

**Australian Government** 





# MURRAY-DARLING BASIN AUTHORITY

# Lake Victoria Annual Report July 2007 - June 2008

March 2009

## WARNING:

This document may contain the names and images of deceased indigenous people.

The Murray–Darling Basin Authority strives to treat indigenous culture and beliefs with respect. We acknowledge that to some communities, it is distressing and offensive to show images of people who have died.

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Front cover images Top – Rufus River at sunset by Sean Freeman (2007) Left – Information Bay ceiling panel by Lyn Barnes (2007) Middle – Grinding dish by Sean Freeman (2007) Right – Old Rufus River crossing by Sean Freeman (2007)

Please be aware that this document contains the names and images of deceased Indigenous people. The Murray-Darling Basin Authority strives to treat Indigenous culture and beliefs with respect. We acknowledge that to some communities, it is distressing and offensive to show images of people who have died.

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# About this Report

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 Authority (MDBA) as a regulated, off-river storage as part of the Murray River system. Lake Victoria is owned and operated by the South Australia Water Corporation (SA Water), on behalf of the MDBA.

Regulation of the Lake over the last 70 years has contributed to the erosion and exposure of Aboriginal cultural material on the lakeshore and surrounding cliffs, 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 of the NSW National Parks and Wildlife Act (1974) to allow continued disturbance of non-burial Aboriginal objects by regulation of the Lake.

The following annual report focuses on those activities that have been carried out against each of the Conditions contained in the Section 90 consent. Satisfactory completion, partial completion and non compliance with the Conditions of Consent have been reported via use of ticks and crosses in the compliance tables. A tick and cross together indicates partial compliance.

The annual report contains excerpts of several different reports published on the work undertaken on Lake Victoria during the reporting period. These excerpts contain summary tables only, and relate directly to how these monitoring activities address requirements of the Section 90 Consent.

Further information on any of these reports will be provided upon request.

# Statement of the status of cultural heritage at Lake Victoria

#### Reporting period 2007 - 2008

The Lake Victoria lakebed and surrounding cliffed areas are continually surveyed by the Lake Victoria Cultural Heritage management team to ensure that any newly exposed burials are recorded and protected.

Cultural heritage is also protected via the impressive regrowth of areas of vegetation, especially in the southern lakebed region and along the eastern foreshore where grazing pressure has been reduced, the effects of wind and wave erosion are less severe, and the operating strategy has allowed for natural conditions to be mimicked.

A better understanding of how cultural heritage is being impacted by ecological and geormorphological processes is currently being developed via a review of the existing monitoring program. The objective of this process is to develop an integrated predictive model to help to guide the protection works program into the future.

Lake Victoria Program Manager December 2008

## A snapshot view of the 2007 – 2008 reporting year

#### **Burial Protection works**

- A six week burial conservation works program was undertaken during May/June of 2008.
- A total of 147 burials are now protected by conservation works in situ at Lake Victoria, with 29 new burials protected during the reporting period.
- Two thousand and six hundred (2,600) geo sand bags were used to replenish old burial mounds and to protect new sites (photographs 5 & 6).

#### **Cultural objects**

 A cultural relics monitoring program has begun, and will now be further developed by the Scientific Review Panel.

#### Lake Victoria Advisory Committee (LVAC) and Community Relations

- There were two LVAC meetings held within the reporting period, with two more held within days either side of the reporting period.
- LVAC meetings consisted of an independent Chairperson and Deputy, 14 members from the Barkindji Elder Council (BEC), two local landholders, and government agencies (SA Water, Department of Water and Energy (DWE), Department of Environment and Climate Change (DECC), Lower Murray Darling Catchment Management Authority (LMD CMA) and the Murray-Darling Basin Authority (MDBA). A place was provided for Irrigators.
- The Lake Victoria depot meeting rooms were extended and concept ideas for a Lake Victoria Meeting and Keeping Place were begun.

#### Aboriginal involvement at Lake Victoria

- Ten formal BEC meetings were held, and on another 17 occasions, individual BEC members contributed at Lake Victoria via participation in field inspections and monitoring activities.
- An Aboriginal cadetship program was developed, with two new cadets appointed by the SA Water Corporation.
- The cultural heritage management team, including the two new cadets, will now consist of four Aboriginal personnel.
- Mr Tom Smith was appointed as Chairperson of the Lake Victoria Advisory Committee, and took up the position in October 2007.
- Three Aboriginal youth were employed on a short term basis on various works programs. The youth were mentored by BEC Elders.

