remains associated with prior Aboriginal occupation.
OEH	means the Office of Environment and Heritage within the Department of Planning and Environment (NSW).
OEH office	means the office listed on the cover page of this AHIP.
priority areas	means those areas identified as having the highest priority for protection

	by revegetation and/or other means in the Cultural Landscape Plan of Management.
Proposed works	means the works described under the heading Proposed Works in this AHIP.
Public register	means the public register established under s.188F of the Act, that contains details of AHIPs issued by the Chief Executive, OEH as described under the heading Information about this AHIP.
Registered Aboriginal Parties	means the Registered Aboriginal Parties listed in the application.
SA Water	means the South Australia Water Corporation, the agency responsible for the operation and management of Lake Victoria and cultural heritage management within the land to which this AHIP applies, under direction from the MDBA.
Scientific Review Panel (SRP)	means the research and recommendations committee comprised of members of a variety of scientific disciplines relevant to Lake operation and environmental management at Lake Victoria.
supply channels(also referred to as delivery channel)	means Frenchmans Creek downstream of the Inlet Regulator to the Lake, and the Rufus River between the Lake and the Murray River.
Tar-Ru	means the traditional Aboriginal name for Lake Victoria (recognised with various spellings including Taroo and Taru).
the Activity	means as follows: operating the Lake including diverting water into the Lake up to a maximum of the Full Supply Level and drawing it down, and including the use of its supply and delivery channels.
the Lake	means Lake Victoria, and refers to the water in the Lake itself and the Lake bed, up to the height of 27 metres. This includes any exposed area of the Lakeshore below 27 metres, regardless of the water level at the time.
threatened species	is as defined in the TSC Act.
TSC Act	is the *Threatened Species Conservation Act 1995* (NSW).

A. PURPOSE

A permit and consent under Part 6 of the *National Parks and Wildlife Act* 1974 (NP&W Act) are required because the operation of Lake Victoria causes damage, destruction or defacement of Aboriginal objects located in the vicinity of Lake Victoria. An AHIP under the NP&W Act is required to allow for the disturbance and excavation of land where Aboriginal burials are exposed and are then to be salvaged. The AHIP granted by the Chief Executive of the NSW Office of Environment and Heritage (OEH) under section 90D(5) of the NP&W Act, replaces the s90 Consent and s87 Permit issued in 1998. The consent was also revised in 2002 and 2006. At the expiry of the most recent AHIP in 2014 an interim AHIP variation was approved to allow appropriate time for negotiation and approval of this variation between stakeholders.

The 2015 variation to AHIP 2471 have been prepared following consideration of issues arising from the implementation of the previous consent and also carries forward, in a similar form and consistent with legislative amendments, conditions from previous related AHIPs. The conditions have been determined after consideration of the application and related supporting material and extensive consultation with a range of stakeholders, including the local Barkindji and Maraura community with an interest in, and historic ties to, the Lake. The conditions provide detailed measures for the protection and management of the Aboriginal cultural heritage in the Lake Victoria area.

The objectives for the management of Lake Victoria are to balance the cultural, spiritual, economic and environmental values of the Lake. This will be continued through investigations, operational actions, implementation of on-ground works, and community involvement in management to improve the environment of Lake Victoria.

The Murray Darling Basin Authority (MDBA) will minimise disturbance of Aboriginal objects and impacts on the environment to the greatest extent possible through appropriate operation of the Lake and management of the landscape. Implementation of the conditions of previous AHIPs by MDBA and its agents have led to better conservation land management practices at the Lake and has improved environmental outcomes.

The purpose of this consent and permit is to protect Aboriginal cultural heritage inclusive of environmental values as a complete cultural landscape recognised as significant. To this end, the Conditions under which the MDBA will continue to operate Lake Victoria as a major water storage, are focused on:

- Maintaining the formal role of the Aboriginal community in decision-making about the protection and management of their heritage at Lake Victoria through participation in the Lake Victoria Advisory Committee (LVAC). Wherever possible, conservation and protection works will be undertaken by members of the local Aboriginal community,
- Maintaining a communications strategy which actively involves the Aboriginal community whom have historic and traditional ties to the Lake, and wider community interests including adjacent land owners and water users who benefit from the water supply provided form the Lake,
- Implementing the Cultural Landscape Plan of Management (CLPoM), which recognises the cultural significance of the Lake Victoria environment. The plan provides for work to be

undertaken to rehabilitate the natural environment where possible, to minimise further environmental degradation and for continued monitoring and reporting.

- Changed operational practices at Lake Victoria to enable the establishment and maintenance of native vegetation on the foreshore and within the littoral zone where feasible, so as to minimise potential damage to Aboriginal objects or to the foreshore of the Lake as an Aboriginal site.
- Providing for the continued security of supply to water users in the Murray-Darling Basin that results from operating the Lake as a water storage, and
- Recognising that the MDBA will continue to operate and manage the Lake in accordance with the relevant NSW legislation and the *Murray-Darling Basin Agreement* 1992 (Schedule 1 of the *Water Act* 2007).

B. BACKGROUND

The AHIP pertains to the area of Lake Victoria (Tar-ru), which is of exceptionally high spiritual and cultural significance to the Barkindji and Maraura Aboriginal people. The same area has been covered by an AHIP (previously a S90 Consent and S87 Permit) since 1998. The original AHIP was revised and reissued in 2002, 2006 and again in 2014.

Lake Victoria is a key water storage in the River Murray System managed by the Murray-Darling Basin Authority (MDBA) on behalf of the Commonwealth Government and the Governments of South Australia (SA), New South Wales (NSW) and Victoria (VIC) in accordance with the *Murray-Darling Basin Agreement* 2008 (the Agreement). An AHIP is required because the MDBA acknowledges that the operation of the Lake can cause harm to Aboriginal objects. Further background information on the significance of the area and previous AHIPs can be found below.

The importance of Lake Victoria

Lake Victoria, traditionally known as Tar-ru, is of exceptionally high spiritual and cultural significance to the Barkindji and Maraura people. There is extensive evidence of Aboriginal occupation at Lake Victoria spanning the past 18,000 years through the presence of large numbers of Aboriginal objects including burials, middens, fireplaces, scarred trees and stone artefacts. These sites and the natural landscape of the Lake and its environs are important components of the spiritual and cultural significance of Lake Victoria.

Lake Victoria now consists of substantial water storage infrastructure including a system of regulators, channels and levees. This infrastructure, originally constructed in the 1920's, allows water to be diverted into the Lake from the River Murray via Frenchmans Creek and released from the Lake back to the River Murray via the Rufus River. Lake Victoria plays a critical role in the conservation and management of water resources in the Murray-Darling Basin and provides significant socio-economic benefits to communities throughout the Murray Valley, including NSW, Victoria and South Australia.

The initial requirement for an AHIP (Section 90 consent and Section 87 permit)

The applicant recognises the significance of the Lake to the Barkindji and Maraura people and acknowledges there is potential for the operation of the Lake to cause damage to Aboriginal objects. Operation of the Lake can exacerbate foreshore erosion which may damage the Lake

environment and Aboriginal objects. Due to the need to continue the operation of Lake Victoria as a water storage, the then Murray-Darling Basin Commission (MDBC) applied to the Director-General of the NSW National Parks and Wildlife Service in April 1998 for a consent to destroy, deface or damage an Aboriginal object under Section 90 of the National Parks and Wildlife Act, 1974, as well as a permit to disturb objects under Section 87 of the Act. A consent and permit were granted on 28 August 1998 and the consent was subsequently amended on 27 May 2002, following review by appeal.

In support of the initial application, the MDBC prepared an Environmental Impact Statement (EIS), titled, *Lake Victoria – Finding the Balance*, February 1998. The EIS identified that the continuing operation of the Lake as a water storage had significant impacts upon the Aboriginal cultural heritage and the environment in and around the Lake. The EIS identified further that, together with the regulation of the River Murray, the operation of Lake Victoria has also had an adverse impact on the surrounding environment, particularly the floodplain east of the Lake. The main impacts have included waterlogging caused by constant inundation and land salinisation caused by rising groundwater. The information contained in the EIS remains relevant to the determination of this AHIP.

The EIS also identified that decommissioning the Lake as a water storage would have significant detrimental environmental impacts. The Lake would be expected to become a groundwater discharge area, resulting in salinisation of the bed of the Lake and surrounding areas. This would significantly and adversely impact upon the ecology of the Lake, any Aboriginal objects located on the lakebed and the water quality of the River Murray downstream of the Rufus River. Any objects, particularly any unidentified and unprotected human remains, may be at risk from damage to a greater extent than would occur under an operating regime which includes regular and periodic inundation.

In reaching a decision on the continued operation and management of Lake Victoria as a water storage, the Director-General (now the Chief Executive) considered the need for conservation and protection of the natural environment of Lake Victoria and its surrounds. The Director-General also considered the substantial ongoing social and economic benefits provided to communities throughout the Murray Valley by appropriate water conservation and supply and the exceptionally high spiritual and cultural significance of the Lake to the Barkindji and Maraura people.

In 2006 a S90 Consent and a S87 Permit was issued to the MDBC to continue operation of Lake Victoria as a water storage. Neither the initial original 1998 nor the 2006 S90 Consent application sought permission to destroy, deface or damage (now termed 'harm') any human remains. All known human remains at Lake Victoria have been protected by extensive sand nourishment and protection works conducted in accordance with the S87 Permit. Where it has not been practical to protect human remains in their original locations, the Barkindji and Maraura people have agreed to remove remains and rebury them in the dedicated reburial cemetery established for this purpose. Any currently unknown human remains which may be identified in the future will continue to be protected or removed and reburied with consultation and approval of the Barkindji and Maraura people.

Community engagement

This AHIP contains conditions for community engagement, and in particular the establishment and maintenance of the Lake Victoria Advisory Committee (LVAC). The management of the Lake will move towards an adaptive approach as further information is collected over time. Relevant information will continue to be considered by the LVAC whose role is to provide advice to the MDBA, partner government agencies and relevant stakeholders about the cultural heritage management of Lake Victoria in accordance with this AHIP.

The LVAC provides a major voice to the Aboriginal community, with representation of Barkindji and Maraura people with an interest in and historic ties to Lake Victoria forming a large part of the committee. The LVAC operates as a partnership between the Aboriginal community, adjacent landholders, government agencies and the MDBA.

The Barkindji Maraura Elders Council (BMEC) is a group in its own right, whose members are Barkindji and Maraura people who are descendants of Lake Victoria Aboriginal people, or have an interest in and historic ties to the Lake Victoria area. The BMEC provides a two-way conduit between the broader Barkindji and Maraura community and the LVAC to distribute information about management activities at Lake Victoria and providing informed advice to the LVAC and the MDBA about community views.

The Barkindji-Maraura community, the wider community, adjacent landholders and government agencies all have a strong interest in the activities conducted by the MDBA in accordance with this AHIP. Regular communication on these activities is provided through the LVAC meetings and in an Annual Compliance Report produced annually.

Communication with the LVAC requires a broad exchange of information and concepts to achieve a shared understanding of issues. This involves communication of a diverse range of information, dealing with cultural matters, scientific research and monitoring and reporting on physical works. Emphasis is placed on effectively communicating within the group, recognising the complexity of some of the information and the differing backgrounds of each member.

The Cultural Landscape Plan of Management

This AHIP contains conditions for a Cultural Landscape Plan of Management (CLPoM) that outlines monitoring programs, strategies and actions to minimise impacts to the cultural landscape at the Lake. The term "Cultural Landscape" refers to the combination of the cultural and natural aspects to the significance of an area.

The CLPoM was published in May 2002 and subsequently revised in 2007. The CLPoM operates within an adaptive management framework, ensuring information from monitoring programs and research guides future cultural heritage management in accordance with nationally accepted best practice cultural heritage management principles. The CLPoM provides the detailed actions needed to deliver this protection. It is intended to be a dynamic document with the LVAC regularly reviewing the CLPoM to improve its content based on the experience, and a better understanding gained over time.

The CLPoM includes strategies for Aboriginal employment, cultural heritage conservation and monitoring, human remains conservation, communication, access, fauna management, lakeshore vegetation and monitoring, lakeshore stability conservation and monitoring, and salinity monitoring.

Lake Victoria Operating Strategy

This AHIP contains conditions that require a Lake Victoria Operating Strategy (LVOS). The LVOS was approved by the Director General (now Chief Executive) in 2002 and prescribes how the water storage function of Lake Victoria shall be managed. The purpose of the LVOS is to achieve the objectives of the AHIP and the CLPoM to minimise, to the greatest extent possible, disturbance of Aboriginal objects through operation of the Lake and management of the landscape.

The early operation of the Lake has demonstrated a capacity for damage to shoreline vegetation through water logging and erosion, where prolonged high water levels are maintained within the Lake. To address this the MDBC developed the LVOS for Lake Victoria which balances the competing objectives of water supply versus the drying cycle required for survival of native vegetation that assists in protecting cultural heritage. In particular, the LVOS reduces the period during which the Lake is held at full capacity. The LVOS allows some flexibility during drought or flood periods or where unforeseen circumstances occur such as failures of major infrastructure.

Monitoring

This AHIP contains conditions for monitoring. Since the commencement of the initial S90 Consent and S87 Permit in 1998, a greater understanding of the cultural landscape of Lake Victoria has been achieved through management, monitoring and reporting requirements. Detailed monitoring between 1998 and 2013 indicates that overall, shoreline vegetation has increased and that shoreline sediment erosion and deposition rates have remained relatively stable over time, except for parts of the eastern foreshore. Based on consideration of this information, the OEH believes that Lake Victoria may continue to be operated as a major water conservation and storage facility while minimising potential damage to Aboriginal objects and to the foreshore of the Lake. This should be achieved by continuing the actions of managing erosion through the re-establishment and maintenance of vegetation together with strategic management of Lake water levels in accord with the LVOS to stabilise the surface of the foreshores of the Lake. The establishment of the native vegetation on the foreshore and littoral zone has contributed to the restoration of the natural values of the Lake and constitutes more appropriate management of the Lake as a significant place to Barkindji and Maraura people.

Areas outside the AHIP

Impacts on Areas outside of the Lake

Under the responsibilities conferred by the EP&A Act, the Chief Executive must take into account all the impacts of the activity. This AHIP is issued to cover the impacts of the activity of the operation of Lake Victoria on Aboriginal objects at the locations described in "Schedule B". However, together with the regulation of the River Murray, operation of Lake Victoria impacts the landscape outside of the AHIP area, primarily to the east of the Lake. Potential impacts outside of the AHIP area contributed to by the operation of Lake Victoria include threatened species habitat, modification to groundwater movement and increased salinisation of land and groundwater. As such there are some conditions in this AHIP that refer to land outside of the AHIP boundary.

Salinisation of the land east of the Lake has been the subject of investigation by Government agencies for many years. These studies have concluded that salinisation has been a key factor affecting the environment in the region, including the viability of some properties. In 2014 MDBA

commenced to update these studies with a focus on a groundwater review, a landscape assessment and an assessment of the financial consequences of salinisation on affected landholders to the east of Lake Victoria and adjacent to Frenchmans Creek.

Variation of Aboriginal Heritage Impact Permit

National Parks and Wildlife Act 1974

NSW GOVERNMENT | Office of Environment & Heritage

C. INSTRUMENT

AHIP IN RESPECT OF ABORIGINAL OBJECTS

Background

An application has been made to the Chief Executive of the Office of Environment and Heritage by:

Murray-Darling Basin Authority

Level 4, 51 Allara Street

Canberra City, ACT 2601

For consent pursuant to section 90 of the National Parks and Wildlife Act 1974 to destroy, damage and deface certain Aboriginal objects in the course of the operation of Lake Victoria and for a permit pursuant to section 87 of the said Act to allow the disturbance and excavation of land; and the disturbance and movement of certain Aboriginal objects which are to be salvaged.

Consent given and permit issued subject to conditions

I, Gary Whytcross, have considered the environmental impact of the activity the subject of the application and

(a) give CONSENT for the purposes of section 90 of the said Act to destroy, damage and deface certain Aboriginal objects which are located at the land specified in Schedule B, and

(b) issue a PERMIT under section 87 of the said Act for the disturbance and excavation of land described in Schedule B and the disturbance and movement of certain Aboriginal objects on that land for the purposes of salvage,

to the said applicant, subject to the conditions specified below.

Gary Whytcross

Director South Branch

Environment Protection and Regulation Division

Department of Environment and Conservation

By delegation

Schedule A:

Description of Aboriginal objects covered by the section 90 consent

Shell middens, stone artefacts, scarred trees and fireplaces including faunal materials associated with these features.

Description of Aboriginal objects covered by the section 87 permit

Shell middens, stone artefacts, scarred trees and fireplaces including faunal materials associated with these features. Aboriginal burials and human remains requiring protection in accordance with section E.

Schedule B: Land to which this AHIP applies

1. Lake Victoria below 27m AHD; and
2. the cliffed shoreline between 27m AHD and 30m AHD; and
3. the section of Frenchmans Creek from the Inlet Regulator to Lake Victoria which is inundated at 27m AHD; and
4. the Rufus River channel and cliffed banks between the River Murray and the Outlet Regulator.

As illustrated in the map at Attachment A.

Administrative Conditions

Commencement and duration

Condition 1. Unless otherwise revoked in writing, this AHIP remains in force until 4th August 2020.

Condition 2. There will be on-going assessment of the operation of the Lake throughout the term of the AHIP. In the lead up to the expiry of this AHIP, the MDBA and the OEH will review the continuing operation and management of Lake Victoria in accordance with the Act, the Agreement and other relevant legislation in consultation with the Aboriginal people and the community.

