Administrative Appeals Tribunal

DECISION AND REASONS FOR DECISION [2010] AATA 702

ADMINISTRATIVE APPEALS TRIBUNAL	**)**	
	)	**No 2010/1149**
GENERAL ADMINISTRATIVE DIVISION	**)**	

Re **No Ship Action Group Inc.**

Applicant

And **Minister for Sustainability, Environment, Water, Population and Communities**

Respondent

And **State of New South Wales**

Joined Party

DECISION

Tribunal Justice Downes, President
Mr P Wulf, Member
Mr M Hyman, Member

Date 15 September 2010

Place Sydney

Decision The decision under review is varied by:

1. Adding the following to condition 2 to the permit as originally granted*:*

   (e) the ship must be cleaned of all remaining wiring, including junction boxes, which might be associated with polychlorinated biphenyls;

   (f) the ship must be cleaned of all canvas and insulation; and

(g) the ship must be cleaned of all exfoliating and/or exfoliated red lead paint;

2. Adding to the section on Sediment Quality in the Long Term Monitoring and Management Plan:

(a) a provision that two sites within the hull are to be added to the sites to be sampled for lead; and

(b) a provision that the Minister for Sustainability, Environment, Water, Population and Communities (or the Minister's successor) or delegate may require additional sampling of lead if the results of sampling already provided for make that appropriate.

.....[sgd].....
Garry Downes
President

CATCHWORDS

ENVIRONMENTAL LAW – environmental protection – sea dumping – international dumping convention – artificial reef placement – decommissioned navy frigate – pollution – potentially harmful material – red lead based paint and copper based anti-fouling – alternatives – recycling – not contrary to aims of convention – artificial reef placement approved.

Environment Protection (Sea Dumping) Act 1981 (Cth)

1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972

Re No Ship Action Group Incorporated and Minister for Environment Protection, Heritage and the Arts and the State of New South Wales (Joined Party) [2010] AATA 212

Shi v Migration Agents Registration Authority (2008) 235 CLR 286

REASONS FOR DECISION

15 September 2010 — Justice Downes, President
Mr P Wulf, Member
Mr M Hyman, Member

SUMMARY

1. The frigate *HMAS Adelaide* was decommissioned in 2008. The Commonwealth of Australia gave her to the State of New South Wales to be used as an artificial reef. The State was granted a permit under s 19 of the *Environment Protection (Sea Dumping) Act 1981* (Cth) for the scuttling and placement of the ship as an artificial reef off Avoca Beach near Terrigal in New South Wales. The No Ship Action Group Inc. has sought review of the decision to grant a permit. The case against the artificial reef proposal was ultimately based principally upon concerns relating to potential harmful effects from red lead based paint in the ship and copper based anti-fouling on her hull. Our decision is to allow the scuttling of the ship to proceed, but to vary the decision by imposing additional conditions to avoid possible harmful impacts on human health and the marine environment.

THE FACTS

2. *HMAS Adelaide* was built in the United States of America and launched in 1978. She was commissioned by the Royal Australian Navy on 15 November 1980. The ship is 138m long with a 14m beam. She has a steel hull with aluminium

superstructure. The ship carried a crew of 221. She carried missile launchers and helicopters. She could cruise in excess of 30 knots.[1] *Adelaide* saw active service in the first Gulf War, East Timor and, more recently, again in the Persian Gulf. The ship was also involved in a hazardous rescue, in the Southern Ocean, of the round-the-world yachtsman, Tony Bullimore. She was in service until she was retired on 19 January 2008.

3. After *Adelaide* was decommissioned, the Commonwealth decided that she should be given to the State for the express purpose of creating an artificial reef near Terrigal which would be attractive to recreational divers. This decision was taken prior to the granting of the permit. On 7 December 2007, the Commonwealth Department of Defence, under a Deed,[2] gave the ship to the State, along with $3 million to prepare the ship for scuttling. The State provided $250,000 plus substantial in-kind contributions.[3] The Minister for Defence later provided the State with an additional $2.8 million.[4] It would appear that the transfer of the *Adelaide* to the State did not actually occur until about 24 June 2009.[5]

4. Substantial work to prepare the ship for scuttling was carried out, first by the RAN and later by the State, including the removal of all military and related equipment. Most of this was used elsewhere. Many non-military components of the ship were also removed and some of them recycled.

