

LONG TERM MANAGEMENT AND MONITORING PLAN

for the

Ex-HMAS CANBERRA Dive Site



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LONG TERM MANAGEMENT AND MONITORING PLAN

1 Purpose

The purpose of this plan is to provide for the post-placement monitoring and management of the ex-HMAS Canberra as an artificial reef for use as a recreational dive site, as per the requirements of the *Environment Protection (Sea Dumping) Act 1981* (Sea Dumping Act).

The focus of the monitoring is to inform management actions to minimise potential risks to the users of the reef and the environment.

2 Background

The State of Victoria has entered into a Deed of Gift with the Commonwealth of Australia (Department of Defence) for the ex-HMAS Canberra to be turned into a recreational dive site. It will be located between Point Lonsdale and Barwon Heads in Victoria approximately 2 kilometres from the shore. The site and ships placement (key points being bow and stern locations) at the scuttling site is detailed on the chart in Appendix A.

The ex-HMAS Canberra was the second of four FFG-7 Class Guided Missile Frigates built for the Royal Australian Navy by Todd Pacific Shipyards Corporation Seattle, Washington, USA. The ex-HMAS Canberra was commissioned on 21 March 1981, and de-commissioned on 12 November 2005.

The vessel hull is constructed of steel and the superstructure is aluminium alloy. Ex-HMAS Canberra has a length overall of 138.1 metres, a beam of 13.7 metres and a final prepared displacement of approximately 2,700 tonnes. In service, the height from keel to top of the mast was approximately 39 metres. The vessel height has been reduced to approximately 24.5 metres with the removal of radar equipment, aerials, sonar, rudder, propeller, and shortening of the masts. The aim of reducing the mast height is to give a clearance of 4 metres from the Lowest Astronomical Tide.

The vessel has been prepared as a dive site by removing potential hazards to divers such as conduits, internal fixings, hatches, ladders, loose material and by barring access to confined spaces. Access holes have been cut to ensure where possible that there are at least two access points to all internal spaces. The vessel is of relatively new construction incorporating significantly fewer hazardous materials than earlier ships. All potential hazards to the environment have been removed such as heavy metals, oils, fuels, greases, general chemicals, refrigerants, PCBs, and batteries as far as practicable. Appendix B provides a series of diagrams that depict the location and condition of the following items prior to scuttling:

- Internal and external views of the ship depicting final configuration as prepared for scuttling (details of hull, deck and bulkheads penetrations made for diver access, state of mast and A-bracket);
- Location of concrete ballast;

- Location of diver access barricades and barred access; and
- Location of bunks, lockers, partitions and other non-structural fittings.

In addition to the provisions of the Sea Dumping Act, the site will be reserved and a manager appointed under the *Crown Land (Reserves) Act 1978*.

It is expected that the site will attract interstate and international recreational divers and visitors, and increase local diver participation and activity. This is expected to realise economic benefits to the Victorian economy and provide a boost to the local dive industry.

3 Responsible Parties

The State Government of Victorian has agreed to accept the Gift of the ex-HMAS Canberra as a dive site from the Commonwealth Government (Department Of Defence) on the signing of the Deed of Gift. A condition of the Deed is that the Department of Defence will prepare the vessel as a dive site including seeking the Federal Government approvals, while the State Government is responsible for seeking State Government approvals. The Birdon Group has been contracted by the Department of Defence to prepare the vessel as a dive site including preparation of the Sea Dumping Permit Application.

While the State Government is technically the owner of the vessel as of the date of the Deed it will not assume management of the vessel until the Department of Defence issues The Birdon Group with a Certificate of Satisfactory Completion.

On issue of the Certificate of Satisfactory Completion the State Government of Victoria will assume responsibility for the vessel and as such implementation of the Long Term Management and Monitoring Plan.

It is proposed that the site will be Reserved Crown Land under the Crown Land (Reserves) Act and a committee of management appointed to manage the site. Parks Victoria is a public authority that provides services to the State and its agencies for, or with respect to, the management of parks, reserves and other land under the control of the State. The Department of Sustainability and Environment, through a management services agreement assigns management of parks and reserves to Parks Victoria. It is proposed that Parks Victoria will be assigned the ongoing management of the dive site.

Parks Victoria will be responsible for the delivery of the monitoring and management of the HMAS Canberra as a recreational dive site.