Proposed Works

Condition 3. The proposed works to which this AHIP applies are as follows; the operation of Lake Victoria in accordance with the Agreement, including;

(a) diverting water into the Lake up to a maximum of the 'Full Supply Level'; and

(b) drawing the Lake down; and

(c) the use of its supply and delivery channels.

Responsibility for compliance with the conditions of AHIP

Condition 4. The AHIP holder must ensure that all persons involved in actions or works covered by this AHIP (whether employees, contractors, sub-contractors, agents or invitees) are made aware of and comply with the conditions of this AHIP.

Project manager to oversee the actions relating to this AHIP

Condition 5. A suitably qualified and experienced individual must be appointed as a project manager who is responsible for overseeing, for and on behalf of the AHIP holder, all the actions relating to this AHIP.

Condition 6. The individual appointed as project manager must be the project manager nominated in the application form

Condition 7. If an alternative to the nominated project manager is appointed, OEH must be notified of their contact details within 14 days of this appointment.

Certain Aboriginal objects must not be harmed

Condition 8. All human remains in, on or under the land must not be harmed, other than any human remains identified as requiring protection, as identified in Part E (S87 Permit).

Condition 9. To ensure that the Aboriginal objects described in Schedule A are not harmed, the Lake Victoria Cultural Landscape Plan of Management (CLPoM) and the Lake Victoria Operating Strategy (LVOS) must be implemented and complied with.

Certain Aboriginal objects may only be moved

Condition 10. The Aboriginal objects within the AHIP area may be moved.

Condition 11. The movement of these Aboriginal objects must be carried out in accordance with the s87 Permit and CLPoM.

Condition 12. The excavation and collection of the Aboriginal remains within the area identified in Schedule B may only be carried out where in situ protection cannot be applied. The excavation and collection must be undertaken in accordance with the s87 permit and CLPoM.

D. SECTION 90 CONSENT CONDITIONS PERTAINING TO THE OPERATION OF LAKE VICTORIA

Advisory and Review Group Conditions

Lake Victoria Advisory Committee (LVAC)

Condition 13. The MDBA will maintain and resource the Lake Victoria Advisory Committee (LVAC) to;

(a) provide advice to the MDBA, partner government agencies and relevant stakeholders on matters concerning the operation of Lake Victoria relating to the protection and management of cultural heritage at Lake Victoria in accordance with this AHIP;

(b) provide a major voice for Barkindji and Maraura people who are descendants of Lake Victoria Aboriginal people, or have an interest in and historic ties to Lake Victoria; and

(c) provide for representation from neighbouring landholders, government agencies, and the broader community.

Condition 14. Membership of the LVAC will consist of representatives from the following stakeholders;

(a) one independent Chairperson and one independent Deputy Chairperson. One of these positions is to be held by a person with professional cultural heritage management experience;

(b) Aboriginal member groups:

(i) Barkindji and Maraura people who are descendants of Lake Victoria Aboriginal people, or have an interest in and historic ties to the Lake Victoria area;

(ii) one representative from the Dareton Local Aboriginal Land Council; and

(iii) one representative from the NSW Aboriginal Land Council;

(c) local landholders;

(d) Western Local Land Services;

(e) irrigators;

(f) government agencies including:

(i) MDBA;

(ii) SA Water;

(iii) DPI Water; and

(iv) OEH.

Condition 15. The MDBA will oversee the membership of the LVAC. LVAC stakeholder groups will nominate representative appointments to the MDBA. The MDBA will consider any recommendation by the LVAC to appoint additional members to the LVAC as either full members or as observers.

Condition 16. The LVAC may make recommendations to the Chief Executive of the OEH to alter the composition of the LVAC.

Condition 17. The MDBA will ensure that an appropriate number of LVAC meetings are convened each year as defined by the Terms of Reference. The LVAC may appoint subcommittees to deal with business out of session. Whenever possible, the MDBA will arrange for meetings to be held at Lake Victoria.

Condition 18. A LVAC quorum shall consist of half the total number of members plus one, of which a majority of members present are to be from Aboriginal member groups described in condition 14b.

Condition 19. The MDBA will:

(a) maintain and review annually with the LVAC, the LVAC Terms of Reference; and

(b) adequately resource the LVAC to undertake the requirements of this AHIP. The MDBA will be guided as to remuneration of sitting fees to members, by the NSW Public Service Commission rates contained in *"Classification and Remuneration Framework for NSW Government Boards and Committees"*.

Condition 20. When communicating with the LVAC and the Aboriginal community, the MDBA will ensure;

(a) all necessary information about an issue, including appropriate technical advice, is provided in an understandable form;

(b) a reasonable time is allowed for full consideration of the issue and the background information;

(c) reasonable opportunity is provided for LVAC members to ask questions or clarify matters about which they are unsure, including access to technical experts;

(d) reasonable time is allowed for Aboriginal member groups to consult with the wider Aboriginal community; and

(e) support and facilities are provided for meaningful consultation.

Barkindji-Maraura Elders Council (BMEC)

Condition 21. The MDBA will consult with the local Aboriginal community through the BMEC regarding the appropriate management of Aboriginal cultural heritage at Lake Victoria, prior to commencement of this work and all works with the potential to harm Aboriginal cultural heritage.

Condition 22. The MDBA will resource and facilitate meetings of the BMEC when they are considering issues relating to Lake Victoria to ensure;

(a) Aboriginal people are consulted and involved in works with the potential to harm cultural heritage and management of cultural heritage at Lake Victoria;

(b) key cultural, social and economic aspirations and traditions of the Barkindji and Maraura people are considered;

(c) an appropriate number of BMEC meetings are convened each year to ensure issues from the BMEC meetings are tabled and discussed at LVAC meetings;

(d) The BMEC can participate in activities associated with the requirements of this AHIP.

Condition 23. The MDBA will be guided as to remuneration of any sitting fees to members, by the NSW Public Service Commission rates contained in "Classification and Remuneration Framework for NSW Government *Boards and Committees*".

Scientific Review Panel (SRP)

Condition 24. The MDBA will establish and maintain a Scientific Review Panel (SRP) that provides technical advice to the LVAC including;

(a) requests to undertake research at Lake Victoria;

(b) identification of relevant research needs;

(c) reviewing as requested, relevant monitoring and research;

(i) rationales,

(ii) objectives,

(iii) methods,

(iv) interpretation,

(v) recommendations; and

(vi) conclusions.

(d) application and implementation of research and monitoring outcomes; and

(e) scientific and technical matters regarding the current and future management of Lake Victoria.

Condition 25. The SRP will be chaired by an MDBA representative. Considering advice from the LVAC and the SRP, the MDBA will appoint SRP members with collective expertise and experience in;

(a) Aboriginal cultural heritage significance, management and protection;

(b) wetland ecology (vegetation);

(c) geomorphology;

(d) hydrogeology; and

(e) natural resource management.

Condition 26. The MDBA will ensure that an appropriate number of SRP meetings are convened annually and will provide appropriate administrative support for these meetings and may seek other expertise as required.

Lake Victoria Cultural Landscape Plan of Management (CLPoM) Conditions

General

Condition 27. The MDBA will continue to maintain and implement the CLPoM (ISBN 978-1-921257-78-0), or approved revisions thereof. The CLPoM will contain strategies and actions needed to deliver this AHIP.

Condition 28. The CLPoM will:

(a) be in accord with the Burra Charter;

(b) operate within an adaptive management framework, ensuring information provided by the LVAC, monitoring programs and research guides future management of the cultural landscape;

(c) ensure that the LVAC is consulted on the operation and review of the CLPoM;

(d) apply to all of the area described in "Schedule B: Area to which this AHIP applies";

(e) recognise that the management of Lake Victoria is part of a broader range of land and water management planning processes;

(f) provide all necessary information about an issue, including appropriate technical advice, in an understandable form; and

(g) recognise and address the need for a balance between competing values, as well as regional and inter-generational equity and ecologically sustainable development principles.

Condition 29. Any revisions to the CLPoM must be referred to LVAC for comment and approved by the Chief Executive prior to implementation.

Strategies

Communication

Condition 30. The CLPoM will contain a communication strategy that ensures communication of the significance and management of Lake Victoria's cultural heritage with the community. This strategy will also provide methods to share Aboriginal cultural heritage information with the community (following BMEC approval). This includes dissemination of the Annual Compliance Report to the Australian Institute of Aboriginal and Torres Strait Islander Studies, Canberra.

Condition 31. The MDBA shall consider funding the Memorial Day activities as part of the communication strategy of the CLPoM.

Access

Condition 32. The CLPoM will contain an access strategy that will increase the protection of cultural heritage material from accidental or intentional damage or loss. The strategy will also manage unnecessary disturbance and minimise intrusion on neighbouring properties.

Aboriginal Employment

Condition 33. The CLPoM will contain an Aboriginal employment protocol for Lake Victoria. The Protocol will ensure that works related to the management of cultural heritage and the cultural landscape are undertaken by Barkindji and/or Maraura people where possible. The Protocol must be in accordance with the relevant agency procurement and employment requirements.

Cultural Heritage Conservation

Condition 34. The CLPoM will contain a cultural heritage conservation and monitoring strategy for Lake Victoria that includes;

(a) an Aboriginal Cultural Information Database (ACID) that will;

(i) record location, description, condition and AHIMS status of burials and other known cultural heritage within the AHIP area;

(ii) be made available to the BMEC;

(b) cross-checking and updating of information in the ACID to the AHIMS;

(c) management actions to address the potential impact of factors such as erosion and salinity on cultural heritage; and

(d) a program to maintain burial protection works.

Lakeshore stability

Condition 35. The CLPoM will contain a lakeshore stability conservation and monitoring strategy for Lake Victoria that will;

(a) identify and prioritise areas for minimising erosion; and

(b) reduce erosion in priority areas.

Native vegetation regeneration

Condition 36. The CLPoM will contain a lakeshore vegetation conservation and monitoring strategy for Lake Victoria that will;

(a) identify and prioritise areas for retention, enhancement and reestablishment of native vegetation; and

(b) promote native vegetation retention, enhancement and reestablishment in priority areas.

Non-native fauna

Condition 37. The CLPoM will contain a non-native faunal management and monitoring strategy for Lake Victoria that includes strategies for identifying and managing negative impacts of non-native fauna on the cultural landscape.

Water Quality

Condition 38. The CLPoM will require the continuation of water salinity monitoring at Lake Victoria. Water quality within the Lake will continue to be managed as a part of the broader Basin water management strategies.

Human Remains

Condition 39. The CLPoM will contain a protocol for responding to the discovery and/or harm of any human remains in, on or under the land that includes:

(a) causing no further harm to the remains; and

(b) conducting works to protect and avoid further harm to the remains;

Research

Condition 40. The MDBA, with the advice of the LVAC and the SRP, will ensure that any research undertaken at Lake Victoria is consistent with the CLPoM.

Lake Victoria Operation Conditions

Condition 41. The MDBA will continue to operate Lake Victoria in accordance with the Lake Victoria Operating Strategy (2002) (LVOS, ISBN 1 876830 36 0), or approved revisions thereof.

Condition 42. The LVOS;

(a) must continue to take into account both the use of Lake Victoria as a water supply and the impact of this use on the cultural landscape;

(b) must remain compatible with the CLPoM and this AHIP;

(c) must be implemented for the life of this AHIP;

(d) may be reviewed and updated at any time by agreement between MDBA and OEH with advice from the LVAC; and

(e) must recognise and address the need for a balance between competing values, as well as regional and inter-generational equity and ecologically sustainable development principles.

Condition 43. Any revisions to the LVOS must be approved by the Chief Executive prior to implementation.

Condition 44. The MDBA will notify the LVAC, the Chairperson of the BMEC and the Chief Executive as soon as reasonably practical if the MDBA plans to deviate from the LVOS. Temporary deviation from the LVOS is only permissible;

(a) if it is consistent with the CLPoM and this AHIP, or

(b) if it is required in an emergency situation or for significant maintenance or upgrading of the Lake Victoria regulating structures or embankments; or

(c) under extreme environmental conditions outside of the range forecast in the LVOS, such as a very large flood event, or an extended drought; or

(d) if required to achieve downstream environmental outcomes, provided that the proposed operation is not detrimental to lakeshore vegetation or the cultural heritage.

Notification and Reporting Conditions

Annual Reporting

Condition 45. The MDBA will provide a Lake Victoria AHIP Compliance Report to the Chief Executive for approval by the end of 30 April each year.

Condition 46. Each Lake Victoria AHIP Compliance Report will cover a full calendar year and will be reviewed by the LVAC prior to submission to the Chief Executive. Following approval by the Chief Executive, the report will be made publicly available and be disseminated to the Australian Institute of Aboriginal and Torres Strait Islander Studies, Canberra.

Condition 47. The AHIP Compliance Report will summarise:

(a) compliance with the conditions of this AHIP;

(b) activities relating to the operation of Lake Victoria;

(c) activities relating to the conservation and management of the cultural landscape at Lake Victoria;

(d) results and recommendations of all monitoring activities conducted at Lake Victoria; and

(e) recommended changes to the CLPoM.

Provision of Aboriginal Site Recording Form

Condition 48. AHIMS register must be updated with new site information for the area authorised by this AHIP, inclusive of

(a) Site registration cards for new sites; and

(b) Aboriginal Site Impact Recording forms.

Impact on Areas Outside of the Lake

Condition 49. The MDBA will conduct a process to quantify the impacts of the operation of Lake Victoria and Frenchmans Creek on neighbouring properties in the interests of achieving an enduring agreement with affected landowners.

Condition 50. The MDBA must maintain awareness of other plans, and any other regional planning or land management processes which may be relevant to the mitigation of any impacts of Lake operation on areas outside Lake Victoria. The MDBA will also share information arising from its own management and monitoring with other relevant land managers. The MDBA should not duplicate the work already underway in these planning processes, but must monitor the work to ensure its completeness. The MDBA must identify

gaps in the monitoring or mitigation of impacts around Lake Victoria, and ensure that these gaps are filled by the preparation and implementation of appropriate strategies.

Condition 51. The MDBA will ensure that groundwater levels around the Lake and its adjacent supply channels will continue to be monitored and that there is ongoing revision of mapping of areas affected by salinity as information from monitoring and modelling indicates changes to groundwater levels in the area. The MDBA must implement appropriate management strategies to prevent or mitigate impacts on the environment resulting from any rise in groundwater, likely to be contributed to by the operation of the Lake and report these in the Annual Compliance Report. Such strategies must include a timeframe for implementation. If approved by the Director-General, these strategies will be implemented by the MDBA.

Condition 52. The MDBA will be responsible for a natural and cultural heritage inventory, including survey for threatened species or objects in the area likely to be adversely impacted upon by salinisation that is likely to be contributed to by the operation of Lake Victoria over the period of this permit and consent. If the revision of the salt effected area indicates a change to this area, then the MDBA will consult with the Chief Executive about whether it is necessary to extend this heritage inventory, and shall do so if the Chief Executive so directs.

Condition 53. If any Aboriginal object found is likely to be damaged, destroyed or defaced by salinisation due to changes to groundwater resulting from the Activity, and that object is not included in the approval granted under this consent, then the MDBA must immediately notify the Chief Executive.

Condition 54. Where salinisation impacts on fauna or faunal habitat, that is likely to be contributed to by the operation of Lake Victoria, then the MDBA will either, where appropriate, implement a strategy, agreed to by the MDBA and Chief Executive to prevent or mitigate the impact of such salinisation or seek an appropriate licence to cover the impact.

General Conditions

Protection of threatened species

Condition 55. In carrying out the Activity the MDBA must not damage any critical habitat, harm or pick any threatened species, population, ecological community or protected fauna, or damage their habitats. The MDBA shall therefore carry out all necessary monitoring to detect any risk of this occurring.

Burials and human remains not included in consent

Condition 56. The consent covers only those objects and areas described in Schedules A and B respectively. Aboriginal burials and loose human bone fragments are not included in this consent but are covered by the associated section 87 permit detailed in Part E.

Aboriginal objects not included in consent

Condition 57. The consent is granted to cover only the operation of Lake Victoria as conditioned by this consent and subject to there not being discovered in the course of this operation any other objects which will be damaged or destroyed by the continuation of the operation. (Destruction of such objects would require the granting of a separate consent).

Indemnity

Condition 58. The AHIP holder agrees to indemnify and keep indemnified, the Crown in right of NSW, the Minister administering the Act, the Chief Executive of OEH, and their employees, agents and contractors, in the absence of any willful misconduct or negligence on their part, from and against all actions, demands, claims, proceedings, losses, damages, costs (including legal costs), charges or expenses suffered or incurred by them resulting from

(a) any damage or destruction to any real or personal property; and

(b) injury suffered or sustained (including death) by any persons arising out of or in connection with any actions undertaken pursuant to this AHIP

Release

Condition 59. The AHIP holder agrees to release to the full extent permitted by law, the Crown in right of NSW, the Minister administering the Act, the Chief Executive of OEH, and their employees, agents and contractors, in the absence of any willful misconduct or negligence on their part, from all suits, actions, demands and claims of every kind resulting from:

(a) any damage or destruction to any real or personal property; and

(b) injury suffered or sustained (including death) by any persons arising from or in connection with any actions undertaken pursuant to this AHIP.

Written Notice

Condition 60. Any requirement to provide written notice to the OEH office in this AHIP may be complied with by;

(a) faxing the notice to the OEH office's fax number; or

(b) sending by registered post to the OEH office's address. The OEH office's contact details are specified at the front of this AHIP; or

(c) sending in electronic form (such as email).