5. The State applied for a permit under s 18 of the Act on 16 December 2009.[6] The permit was granted by a delegate of the Minister for Environment Protection, Heritage and Arts on 22 March 2010 for 50 years.[7] This time period is relevant to conditions imposed by the permit.

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[1] About 55km/h.
[2] *Deed between the Commonwealth of Australia and the State of New South Wales in relation to the Gift of the ex HMAS* Adelaide (undated) – herein Deed.
[3] Exhibit CA12 to affidavit of Craig Abbs, 18 May 2010 – Letter from Premier of NSW to Minister for Defence dated 30 September 2008.
[4] Exhibit CA13 to affidavit of Craig Abbs, 18 May 2010 – Letter from the Minister for Defence to the Premier of NSW dated 15 June 2008.
[5] Exhibit CA14 to affidavit of Craig Abbs, 18 May 2010 – Letter from Premier of NSW to Minister for Defence (undated).
[6] T 231 p 3041.
[7] Exhibit 8.

6. As part of the process of seeking approval, numerous environmental studies were carried out and their results considered in the decision-making process.[8] The delegate was also furnished with information and advice, on the preparation of the ship, by an independent assessor to the Minister.[9] The studies and advice influenced the choice of site and positioning of the ship as well as the conditions that were imposed on her scuttling and future management. The site decided upon was an area of approximately 0.42km^2 about 1.5km south-west of the Skillion at Terrigal.[10]

7. A number of conditions attached to the permit are particularly relevant to this review, including the requirements of a Long Term Monitoring and Management Plan,[11] which was designed to collect information on the environmental impact of the scuttling in the months and years that followed. The conditions include a requirement for sediment quality analysis at various periods after scuttling.

8. On 23 March 2010, the Action Group filed an application for review of the decision to grant the permit. The following day, after an urgent hearing, the Tribunal (Justice Downes, President) stayed the operation of the decision pending determination of the application.[12] The full hearing took place over five days in July 2010.

ISSUES

9. The ultimate issue before the Tribunal is whether a permit should be granted which would permit the scuttling of the *Adelaide* as the means of carrying out an artificial reef placement. The Action Group, which is a community group based in the area near where the ship would be scuttled, originally put forward in their Statement of Issues a long list of concerns to be agitated in the matter. The emphasis of these

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[8] Exhibit CA3 to affidavit of Craig Abbs, 18 May 2010 – T 10 p 33: The Ecology Lab Pty Ltd (June 2008) *Sinking of Ex-HMAS Adelaide off the Central Coast of NSW: Review of Constraints and Site Selection*; Exhibit CA6 to affidavit of Craig Abbs, 18 May 2010 – T 73 p 785: WorleyParsons Services Pty Ltd (December 2009) *Ex-HMAS Adelaide Artificial Reef: Review of Environmental Factors*; Exhibit CA16 to affidavit of Craig Abbs, 18 May 2010 (T Doc 15 p 2005): WorleyParsons Services Pty Ltd (March 2010) *Long Term Monitoring and Management Plan*.

[9] Exhibit H – T 38 and T 70.

[10] Affidavit of Craig Abbs, 18 May 2010, para 22.

[11] Exhibit CA16 to affidavit of Craig Abbs, 18 May 2010.

[12] *Re No Ship Action Group Incorporated and Minister for Environment Protection, Heritage and the Arts and the State of New South Wales (Joined Party)* [2010] AATA 212.

concerns was on the presence of polychlorinated biphenyls (PCBs) on the ship. In addition, issues were raised relating to the alleged presence of harmful metals, copper based anti-fouling and rust preventative compounds. Issues were also raised as to whether the proposal was contrary to the applicable international convention, whether alternative methods of disposal should be adopted and whether the correct permit had been granted.