4 Post Placement Monitoring

To ensure that the ex-HMAS Canberra meets its primary purpose of being a recreational dive site, monitoring the condition of the vessel will need to be undertaken to ensure diver safety is maintained. The monitoring of the dive site will include positional and structural monitoring and may include biological and environmental monitoring (subject to the findings from the environmental site assessment work).

Underpinning the monitoring program is a risk management framework which has been used to assist in determining the need for monitoring and the effectiveness of the management response to risks identified. Risk management is based on identifying risks, assessing the likelihood and consequence of the risk occurring, and then identifying the management response and assessing the residual risk.

The stability of the wreck in terms of its position is a key safety concern to divers. If the vessel rolls onto its side some of the access holes may become blocked and internal fittings may dislodge creating a risk to divers. Advice from Commercial Marine Solutions (CMS) is that the vessel will be stable once it settles into the sand by 1.5 metres. Therefore there is a need to monitor the vessel position while it is settling in to the sand. The position of the vessel will be documented and appended to this plan prior to the issue of the Certificate of Satisfactory Completion.

It is predicted that the vessel will slowly deteriorate over time. The rates of deterioration will depend on the types of material, thickness and relationship to other metals on the vessel. The parts of the vessel that are expected to deteriorate fastest are the remaining furnishing and aluminium honeycomb partitioning; these will need to be monitored more frequently than the structural components. Advice from CMS¹ is that steel will reduce to 50% of the original thickness within 24 years, and aluminium will reduce to 50% of the original thickness in 18 years at the air/water interface. (A 50% reduction represents significant material failure). Fully submerged, the rate of corrosion is much slower, indicating that the vessel will be viable as a structurally safe dive site for at least 20 years.

The preparation of the vessel as a dive site has involved creating access points, removing conduits and other items which could get caught on diving equipment, barring off of confined spaces and installing diver warning signs on entry points to the vessel. Ongoing monitoring of these works in particular the barring off and access points are important in ensuring diver safety. Monitoring will need to ensure that growth of marine organisms does not adversely impact on the function of the signs or access points. The effectiveness of the barring off will need to be monitored. Refer to Appendix B for the location of the elements that require monitoring.

The colonisation of marine flora and fauna on the vessel is of interest and could provide some useful insights into the impact of creating artificial reefs on nearby reefs. However given that the objective is to create a safe dive site, monitoring of this aspect is not considered a priority. The focus of any environmental monitoring will be on ensuring early detection of marine pest species.

In placing the vessel consideration has been given to ensure that the bow of the vessel is facing the prevailing wave conditions. This should minimise the risk of changes to the seabed topography. If there are changes to the seabed then there is a risk that this could have an impact on the stability of the vessel and as such have the potential to impact on diver safety and will require monitoring.

¹ Commercial Marine Solutions P/L. "Ex HMAS Canberra Dive Wreck" Version E 5.3.2009

The placement of the vessel on the bottom is not anticipated to have a significant impact on the physical characteristics of the sediment. In preparing the vessel as a dive site all potential environmentally hazardous materials have been removed as far as practicable. The underwater hull was last painted October 2004 using the Intersmooth 360 Ecoflex anti-fouling system which is trybutylin (TBT) free and is at the end of its 5 year life. The breakdown of the remaining materials being steel, aluminium, concrete, lead ballast and fibrous insulation are expected to have minimal impact on the substrate and water quality as per the findings of R.K Johnston et.al². Therefore it is not proposed to undertake sediment or water quality monitoring.

In summary the monitoring program will aim to ensure diver safety, by focusing on the following areas: vessel positional stability, seabed topography (in so far as it has the potential to impact on vessel stability), structural integrity, access holes, barring off and deterioration of furnishings and partitioning.

A Dive Site Monitoring Schedule is included in Appendix C.

5 Methodology

There are a number of different methodologies for monitoring the vessel ranging from site inspections or remote sensing. A combination of these types of investigations will be used to meet the objectives of providing a safe dive site. Cost effectiveness and accuracy of the information required will influence the methodology adopted.

Site survey data prepared for the Sea Dumping Permit will be used as baseline data for comparison and analysis against the ongoing monitoring results. Supplementary baseline data will be collected and/or assembled as necessary to support the ongoing monitoring program. This may include ship preparation details, ship structural scantlings, and post scuttling details (e.g. Ship position, orientation, scuttling damage, initial sinkage, etc).