E Conditions applying to this Section 87 Permit to Salvage

Salvage of objects under this permit and consent

Condition 61. This permit enables the salvage of Aboriginal objects in the circumstances described below. The salvage work is to be carried out by the Lake Victoria Cultural Heritage Manager and individuals or contractors under his/her direct supervision. The MDBA shall be responsible for the manner in which any work covered by this permit is performed.

Condition 62. All agents, employees, contractors and staff of the MDBA who are engaged to perform work under this permit shall be suitably skilled or possess suitable expertise for the work they are engaged to conduct. All activities must have adequate skilled supervision to allow the work to be conducted in an appropriate professional manner.

Condition 63. The terms and conditions of this permit may be varied at any time at the discretion of the Chief Executive.

Condition 64. This permit may be revoked at any time at the discretion of the Chief Executive. In the event of this permit being revoked -

(a) the Person to whom the permit was issued shall

i. leave the areas, the subject of that permit, in a condition satisfactory to the OEH within two weeks from the date of revocation of that permit;

ii. furnish the OEH within six months from the date of revocation of the permit, a full report on the work completed at the date of revocation. Such a report shall include a complete list of any material recovered;

iii. within six months from the date of revocation of a permit deposit any Aboriginal Objects removed during work associated with the permit, together with a copy of all field records, in a place determined by the Barkindji and Maraura Elders Council of the Lake Victoria Advisory Committee or, if they so wish, at The Australian Museum or at another place designated by the Museum.

(b) OEH, the Australian Museum and the LVAC shall have the right to use and authorise the use of information collected under the permit.

Condition 65. The Act provides for officers to have access to premises when undertaking their duties. Officers will be conscious of the agreed protocols in relation to access to the Lake as contained in the CLPoM, and comply with these requirements.

Condition 66. An officer of the OEH, acting on the authority of the Chief Executive, may at any time examine work done or any objects recovered under this permit.

Condition 67. This permit does not in itself give authority to enter or work on freehold land or leased Crown Land.

Condition 68. Upon publication of any information relating to work done under this permit, a copy of such publication(s) shall be forwarded to the OEH, the LVAC, and the Australian Institute of Aboriginal and Torres Strait Islander Studies, Canberra, unless permission to do otherwise has been obtained from the OEH.

Condition 69. The OEH and The Australian Museum may supply copies of relevant reports as furnished by the holder of the permit to local Aboriginal communities. Upon request by the OEH, the holder of this permit shall supply a summary of his/her findings with photographs, diagrams, etc., as required, to local Aboriginal communities or other local interest groups.

Condition 70. The holder of this permit shall notify the relevant Archaeologist of the OEH and the BMEC at the commencement and completion of fieldwork including monitoring, and shall supply to those persons details of field work programs and results. When any new object is discovered, the MDBA shall notify OEH as soon as possible, in accord with section 91 of the National Parks and Wildlife Act.

Condition 71. The granting of this permit does not excuse the MDBA from any obligation to obtain any authorisation required under any other Act to carry out any part of the activity.

Condition 72. In carrying out the Activity MDBA must not damage any critical habitat, harm or pick any threatened species, population, ecological community or protected fauna, or damage their habitats. The MDBA shall therefore carry out all necessary monitoring to detect any risk of this occurring.

Condition 73. Any Aboriginal Objects that are recovered under the section 87 permit and are not reburied, being the property of the Crown, shall be returned to the control and custody of the BMEC, at or before a period of two years from the date of recovery of the Objects. The Objects may be dealt with in accordance with any reasonable direction from this group. Should this group not wish to accept control and custody of the said Objects they shall be deposited at The Australian Museum, in accordance with adopted procedures for the deposition of Aboriginal Objects as prescribed by The Australian Museum, at or before a period of two years from the date of recovery of the Objects. Information about deposition requirements can be obtained from the Aboriginal Collections Manager, Division of Anthropology, The Australian Museum, on (02) 9320 6410.

Condition 74. At the same time that any Aboriginal Objects are deposited with the BMEC or the Australian Museum, a copy of each of the reports referred to below applying to the permit, field notes, site plans, section drawings and relevant photographs, shall be deposited with the Objects.

Condition 75. The holder of the permit shall furnish the OEH with a final report at the completion of the salvage work or expiry of the permit or any renewal thereof, or as specified in the guidelines, whichever occurs first. Such a report shall include:

(a) a complete list of all material recovered;

(b) a detailed description of the methods of excavation/collection and analysis used;

(c) a detailed plan of the site, including the location of collection areas, all trenches, auger holes and spoil heaps;

(d) summary of consultation undertaken with relevant Local Aboriginal Land Councils or relevant Aboriginal Community Groups; and

(e) any other records or materials, relevant to the permit, as requested by the Chief Executive, including any field notes, site plans, section drawings and relevant photographs.

Actions authorised by this Section 87 Permit

Condition 76. The following actions are permitted for the purposes of section 86(a) of the Act:

(a) monitor locations where Aboriginal burials are exposed in areas of the Lake, cliff faces, the beach and the shoreline and, where possible, provide *in situ* protection.

(b) Salvage collection and reburial of loose human bone fragments that have been revealed by erosion. Following reburial the human remains must be protected by the construction of sand bag mounds, or other methods considered appropriate, to conserve the reburial location and control further erosion in its proximity.

(c) monitor the stability of re-burial sand bag mounds and maintain them as necessary;

(d) monitor erosion/deposition processes along the shoreline with an emphasis on recording the impacts that these processes have on the erosion and redeposition of archaeological materials; and

(e) Salvage collection and reburial of *in situ* burials where the MDBA becomes aware that burial(s) are endangered by on-going erosion, and considers that it cannot be protected *in situ* by any practicable means. In such cases the MDBA will consult the Barkindji and Maraura people about the proposed excavation and re-burial. The MDBA will then notify the OEH, and seek approval for excavation and re-burial. The notification will justify the reasons why the burial cannot be conserved *in situ*, and outline the details of consultation with the Barkindji and Maraura people. The OEH may approve excavation and reburial under this permit on a case by case basis. In considering whether to grant such approval the OEH will consider the viewpoints and any comments expressed by the Barkindji and Maraura people on the Lake Victoria Advisory Committee, and,

The following actions as per section 86(b):

i. the disturbance or movement of those objects listed in Schedule A

ii. the disturbance or movement of burials in accordance with Condition 78 above.

F. CONDITIONS APPLYING TO THE CARE AGREEMENT

Temporary storage of certain Aboriginal objects

Condition 77. Any Aboriginal objects that are removed from the land by actions authorised by this AHIP, must be moved as soon as practicable to the temporary storage location in the table below, pending any agreement reached about the long term management of the Aboriginal objects.

Condition 78. The temporary storage location is as follows:

Location name:	Lake Victoria Barkindji-Maraura Elders Council Keeping Place.
Address:	Lake Victoria Keeping Place, Rufus River Rd, Via Wentworth NSW 2648.
Storage particulars:	Locked in storage room.

Condition 79. Any Aboriginal objects stored at the temporary storage location must not be further harmed, except in accordance with the conditions of this AHIP.

Long term management of certain Aboriginal objects

Condition 80. The long term management of any Aboriginal objects collected under this AHIP will be undertaken in accord with the conditions of Care Agreement C0000199 between the OEH and the Barkindji-Maraura Elders Council (BMEC).

INFORMATION ABOUT THIS AHIP

Public Register

Under section 188F of the Act, the Chief Executive of OEH is required to keep a public register containing the details of each AHIP issued. The details of this AHIP that will be published on the public register are outlined on the front page of this AHIP.

The public register is available online at www.environment.nsw.gov.au

Appeals

Under section 90L of the Act, the AHIP holder may appeal to the Land and Environment Court if they are dissatisfied with any condition of this AHIP. The appeal must be lodged within 21 days of the date this AHIP was issued.

Penalties for breach of the Act or AHIP condition

Significant penalties can be imposed by the Land and Environment Court for harm to an Aboriginal object or Aboriginal Place other than as authorised by a condition of an AHIP, or for a breach of an AHIP condition. OEH can also issue penalty notices for a breach of the Act or AHIP condition.

Responsibility for obtaining all approvals and compliance with applicable laws

The AHIP holder is responsible for obtaining and complying with all approvals necessary to lawfully carry out the work referred to in this AHIP, including but not limited to development consents.

Other relevant provisions of the *National Parks and Wildlife Act*

Newly identified Aboriginal objects must be notified to the Chief Executive of OEH under s.89A of the Act using the form available online at www.environment.nsw.gov.au

Stop work orders, interim protection orders and remediation directions may be issued in certain circumstances to protect Aboriginal objects or places.

Obligation to report Aboriginal remains under Commonwealth laws

The AHIP holder may have additional obligations to report any discovery of Aboriginal remains under the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*.

Exercise of investigation and compliance powers

Officers appointed or authorised under the Act may exercise certain powers and functions, including the power to enter land.

Duration of AHIP

This AHIP remains in force for the period specified in the AHIP.

Variation of AHIP

The AHIP holder may apply to the OEH office for a variation of any conditions of an AHIP, using the AHIP variation application form available online at www.environment.nsw.gov.au. Requests for significant variations must be accompanied by evidence of further consultation with Registered Aboriginal Parties and may include payment of fees.

The conditions of an AHIP may be varied at any time by the Chief Executive of OEH in order to correct a typographical error or to resolve an inconsistency between conditions. The AHIP holder may appeal a decision of the Chief Executive of OEH to vary the conditions of the AHIP.

Consent and Permit not transferable

The AHIP holder (MDBA) may not apply to transfer this AHIP. This section 90 consent and section 87 permit are not transferable.

Surrender of AHIP

The AHIP holder may apply to surrender this AHIP by using the AHIP surrender application form available online at www.environment.nsw.gov.au. The surrender must be approved by the Chief Executive of OEH and may be subject to conditions.

Suspension and revocation of AHIP

An AHIP may be suspended or revoked at any time at the discretion of the Chief Executive of OEH. Prior to suspending or revoking the AHIP, the AHIP holder will be given notice and an opportunity to make submissions. The AHIP holder will be notified in writing of the final decision. The AHIP holder may appeal a decision to revoke the AHIP.

Entry to land

An AHIP does not automatically entitle its holder to enter land for the purpose of conducting work related to the AHIP. The AHIP holder is responsible for obtaining permission to enter land from the owner and/or occupier of the land.

Disclosure of information pursuant to lawful requirement

This AHIP does not prevent the disclosure of any information or document in OEH's possession in accordance with any lawful requirement.

Making copies of reports

By providing a report, the AHIP holder acknowledges that OEH can use the information in that report to inform its regulatory functions, note details of that report in AHIMS and include a copy of the report in its library which may be available to members of the public.

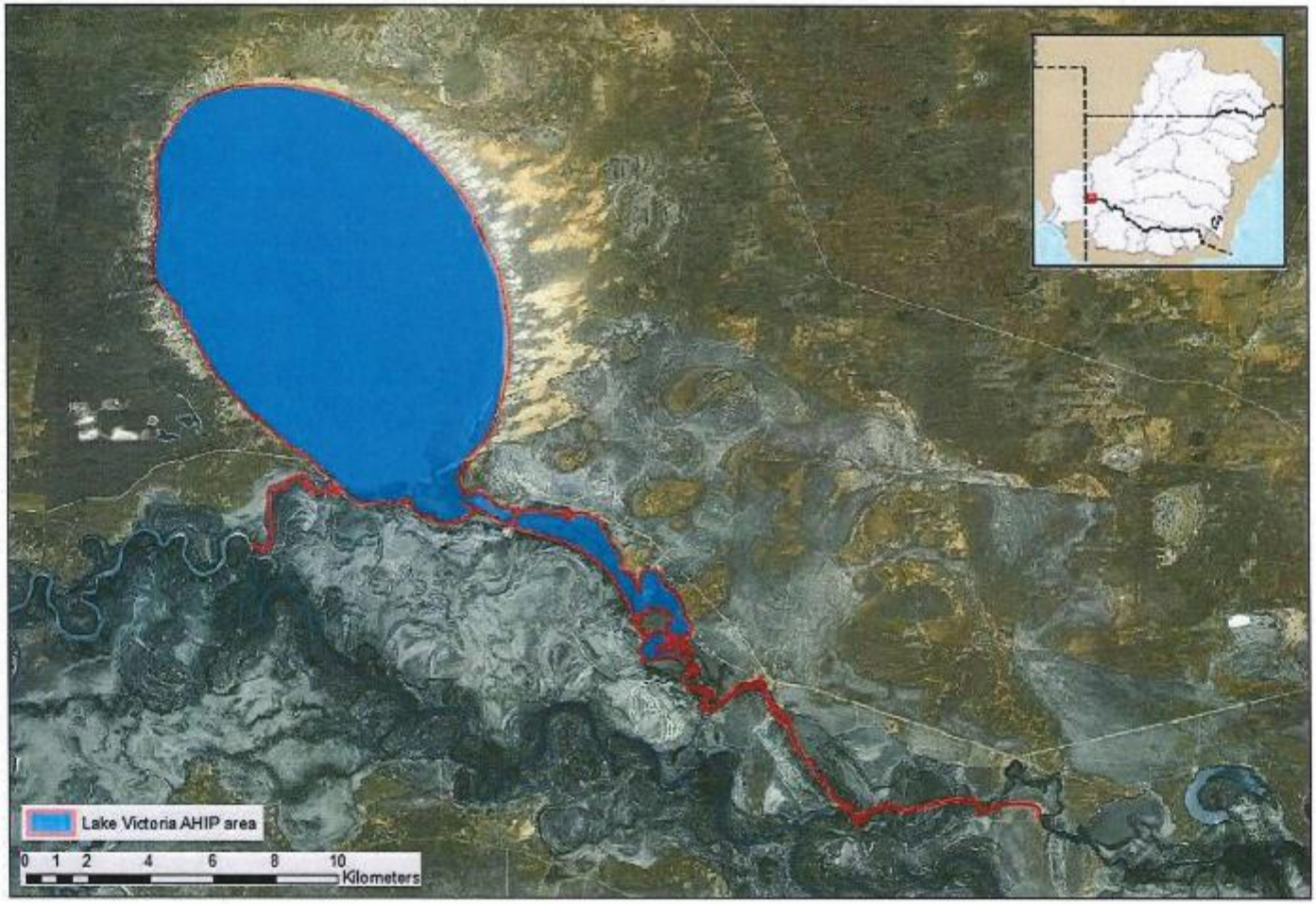
OEH is able to make copies of any reports provided to OEH under this AHIP.

Variation of Aboriginal Heritage Impact Permit

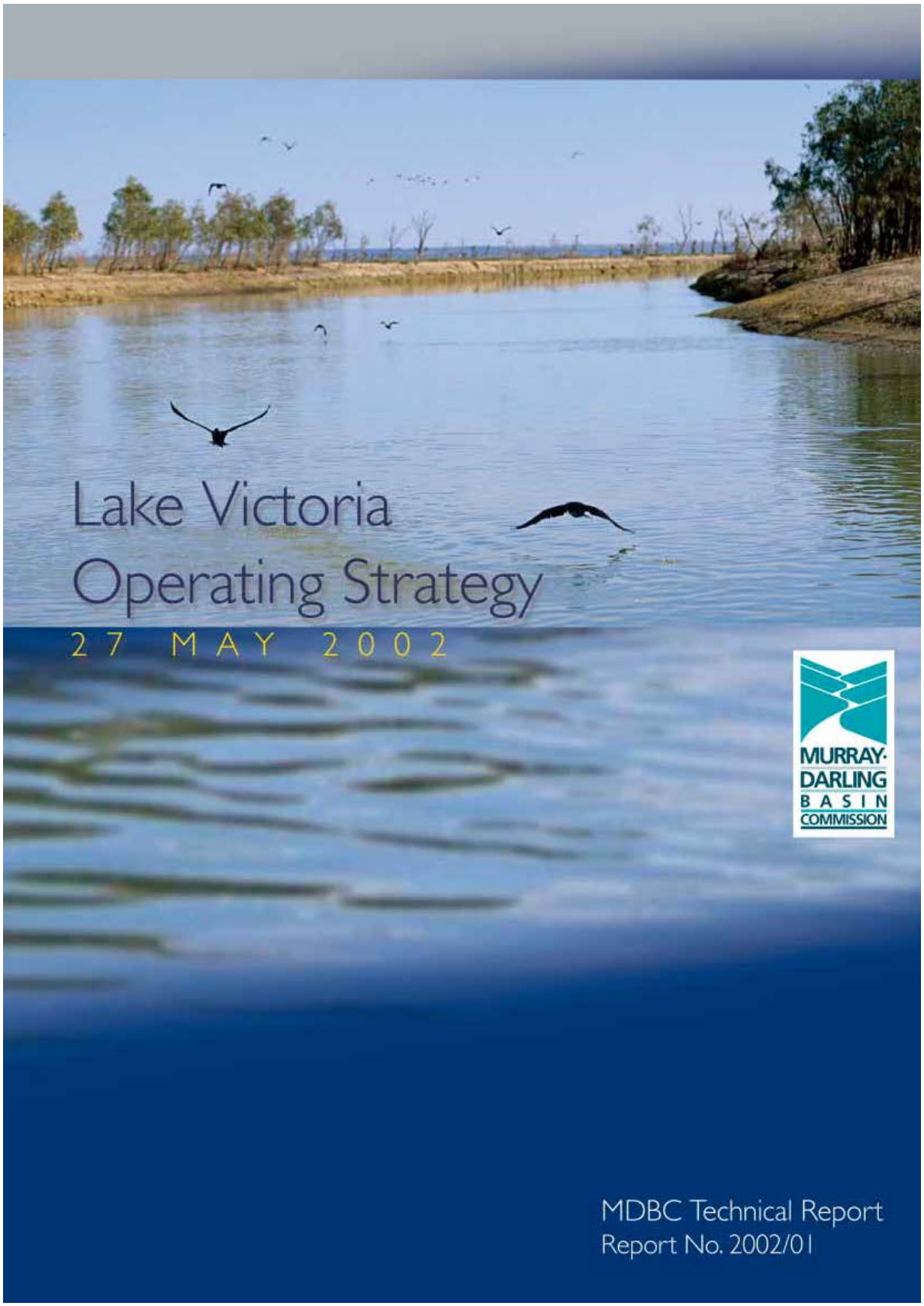
National Parks and Wildlife Act 1974

NSW GOVERNMENT | Office of Environment & Heritage

ATTACHMENT A: MAP OF CONSENT AREA



Lake Victoria Operating Strategy, 2002



Integrated catchment management in the Murray–Darling Basin

A process through which people can develop a vision, agree on shared values and behaviours, make informed decisions and act together to manage the natural resources of their catchment: their decisions on the use of land, water and other environmental resources are made by considering the effect of that use on all those resources and on all people within the catchment.