10. In the first two days of the hearing many of these claims were abandoned. Of particular note, on the second day, the major claim relating to PCBs was abandoned. This may have been prompted by further preparatory work done on the ship by the State whilst the matter was being prepared for hearing. Normally, such a significant change in the nature of a claim before the Tribunal should not wait until after the hearing commences. Earlier, on the first day of the hearing, the claim relating to metals was abandoned, except for claims relating to chromium and to copper anti-fouling paint. On the second day of the hearing the metals claim was revived by reference to the presence of lead in red lead paint. The chromium claim was abandoned. The PCBs issue was abandoned and the lead issue was revived as a result of an inspection of the ship for the first time, on the first day of the hearing, by the Action Group's principal expert witness from the United States of America. The Action Group was granted leave to reopen these aspects of their Amended Statement of Issues.

11. The Action Group accordingly proceeded to press three issues: two related to the potential for pollution of the marine environment, namely by lead and copper, and a third related to the preferability of recycling the ship rather than scuttling it. All of these claims were raised in the context of an argument that the proposal did not comply with the applicable international convention or its aims.

12. The State, having put considerable effort into responding, both in a legal and in a practical sense, to the issues originally agitated by the Action Group, chose to continue to put before us material relating to some of the abandoned issues, in particular to PCBs. The State was also compelled, by the agitation of lead as an issue, to undertake testing for lead in the paint on the ship and submit new evidence on that point, at very short notice, while the proceedings were under way.

13. It is appropriate to note the difficulties that arose from the use of expert witnesses from overseas. The identification and engagement of expert witnesses is a matter for parties, but this case illustrates the problems that can arise when expert witnesses are not able to assess a matter closely because of distance. Until the day the hearing commenced none of the applicant's experts had seen the ship. One of the State's experts had not viewed the ship until immediately before the hearing. These experts had expressed opinions in reports on the potential for pollution coming from the ship based on the evidence and information of others.

14. On the first day of the hearing, one of the applicant's experts made an inspection of the ship. As a result of his examination, the claim relating to PCBs, which, until that time had been the Action Group's primary claim, was abandoned, and the claim relating to lead, which had been abandoned by the Action Group's counsel in the hearing while the expert was out inspecting the ship, was revived. We were not told what led to the PCBs claim being abandoned, but the lead claim was revived because, during his inspection, the expert noticed what appeared to be paint containing lead. It is important to note that the majority of the witnesses for the State and the independent advisor originally and specifically indicated that there was no lead in the paint on the *Adelaide*. However, once the issue of lead was identified by the Action Group, the State's experts and independent advisor retreated from their original position and conceded that lead-based paint was present.

15. It is unfortunate that this case should have involved the assertion of a serious claim which had to be abandoned when the expert, on whose opinion it was based, advised this course after one inspection which involved nothing more than observation. It is, however, likely that this change in position relating to PCBs was a result of the considerable and continuing work which the State has carried out in response to the claim. The entire case could have proceeded far more smoothly, however, if local experts had been available on both sides. That might have permitted the ship to be examined on a number of occasions and a cooperative approach to be adopted between the State and the applicant's experts, with the likelihood that the issues could have been clarified before the date of the hearing. Similar comments can be made about the addition of the claim relating to lead. In other fields, Australian experts can normally be found to assist courts and tribunals on matters requiring special knowledge. It is not obvious why the environment

should be any different although the Tribunal is aware that environment actions brought by community groups often have limited financial backing.

16. It would have been easy to reach the conclusion that the Action Group was taking an opportunistic approach to a goal of stopping the scuttling at all costs. We have not come to such a conclusion, but it is worth noting, for the benefit of those seeking review of decisions, that such an approach may be a legitimate course when dealing with decision-making at the political level, but before this Tribunal what is required is grounds and evidence and it is inappropriate to object first and look for evidence afterwards – particularly where, as here, cost and delay may result.