#### Plan of Management

• The reviewed Plan of Management was submitted to the Director General of DECC by the 1st of August 2007, and later glossy versions were produced.

#### Reporting

• The LVAC approved Annual Report was provided to the Director General of DECC by the end of January 2008 and a newly formatted version was published on the MDBC website on the 22nd of August 2008.

#### **Scientific Monitoring**

- Wayne Stephenson of the University of Melbourne undertook monitoring of shoreline change twice (for the first time) to differentiate between impacts from wind and wave actions on sediment movement.
- Dr Stephenson's 2006-2007 annual report flagged that profiles 28, 25, TGB2 and TGB 3 are all presenting evidence of possible sediment loss.
- Dr Ian Sluiter undertook vegetation monitoring, and produced a report in which he recommends that vegetation monitoring be increased in the Talgarry and Nulla beach zones.
- Mark Mitchell and Matt Baker from DWE undertook groundwater monitoring, and began an EM31 survey of the shoreline in response to possible impacts from salinity because of lower than normal Lake levels.
- Greater emphasis was placed on the integration of varied data sets to improve our understanding of impacts to cultural heritage.
- The Scientific Review Panel met on three occasions and provided preliminary advice to MDBA in relation to a review of the monitoring program.

## **Communication and Access**

• The Lake Victoria Information Bay was nearly completed.

## Revegetation

• A greenhouse and nursery were established at Lake Victoria.

#### Land Management

- A total of 26,480 Litres of Bi-Active chemical was used to control weeds in the consent area.
- Outbreaks of golden dodder were detected for the first time.
- The feral control program continued.
- Intense rabbit treatments were undertaken in the Snake Island and Noola Station areas.

## Lake Operations

- Lake levels were at a level of 23.43 AHD on the 1st of July 2007 and rose to a level of 25.98 AHD on the 13th of September, before once again drawing down to 23.22 AHD on the 9th of May 2008. These low levels reflect the ongoing dry conditions in the Murray Darling Basin.
- The Lake continued to be operated according to the Lake Victoria Operating Strategy.

## Impacts outside of the lake

- The MDBA continued negotiating with neighbouring landholders in relation to impacts as a result of Lake operations.
- The AEMS salinity mapping project and BRS –EM survey was ongoing.

# Lake Victoria Advisory Committee and Community Relations

# (Consent Conditions 1 – 11)

	Compliance Response
Lake Victoria Advisory Committee	<ul> <li>The Lake Victoria Advisory Committee (LVAC) met twice within the 2007-2008 reporting period, on the 31<sup>st</sup> of October 2007 (number 52) and the 13<sup>th</sup> of March (number 53).</li> <li>Two other LVAC meetings were held close to the start and end dates of the reporting period, on the 27<sup>th</sup> of June 2007 (51) and the 30<sup>th</sup> of July 2008 (54).</li> <li>Mr Tom Smith took over from Acting Chairperson Dr Jane Lennon in October 2007</li> <li>In October 2007, LVAC welcomed the following new SA Water staff members: <ul> <li>Mr Jim Rishworth (SA Water Murray Operations Manager and new LVAC committee member)</li> <li>Mr Neville Skipworth (Lake Victoria Manager – SA Water)</li> <li>Mr Greg Warren (BEC Facilitator- LMD CMA) was also welcomed to LVAC in October 2007.</li> </ul> </li> <li>Three LVAC Working Group Meetings were held (September and December 2007 and March 2008), with another on the 9<sup>th</sup> of April to streamline financial reporting arrangements.</li> <li>Works began on the extension of the Lake Victoria meeting room at the SA Water depot to enable future LVAC meetings to be held at Lake Victoria.</li> <li>Initial consideration of a Lake Victoria Meeting Place, and possibly an Aboriginal 'Keeping Place' began with consultation between Alan Croker of 'Design 5' Architects and LVAC meetings</li> </ul>
BEC meetings and BEC involvement at Lake Victoria	<ul> <li>The BEC formally met on 10 occasions.</li> <li>BEC members were involved in 14 separate monitoring field trips (burial protection works, the Noola conservation reserve fence line project, Rufus River monitoring and monthly Lake inspections), and as sub committee members attending additional meetings.</li> <li>The MDBA paid a total of \$17,250 to support the BEC meeting process.</li> <li>Mr Ray Lawson (BEC Elder) and the Cultural Heritage Manager provided a cultural heritage induction to SA Water personnel in March 2008.</li> </ul>