Our values

We agree to work together, and ensure that our behaviour reflects the following values.

Courage

- We will take a visionary approach, provide leadership and be prepared to make difficult decisions.

Inclusiveness

- We will build relationships based on trust and sharing, considering the needs of future generations, and working together in a true partnership.
- We will engage all partners, including Indigenous communities, and ensure that partners have the capacity to be fully engaged.

Commitment

- We will act with passion and decisiveness, taking the long-term view and aiming for stability in decision-making.
- We will take a Basin perspective and a non-partisan approach to Basin management.

Respect and honesty

- We will respect different views, respect each other and acknowledge the reality of each other's situation.
- We will act with integrity, openness and honesty, be fair and credible, and share knowledge and information.
- We will use resources equitably and respect the environment.

Flexibility

- We will accept reform where it is needed, be willing to change, and continuously improve our actions through a learning approach.

Practicability

- We will choose practicable, long-term outcomes and select viable solutions to achieve these outcomes.

Mutual obligation

- We will share responsibility and accountability, and act responsibly, with fairness and justice.
- We will support each other through necessary change.

Our principles

We agree, in a spirit of partnership, to use the following principles to guide our actions.

Integration

- We will manage catchments holistically; that is, decisions on the use of land, water and other environmental resources are made by considering the effect of that use on all those resources and on all people within the catchment.

Accountability

- We will assign responsibilities and accountabilities.
- We will manage resources wisely, being accountable and reporting to our partners.

Transparency

- We will clarify the outcomes sought.
- We will be open about how to achieve outcomes and what is expected from each partner.

Effectiveness

- We will act to achieve agreed outcomes.
- We will learn from our successes and failures and continuously improve our actions.

Efficiency

- We will maximise the benefits and minimise the costs of actions.

Full accounting

- We will take account of the full range of costs and benefits, including economic, environmental, social and off-site costs and benefits.

Informed decision-making

- We will make decisions at the most appropriate scale.
- We will make decisions on the best available information, and continuously improve knowledge.
- We will support the involvement of Indigenous people in decision-making, understanding the value of this involvement, and respecting the living knowledge of Indigenous people.

Learning approach

- We will learn from our failures and successes.
- We will learn from each other.

Lake Victoria Operating Strategy

27 MAY 2002

(Part of the Lake Victoria Cultural Landscape Plan of Management)

i

MDBC Technical Report
Report No. 2002/01

Lake Victoria Operating Strategy

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Contents

Cover photo: Lake Victoria inlet channel at entrance to Lake Victoria. East Moon Island is on the left, Snake Island on the right. Water level approx EL 23 m. © Peter Solness/Network Photographers.

Versions

Version	Description	Date	Distribution
1.0	First Draft–Investigation Report	28/05/01	For Lake Victoria Project Board Mtg 30/05/01.
2.0	Second Draft–Investigation Report	04/06/01	For Water Liaison Committee and MDBC Lake Victoria Project Team review.
3.0	Third Draft–Investigation Report	08/06/01	For discussion with NPWS. Draft with annotated comments only.
4.0	Fourth Draft–Lake Victoria Operating Strategy	25/02/02	Draft LVOS to Lake Victoria Project Board.
5.0	Final Draft–Lake Victoria Operating Stategy	05/03/02	Final Draft to Murray Darling Basin Commission Meeting #63.
6.0	Lake Victoria Operating Strategy	15/03/02	Submitted to Director General, NPWS for approval. Approved by DG NPWS 27 May 2002.

Acknowledgments

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The Project Board would like to thank Dr Jane Roberts for input and review of the discussion on ecological aspects of the Strategy. In addition, the Project Board would like to thank NPWS staff Terry Korn, John Pickard and Geoff Robertson for their important contribution to the development of the Strategy.

Project Team:

Bruce Campbell	RMW River Management Engineer
Helen Doyle	RMW Lake Victoria Program Manager
Brenton Erdmann	Department for Water Resources SA
Jim Foreman	MDBC Water Resources Modeller
Bryan Harper	RMW Manager Production
Dr Jane Roberts	Ecological Consultant
Dr Wayne Stevenson	Geomorphological Consultant

Note: River Murray Water, an internal business unit of the Murray–Darling Basin Commission, is responsible for the operation, management and renewal of the works of the River Murray and lower Darling system under the Murray–Darling Basin Agreement.

2

Lake Victoria Operating Strategy–May 2002

1. Introduction

Lake Victoria is a naturally occurring shallow freshwater Lake approximately 60 kilometres downstream of the Murray–Darling Junction in south-western New South Wales, close to the South Australian and Victoria borders. Since 1928, Lake Victoria has been operated by the Murray–Darling Basin Commission (MDBC) as a regulated, off-river storage as part of the River Murray system. The other storages in the River Murray system are Hume Dam, Dartmouth Dam and the Menindee Lakes. The South Australian Water Corporation (SA Water) manages Lake Victoria storage, on behalf of the MDBC. SA Water is also responsible for operation of Lake Victoria, under the direction of River Murray Water (RMW), a business unit of the MDBC established to operate and oversee the management of the River Murray system storages in accordance with the Murray–Darling Basin Agreement.

Lake Victoria was an important centre for traditional Aboriginal people, and remains so for associated Aboriginal people today. The cultural heritage of Lake Victoria is recognised as being of exceptionally high significance to Aboriginal people with traditional and historic affiliation to the Lake, but it is also highly significant to the broader Australian community at a national level.

Regulation of the Lake over the last 70 years has contributed to the erosion and exposure of Aboriginal cultural material on the Lakeshore, in particular Aboriginal burial grounds. Since 1994, substantial works have been built to protect all known burials from wave and wind erosion, and an Environmental Impact Statement (EIS) was prepared to support an application under Section 90 (s90) of the NSW National Parks and Wildlife Act (1974) to allow continued disturbance of non-burial Aboriginal relics by regulation of the Lake.

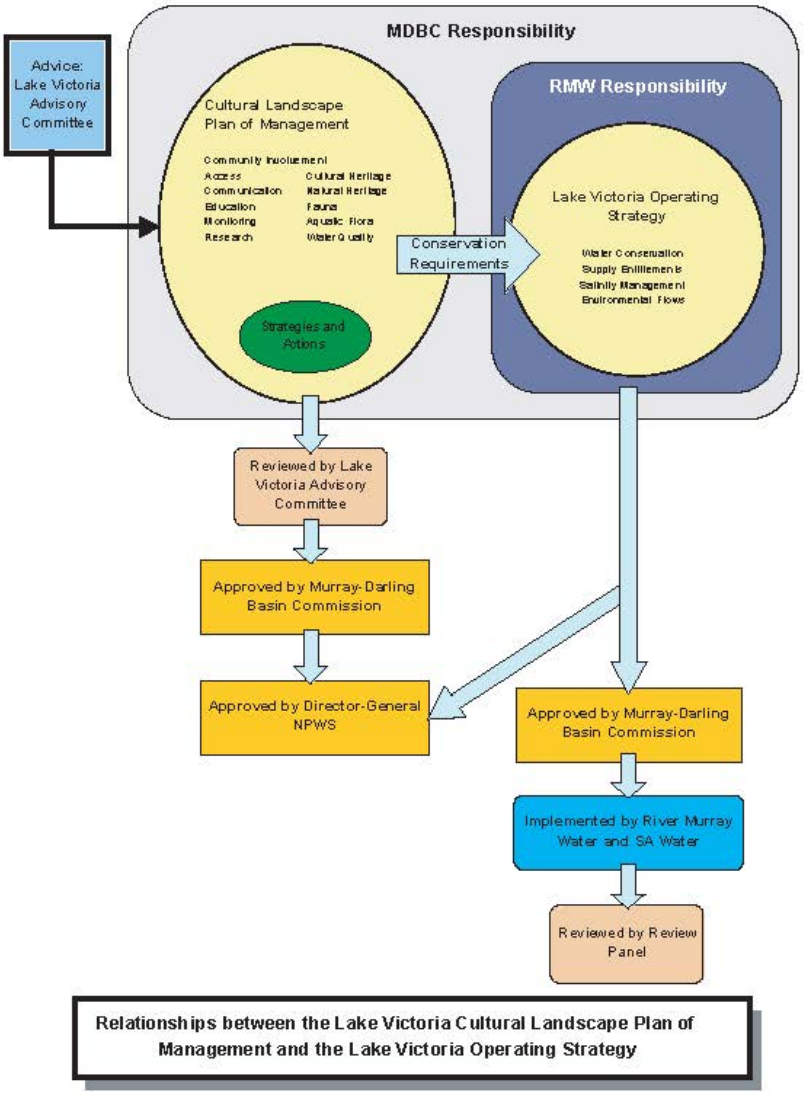
Lake Victoria water storage plays a vital role in the operation of the River Murray system for water supply. The continued operation of Lake Victoria is essential to maintain the water conservation requirement of the River Murray system, and preserve existing security of water entitlements. In addition, in recent years Lake Victoria has been used to enhance small to medium sized floods in the Lower Murray, providing important environmental benefits to wetlands such as the Chowilla Floodplain. This use of Lake Victoria is expected to become more frequent in future.

1.1 Purpose of the Lake Victoria Operating Strategy

The NSW National Parks and Wildlife Service (NPWS) issued an eight-year Section 90 Consent (the s90 Consent) to the MDBC on 27 August 1998, subject to a series of Conditions which are listed in the Lake Victoria Cultural Landscape Plan of Management (CLPM). The s90 Consent has been issued on the basis that disturbance of Aboriginal relics will be minimised to the greatest extent possible through future operation of the Lake and management of the landscape. These Consent Conditions will be implemented through the CLPM.

The Lake Victoria Operating Strategy (LVOS) forms a component of the CLPM, as shown in **Figure 1**. The LVOS describes how the water storage function of Lake Victoria shall be managed in order to achieve the objectives of the s90 Consent.

Figure 1: Relationship between CLPM and LVOS



1.2 Need for Adaptive Management

Operation of the River Murray system storages, including Lake Victoria, has evolved over the past 80 years. The LVOS represents another step in this evolutionary process. Further changes to the management of the River Murray system are expected to occur in future, particularly in response to greater understanding and awareness of environmental impacts caused by regulation of the River Murray.

The LVOS provides the basis for the management of Lake Victoria to achieve the objectives of the s90 Consent, based on current understanding of the threats to Cultural Heritage, and based on current operation of the River Murray system. Assessment of the impacts on the remainder of the River Murray system caused by altered operation of Lake Victoria under the LVOS has concentrated on the availability and security of existing water entitlements, water quality and downstream environmental impacts given current operation of the system as a whole. However, operations such as manipulation of Lake Victoria storage volume to enhance environmental outcomes during flood events will be case specific. This analysis cannot consider every contingency that may arise. Hence, the LVOS provides a degree of flexibility to adapt to unforeseen or unusual circumstances in the short-term. It is inevitable that other significant changes to the management of the River Murray system will occur in the long-term. The relatively short life of the s90 Consent also provides an opportunity to review the LVOS in response to changing circumstances.

1.3 Key Assumptions

The core assumption in the s90 Consent is that vegetation will stabilise the Lake foreshore. Native vegetation indigenous to Lake Victoria is preferred. The two key mechanisms to achieving this goal are (i) removing grazing pressure from the Lake foreshore[1]; and (ii) implementing a hydrologic regime suitable for native indigenous vegetation, compatible with water supply objectives. The LVOS describes the resultant hydrologic regime.

An obvious consequence of the use of Lake Victoria as a water storage is that water levels are elevated compared with those of "natural" conditions, that is those that would have occurred if there were no regulation of flows or diversions from the River Murray system. **However, a key assumption of the LVOS is that a similar pattern of water level variability, in terms of both timing and duration of wetting and drying, will be suitable for native vegetation at a higher elevation than occurred naturally.**

Whilst the LVOS provides a hydrologic regime that is expected to be suitable for certain littoral and riparian plant species, it is likely that geomorphic characteristics of the lake bed such as soil types, slope, and exposure, as well as grazing from native and feral animals may preclude the establishment of or reduce the survival of native vegetation in some areas around the Lake. A detailed assessment of the likelihood of native vegetation successfully colonising distinct areas of the Lake has not been undertaken given the complexity of the system and hence the time and resources required. However, the LVOS aims to meet the underlying requirement of the s90 Consent, particularly in relation to enhanced vegetation. Monitoring of the vegetation and erosion responses on the Lake foreshore is required by the s90 Consent. Periodic review of findings of the monitoring program will identify areas where additional works are required to overcome localised impacts, or where refinement of the LVOS is required.

1. Foreshore – the part of the shore between the ordinary high water mark and low water mark (Macquarie Concise Dictionary). Here this refers to the bed of the Lake that is routinely exposed below EL27 m.

6

Lake Victoria Operating Strategy–May 2002

2. Overview of Operation of Lake Victoria

2.1 Lake Victoria's role in the River Murray System

Lake Victoria plays a vital role in managing the water resources of the River Murray system. The Lake is used to capture and store for later use water sourced from spills of upstream storages, and surplus from tributaries or "rain rejection" of irrigation water. The location of Lake Victoria and Menindee Lakes is particularly significant. Both of these water storages are located downstream of the Barmah Choke, and hence have a crucial role in meeting South Australia's entitlements during periods of high water demand. In this role, Lake Victoria and Menindee Lakes are managed in "harmony" (Harmony Operation, refer Section 2.2).

Lake Victoria is also critical to the efficient management of water for Victoria, New South Wales and South Australia, as it is located immediately upstream of the South Australia border, and inflows and discharges can be managed to accurately meet minimum required flows downstream.

Inflows and discharges at the Lake are also manipulated to provide water salinity benefits in South Australia (Lake Victoria "Flushing Rules"). Under regulated flow conditions, when the water in the Lake is of lower salinity than the salinity of the River Murray, the flow through Lake Victoria is maximised to dilute the river water. When the salinity of the river is lower than the Lake, the flow through Lake Victoria is minimised to ensure that the best quality water passes to South Australia. When flows are higher than regulated requirement and the river salinity is lower than Lake Victoria, through flow is maximised to freshen the Lake.

In recent years, Lake Victoria has also been used to manage flows for downstream environmental benefit (refer to Section 2.4).

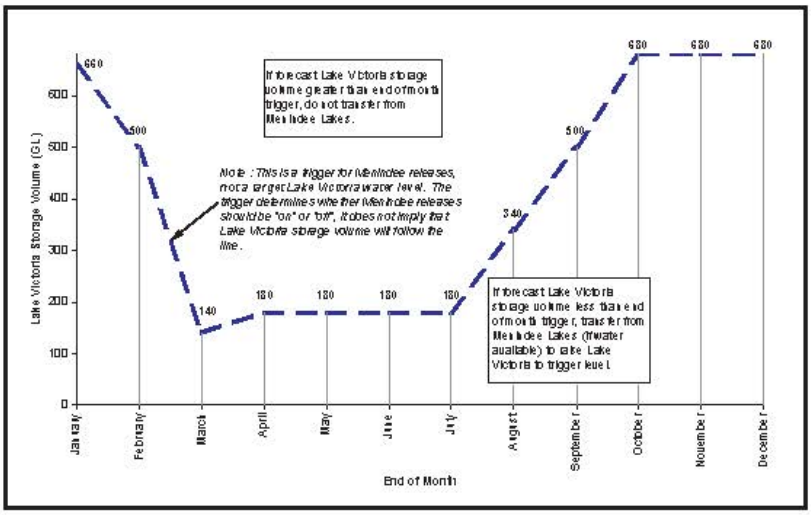
2.2 Harmony Operation of Menindee Lakes and Lake Victoria

Harmony operation of Menindee Lakes and Lake Victoria commenced in the late 1980s as a component of the 1988 Salinity and Drainage Strategy for the River Murray system. Harmony operation involves transferring water from Menindee Lakes to Lake Victoria if flow in the River Murray is insufficient to maintain suitable storage volumes in Lake Victoria. In summary, harmony operation balances the advantages of reduced evaporation (annual evaporation rates at Menindee Lakes are higher than at Lake Victoria) against the increased risk of loss of water resource as a result of spill from Lake Victoria. Evaporation savings resulting from harmony operation are used to supply South Australia's Additional Dilution Flow (ADF) of an extra 3 000 ML/day. The additional dilution flow is provided during periods when it has minimal impact on upstream water resource availability. It is supplied when Hume and Dartmouth combined storage is above 2 000 GL, and Menindee Lakes storage is greater than 1 300 GL for all months except June and July (1 650 GL) and August (1 500 GL).