THE STATUTORY CONTEXT AND ITS APPLICATION

17. The long title of the *Environment Protection (Sea Dumping) Act 1981* (Cth) includes the following description: "An Act providing for the protection of the environment by regulating dumping into the sea… and artificial reef placements". It is an offence under the Act to dump a vessel into Australian waters or any part of the sea (s 10A) or to carry out an artificial reef placement (s 10E) "otherwise than in accordance with a permit". Placing a vessel "into the sea for the purpose of creating an artificial reef, being a placement that is not contrary to the aims of the Protocol", is an "artificial reef placement".[13] The Protocol is the 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972, done at London on 7 July 1996.

18. Section 18 authorises application to the Minister for the grant of permits. The Minister may require an applicant to provide further information (s 18(3)) and to undertake "research or analysis relating to the effect that the proposed dumping or artificial reef placement might have on the marine environment" (s 18(4)(a)) or to reimburse the Commonwealth for carrying out or supervising such work.

19. The power to grant permits is conferred on the Minister by s 19. By s 19(1) "the Minister may, in his or her discretion, grant, or refuse to grant, a permit". A "permit for dumping or loading for dumping... may only be granted for controlled material that is within Annex 1 to the Protocol" (s 19(5)). Vessels are both controlled

[13] Section 4 "artificial reef placement" and "Protocol".

material (s 4) and within Annex 1. Such a dumping permit "may only be granted in accordance with Annex 2" (s 19(5)(b)). Permits for an artificial reef placement of seriously harmful material cannot be granted (s 19(8)). Seriously harmful material means "radioactive material" (s 4). The Act authorises the prescription by regulation of other material as seriously harmful material, but no regulations have been made. "In considering the granting of a permit, the Minister must have regard to the following (so far as they are relevant): (a) the Protocol" (s 19(8A)). The Minister may require an applicant "to enter into an agreement… [to] undertake… research and monitoring relating to… the release into the marine environment… of any contaminants" (s 19(9)).

20. The preamble to the Protocol stresses "the need to protect the marine environment and to promote the sustainable use and conservation of marine resources". It recites a conviction:

> *… that further international action to prevent, reduce and where practicable eliminate pollution of the sea caused by dumping can and must be taken without delay to protect and preserve the marine environment and to manage human activities in such a manner that the marine ecosystem will continue to sustain the legitimate uses of the sea and will continue to meet the needs of present and future generations.*

21. "Dumping" includes "any deliberate disposal into the sea of vessels" but does not include "placement of matter for a purpose other than the mere disposal thereof, provided that such placement is not contrary to the aims of this Protocol" (Art 1.4). Pollution means the introduction into the sea of wastes or other matter (Art 1.10):

> *… which results or is likely to result in such deleterious effects as harm to living resources and marine ecosystems, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities.*

22. Article 2 contains the following objectives:

> *Contracting Parties shall individually and collectively protect and preserve the marine environment from all sources of pollution and take effective measures, according to their scientific, technical and economic capabilities, to prevent, reduce and where practicable eliminate pollution caused by dumping or incineration at sea of wastes or other matter. Where appropriate, they shall harmonize their policies in this regard.*

23. Article 3.1 incorporates "a precautionary approach", as follows:

> *In implementing this Protocol, Contracting Parties shall apply a precautionary approach to environmental protection from dumping of wastes or other matter whereby appropriate preventative measures are taken when there is reason to believe that wastes or other matter introduced into the marine environment are likely to cause harm even when there is no conclusive evidence to prove a causal relation between inputs and their effects.*

24. Article 23 provides that the Protocol "supersede[s] the Convention as between Contracting Parties to [the] Protocol which are also Parties to the Convention." It is therefore the Protocol, and not the parent Convention, that determines Australia's international obligations.

25. Paragraph 5 of Annex 2 requires "[a]pplications to dump wastes or other matter" to give consideration to waste management options as follows:

> *Applications to dump wastes or other matter shall demonstrate that appropriate consideration has been given to the following hierarchy of waste management options, which implies an order of increasing environmental impact:*
>
> *1. re-use;*
>
> *2. off-site recycling;*
>
> *3. destruction of hazardous constituents;*
>
> *4. treatment to reduce or remove the hazardous constituents; and*

5. disposal on land, into air and in water.