Landholder communication	<ul> <li>Regular liaison occurred between SA Water and DWE in relation to:</li> <li>Weed management of sensitive areas (i.e.; Duncan's corner, South Eastern, South Western and, Noola foreshore) – Dec 07 / April 08.</li> <li>Burial conservation works – May / June 08.</li> <li>Feral animal treatment works – ongoing</li> <li>LVAC meeting arrangements - ongoing</li> <li>A field inspection with the Scientific Review Panel in July 2007</li> </ul>
Employment of workers at the Lake	<ul> <li>The Aboriginal Employment Strategy for the Plan of Management was completed.</li> <li>An interview panel which included two BEC members, conducted interviews for selection of two LVS Aboriginal cadets on the 16-17 of September. Two candidates were successful and they will commence later in 2008.</li> <li>With the new cadets, the cultural heritage management team will now consist of four Aboriginal personnel.</li> <li>Shaun Lawson was employed for a period of 3 months, undertaking both weed spraying and general operations maintenance during (March), and for the burial conservation works during (May/June 2008).</li> <li>Both Stuart Smith and Rodney Lawson were employed for the 6 week burial conservation works program (May/June 2008).</li> <li>Mentoring support was provided by BEC members (Ray Lawson, Brian Carter and Roland Smith) during the burial conservation works program.</li> <li>Shaun Lawson was employed to assist with rabbit control work on Noola Station in 2007</li> <li>The BEC were involved in the selection of Aboriginal youth to assist construction of the Noola riparian conservation fence line later in 2008.</li> </ul>
Sharing of Information with the broader community	<ul> <li>BEC members were assisted by junior members of the local Aboriginal community (in a paid capacity) to undertake both mentoring and salvage works. Junior members were Roland Smith (jnr), Nicolas Smith and Shane Johnson.</li> <li>The BEC Chairperson presented information about Lake Victoria to the National Indigenous Land and Sea Conference at Cardwell in October 2007.</li> <li>In February the Cultural Heritage Manager and Program Manager briefed a group of students from Boort School.</li> </ul>



Photo 1 – Left Lunch break on works program

Photo 2 - Right BEC Elders, May Johnson and Brian Carter inspect protection works

Photos courtesy Mike Gilby



# **Cultural Landscape Plan of Management**

# (Consent Conditions 12 -37)

	Compliance Response 🛛 🖌 and 🗡
Plan of Management (cc12- 17)	<ul> <li>The reviewed Plan of Management was presented to the Director General of DECC by the 1st of August 2007, and further modification to the document was then undertaken at the request of DECC.</li> <li>Further development of a final glossy version of the Plan of Management was undertaken to ensure that a more workable format was achieved. In March 2008 the LVAC was provided copies of the glossy version to comment on before it went to print.</li> </ul>
Reporting Processes (cc 18)	<ul> <li>The draft Annual Report was submitted to LVAC members at least two weeks prior to the final LVAC meeting of the year in 2007 (Meeting 52). Advice was provided by LVAC committee members, and a final version was provided to the Director General by the end of January 2008.</li> <li>A presentation of final report was scheduled on the LVAC 53 agenda; however the presentation was not undertaken.</li> <li>The report was published on the MDBC website on the 22nd of August 2008, once the MDBC had aligned the format to the new MDBC publication style and River Murray Water had approved the document.</li> <li>A new annual report template has been developed which includes the new MDBC style format and the simpler reporting style.</li> </ul>
Communication and Access Strategy (cc 20)	<ul> <li>The Lake Victoria Information Bay site was nearly completed.</li> <li>`No wash, No Ski Zone' signs were completed and installed.</li> <li>Cultural Heritage signs placed at various locations around the Lake</li> </ul>
Strategies for Revegetation (cc 21)	<ul> <li>The construction of a greenhouse and nursery were started with the initial greenhouse structure built by July 2008. These facilities will be used to propagate endemic native seeds, with the aim of using plants grown on site to target areas on the foreshore where a lack of vegetation presently exists, especially on the northern and eastern foreshores. It is intended that the local community will be involved in this project.</li> <li>The Scientific Review panel, which visited the site for the first time in October 2007, will provide further scientific advice to the MDBA in relation to revegetation of the foreshore.</li> </ul>