It is proposed that an ongoing reporting system will be established for commercial and recreational divers. This system will allow divers to report back to Parks Victoria observations on the condition of the barring off, access points and interior fixings. Plans of the vessel layout and key safety features that require monitoring will be made available on the Parks Victoria web site to assist with monitoring.

Technical investigation of the vessel position and its stability could be monitored by either fixing tracking devices on the vessel that provide GPS locations over time or by undertaking periodic multi-beam echo soundings. Alternatively a monitoring point on the deck could be established where an inclinometer could be placed to measure any change in the angle of rest. The methodology adopted will depend on its accuracy and cost effectiveness. This will be determined by Parks Victoria through consultation with an appropriately qualified contractor or consultant. The advice from CMS dated 30 March 2009 is that the vessel will become stable once it has settled into the sand.

² R.K. Johnston, et.al. Assessing the Ecological Risk of Creating Artificial Reefs from ex-Warships.

Seabed topography could be monitored through the recreational and commercial diver feedback reporting. If there are any significant changes noted by the divers then a hydrographic survey may be required. It is proposed to contract the Port of Melbourne Corporation to deliver the hydro graphic survey work if required, to the standard they delivered as part of the survey work for the Sea Dumping Permit.

Reference points have been identified at key point on the hull by CMS as being representative of the general condition and type of material found on the vessel; these will be used to monitor the structural condition of the vessel. The thickness of the steel and aluminium will be established prior to scuttling and then measured every five years. The rate of wasting will be compared to the predicted rate to provide an estimate of asset life, which is predicted to be beyond 20 years. The reference points are shown on Appendix D.

6 Management Actions

Where the monitoring program has determined that there is a risk to diver safety the management actions outlined in the following table will be taken.

Monitoring program	Response
vessel positional stability (angle of rest)	<p>In the unlikely occurrence that there is a significant change in the position of the vessel (an angle of rest exceeding 26 degrees) then there will be a need to undertake a more detailed risk assessment of the impact of the change in position on diver safety.</p> <p>The immediate action is to advise divers not to enter the vessel.</p> <p>Appoint a suitably qualified marine surveyor and risk assessor to determine the significance of the change in position and to provide advice on remedial actions.</p>
seabed topography	<p>If there is significant change in the sea bed topography (erosion of the sand from under the vessel) seek advice from marine surveyor to determine if there is a risk to the stability of the vessel. If there is then follow the actions outlined above.</p>
structural integrity	<p>If there is significant deterioration (greater than 50% reduction) in the thickness of material at the monitoring points, appoint a marine surveyor to determine the risk to divers of a structural failure.</p> <p>Advise divers not to enter the internal spaces of the vessel.</p>
access holes, barring off and deterioration of furnishings and partitioning	<p>If there is significant deterioration of the non-structural fittings or failure of the barring off then advise divers to avoid those areas until the risk can be either removed or rectified by a suitably qualified and authorised contractor.</p>
marine biota	<p>If marine pest species are identified seek management advice from DSE and the Department of Primary Industries (Fisheries).</p>