26. The Minister may suspend or revoke a permit (s 20) and "impose conditions in respect of the permit and may, at any time, revoke, suspend or vary, or cancel a suspension of, a condition so imposed" (s 21(1)).

27. The Minister may delegate the power to grant permits (s 34). Applications for review of decisions under ss 19, 20 and 21 may be made to the Administrative Appeals Tribunal.

28. After *Adelaide* was given to the State, substantial work of preparation for the scuttling was carried out. This involved the removal and recycling of components of the ship including the investigation and removal of harmful material. Some of this was done before the application for the permit was made. Significant work was done after the application was submitted, in consultation with the Minister's Department and in anticipation of the granting of a permit. Some of it has been done since the grant of the permit, during the pendency of this application for review.

29. Two questions arise as to how we should assess the application before us. First, should we undertake an evaluation of alternatives of the kind contemplated by Annex 2 to the Protocol? Should we, for example, balance recycling the ship against its placement as an artificial reef? Secondly, if we should, what consideration should we give to the fact that at the time of the making of this application, much of the ship's fittings had been stripped out, holes had been cut in her hull (to render access and egress easier after scuttling) and other substantial expenditure had been incurred preparing her for use as an artificial reef. Should we, for example, undertake the balance exercise by reference to the ship as she is, or as she was at the time she was decommissioned?

30. The first question requires an examination of the Act and its association with the Protocol. In particular, it requires consideration of whether the Act applies differently to dumping and reef placement.

31. The Act plainly distinguishes dumping from reef placement (long title, ss 4, 10A, 10E and s 19(5) and (8)). However, the short title of the Act may suggest that reef placement is no more than a particular species of dumping. Artificial reef placement is defined, but dumping is not. We have come to the conclusion that, because separate permits are available and the Act otherwise distinguishes between dumping and reef placement, in some respects at least, the two are to be distinguished.

32. Section 19(8) contemplates the possibility of reef placement for material which is not seriously harmful. A more difficult question is whether s 19(5) applies to reef placement. We have come to the conclusion that because s 19(5) refers specifically to a "permit for dumping…", by which it must mean a permit under s 10A, that it does not apply to an application for a permit under s 10E for the placement of an artificial reef. This may not have any significant practical effect, however, because s 19(8A) requires the Minister to have regard to the Protocol when considering an application for any permit. Further, a scuttling will only be reef placement and not dumping, when it is not contrary to the aims of the Protocol (s 4). These matters will always draw the Minister's attention to the Protocol.

33. The Protocol does not recognise any practice of artificial reef placement, but it does recognise "placement of matter for a purpose other than the mere disposal thereof" (Art 1.4.2.2). Such a placement is excluded from the definition of "Dumping" provided that it is "not contrary to the aims of this Protocol". These words are repeated in the definition of "artificial reef placement" in s 4. If "Dumping" in Art 2 is confined to dumping as defined in Art 1, the objectives in Art 2 do not apply to a case such as the present, provided that it is not contrary to the aims of the Protocol. Paragraph 5 of Annex 2 would not apply.

34. The Protocol was done and amended by a diplomatic convention. The text was debated and adopted by representatives of many countries, most of whom spoke a language other than English as a first language. Many of them would have taken part in the debate through simultaneous translation of what they heard and what they said. Diplomatic conventions generally work by consensus. Drafting committees work before and during the convention to arrive at texts which find favour with all delegates or, more usually, texts which do not contain items which a delegate

wishes to single out for express opposition. This is generally not a drafting process as logical as the drafting of a piece of legislation, or a large commercial contract, in our system. Compromise is frequent. If the drafting process is not precise, this should be recognised in the process of interpretation.

35. It is plain that the Protocol recognises placement for a purpose other than mere disposal which is "not contrary to the aims" of the Protocol as not being dumping. The sting is, however, in the tail. In every case it is necessary to test whether the proposed action is contrary to the aims of the Protocol. That involves looking at the objectives in Article 2 and at the meaning of "Pollution" in Article 1. An artificial reef placement which was likely to result in harm of the kind identified in the definition of "Pollution" would almost certainly be contrary to the aims of the Protocol. It would consequently amount to dumping and the Protocol would apply generally. For Australia, this conclusion flows both from the definition of "Dumping" in the Protocol and the definition of "artificial reef placement" in s 4 of the Act.