Photo 3 – new Greenhouse

Photo 4 – `No wash – No ski signs'



Courtesy Lyn Barnes

Courtesy Mike Gilby

Research Activities (cc 22)	<ul> <li>Continuation of the EM31 survey and research related to salinity levels on the foreshore has been undertaken.</li> </ul>
Review Panel (cc 23-26)	<ul> <li>The newly formed Scientific Review Panel (SRP) met on three separate occasions, in September 2007 and March 2008 to review the present monitoring methodology and reporting arrangements. In October 2007, they participated in a field trip to the Lake.</li> <li>Initial advice from the SRP, about how the scientific monitoring program and reporting arrangements could be improved was provided by each scientist to the MDBA by the end of the reporting period.</li> </ul>
Monitoring Cultural Heritage and Monitoring Burial Protection Works	<ul> <li>The following is a list of burial mounds (29 in total) which have been added to the cultural heritage data base within this reporting period, with a total of 147 burials now recorded:         <ul> <li>Thirteen burials on Snake Island</li> <li>Four burials on Duncan's corner</li> <li>Eleven on the South Western Beach</li> <li>One on Frenchmans Creek</li> </ul> </li> <li>In addition, there are twenty-one burial sites on Talgarry Barrier (TB 65-86) that Gary Schultz has recommended we attempt to verify by using</li> </ul>
(Consent Conditions 27 – 29) Photo 5 Photo 5	<ul> <li>original GPS points to guide us to confirm if there is evidence of burials at these locations.</li> <li>Discovery of the new burials was a result of survey undertaken by the cultural heritage team and a ten year resurvey undertaken by Gary Schulz from SA Water with the result, Volume 2 of his two set series on 'Lake Victoria Cultural Heritage' reports produced.</li> <li>Two thousand, six hundred (2,600) geo-fabric sand bags were laid to replenish existing burial mounds, and to protect new burials in the burial protection works program which was undertaken in July 2008.</li> <li>Surveillance of cliffed areas on the south eastern foreshore and Talgarry was undertaken on a regular basis.</li> <li>The establishment of 25m<sup>2</sup> transects on the Snake Island beach to enable thorough survey of the area by the cultural heritage management team.</li> <li>Completion of tagging and confirmation of GPS coordinates of all</li> </ul>
Photo 6	<ul> <li>mounds located on the southern lake-bed.</li> <li>All erosion monitoring trees on the southern lakebed have been tagged</li> <li>The scar trees on Moon, East Moon Islands, Frenchmans Creek and Rufus River are now tagged.</li> <li>The 1997 EIS data set (on cultural relics) was assessed and reorganised for use in development of a 2007 cultural heritage relics monitoring program by Mr Sean Freeman from 'Australian Heritage Services'. Mr Freeman presented information from this project to LVAC</li> </ul>
PNOIO /	in March 2008, and provided a draft report on his findings.

Photo 5 and 6 - Deterioration of a burial mound on Frenchmans Creek - February 2007, and the same burial after the 2007 protection works - June 2008. Photos courtesy of Gary Schultz and John Grima

Photo 7 – Flagged material at Snake Island surveying transects – early 2008. Photo courtesy of John Grima

Understanding, assessing and monitoring the environment, impacts and mitigation actions (Consent Conditions 27 - 37)

Section 90 Consent and Compliance Response for Erosion Monitoring at Lake Victoria (NPWS 2006)

By Dr Wayne Stephenson (University of Melbourne)