South Australia's flow requirements (including both monthly Entitlement Flow and Additional Dilution Flow) are met by flow from the Murray and releases from Lake Victoria as required. However, harmony transfers from Menindee Lakes to Lake Victoria are not dependent on triggers for ADF, but are governed by storage in Lake Victoria relative to harmony transfer trigger levels.

Harmony operation triggers for Lake Victoria storage volume are shown in **Figure 2**. These triggers were developed to determine if and when transfers should be made from Menindee Lakes to supplement Lake Victoria storage. These triggers are not target levels for Lake Victoria storage volume itself. The triggers simply dictate when transfers from Menindee Lakes are made, should the storage volume in Lake Victoria fall below the trigger.

Figure 2: Lake Victoria Storage Triggers for Harmony Operation with Menindee Lakes



Harmony transfers from Menindee Lakes to Lake Victoria are most often made in late spring and summer. Flow in the River Murray upstream of Lake Victoria is typically low at this time. In autumn, low trigger levels for harmony transfers are designed to conserve water in Menindee Lakes and maximise the draw on Lake Victoria to meet South Australia's flow requirements (including ADF if necessary). This is because there is a good chance that Lake Victoria can be refilled from "surplus" flows in the following winter–spring period. If transfers from Menindee were made at this time, there is a higher risk that this water would be subsequently spilled.

2.3 Historical Operation of Lake Victoria Storage

The pattern of actual water levels in Lake Victoria since the regulation works were constructed in the late 1920s is shown in **Figure 3**. Note that the historical operation of Lake Victoria reflects the development of water supply and irrigation systems in the River Murray system over the last 80 years. The historical record shows that water levels were consistently high from the mid-1940s to the mid-1970s except during periods of drought.

Long periods of high water levels in Lake Victoria early in the historical record most likely caused the demise of the River Red Gums that remain on the lake bed today.

From the mid-1970s, the variability in Lake water levels increased. This reflects the increased reliance on Lake Victoria as water supply development increased. However, prior to 1995, very conservative operation of Lake Victoria was applied. Based on previous operating rules, any water above South Australia's requirements was stored in Lake Victoria whenever airspace was available. Using these operating rules, the MDBC Benchmark Run (modelled pre-LVOS conditions) shows that Lake Victoria would be at capacity more than 50% of the time.

Figure 3 shows that from the early 1980s, a pattern of lower water levels in Lake Victoria in autumn is apparent in most years. This pattern is more pronounced following the introduction of the Harmony Rules for Menindee Lakes and Lake Victoria in the late 1980s. This behaviour is also apparent in most years modelled under MDBC Benchmark Conditions (Refer to Section 3.1 for a description of modelled Benchmark and Natural Conditions).

The Lake Victoria Operating Strategy aims to build on this pattern, to provide more opportunities to draw down the Lake and hence to provide an enhanced drying cycle for vegetation, with negligible impacts on water resources, water quality and downstream environmental outcomes.

2.4 Environmental Flow Operations

River regulation and water resource development in the Murray–Darling Basin since European settlement has resulted in a substantial reduction in the number and size of small to medium sized flood events in the Lower Murray. These small to medium sized flood events are particularly important to the floodplain environment of the Lower Murray, including large wetland complexes such as the Chowilla floodplain. The Lower Murray floodplain is now drier for significantly longer periods than natural conditions.

In recent years, Lake Victoria has been used to enhance peak flood flows in the Lower Murray downstream of Rufus River, to partially compensate for the impacts of upstream river regulation and water resources development. During spring 2000, two separate and distinct flood peaks were enhanced to improve the connectivity of the Lower Murray floodplain. On each occasion, water was stored in Lake Victoria prior to the arrival of the flood peak, and as the peak arrived, water was released from Lake Victoria to increase the size of the peak. In addition, weir pools along the Lower Murray were raised to increase floodplain inundation. This produced a significantly larger area of inundation than would have otherwise occurred.

Significantly, these events represented the first time that Lake Victoria had been used to increase the size of a flood peak. The spring 2000 events demonstrate the important role that Lake Victoria plays in managing flows in the Lower Murray for environmental benefit, in addition to its role in securing water resources. Growing awareness of the importance of small to moderate floods to the Lower Murray floodplain environment means that this style of operation is likely to become more frequent in future. In planning this type of operation in future, it will be important to consider the environmental objectives of the entire system.

2.5 Emergency Operations

Lake Victoria can also be used to mitigate large flood peaks if desired. Whilst the inlet and outlet capacity, and the storage volume, are relatively small (and hence the effects are small), operation of Lake Victoria to mitigate large floods will be considered if life or property is at risk.

Lake Victoria could also conceivably be used to mitigate the impacts of other forms of emergency operations, such as response to large outbreaks of blue-green algae in the Lower Murray, or urgent and unplanned maintenance activities for a River Murray system structure.

Figure 3: Historical Lake Victoria Storage Level

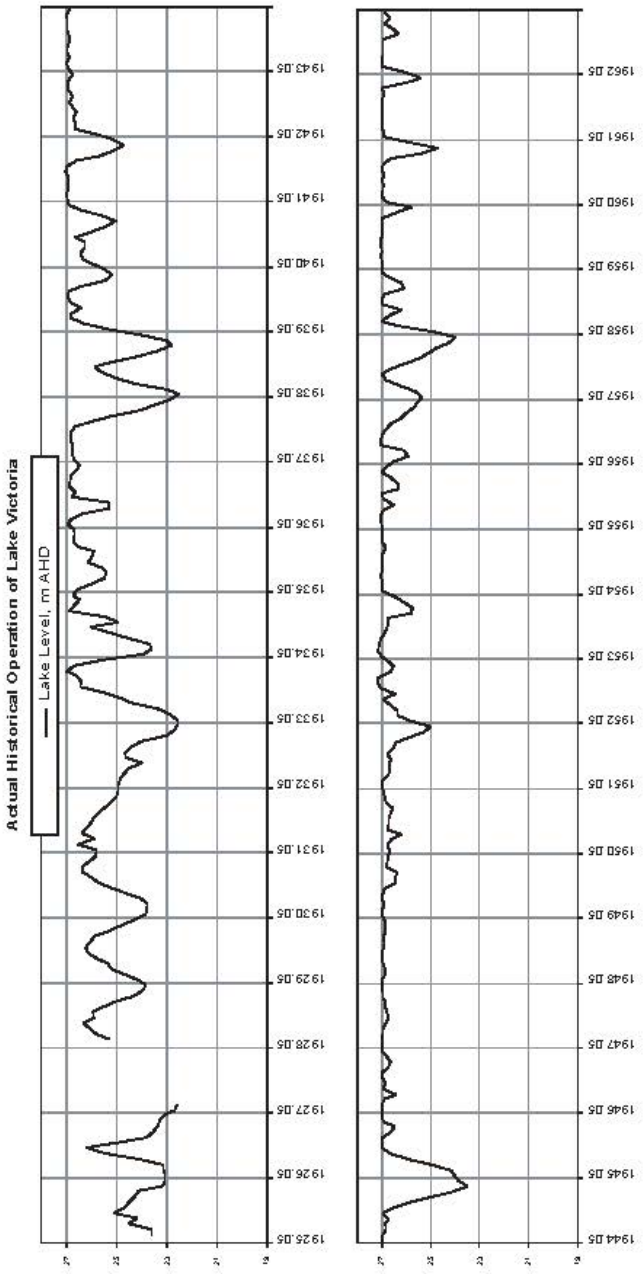
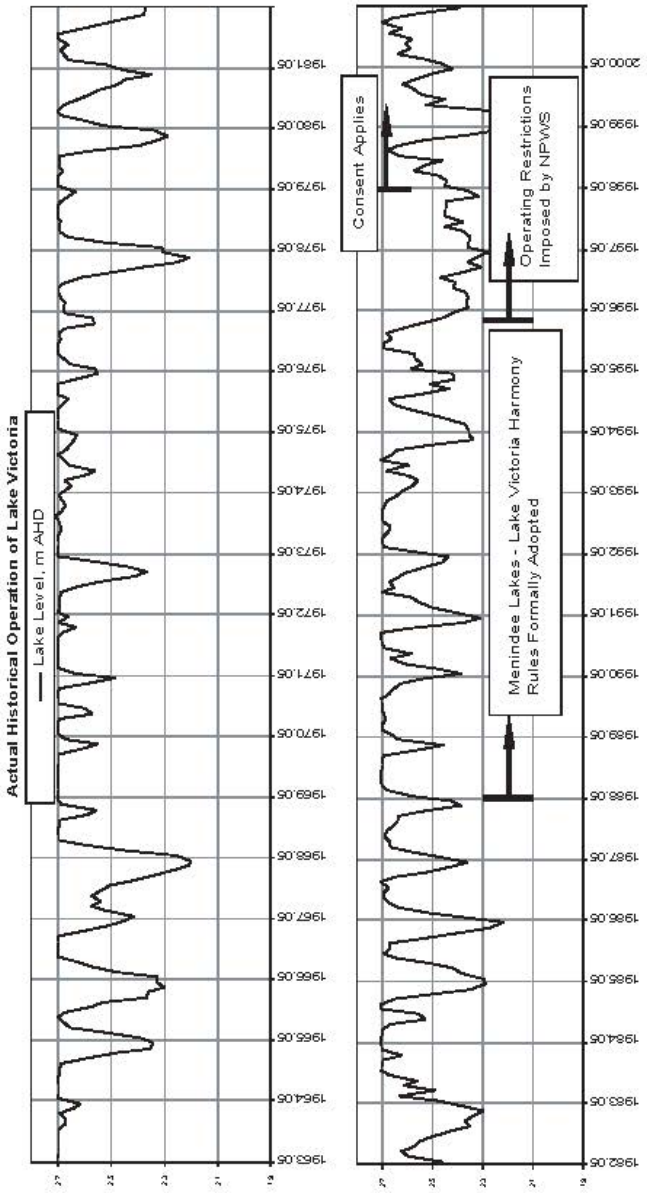


Figure 3: Historical Lake Victoria Storage Level continued



11

12

Lake Victoria Operating Strategy–May 2002

3. Basis of the Lake Victoria Operating Strategy

3.1 Background

The LVOS introduces flexibility in Lake Victoria's operating level, consistent with vegetation requirements, at negligible cost to water resources. In most years, Lake Victoria can be refilled for its water conservation duty. This is possible because Lake Victoria is a relatively small storage compared to the other River Murray system storages, yet it is placed near the bottom of the River Murray system, thus having a significantly greater catchment. Hence, the autumn drawdown feature apparent under existing operating rules can be enhanced, to provide a greater drying cycle for vegetation, without compromising water availability in the following season because the Lake can be filled in the following spring in most years.

The Lake Victoria Operating Strategy was negotiated based on an extensive technical investigation. The final option selected is reliant on the MDBC's Water Resources Assessment Model, which is used to predict storage volumes and flows throughout the River Murray system. Section 3.2 briefly describes the process by which the LVOS was developed.

The development of the LVOS was based on the MDBC's Monthly Simulation Model, which is used by the MDBC to assess the impact of existing and alternative management of the River Murray system. The model includes streamflows, storage volumes, consumptive water demands, and water quality amongst a comprehensive range of parameters and outputs, over a period of 106 years from 1891–1997. The LVOS has been compared to two key scenarios:

- **Natural Conditions**

  "Natural Conditions" comprises modelled system flows over the period 1891 to 1997 assuming no storages and no irrigation or water supply development throughout the whole River Murray system and tributaries.

  Prior to construction of regulating works at Lake Victoria, the water level in the Lake rose and fell with the River Murray downstream of Rufus River.

  This scenario is useful in comparing the variability of water levels that occurred at certain elevation bands under natural conditions to those that would occur at higher elevations for alternative scenarios.

- **Benchmark Conditions**

  "Benchmark Conditions" imposes current development and practices (existing major storages, current irrigation development, and current operating rules as at March 2002) over the period 1891–1997 using actual inflows. The Benchmark Run used is the same case used for the MDBC Environmental Flows project. The Benchmark Run does not reflect historical operation of Lake Victoria, which was different because irrigation systems and headworks structures were constructed progressively, and operating rules have changed from time to time.

3.2 Development of the Strategy

The investigation commenced with an analysis of the impact of a simple upper bound on water level in Lake Victoria, expressed as a maximum level each month. This upper bound was proposed as a starting point by NPWS, based on generic watering regimes typical of other wetlands in the region. The analysis showed that an upper bound contained several undesirable features, including a concentration of water levels at set elevations, particularly during spring. This feature was judged to have an increased potential for wind and wave erosion caused by storm events at these elevations. In addition, the limitations on refilling Lake Victoria in winter and spring produced significant impacts on water resource availability and resulted in reduced opportunities to utilise Lake Victoria to enhance small to medium flood events in the Lower Murray. However, the analysis did show that a drawdown of Lake Victoria in autumn

could be introduced with negligible impact on water resources provided that a more conservative refilling strategy was included.

Based on this analysis, a "risk management" approach to refilling Lake Victoria was developed, based on the MDBC's Water Resources Assessment Model. This model is used each month throughout the year (fortnightly in spring) to provide advice of seasonal water availability to the water resource managers in New South Wales, Victoria and South Australia. The model produces a forecast of streamflow and storage volumes throughout the River Murray system for a range of inflow conditions. Preliminary results showed that it was possible to achieve a hydrological regime in Lake Victoria closely simulating the natural pattern, albeit at a higher elevation, in terms of both statistical variability and seasonality.

In further developing the LVOS, the water resources assessment methodology was refined by a process of iteration. The most important feature of the LVOS, from a water resources standpoint, is that the Strategy reflects the compromises that are required to manage water resources across the entire River Murray system, not just Lake Victoria in isolation. Opportunities to maintain lower water levels in Lake Victoria when upstream resources are abundant have been included (with negligible additional impact on water availability). In addition, greater conservatism when upstream resources are scarce has also been included to minimise the impacts on water availability during dry periods.

3.3 Guiding Principles

Before describing the fundamental principles underlying the LVOS, it is pertinent to briefly reflect on the overarching principles of catchment management adopted by the six governments of the Murray–Darling Basin.

3.3.1 Integrated Catchment Management Principles

The Murray–Darling Basin Ministerial Council has agreed that Integrated Catchment Management (ICM) principles shall be used in managing the natural resources of the Basin[2]. The goals and outcomes sought at Lake Victoria should also be viewed in the context of the goals and outcomes sought for the remainder of the River Murray system.

The ICM goals expressed by the MDB Ministerial Council include:

- Healthy Rivers;
- Healthy Ecosystems and Catchments;
- Innovative, Competitive and Ecologically Sustainable Industries; and
- Healthy Regional Communities.

At a subcatchment scale, the outcomes sought will differ from catchment to catchment. They will be the result of the choices that are made for that catchment, and will relate to the level of protection that we want to provide for assets at risk from continuing degradation, including:

- Environmental Assets – e.g. wetlands, fish, birds and native vegetation;
- Economic Assets – e.g. drinking water, productive land, built infrastructure, water for irrigation and stock, and recreational tourism; and
- Social Assets – e.g. rural and regional communities, cultural sites and values, and recreational areas.

In striving for these goals the Murray–Darling Basin Initiative Partners have agreed to apply important principles to all decisions. They have agreed to manage the resources of the Basin in an integrated, accountable and transparent manner, seeking effective and efficient means of achieving the goals, taking full account of all costs and benefits based on the best currently available information.

These principles of integrated catchment management have particular relevance to Lake Victoria, given the cultural heritage values of the Lake, and its value as a wetland ecosystem. The principles are also important in the context of the significant role that Lake Victoria plays in

2. Integrated Catchment Management in the Murray–Darling Basin 2001–2010, Murray–Darling Basin Ministerial Council 2001.

managing water resources and environmental flows in the River Murray system.

The information regarding the environmental costs and benefits of changing the operation of the Lake Victoria storage is not well understood currently. The LVOS is based on the best available understanding at this time but it is recognised that adaptive management, responsive to new information will be essential if we are to meet the ICM principles endorsed by the Murray–Darling Basin Ministerial Council.

3.3.2 Water Storage Management Principles

The existing Harmony Rules for Menindee Lakes and Lake Victoria require Lake Victoria to be drawn down in autumn in preference to other storages, if needed to assist in meeting South Australia's flow requirements. However, the existing operating rules do not provide for Lake Victoria to be drawn down if South Australia's requirements can be met from unregulated flows originating from further upstream.

With a capacity of 680 GL, Lake Victoria is a relatively small storage in comparison to the other three major MDBC storages, whose combined storage is about 8 940 GL. In addition, Lake Victoria has a much greater catchment area than upstream storages, and consequently ensuring that the Lake is drawn down in autumn (even if South Australia's requirements are exceeded) to provide opportunities for vegetation can be achieved with very small risk that the water cannot be recovered by the following spring.

The fundamental principles underlying the Lake Victoria Operating Strategy are:

- **That a drying cycle can be introduced by ensuring a drawdown of Lake Victoria in late summer and early autumn with very small risks to water resources.**

  This is because the Lake can almost always be refilled sufficiently to prevent a "memory" of the autumn drawdown impacting on water resource availability in the following season.