7 Frequency and Duration

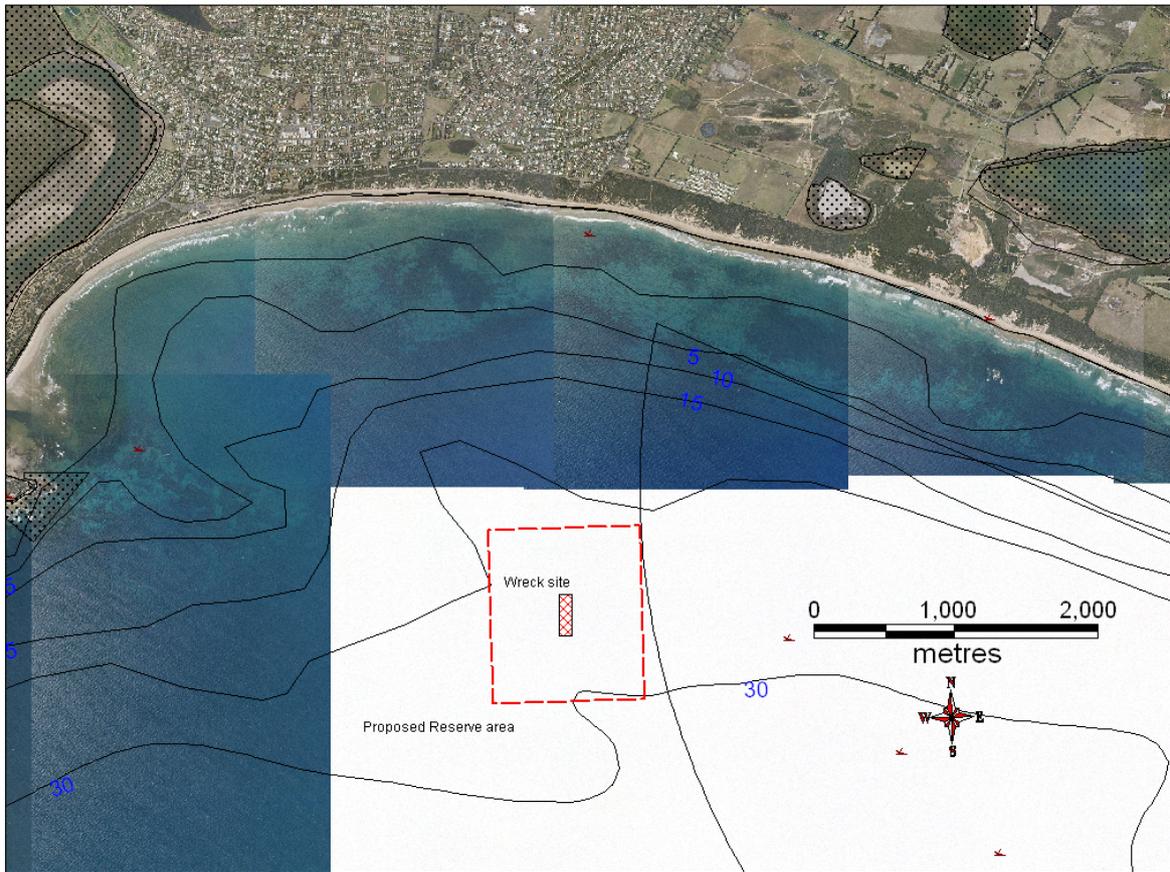
The monitoring program needs to have the capacity to run for the asset life as a dive site. The proposed minimum frequency of monitoring is detailed at Appendix C against the specific tasks. The frequency and duration of monitoring will be subject to review. If there is a significant issue identified in the monitoring program then additional monitoring may be required.

8 Records and Reporting

Monitoring data, results and analysis will be retained on official files as per Parks Victoria's record management system. Where appropriate summary reports will be made available to the public on the Web.

The monitoring data, results and analysis, along with any actions taken will be reported to DEWHA as soon as practical post scuttling by The Birdon Group and 12 months after scuttling. On request of DEWHA a report will be prepared and submitted 5 years after scuttling.

Appendix A Ex HMAS Canberra Dive Wreck Location Map



Appendix B Ex HMAS Canberra – dive site layout plans

Appendix C Dive Site Monitoring Schedule

Monitoring program	Objective	Specific Details	Monitoring Frequency
stability	To ensure that the wreck placement has been effective.	Monitoring is to determine that the wreck has achieved the predicted settlement into the sand	12 months after scuttling
seabed topography	To determine if the placement of the vessel is causing scouring of the sea bed and if there is an impact on stability.	Any significant changes to the seabed topography caused by the dive site are to be documented and assessed.	12 months after scuttling 5 years after scuttling
structural integrity	To ensure that the structural condition of the vessel does not pose a risk to divers.	Establish thickness monitoring points for the steel and aluminium. When the thickness reaches less than 50% of the original material thickness this will trigger more comprehensive investigations of the structural condition of the wreck.	5 year intervals
access holes, barring off and deterioration of furnishings and partitioning	To minimise risks to divers.	Monitoring the condition of the internal structures and outfit items, and covering, integrity of diver barricades, and ensuring no blockages or obstructions impede diver access (particularly light construction fit out items such as remaining bunks and metal joiner partition bulkheads) and ensuring diver safety signs remain in place. Inspection and reporting by commercial and recreational divers to Parks Victoria. When required Parks Victoria will engage a contractor to undertake monitoring and repair works.	Ongoing
establishment of marine biota	To understand the impact of creating an artificial reef on surrounding fish populations.	Seek funding to establish a research partners project with a University to prepare along term research project.	No fixed time

Appendix D Monitoring points