Erosion Monitoring Consent Conditions	Compliance Response
Condition 27: The CLPoM will contain	Thirty five transects, some established as early
strategies for monitoring cultural heritage, the	as 1998, are surveyed annually for the purpose
impacts of erosion, deposition, saline	of monitoring erosion and protection work
groundwater and salinity on the Lakeshore,	performance. The majority of transects are
particularly targeting recording the condition,	located in areas of high cultural value. In 2008
protection and monitoring of known and newly	these transects were surveyed twice to capture
discovered burials, and of any sites identified as	change associated with both wind erosion when
being of special significance, according to	lake is low, and wave erosion when the lake is
measures described in detail in the section 87	closer to full storage.
permit.	
Condition 28: Where works have been	A number of erosion monitoring transects cross
constructed for the purpose of protecting burials	the major burial protection works (major burial
and other significant objects and sites from	works are defined here as those works intended
physical impact, a monitoring and maintenance	to retain large quantities of sand in place to
program will be established, and this will be	provide a cover and hence protection of burials,
Included in the CLPOM.	rather than individual burial mounds) and
	document the performance and condition of
	those works. Each year recommendations are
	made with regard to the maintenance of those
Condition 20: The CL DoM shall contain a	WOIKS.
strategy for the identification assessment	monitored through the survey of 35 transect and
monitoring and where possible management of	visual inspections during surveying. These
all physical and biological processes affecting	transacts are surveyed annually and the majority
the stability of the Lakeshore. The strategy will	are located in areas of high cultural value and
include the identification of priority areas for	zones where erosion is known to be a problem
minimising erosion around the Lakeshore	In 2008 these transects were surveyed twice to
focusing on historically undisturbed sediments	capture change associated with both wind
especially those containing cultural material, or	erosion when the lake is low, and wave erosion
that with intrinsic geomorphological significance.	when the lake is closer to full storage. In as far as
The Strategy shall also contain actions for the	possible, profile change is explained with respect
minimization of erosion, taking into account the	to the process environment. Reporting of change
broader cultural landscape values. Where	on each profile always identifies when significant
significant erosion is monitored, the MDBA shall	erosion of historically undisturbed sediments has
review the causes of the erosion, and provide a	occurred. Recommendations are made to SA
copy of that review to the Director-General. The	Water when it is necessary to report significant
review will include any measures proposed to	erosion to the Director-General DECC.
reduce the rate of erosion, and the timetable for	
their implementation. Any changes to the	
strategies in the CLPoM resulting from	
information collected in the monitoring program	
must be referred to the LVAC for comment and	
approval by the Director – General.	

Condition 31: All investigation, assessment and	Erosion monitoring utilizes current best practice.
monitoring activities will utilize current best	
practice. The results of all the investigations,	
monitoring and assessment activities will be	
noted in the Annual Report	

- Dr Stephenson's report is available upon request.
- An inspection of gully erosion at various points around the Lake was undertaken in March with Katie Hollingsworth (Riparian Program Manager/RMW) and Tony Crawford (River Management Engineer/DWE) to assess possible actions to reduce impacts to the foreshore.



Photo 6 Katie Hollingsworth and Tony Crawford inspect erosion on the northern beach

Photos courtesy Lyn Barnes



Photo 7 The Scientific Review Panel inspect the South Eastern Beach area in October 2007

# Monitoring Vegetation (Consent Conditions 30 – 37) (Permit 57)

Section 90 Consent and Compliance Response for Vegetation Monitoring at Lake Victoria (NPWS 2006)

By Dr Ian Sluiter (Ogyris Pty Ltd)

Flora Monitoring Consent Conditions (NPWS 2006)	Compliance Report
<b>Condition 32:</b> The Cultural Landscape Plan of Management (CLPoM) will contain a strategy for the ongoing identification, assessment and monitoring of vegetation on the Lakeshore. The strategy will include actions for the retention and enhancement of native vegetation on the Lakeshore, taking into account the broader cultural landscape, cultural heritage values and natural attributes. Where natural significance values, in identified priority areas are demonstrably negatively affected by the operation of the Lake, and /or there is a measured decrease in the extent of vegetation cover by the plant species identified in the CLPoM, the MDBA will review the causes of vegetation decline and where possible, take appropriate corrective management action and report these to the Director-General.	Annual botanical field assessment and reporting from culturally sensitive areas which included comparison with previous year's data allows for feedback to the MDBA (via SA Water) on the status of the vegetation surrounding the Lake. No culturally sensitive areas were found where there was a significant "measured decrease in the extent of vegetation cover by plant species identified in the CLPoM". In most instances, despite a lack of floodwaters at levels above 26m AHD over the past 2 years, plant cover and biomass has been maintained. Some `browning off' of spiny sedge is considered to be due to autumn-winter frosts combined with a lack of rainfall. A Lake-fill cycle to 27 m AHD over the 2008/2009 summer period, from the experience of the past 10 years of monitoring under current Lake operations, would in all likelihood, lead to a major rejuvenation of key species such as spiny sedge, spiny mud-grass, common reed and river red gum. In a couple of isolated areas, tree health decline of river red gum was noted. These occurred at Talgarry Wells and around the western shoreline. The reasons for this decline are currently under investigation as part of a separate study by the author. The fact that this separate study has been commissioned shows that the feedback loop and reporting mechanisms within the CLPoM are working.
<b>Condition 33:</b> The MDBA must monitor the nature and distribution of Lakeshore vegetation, including both native and introduced species, and identify and assess the range of processes affecting these and their interactions.	Monitoring lines exist around the perimeter of the Lake and <u>all</u> plant species are measured, recorded and reported upon. The reasons for plant species expansion and decline are explained within this report.
<b>Condition 34:</b> Vegetation monitoring will also include assessment of the impact of vegetation on the sedimentation and erosion of sediments with in situ cultural heritage that have been identified as priority areas.	Monitoring is concentrated in culturally sensitive areas and occurs along the same transects as used in the Shoreline Change Study. Where significant sedimentation or erosion occurs, the vegetation response is noted.
<b>Condition 57 (Consent and Permit):</b> In carrying out the activity, the MDBA must not damage any critical habitat, harm or pick any threatened species, population, ecological	No threatened flora species or Threatened Species Conservation Act 1995 listed plant communities have been recorded from the Consent area at Lake Victoria. Threatened plant communities listed by