- **That a suitable risk management strategy is used to refill the Lake as late as possible in winter and spring.**

  In winter/spring, priority is given to refilling Lake Victoria unless surplus flows are predicted using the Water Resources Assessment Model minimum inflow case[3]. If surplus flows (greater than the volume needed to refill Lake Victoria to capacity) are predicted, then Lake Victoria is drawn down and the Lake is refilled as late as possible.

  Hindsight will show that in many cases Lake Victoria could have been refilled later. This is a necessary outcome of the need to manage water resources conservatively.

- **That the implementation of the LVOS reflects the water availability status of the whole of the River Murray system.**

  This last point is incorporated in the following secondary principles:

  – *If upstream water resources are low, a more conservative autumn operation applies.*

  To further reduce the impact on water resource availability, the LVOS is linked to the status of upstream resources. An assessment of the status of upstream resources is undertaken prior to unregulated drawdown of the Lake in late summer/autumn. If volumes held in upstream storages are low, water can be stored in Lake Victoria during autumn above the normal maximum levels. This compromise does not significantly affect vegetation outcomes, as the conditions that lead to low upstream storage volumes almost always result in water levels in Lake Victoria lower than the autumn drawdown targets.

  – *If upstream resources are abundant, base the drawdown/refilling of Lake Victoria in winter/spring on a more optimistic forecast of surplus flows upstream.*

  If resources in other River Murray system storages are abundant in spring, a less conservative inflow case than minimums is used to plan refilling of Lake Victoria. This

3. The minimum inflow case assumes that inflows for the rest of the season will be equal to the lowest on record. It is used to set water allocations in the River Murray system.

reflects the reduced reliance on water stored in Lake Victoria in wet years, and the likelihood that drawing down Lake Victoria in the following autumn would result in surplus flows.

3.3.3 Vegetation Management Principles

Vegetation "Establishment Phases" versus "Maintenance Phases"

The LVOS hydrologic regime is designed to be sustainable to native vegetation in the long-term. The colonisation of the Lake Victoria foreshore by some vegetation species (such as River Red Gum) is expected to be episodic, and dependent on a range of factors, including water level variation whilst the vegetation is still establishing. Mature vegetation is capable of tolerating a significantly greater water level range and duration of inundation than establishing vegetation. Hence, the suitability of the LVOS hydrologic regime for native vegetation should be considered in the context of vegetation "establishment phases", that is the opportunities for recruitment and establishment of immature vegetation; and "maintenance phases", that is the continued survival of established vegetation.

The LVOS hydrologic regime has been assessed based on a broad comparison to the natural regime (refer below). The process of vegetation establishment at Lake Victoria under the LVOS is likely to be characterised by colonisation following favourable conditions, which in permanent and semi-permanent lakes typically follows a drawdown re-inundation sequence, however some setbacks are expected to occur from time to time. This may be compared to the natural thinning processes that occur during flooding of floodplain wetlands.

Vegetation establishment phases have not been specifically assessed due to the complexity of factors that influence colonisation. It is not possible to model vegetation establishment with sufficient accuracy to allow the development of alternate operating rules that favour the survival of immature vegetation following a significant establishment event. Hence, the general operating rules do not make specific provision for an establishment phase. Drawdown events are expected periodically, and these are expected to give some opportunities for native species to establish, as the proposed LVOS corresponds broadly to the natural hydrologic regime in two important respects: gross variability and seasonal pattern (refer below).

However, it should be noted that past practice has provided less opportunity for colonisation of vegetation. Hence, deviations from the LVOS general operating rules may need to be made from time to time in order to assist vegetation that is establishing in key areas, or vegetation that has re-established following a significant setback. It is feasible that measures such as lowering refilling targets if upstream resources are abundant, or delaying harmony transfers from Menindee for a short time to extend drying, could be made at some times with minimal additional impact on water resources. It is expected that these options would be exercised infrequently, such as following a number of seasons in which the application of the LVOS has resulted in above average water levels.

The need to allow immature vegetation to establish will most likely be based on the outcomes of vegetation monitoring conducted under the CLPM, and options should be assessed on a case by case basis in conjunction with other River Murray system requirements at the time.

Key Aspects of the Hydrologic Regime

Two key aspects of the LVOS hydrologic regime have been compared to natural conditions and benchmark conditions using the graphical presentation described below.

(a) Water Level "Gross Variability"

Gross variability is defined as the proportion of time that an elevation band is either wet (water level at or above a particular elevation) or dry (water level below a particular elevation). The gross variability of different scenarios can be compared by "normalising" each scenario about

its own median level, as shown in **Figure 4** and **Figure 5**.

Figure 4 shows the probability of exceeding a range of levels in Lake Victoria under Natural Conditions and Benchmark Conditions. Note that under Benchmark conditions, Lake Victoria would be at Full Supply Level (FSL) EL27 m greater than 50% of the time.

Figure 5 compares the gross variability for the Benchmark Run to Natural Conditions. This graph can be described as a comparison of the slope of each curve shown in the previous graph, normalised about their respective median levels.

Gross variability of water level is a useful indicator of whether the hydrologic regime for a given option would support a similar distribution of vegetation above and below the median water level to natural conditions. This comparison can be made by comparing the slope of the curve for each scenario to the corresponding slope of the natural conditions case. A similar shaped curve implies a similar water level gross variation about the median level, in terms of the proportion of time spent wet or dry.

However, the gross variability does not allow a comparison of seasonality.

Figure 4: Distribution of Lake Victoria Levels for Natural and Benchmark Conditions

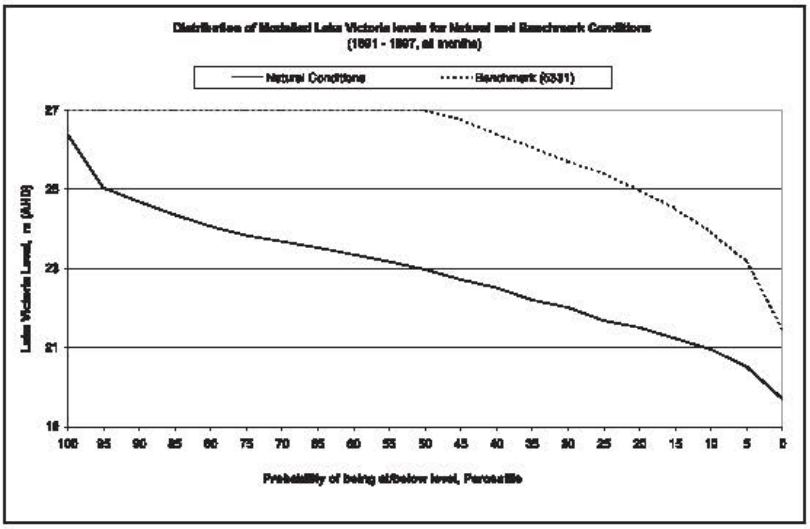
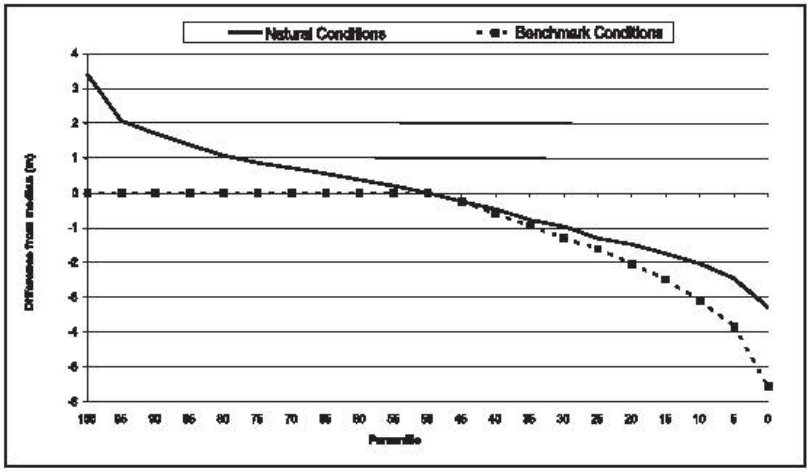


Figure 5: Gross Variability of Natural and Benchmark Conditions



(b) "Box Plot" Comparison

A second comparison, using "Box Plots" has been used to allow an assessment of seasonality. The diagram in **Figure 6** provides a simple guide on how box plots may be interpreted.

Figure 6: Box Plots Interpretation Guide

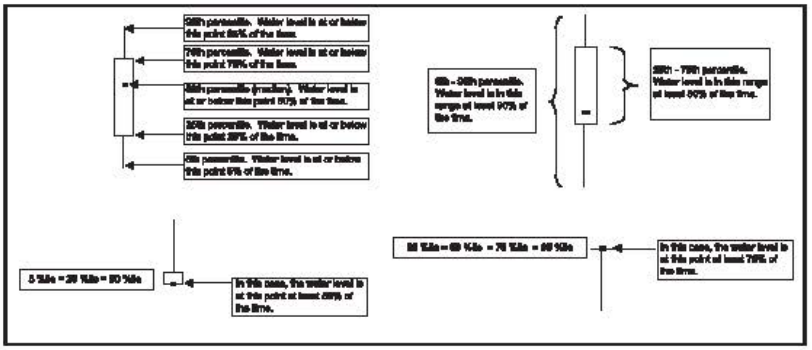


Figure 7 shows a box plot for natural conditions. The box plot shows the relative probability of differing water levels occurring at Lake Victoria each month. The water levels are represented as exceedance percentile levels, that is the proportion of months that the water level is equal to or less than a certain level.

Figure 7 shows that under natural conditions, water levels in Lake Victoria are lowest in March–April–May, and peak in September–October–November.

Figure 7: Natural Conditions Box Plot

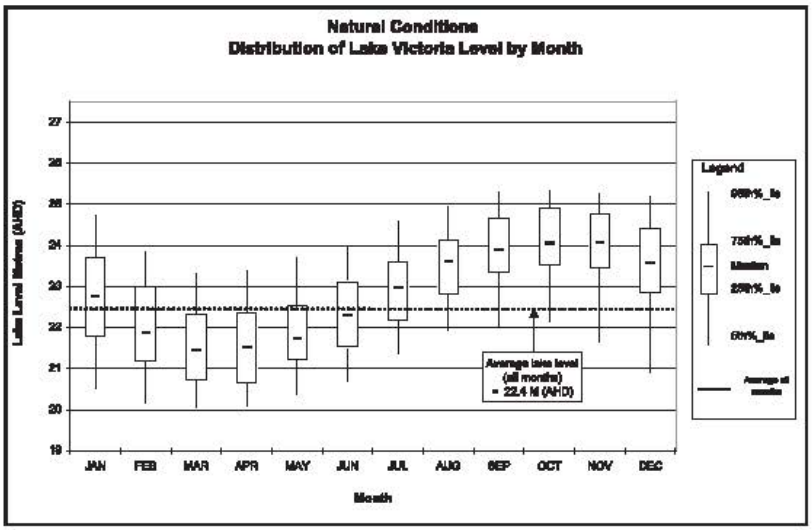
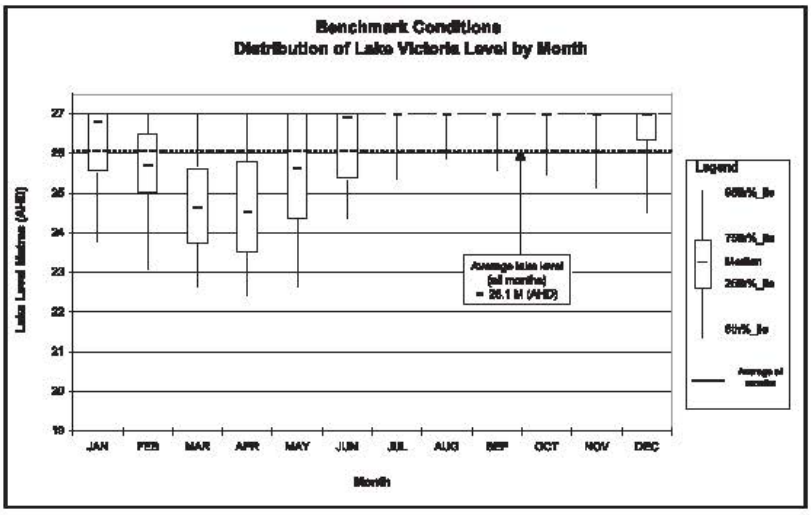


Figure 8 shows a box plot for benchmark conditions. This figure shows that under benchmark conditions, Lake Victoria is at capacity in more than 75% of all months from July to November. However, **Figure 8** also shows that the Lake is often drawn down in late summer–autumn (usually as a result of the rules governing harmony operation with Menindee Lakes), with the lowest levels typically occurring in March–April. This timing corresponds well with the timing of the lowest Lake levels that occur under natural conditions.

Figure 8: Benchmark Conditions Box Plot



4. Description of the Lake Victoria Operating Strategy

4.1 General Operating Rules

In summary, the Lake Victoria Operating Strategy rules are as follows:

Basic Rules

- Commencing late February, drawdown Lake Victoria to 26.5 m by the end of February, 25.6 m by the end of March and to 24.5 m by the end of April (unless upstream resources are low, refer below).
- Do not store water in Lake Victoria above 24.5 m in May (unless upstream resources are low, refer below). Supply South Australia's normal Entitlement and Additional Dilution Flow requirements from a combination of flow in the River Murray upstream of Lake Victoria and Lake Victoria as necessary during May.
- On 1 June, commence refilling Lake Victoria using surplus flows (unless surplus is more than sufficient to fully refill the Lake, refer below).
- During winter and spring, continually monitor volume of water in transit upstream of Lake Victoria using MDBC's Water Resources Assessment model. If flows sufficient to refill the Lake are predicted under minimum inflow conditions, temporarily cease or if feasible reverse refilling of Lake Victoria, and refill to FSL EL27 m as late as possible using the forecast flows in transit.

Conditional Rules

- If at any time Hume–Dartmouth combined storage > 5 500 GL (79% of combined capacity) AND Menindee storage > 1 000 GL (50% of surcharge capacity), use the 75% probability of exceedance (dry) case to plan refilling of Lake Victoria rather than the minimum inflow case.

This rule applies for at least one month in 45 years out of the 106 years from 1891–1997. Lake Victoria reaches FSL EL27 m in 89 out of 106 years.

Notes:

1. *This rule is designed to provide additional opportunities to drawdown Lake Victoria in spring. The impacts on water resources resulting from this rule are negligible.*

- If forecast NSW Reserve (all storages) at the end of May < 1 000 GL, OR Menindee Lakes is in NSW control, do not drawdown Lake Victoria surplus to regulated requirement in the period February–May. That is, do not dump water from Lake Victoria in late summer–autumn.

This rule applies in 191 months out of a total of 424 months for the period February–May in the 106 years modelled. This rule results in Lake Victoria being above EL24.5 m in April or May in 16 out of the 106 years, demonstrating that when this rule applies, Lake Victoria is usually below the drawdown targets anyway. Using this rule, the highest minimum water level for the year May–April is EL24.9 m.

Notes:

1. *Forecast NSW Reserve at the end of May is the forecast volume that NSW will hold in all four River Murray system storages at the end of the current irrigation season. It is obtained from MDBC's monthly water resource assessments. This conditional rule is intended to prevent impacts on New South Wales, Victorian and South Australian water users in dry years (New South Wales reserves are chosen as they are likely to be less than Victorian reserves given Victoria's water allocation policy).*
2. *MDBC relinquishes control of Menindee Lakes to NSW when storage in Menindee Lakes falls below 480 GL (24% of surcharge capacity). MDBC regains control of Menindee Lakes when storage volume next exceeds 640 GL. This feature of*

Menindee operation is for the purpose of providing drought reserves to the Lower Darling system, including town water supply to Broken Hill and Menindee. Low reserves in Menindee Lakes have important ramifications for the management of the River Murray downstream of the Barmah Choke in the following irrigation season. When Menindee is low, added strain may be placed on the Barmah Choke and water users between Barmah and the SA Border if Lake Victoria is drawn down surplus to SA requirements.

3. *On many occasions Lake Victoria will also be relatively low when this conditional rule applies. Refer to Section 5 for more detail.*

4.2 Environmental Flow Operating Requirements

In this context, Environmental Flow operations are defined as the use of Lake Victoria to enhance the size or extend the duration of a flood peak in the Lower Murray. As described in Section 2.4, Environmental Flow operations are likely to become more frequent in future. The operation of Lake Victoria for each event is likely to be subtly different. The operation of Lake Victoria during Environmental Flow events will be undertaken in consultation with the Review Panel (refer Section 6.1) and NPWS.

Environmental Flow operations are likely to take place during periods of high water resource availability. Hence, there may be less need to maintain high water levels in Lake Victoria following the event, particularly in the case of a Darling River flood coinciding with a River Murray flood. If an Environmental Flow operation requires a significant increase in the duration of high water levels in Lake Victoria, consideration should be given to reducing refilling targets in Lake Victoria following the Environmental Flow operation to offset any impact on vegetation in Lake Victoria.

Flood events normally take about 4 weeks to travel from Albury to Lake Victoria. However, under flood conditions, the majority of the flow branches out from the River Murray, and travels through the Edward/Wakool River system, a complex network of anabranch streams and floodplains. It is very difficult to accurately predict flood peaks in the Lower Murray before floods return to the River Murray from the Edward/Wakool system. This effectively reduces the lead-time available to make decisions on Environmental Flow operations.

Normally, travel times in the River Murray upstream of Lake Victoria will be sufficient to provide some warning that an alteration to the operation of Lake Victoria is needed for the purpose of enhancing environmental outcomes in the Lower Murray. However, on some occasions, it may be necessary to alter Environmental Flow operations quickly, in response to rapidly changing circumstances. Under these circumstances, the Review Panel will be informed of changes to the operation of Lake Victoria as soon as practicable. If necessary, consideration should be given to altering the operation of Lake Victoria following the passage of the flood peak.