36. We must accordingly first examine whether the proposal is contrary to the aims of the Protocol. This requires us to give attention to the Protocol as a whole, including the Annex, although the Annex may not strictly apply if the proposal is found not to be contrary to the aims of the Protocol.

37. We accordingly propose to place weight on the desirability of avoiding pollution and to do this in accordance with a precautionary approach. We will give consideration to alternatives, particularly recycling. We note, however, that if we were to conclude that the ship should be recycled rather than scuttled, the only action allowed to us by the Act would be to refuse to grant a permit.

38. That takes us to the second matter. In considering alternatives, do we take the ship as she is now, or as she was at or about the time of decommissioning? We do not think that the gift of the ship by the Commonwealth to the State is, *per se*, as advocated by the State, a matter to be taken into account. If a permit should not have been issued before the making of the gift, nothing surrounding the gift could change that.

39. Changes made to the ship in consultation with the Minister's Department, during the process provided for in s 18 are, however, in a different category. The ship must be assessed as she is where this process has led to significant and, possibly, irreversible changes to her structure. This approach is consistent with the decision of the High Court in *Shi v Migration Agents Registration Authority* (2008) 235 CLR 286, although the point presently being considered was not raised in that appeal. It is also consistent with the Action Group's submissions, which included the statement, at [84], "that the Tribunal must base its consideration of recycling on the current condition of the vessel".

40. It seems to us, therefore, that our discretionary decision-making must be applied to the ship stripped of her fittings, with holes in her hull and ready to be scuttled for use as an artificial reef. When we contemplate alternatives we need to address the ship as she is, ready for placement as a reef, and not as she was.

41. In these reasons we have also had regard to the *Guidelines for the Placement of Artificial Reefs* made under the Protocol and published jointly by the International Marine Organization and the United Nations Environment Program.[14] These require that "Contaminants that are likely to cause harm to the marine environment should be removed… to the maximum extent possible" (Art 5.1 of Annex 5). They also require "vessels to be cleaned of potential sources of pollution" (Art 5.2). The Guidelines provide: "Regulations should strive at all times to enforce procedures that will result in environmental changes as far below the limits of environmental change as practicable" (Art 9.3). We have also had regard to the IMO Guidelines on Ship Recycling.[15]

THE EXERCISE OF DISCRETION

42. The Act gives the Minister the power to grant or not to grant permits "at his or her discretion". The limits of the discretion are not explicitly defined by the Act, but the Act calls up the provisions of the Protocol, which substantially condition the Minister's discretion, and impose some precise requirements.

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[14] Exhibit B – London Convention and Protocol/United Nations Environmental Programme, Guidelines for the Placement of Artificial Reefs, 2009.
[15] Exhibit C – International Maritime Organisation, IMO Guidelines on Ship Recycling, 4 March 2004.

43. The State argued that the Act allowed non-environmental matters to be taken into account in decision-making. The Action Group contended that only environmental matters can be considered by the Minister. The Act offers no direct guidance on that issue, but the Protocol deals almost exclusively in the protection of the environment. In just one or two places, the Protocol contemplates allowing economic considerations to be taken into account: for example, the preamble refers to "the legitimate uses of the sea"; Para 6 of Annex 2 refers to "appropriate opportunities... to re-use, recycle or treat the waste without undue risks to human health or the environment **or disproportionate costs**" (emphasis added). We add that the whole concept of placement for a purpose other than disposal, or placement as an artificial reef, implies the legitimacy of purposes which may be other than environmental. Our conclusion is that the essential drivers of decision-making on permit applications are environmental, but that at the margins economic and other non-environmental considerations can be taken into account, for example when choosing among options of similar environmental merit, or in order to discount an option the costs of which are manifestly out of proportion to any environmental benefit.