community or protected fauna, or damage		
their habitats. The MDBA shall therefore		
carry out all necessary monitoring to detect		
any risk of this occurring.		

Benson (2006) do occur in areas surrounding the Consent area which is managed by either SA Water or the New South Wales DWE.

Dr Sluiter's report is available upon request.

Compliance Response		
Management of Weeds (cc 32-33)	<ul> <li>A total of 26,480 Litres of Bi-Active chemical was used by `Bernhardts Pest and Weed Control' contractor to treat horehound, Noogoora burr, golden dodder, castor oil plant and Bathurst burr in the consent area (1:100 mix general use).</li> <li>The establishment of summer weed control monitoring photo points was undertaken.</li> <li>Golden dodder was detected as a new and problematic weed. Outbreaks were treated over summer with a total of 2,200 litres of Roundup at a stronger mix of 10:100L.</li> <li>Map 1 (page 21) provides further detail about where weed controls were undertaken</li> </ul>	
Management of feral animals (cc 35)	<ul> <li>Rabbit numbers continued to fluctuate between 6.56 p/km – 0.5 p/km in the Snake Island area, and on Noola (area 1), between 6.46 p/km33 p/km.</li> <li>Intense treatment was undertaken in the Snake Island area and on Noola Station, close to the consent boundary.</li> <li>On Snake Island in September 2007 rabbit numbers counted were 3.68 p/km, in December there were 1.03, and in May 2008 there were 2 p/km.</li> <li>Some rabbit complexes destroyed on Noola contained up to 80 holes, with one 100 metre area containing 177 holes.</li> <li>Project planning for construction of a `stock proof' riparian conservation reserve fenceline along the western margin of Lake Victoria, with plans to complete the fence by October 2008.</li> </ul>	



Photo 8. Frank Bernhardt treats Warrens with a rodex machine



Photo 9. A patch of golden dodder to be treated

Photos courtesy of Mike Gilby

Salinity at Lake Victoria Shoreline (Consent Conditions 37 – 38, 42 - 44)

2007/2008 Groundwater Monitoring Results

Compliance with Consent Conditions

By Ma	rk Mitchell (D	WE)	
Relevant Consent Condition	Compliance with Consent Condition Y/N	Comment on compliance with consent condition	Action Recommended Y/N
37	Y	The groundwater quality is monitored by conducting electromagnetic surveys along established transects and down bore hole electromagnetic surveys. These surveys enable the monitoring of variations in the groundwater salinity over time. An investigation is currently occurring on the salinity of the Lake bed to determine the variation in soil salinity and the potential impact of the soil salinity on cultural heritage sites and revegetation. This investigation is ongoing and will be completed during the 2008/09 year.	Ν
42	Y	There is an established groundwater level monitoring network surrounding Lake Victoria. It includes sites on the River Murray floodplain to the south and south-east of the Lake and on the adjacent land off the floodplain. This monitoring network has groundwater level data loggers installed. Multiple daily measurements are taken at each of these sites	Ν
44	Y	There is an established groundwater level monitoring network surrounding the Lake. This monitoring network has groundwater level data loggers installed. Multiple daily measurements are taken at each of these sites. The monitoring indicates that there has been a minimal change in groundwater levels. Any increase in the area affected by salinity or change in condition of the environment is not directly associated with the current groundwater levels. Any change would be associated with an adjustment to the saline environment.	Ν
46	Y	An investigation (EM31) is currently occurring on the salinity of the Lake bed to determine the variation in soil salinity and the potential impact of the soil salinity on cultural heritage sites and revegetation. This investigation is ongoing and will be completed during the 2008/09 year.	Ν