Natural flood events in the Lower Murray were typically characterised by a slow rising limb followed by a rapid recession. This feature is also apparent today. In deviating from the LVOS to store water in the Lake for release as the flood peak passes, it will be necessary to manage the filling of Lake Victoria to avoid undesirable impacts on fish migration. This may mean that water will need to be stored in the Lake gradually, avoiding sudden changes that could temporarily reduce downstream flows (and hence affect fish movement).

In addition, in refilling Lake Victoria following the passage of a flood event, it may be necessary to avoid steepening the flood recession in the Lower Murray, for example to reduce the risk of bank slumping. Given that flood recessions are typically rapid, this may mean that there is insufficient surplus volume available to fully refill Lake Victoria. This requirement is compatible with the goals of the Lake Victoria Operating Strategy, as it would offset the

increased water levels that result from storage of the volume needed to enhance the flood peak. The ability to forego complete refilling of Lake Victoria following an environmental flow operation will depend on an assessment of water resources impacts at the time.

4.3 Deviation from Lake Victoria Operating Strategy to Enhance Vegetation Establishment

Deviations from the agreed Lake Victoria Operating Strategy may need to be considered from time to time to assist vegetation that is establishing in key areas, or vegetation that has re-established following a significant setback. Altered operation for this purpose will be opportunistic, and hence will need to be assessed on a case by case basis. Options such as lower refilling targets or earlier drawdown to reduce the period of inundation may be desired.

The impact on the River Murray system as a whole should be identified when considering the various options. The recommended approach shall be determined in consultation with the Review Panel and NPWS.

4.4 Emergency Operation Requirements

In the event of an emergency such as a very large flood, large algal bloom in the River Murray/Lower Darling, or unplanned or urgent maintenance of a River Murray system structure or work, it may be necessary to store water in Lake Victoria above the maximum autumn water level targets or refilling rate determined by the General Operating Rules. If an alteration to Lake Victoria operation becomes necessary due to an emergency, the recommended operation shall be determined by MDBC and appropriate advice provided to the Review Panel and NPWS.

4.5 Maintenance Requirements

From time to time it may be necessary to alter operation in order to undertake planned maintenance of Lake Victoria's regulating structures or embankments. These activities are typically planned to minimise the risk to water resources resulting from the works, and hence the impact on the LVOS is expected to be minimal. However, if a need arises to alter operation from the general operating rules, other than in an emergency, the action to be taken shall be determined in consultation with the Review Panel and NPWS.

24

Lake Victoria Operating Strategy–May 2002

5. Impact of the Lake Victoria Operating Strategy

5.1 Hydrologic Regime – Suitability for Vegetation

5.1.1 Comparison of Variability and Seasonality to Natural Conditions

Figure 9 shows a comparison of the gross variability of the LVOS compared to benchmark and natural conditions. This graph shows that the LVOS achieves a close approximation of the natural water level variability across most of the water level range, with the exception of the upper part of the range (corresponding to large flood events under natural conditions). **Figure 9** also shows that the LVOS is significantly closer to natural variability than the benchmark case.

Figure 9: Comparison of Gross Variability

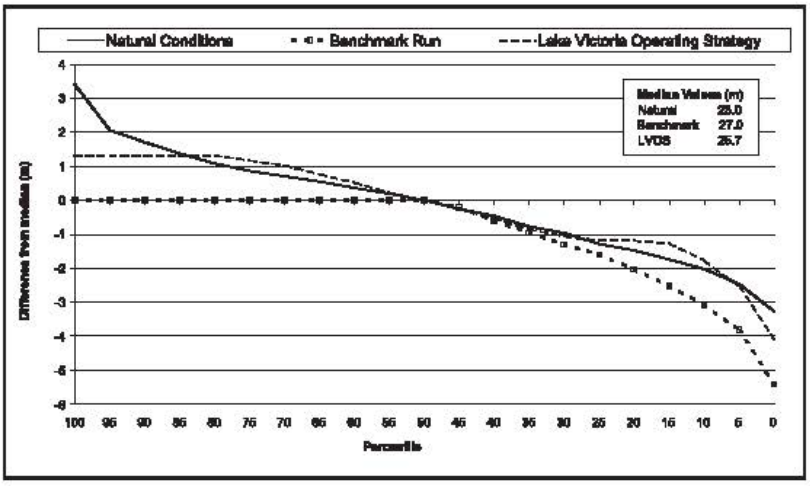


Figure 10: LVOS Box Plot

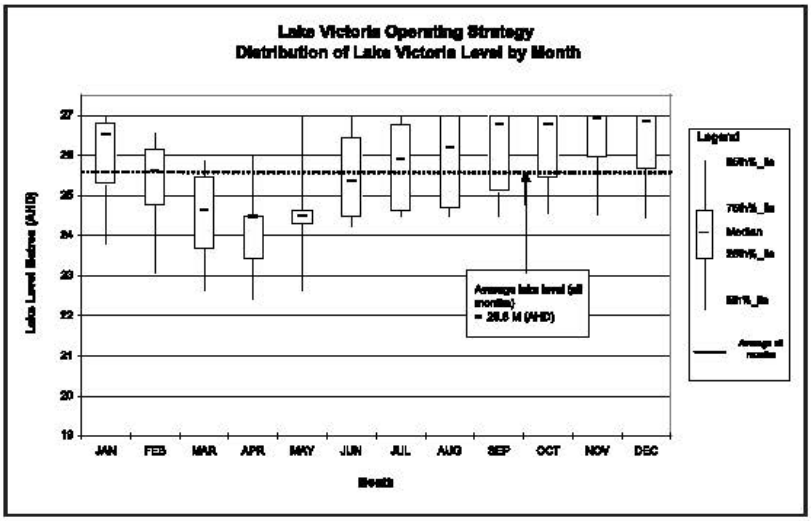


Figure 10 shows the box plot for the LVOS. A comparison with **Figure 7** and **Figure 8** on pp. 19 and 20 shows that the LVOS has achieved a seasonality of water level variation similar to natural conditions. Water levels in Lake Victoria are also lowest in autumn, and peak in late spring – early summer.

5.1.2 Suitability of Hydrology to Key Species

Table 1 presents a description of the water requirements of key species known to commonly occur on the Lake Victoria foreshore, and a simple analysis of the suitability of the LVOS. The water requirements of each species is based on "Rivers as Ecological Systems: The Murray Darling Basin", MDBC 2001 and Roberts and Marston 2000. It should be noted that these references are more based on floodplain habitats than wetland habitats. Additional comments have been based on Sluiter and Robertson 2000.

The LVOS might be expected to contribute to the vegetation impacts outlined in each of the relevant comments in **Table 1**. The success of particular species will also be influenced by other factors such as soil type, soil stability, wind and wave fetch, groundwater depth, etc., which vary at different locations on the lake bed. In practice these outcomes will be continuously reviewed as part of the monitoring and review procedures of the CLPM.

Table 1: Water Requirements of Significant Perennial Wetland Species Known to Occur at Lake Victoria

Species	Maintenance	Establishment
River Red Gum *Eucalyptus camaldulensis* **Large Tree**	Average flood frequency 1–2 years; average duration 4–7 months, winter–spring, and lasting no more than 24 months. Shorter durations can be supplemented by summer floods. Flood frequency and duration may need to be reduced if the watertable is shallow or trees have access to permanent water. Complete drying between flood cycles as much as possible.	In a floodplain environment, a large flood is needed, extending well into late spring or early summer; followed by wet winter–spring, or shallow and brief or pulsed winter–spring floods, and even brief or shallow summer flooding.
	Comment: River Red Gum woodland occurred naturally in the littoral zone of Lake Victoria, as evidenced by the stands of dead timber that remain today between approximately EL22.5 and EL24 m. There are currently live stands of mature River Red Gum on the sandy barrier islands and Lake margins at ~EL26.5 m–EL27 m. There has been some recent regeneration in low wave energy sites in the southern lake bed area at ~EL26 m, with scattered individuals as low as approximately EL25.5 m; as well as on the south-east shoreline at Talgarry at ~EL24.6 m–EL25 m. **Suitability of LVOS Hydrologic Regime – High above ~EL25.5 m. Low below EL25.5 m due to long establishment timeframe.**	
Black Box *Eucalyptus largiflorens* **Small–Medium Tree**	Flood frequency of 1 in 3–5 years with duration 2–4 months, but can tolerate reduced frequencies if there is no reduction of flood duration. Flood timing may not be critical for maintenance of adult trees. Continuous flooding of 4 or more months may be initially beneficial, but if repeated or sustained is likely to lead to long-term loss in vigour as soil oxygen is gradually depleted.	In floodplains, requires flooding for 2–4 months or longer, with slow recession. Timing may be important; natural regenerating flood occurred in spring–summer. Can regenerate without flooding if rainfall is high enough followed by a wet summer.
	Comment: Black Box occurred naturally at Lake Victoria, at higher elevations than River Red Gum corresponding to less frequent periods of high water levels or large floods. Remnants of dead Black Box are also present on the lake bed today, generally above EL24.5 m. Some live Black Box are present on the southern lake bed zone at elevations just below FSL and above. Regeneration of Black Box may occur following the removal of grazing pressure, but is likely to be restricted to a fringe at/just below FSL 27 m. **Suitability of LVOS Hydrologic Regime – Poor below ~EL26.9 m.**	

Species	Maintenance	Establishment
Lignum ***Muehlenbeckia florulenta*** **Small–Medium Shrub**	Average flood frequency 2–8 years, more frequent in the north-west parts of the Murray–Darling Basin and less frequent in southern areas. Ponding duration 3–5 months in the south, 6–12 months in the north. Continuously wet conditions should be avoided. Complete drying to cracking stage between floods essential to ensure soil aeration and recharge soil water. No evidence as to whether season is important. Natural flood season is late summer in northern areas, spring–summer in southern areas.	Germination requirements not studied. Field observations suggest season of flooding may be critical, with summer floods lasting long enough to wet soil profile and allow a germination–establishment cycle in late summer to autumn.
	Comment: Lignum prefers cracking grey clay soils. Pre-regulation, Lignum was the dominant plant of the southern Lakeshore from EL24 m–EL25.5 m. Existing Lignum communities are restricted to low energy protected parts of the southern Lakeshore area south of the Frenchmans Islands at elevations of EL26 m or slightly higher. There is little of this soil type present at the upper levels where the hydrological regime would be suitable. **Suitability of LVOS Hydrologic Regime – High above ~EL26.5 m. Poor below EL26 m. Limited occurrence expected due to generally unsuitable soil type, with the exception of some areas in the southern Lakeshore area.**	
Common Reed ***Phragmites australis*** **Tall Emergent Grass/Rush**	Tolerates a range of water regimes from permanently flooded in 1–1.5 m to infrequently (1 year in 20) flooded on steep or short riverbanks where parts of plant remain close to water. Requirements for extensive stands in flat areas probably narrower. No seasonal requirement has been noted but near annual (1 in 1–2 years) flood frequency is needed to maintain vigour.	Field conditions for reproduction from seed and growth of seedling not known for Australia, and it is not known how well knowledge from temperate European climates can be applied to semi-arid climates, or if the genotypes have same responses. Can regrow from fragments, both stem and rhizome, which is a routine means of propagation.
	Comment: Phragmites is currently present on the lake bed above ~EL26.0 m. Phragmites is a palatable species for cattle, and regeneration in the southern lake bed and Frenchmans Islands has been extensive since the removal of stock from these areas. Dense stands are present above EL26.5 m. **Suitability of LVOS Hydrologic Regime – High above ~EL25.5 m**	

Species	Maintenance	Establishment
Spiny Mudgrass *Pseudoraphis spinescens* **Emergent Grass, Floating Mat when flooded**	In cooler parts of its range, it requires a flood duration of 5 months minimum starting from mid-winter to achieve full stem extension; duration of 7 months maximum or until after mid-summer to eliminate competition from milfoil. Depth minimum of 0.5 m to eliminate competition from River Red Gum seedlings. Shorter floods of 2–3 months can achieve growth in warmer areas such as western NSW.	Germination and establishment requirements with respect to timing, duration and depth are unknown except that germination can occur in either moist or shallow water conditions. Regeneration from plant fragments probably occurs, but circumstances and importance of this are not sufficiently well known to derive recommendations.
	Comment: Pre-regulation, Spiny Mudgrass was probably a common component of the southern Lakeshore area from EL22 m–EL24 m. It currently (1999) has a wide distribution on the lake bed from EL24.5 m–EL27 m, in particular where grazing pressure has been reduced, although cover is sparse below ~EL25.5 m. Spiny Mudgrass is particularly important as a component of the open floodplain areas. Sluiter and Robertson identified Spiny Mudgrass, River Couch and Spiny Sedge as the three key taxa suitable for stabilising the Lakeshore sediments. **Suitability of LVOS Hydrologic Regime – High above ~EL25.5 m. Moderate – Low below EL25.5 m.**	
River Couch (also known as Rat's Tail Couch) *Sporobolus mitchelli* **Dense Emergent Grass.**	Flood and drought tolerant. Duration of 1–5 months, rarely for more than 60 cm. On riverbanks and adjacent floodplains, needs floods that are either continuous and lasting several (4–5) months, or pulsed 2–3 times per year. Generally favours intermittently flooded areas, but clearly able to withstand prolonged periods of inundation.	Unknown
	Comment: Pre-regulation, River Couch probably colonised the depressions of Frenchmans Creek and Rufus River, natural levees and associated margins and floodplains. It was also probably present along with Spiny Mudgrass at EL22 m–EL24 m. River Couch currently (1999) has a wide distribution on the lake bed, in particular in the open southern Lakeshore areas from EL23.5 m–EL25.5 m where grazing pressure has been reduced. Another key species suitable for stabilising the Lakeshore sediments. **Suitability of LVOS Hydrologic Regime – As per Spiny Mudgrass**	

Species	Maintenance	Establishment
Spiny Sedge *Cyperus gymnocaulos* **Tussocky Emergent Sedge**	Occurs on riverbank and Lakeshore habitats. On riverbanks is typically found where flooding is shallow and lasts 2–6 months, usually less than 60 cm. Optimum flooding regime in Northern Victoria is 3 months in spring–summer, flooding very shallow, less than 10 cm. The plant is rarely grazed by stock but is occasionally utilised by cattle when other forage is scarce. Extremely hardy with stout woody rhizomes. Maintenance requirements in Lakeshore habitats not well documented.	Unknown
	Comment: Spiny Sedge is currently (1999) widespread on the Lake foreshore, in generally sandy areas. There is also evidence that Spiny Sedge is able to establish and survive in the palaeosols (black sedimentary deposits). Despite the typical water regime described above, in Lake Victoria it has widespread distribution from EL24.5 m–EL27 m although cover is fairly sparse at lower levels. This may be a result of being less palatable than other species, although the cover appears to have increased, particularly above ~EL24.5 m, since the removal of stock from the southern Lakeshore and Frenchmans Islands. The cover also appears to have increased since the FSL restriction of EL24.5 m was lifted in 1998. Spiny Sedge is expected to be an important species in vegetation re-establishment at the Lake, as it occurs at lower elevations than the other common species described above. Another key species suitable for stabilising the Lakeshore sediments. **Suitability of LVOS Hydrologic Regime – High above ~EL25.5 m, moderate above ~EL24.5 m based on recent observations.**	

5.2 Water Resources

Table 2 provides a summary of the modelled impacts on water resources and salinity. **Table 2** shows a very small increase in average annual diversions for NSW and Victoria. In reality this means that the impact of the LVOS on average annual diversions in NSW and Victoria is negligible, and within acceptable error margins. **Table 2** also shows a small increase in the average annual flow to South Australia (3.2 GL), which may be attributed to evaporation savings in Lake Victoria.

The **Peak Shortfall** described in **Table 2** may be defined as the greatest difference between the water diverted and the volume that would have been diverted in any year, under the observed climatic conditions, had full entitlement been available (i.e. 100% for New South Wales, 210% for Victoria, Entitlement flows for South Australia). It is a theoretical "desired" diversion that does not include limitations imposed by the Cap. Peak shortfall is useful to determine the impact in the year in which resources were most constrained (which may not be the year of lowest diversion). In this case, a negative value implies a reduced shortfall (that is, more water was diverted in that year).