44. The precautionary approach, as set out in Art 3.1 of the Protocol, is not in the terms familiar from other environmental legislation: rather than "risk of serious or irreversible harm" and "absence of full scientific certainty", there is a reference to "preventative measures" being warranted where there is "reason to believe" the introduction of wastes or other matter into the environment is "likely to cause harm even when there is no conclusive evidence to prove a causal relation between inputs and their effects". We read this formulation – which is similar to that found in other international instruments on marine pollution such as the OSPAR Convention[16] and the Helsinki Convention[17] – as applying the more usual formulation in a narrower context: the introduction of pollutants into the marine environment is by and large irreversible, and so the requirement or possibility of "irreversible harm" does not need to be specified, and the usual broad reference to full scientific certainty is replaced by a more focused reference to proof of a causal relation between inputs

[16] Convention for the Protection of the Marine Environment of the North-East Atlantic, done at Paris, 22 September 1992, as amended from time to time, Art 2.2(a).
[17] Convention on the Protection of the Marine Environment of the Baltic Sea Area, done at Helsinki 9 April 1992, as amended from time to time, Art 3.2.

(ie pollutants) and their effects. Making this rough equivalence between the two formulations, we believe that the jurisprudence on the more general formulation of precaution is, unless there are reasons to the contrary, broadly relevant to the formulation from the Protocol, although it is that formulation itself which in the end must be decisive.

45. Nevertheless, the environmental objectives and the precautionary approach in the Protocol are general expressions and do not of themselves lead to a clear decision. They require a weighing of considerations to determine the extent to which action to prevent, reduce or eliminate pollution should be undertaken. This approach is applied below in the context of the relevant pollutants. The process is assisted by the use of other established government policies that relate to sea dumping in general, the scuttling of ships and the particular pollutants under consideration.

EVIDENCE

46. The evidence presented to us was as follows:

(a) Affidavit of Mr Ian Donoghue, Director-General, Defence Asset and Inventory Management in the Defence Materiel Organisation, detailing the process by which the ship came to be given to the State and the consideration of alternatives.

(b) Affidavit and appended reports by Mr Craig Abbs of the NSW Land and Property Management Authority detailing the process of organising the scuttling of the ship and the preparation and submission of the application for a permit.

(c) Affidavit by Mr David Coyle, 20 May 2010. Mr Coyle, a former member of the RAN, who, for a time, was part of the crew of the ship, described the decommissioning and paying off of the ship, and its preparation for scuttling. Mr Coyle was, during that process, and remains, the day-to-day manager of the ship at its mooring in Sydney Harbour. Mr Coyle also made two affidavits of 3 July, one on PCBs and one on ship

recycling, giving likely cost. Mr Coyle also gave oral evidence regarding the expected costs of recycling the ship.

(d) Affidavits of those involved in preparing the ship for scuttling, providing information on the process followed and action taken to remove hazardous materials: affidavits of Mr Andrew Levett, a mechanical engineer, on preparing the ship, including identifying environmental hazards and of Ms Lynne Curnow, an environmental scientist and consultant, on the program for removing environmental hazards from the ship.

(e) Affidavit of Mr John Polglaze, an environmental scientist who had an eighteen year career with the RAN and now holds the rank of Lieutenant-Commander in the Reserves. He served aboard the *Adelaide*. He has environmental qualifications and experience, with respect to pollution management, which are heavily focused on the marine environment, especially in a naval context. He has spent some years with the environmental consultancy firm, URS Australia Pty Ltd, specialising in marine environmental management and has been involved especially in the use of ships as artificial reefs, in Australia and the United States of America. He was engaged by the Minister's Department to provide advice on the proposal to scuttle the *Adelaide*. He provided an affidavit dated 17 May 2010 and a large bundle of attachments relating to the preparation of the ship for scuttling and his assessment of the compliance of the preparations with the requirements of the Minister's Department. Mr Polglaze also provided an affidavit of 15 July 2010 setting out the paint regimes applied to other Australian naval ships scuttled in recent years as dive wrecks, in particular the use of lead based paint in those ships, attaching documents recording those paint regimes.