Report available upon request

## Lake Operations

## (Consent Conditions 38 – 41)

By Bruce Campbell (River Murray Water)



#### Lake Victoria Water Level 2007-08



## Impacts on Areas outside of the lake

# (Consent Conditions 42-47)

	Compliance Response
Consent Conditions 42- 47	<ul> <li>Links to the Chowilla project and planning procedures via the Lake Victoria Regional Committee continue.</li> <li>Continuation of the AEMS salinity mapping project and BRS –EM survey to assist managers with information about where salt is accumulating within the floodplain, and on surface/groundwater dynamics.</li> <li>Ongoing negotiations with landholders in relation to the protection of the Lake Victoria foreshore</li> <li>Communication between the LVAC/BEC and the `Living Murray', Chowilla icon site, Working Group were established</li> </ul>

Photo 11.

Photo 10. The Information Bay site is to be completed in the next reporting period



Riverina TAFE students paint the Information Bay ceiling panels –November 2007



Photos courtesy Lyn Barnes

## **Recommendations for alteration to the Plan of Management**

The following suggestions are provided for alteration to the Plan of Management:

- Alter Table 2, `Consent Condition 18 Reporting Processes' by adding additional information as recommended:
  - 1. Under the heading `STRATEGIES what to do' add the words:
    - (Insert as the first dot point), `Identify positions responsible for contributions to the Annual report each year, create and update templates related to each position and then ensure that relevant material is collected and organised in an ongoing manner throughout each reporting period'.
  - 2. Under the heading `ACTIONS how to do it', as the second dot point, add the following words
    - (Insert as the second dot point), `Contributions from LVAC committee members are to be provided to the Program Manager by no later than the end of August of each year.'
    - Alter existing first dot point to read `Monitoring reports aim to be provided by no later than the end of August of each year'
    - Insert another dot point after the exiting third dot point. The new sentence would read 'Submit the LVAC approved report to River Murray Water for consideration by the end of December of each year'.
    - Alter the requirement to submit the final annual report to the DECC by the end of the January of each year and change it to read 'the Annual Report is required to be submitted to DECC no later than the end of February of each year'.
    - Add a final dot point to read 'The Annual Report will be published on the web once it has been approved by RMW and has been submitted to DECC.
- The development of new policies, strategies and additions to the `Protocol' and `Action Tables' Sections of the Plan of Management. This would include:
  - 1. LVAC Code of Conduct
  - A Community Engagement Policy which may include, but is not limited to, appropriate Terms and Conditions for employment of additional community members linked to the Plan of Management. It would also contain guidelines for the processing of payments and fees for service which are linked to Consent Condition 1, and would preferably align also with fees for service agreed by other government agencies within NSW.
  - 3. Include within the existing Protocol for `Monitoring of Cultural Heritage' a strategy outlining how members of the BEC and possibly other community participants may be allocated responsibility for monitoring of defined areas and/or objects around the lake. This strategy should relate to V1 and V2 reports and other materials as developed by Gary Schultz, and monitoring of cultural objects procedures as they are further developed.