Table 2: Summary of Water Resource and Salinity Impacts

Description of Run	Benchmark (Environmental Flows benchmark used for consistency)	Lake Victoria Operating Strategy Difference (LVOS minus Benchmark)
RUN NUMBER	5 674 000	5 937 000
AVERAGE NET DIVERSION (GL)		
New South Wales	1 911.0	0.3
Victoria	1 639.0	0.3
Anabranch Use	53.3	0.0
Anabranch Off Allocation	24.7	1.2
Tandou	58.6	–0.1
Tandou Irrigation Use	33.5	–0.1
PEAK SHORTFALL (GL)		
New South Wales	2 512	–17
Victoria	723	0
South Australia	340	2
% OF YEARS WITH NSW ALLOC < 40 %	4.6	1.8
% OF YEARS WITH VIC ALLOC < 100%	2.8	0
% OF YEARS WITH SA SUPPLY < 90 %	1.8	0
MINIMUM NSW DIVERSION (GL)	498	–17
SALINITIES (EC)		
Torrumbarry	111.3	0.0
Swan Hill	268.2	0.0
Euston	263.7	–0.1
Red Cliffs	312.0	–0.2
Merbein	349.0	–0.3
Lock 9	358.3	–0.9
Renmark	397.0	–1.2
Berri	429.4	–1.8
Morgan	551.0	–3.5
Murray Bridge	599.8	–4.3
Salinity Costs as per GHD Study ($1 000/Year)		
Agricultural		–105
Urban & Industrial Users		4
Total		–101
VALUE OF HYDRO-ELEC ($1 000/YEAR)	9 074	4.5
TOTAL COSTS LESS HYDRO VALUE	–777 533	–116
FLOW TO SOUTH AUSTRALIA (GL/year)	6 702	3.2
GROSS MARGIN FOR IRRIGATED AGRICULTURE		
NSW (Million/Year)	227.0	0.02
Victoria (Million/Year)	334.4	0.01

In identifying the impact on water resources of the LVOS, it is also important to consider the impact in years of low water availability. **Figure 11** and **Figure 12** show the average impact, the impact in the 10 years of lowest diversion, and in the year of lowest diversion compared to Benchmark for New South Wales and Victoria. These impacts are also low and are considered acceptable. It should be noted here that the diversions in the lowest 10 years and the lowest single year for both New South Wales and Victoria are higher than the results of previous modelling studies. This is because the MDBC Cap on diversions has now been included in the Benchmark, which has the effect of "smoothing" diversions by limiting extractions in some years, which results in higher reserves in dry years.

Figure 11: NSW Diversion Impact

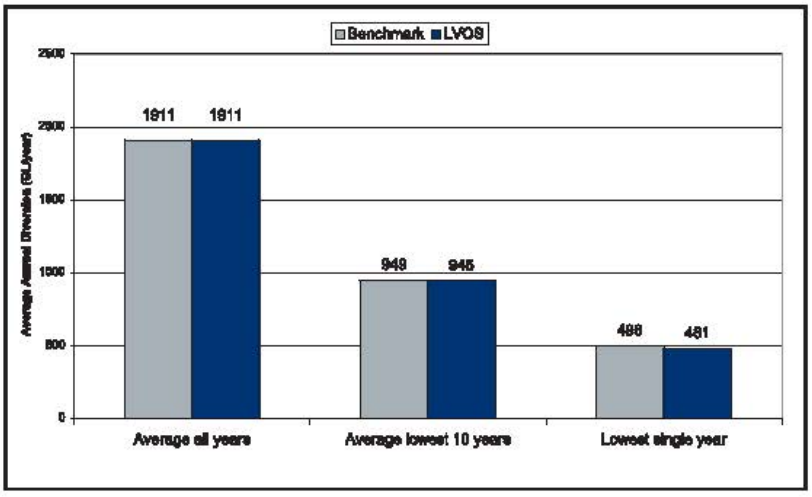
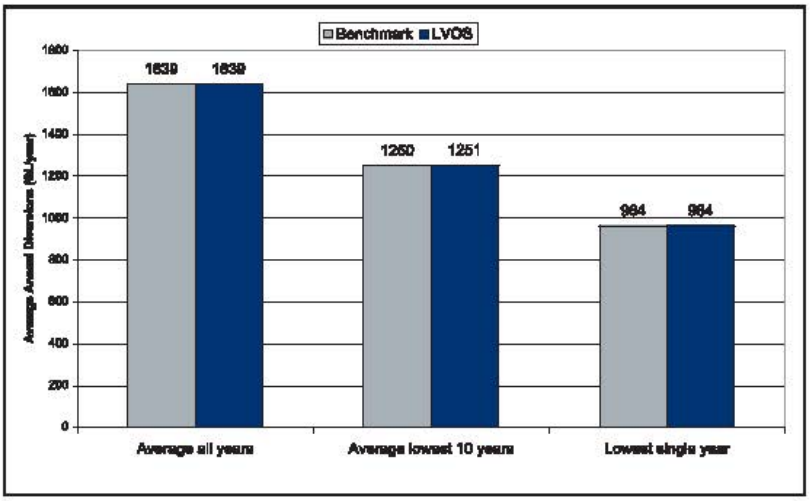
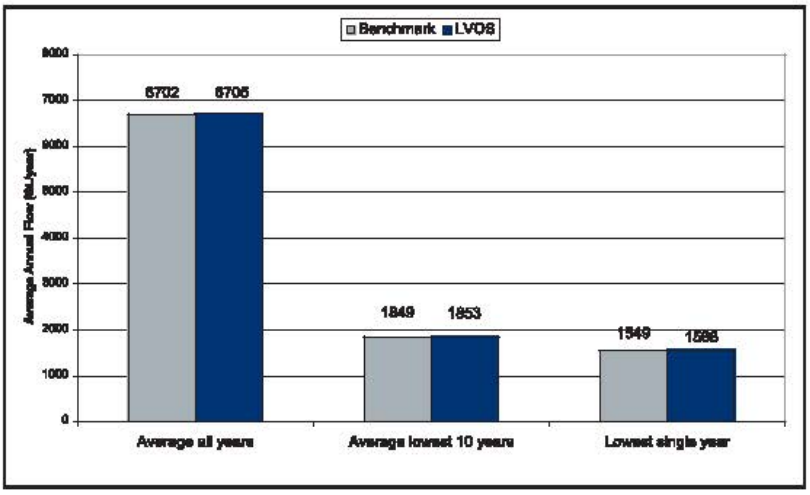


Figure 12: Victorian Diversion Impact



Similarly, **Figure 13** shows the impact on flow to South Australia. The LVOS results in a small increase in flow to South Australia in dry years.

Figure 13: Impact on Total Flow to South Australia



5.2.1 Seasonal Flow Pattern Downstream of Lake Victoria

Figure 14 shows the average impact on flow to South Australia for each month. This graph shows that there is an increase in flow in late summer–autumn as a result of the drawdown of Lake Victoria, with a corresponding decrease in average monthly flow in spring, as a consequence of the delayed refilling of the Lake.

In relative terms, the increase in flow in autumn is of greater magnitude than the decrease in spring, which results in some salinity benefits (refer to Section 5.3 below).

In general, a reduction in the magnitude of spring flows in the Lower Murray is undesirable. Spring flows are already the most affected by river regulation and water resources development upstream. It is the reduction in frequency of overbank flows during this time of year which is of greatest concern with respect to environmental outcomes in the Lower Murray. However, it is important to consider the following points when assessing the impact shown in **Figure 14**.

(i) The modelled results do not include earlier filling to conduct Environmental Flow operations.

Figure 14 does not include changes in the timing of flows that would result from the Environmental Flow operations described in Section 4.2. These changes would occur in years of higher flow. The effect of alterations in the management of Lake Victoria for Environmental Flow operations would be to store additional water in Lake Victoria earlier in the year. This would bring forward the timing of the reduction in flow in the Lower Murray shown in **Figure 14**.

(ii) The modelled results do not include peak flood flow enhancement.

Figure 14 also does not include the flood enhancement aspects of the Environmental Flow operations described in Section 4.2. This would effectively increase the volumes in both Benchmark and LVOS cases in September–November, when the majority of Environmental Flow operations are likely to take place. Due to the conservative filling strategy of the LVOS, it is unlikely that opportunities to enhance flood flow peaks would be significantly affected, and hence the volumes that would be released under both cases would be almost identical.

Whilst the changes to the seasonal flow pattern in the Lower Murray are expected to be less than that shown in **Figure 14**, some change is inevitable. However it is considered that the trade-off between the potential environmental outcomes at Lake Victoria as a result of the revised LVOS and the likely reduced environmental outcomes for the River Murray floodplain downstream of Lake Victoria are an acceptable consequence of continued operation of Lake Victoria.

5.3 Salinity

Table 2 shows that the modelled salinity impacts in the River Murray system resulting from the LVOS range from no change to a very small improvement. No significant change in River Murray salinity occurs upstream of the Darling River junction, and hence there is no salinity cost to New South Wales or Victoria.

At Morgan, the LVOS results in a modelled average annual reduction in salinity of 3.5 EC based on the benchmark case used. This is largely a result of the drawdown of the Lake in autumn, which provides slightly higher flow to South Australia in autumn than benchmark conditions. Flows in spring are slightly less than benchmark conditions due to refilling of Lake Victoria. However, the increase in flow in autumn is proportionally greater than the decrease in spring, with the net effect of greater dilution in autumn.

The reduction in salinity at Morgan is consistent with the objectives of the MDBC's Basin Salinity Management Strategy. The reduction is significant, and is a positive outcome from the LVOS.

Figure 14: Monthly Impact on Flow to South Australia

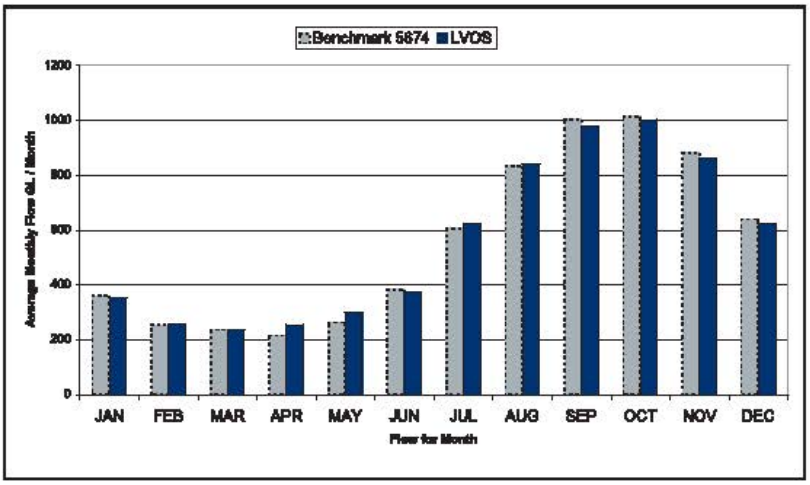
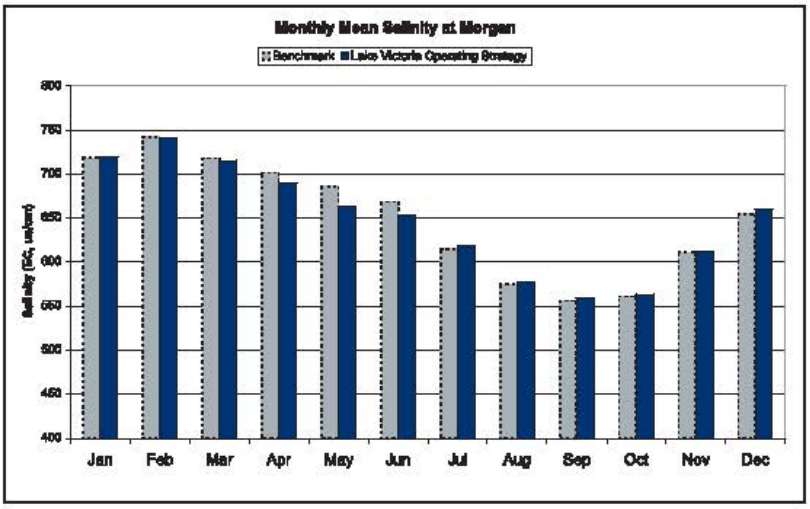


Figure 15: Monthly Impact on Salinity at Morgan



6. Communications

6.1 Review Panel

Section 3.5 of the Cultural Landscape Plan of Management details the role and responsibility of the Review Panel.

The Review Panel's responsibilities include:

- Review proposals for research at Lake Victoria;
- Review and approve the monitoring program required for the Consent;
- Review results of the monitoring program, and make recommendations for the subsequent year's research plan, and if applicable, **any changes to management practices or Lake operations deemed necessary from the monitoring results**; and
- **Participate in any consideration of proposed changes to management practices and Lake operations, whether the recommendations are made from the review of monitoring results or from any other source.** *With respect to emergency operations, or operational decisions that by their nature require rapid response, this does not apply (refer to Section 4.2 & 4.4).*

The Review Panel will meet on an as required basis. As described in Section 4, the Review Panel will consider any deviation from the general operating rules, including for environmental flow operations, planned maintenance activities and deviation from the LVOS to enhance vegetation establishment.

6.2 LVAC and NPWS Reporting Requirements

6.2.1 Routine Operations

The LVOS is responsive to changing conditions in the River Murray system. The refilling of Lake Victoria under the LVOS is also based on a conservative assumption that conditions will be very dry. The operation of Lake Victoria will need to be refined following rainfall events, particularly in spring.

RMW will continue to provide advice to the LVAC describing routine operations in accordance with the general operating rules. This advice is expected to be in the form of an informal briefing, but shall include a graphical presentation of forecast operation of Lake Victoria.

The advice provided to LVAC shall also be presented to NPWS. This shall form the basis of routine tracking of operations under the LVOS. However, if a forecast has not been updated for 12 weeks, or if there is a significant change to operations such as a very large rainfall event in spring, an updated forecast shall be provided to NPWS.

6.2.2 Deviation from General Operating Rules

The Review Panel will advise the LVAC and NPWS when deviation from the general operating rules is required.

6.2.3 Annual Reporting

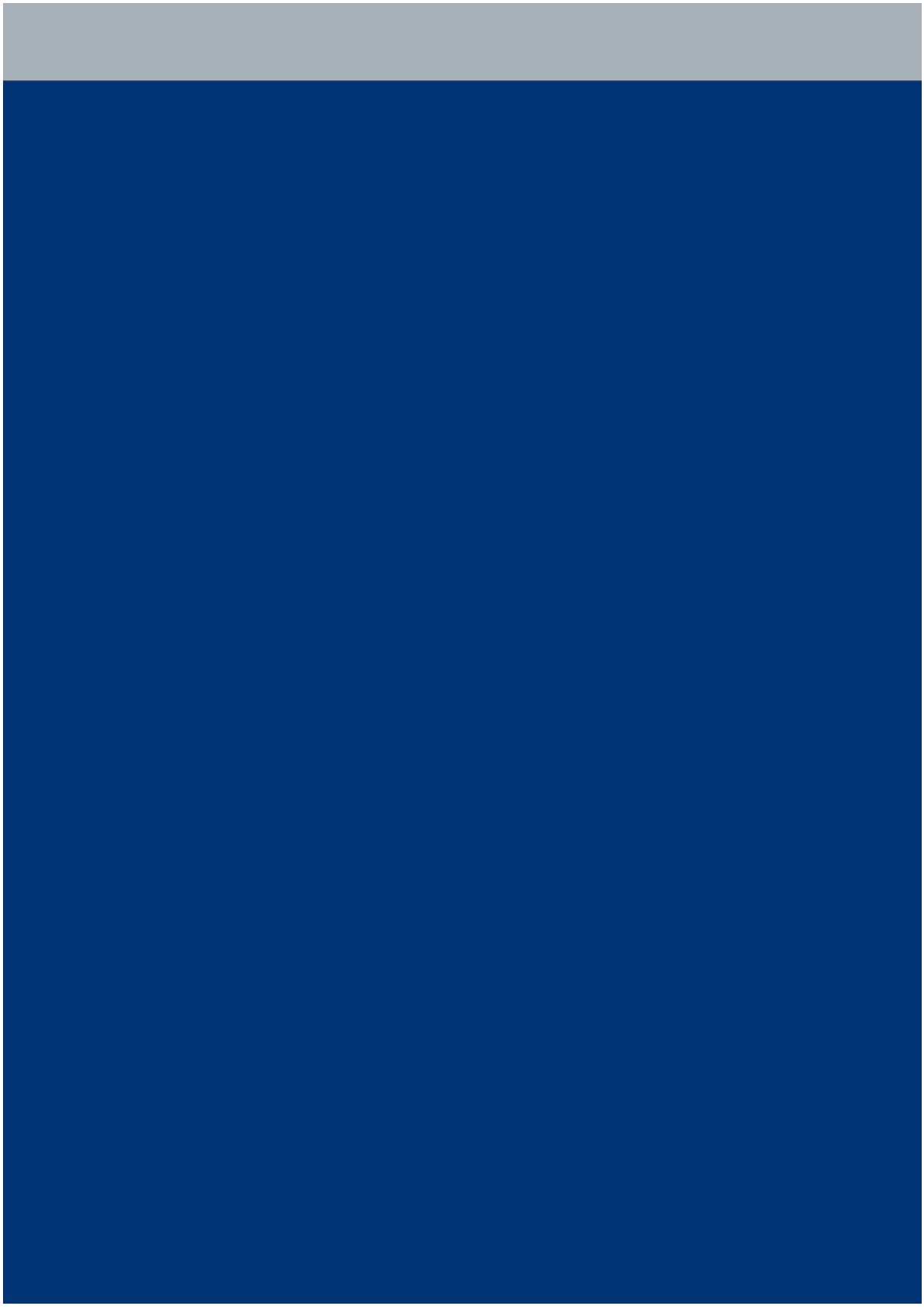
Annual reporting requirements are described in Section 3.7 of the CLPM. The Annual Report shall include a description of operations undertaken over the previous 12 months.

7. References

1. Murray–Darling Basin Commission (2001); Rivers as Ecological Systems: The Murray–Darling Basin, MDBC, Canberra. ISBN 1 876830 03 4.

2. Roberts, J. and Marston, F. (2000); Water Regime of Wetland & Floodplain Plants in the Murray–Darling Basin: A Source Book of Ecological Knowledge. CSIRO Land and Water Technical Report 30/00 October 2000. Canberra. ISBN 0 643 06084 7.

3. Sluiter, IRK and Robertson, P. (2000); Flora and Fauna of the Lake Victoria Area, South-west New South Wales. Ogyris Ecological Research Report No. 99/04 January 2000.



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