#### Table 1 – Cultural Heritage Management Program Expenditure 2007-2008 Financial Year

SERVICE LAKE VICTORIA	WORK ORDER	WORKORDER DESCRIPTION	ORIGINAL BUDGET	LABOUR	CONTRACTED	MATERIALS - STORE SUPPLY	MATERIALS EXTERNAL	FUELS AND OILS	VEHICLE REGISTRATION	PLANT AND VEHICLE REPAIR	SERVICES PROVIDED BY CONTRACTORS	ELECTRICITY	CHEMICALS	MOBILE PHONE	ACTUAL YTD
MONITORING OF	FLORA AND	EROSION:													
	MD710252	MONITORING OF FLORA AND EROSION	44,000	16,348.16			567.82				74,188.44				91,104.42
	MD810102	CULTURAL HERITAGE WORKS	0			2,993.57						645.13			3,638.70
			44,000	16,348.16		2,993.57	567.82	0.00			74,188.44	645.13		0.00	94,743.12
FORESHORE MAN	NAGEMENT, I	NCLUDING BURIAL PROTECTI	ON WORKS, PES	T AND PLAN	CONTROL										
	100740050		44.000		04.000.00										
	MD710253	CONTRACT LABOUR	44,000	5 834 57	24,629.99	3 531 24	23 318 38	4 241 46			43 612 02				24,629.99
	MD710165	MATERIALS	0	0,004.07		0,001.24	20,010.00	4,241.40			40,012.02			1,449,77	1,449,77
	MD710326	MATERIALS	0				1.182.20							.,	1.182.20
	MD710255	ROAD REPAIRS	32,000	64.17											64.17
	MD710256	PEST CONTROL	44,000	981.48		4,050.06	2,287.97	7,733.19			48,812.41				63,865.11
	MD710328	WEED CONTROL	0				1,677.27				34,244.34				35,921.61
	MD710169	CONSULTANTS - FLORA	0								27,581.00				27,581.00
	MD710257	PLANT AND VEHICLES	53,000				193.00	628.13	5,730.50	979.33	4,957.19				12,488.15
	MD710258	WAGES	64,000	85,943.29			00.45								85,943.29
	MD710259		0				23.45							2 700 57	23.45
	MD710260		0				18 740 60							2,700.57	2,700.57
	MD710201		0				10,740.09				3 055 56				3 105 55
	MD710179	OPERATING COSTS VEHICLE	0				45.55	1 974 00		502.96	3,033.30				2 476 96
								1,01 1.00		002.00					2,110.00
			237,000	92,823.51	24,629.99	7,581.30	47,472.95	14,576.78	5,730.50	1,482.29	162,262.52	0.00		4,150.34	360,710.18
AND AND PROP		EMENT AT KUI KURNA STATI	ON:												
	MD710262	PEST CONTROL	0								1,225.15				1,225.15
	MD710263	MATERIALS	0				9,747.58				,				9,747.58
	MD710264	WAGES	44,000	14,691.43											14,691.43
			44,000	14,691.43	0.00	0.00	9,747.58	0.00	0.00	0.00	1,225.15	0.00	0.00	0.00	25,664.16
LAND AND PROP		SEMENT AT NOOLA STATION A	AND LAKE VICTO												
	MD710266	PEST CONTROL	38.000				243.69				43,692,62		239.95		44,176,26
	MD710267	MATERIALS	0				1.177.51								1.177.51
	MD710268	WAGES	54.000	33,588.36			.,								33,588.36
	MD710269	PLANT AND VEHICLES	0	,			221.41								221.41
	MD710270	NULLA PUMP STATION	0	2,261.39		29.17		13,722.07			7,112.96				23,125.59
			92,000	35,849.75	0.00	29.17	1,642.61	13,722.07	0.00	0.00	50,805.58	0.00	239.95	0.00	102,289.13
			417,000	159,712.85	24,629.99	10,604.04	59,430.96	28,298.85	5,730.50	1,482.29	288,481.69	645.13	239.95	4,150.34	583,406.59
UPGRADE NULLA	ACCESS TR	ACK	-				10.004								10.04
	MD/10298		0				-16,082.50								-16,082.50
INFORMATION BA				0.005.05			0.055 5 1				4 50/ 00				0.005.10
	MD/10302		0	2,085.65			2,957.71				1,581.82				6,625.18
MEASURES TO R		A FROM FORESHORE	100.000												0.00
	1010010104		100,000												0.00
TOTAL			517,000	161,798.50	24,629.99	10,604.04	46,306.17	28,298.85	5,730.50	1,482.29	290,063.51	645.13	239.95	4,150.34	573,949.27

## Murray–Darling Basin Authority

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Map 1 – Area treated for weeds within this reporting period



## References

- Mitchell, M 2008, *Salinity at Lake Victoria Shoreline*, Department of Water and Energy, New South Wales.
- Sluiter, I 2008, Flora and Fauna of the Lake Victoria Area, Southwest New South Wales. 12.) Annual Vegetation Monitoring, Winter 2008. Part 1: Main Report, Ogyris P/L, Victoria.
- Stephenson, W & Thornton, L, 2008, *Lake Victoria monitoring programme: assessment of shoreline change 2008,* Department of Resource Management and Geography, University of Melbourne, Victoria.