(f) Affidavits from Mr Richard Arthur, Mr Leslie Graham, Mr Rick Parsons, Mr Wayne Green, Mr Oliver Philpot, Mr John Asquith, Ms Paula Bradly, Mr William Kilpatrick and Dr David Powter on the economic and community case for the dive wreck. Mr Philpot was cross-examined.

(g) An affidavit by Professor William Gladstone on colonisation of the wreck by biota.

(h) Affidavits from Mr Scott Fortey, Mr Malcolm Poole, Mr Quentin Riley and Mr Benjamin Smith, declaring their opposition to the scuttling of the ship.

(i) Reports and oral evidence from five expert witnesses, two engaged by the Action Group and two by the State, as well as the independent advisor. Dr Peter deFur, a biologist, and Mr Werner Hoyt, a marine engineer with experience in preparing ships for scuttling, are experts from the USA engaged by the Action Group. Dr deFur appeared by video link; Mr Hoyt in person. The State engaged the services of Mr Bjorn Bjorkman, an ecotoxicologist from the USA with specialist expertise in the marine environment and Dr Garry Smith, an expert with extensive experience in both human health and ecological aspects of risk assessment. Mr Polglaze was the independent advisor. All three appeared in person. The five expert witnesses provided written reports. Prior to giving their evidence they met to see what matters they could agree on. A document was produced which recorded a summary of their opinions. It was put into evidence before us. The experts all gave their evidence concurrently, including Dr deFur by video link.

(j) Dr deFur provided a supplementary report dated 16 July 2010, ostensibly in reply to the evidence of Mr Bjorkman, dealing especially with the potential for lead to enter the food chain. Counsel for the State objected to the report on the basis that its late submission was prejudicial to the State; that it was not written so as to respond to Mr Bjorkman; that it sought to introduce new evidence which could as easily have been provided during Dr deFur's oral evidence and that the evidence it did offer was both outside Dr deFur's field of expertise and vague, general and alarmist in tone. In the event we have not placed significant weight on the supplementary report.

(k) Evidence, expert and lay, provided to establish the levels of lead in the paint on the ship, comprising oral evidence and an affidavit from Mr

Coyle on his calculation of the area potentially painted with lead-based paint; oral evidence by Ms Carol Bodle explaining the X-ray fluorescence testing of the paint and an expert report and oral evidence by Mr Ross McFarland, an environmental consultant, relating to his calculations of the total lead loading on the ship. Mr McFarland also provided an expert report on the level of PCBs on the ship.

(l) Affidavit of Mr Andrew Sissons, Akzo Nobel Pty Ltd's account manager for the RAN with regard to the supply of anti-fouling paint, dealing with the history of the application of anti-foulants to the *Adelaide*. Mr Sissons was cross-examined.

(m) Affidavit by Mr Jim Puckett, Executive Director of the Basel Action Network, an international advocate on ship recycling, describing and advocating recycling rather than scuttling of the ship.

POLYCHLORINATED BIPHENYLS (PCBS)

47. PCBs have been the subject of considerable attention not only in the context of the matter currently before us, but also more broadly in the international and Australian communities. Although the Action Group chose not to press its claim relating to PCBs, we take the view that arriving at the preferable decision in this matter requires us to be sure that any PCBs are being appropriately managed.

48. There was evidently an awareness of the need to remove PCBs from the ship as the preparation of the ship proceeded and this continued after the application for review was lodged. The application listed PCBs as one of the issues for the review to consider. Successive tests documented progress on removing PCBs and as a result of those tests, the worst case scenario at the time of the hearing appeared to be that less than 0.1kg of PCBs remained on the ship.

49. During the inspection of the ship, the expert members of the Tribunal noted and brought to the attention of the parties a quantity of wiring that would be likely to be associated with PCBs that remained on board. The Tribunal was advised by

Mr Coyle that removal of this wiring was continuing and would be completed prior to the scuttling of the vessel.

50. The Commonwealth has an existing policy on PCBs set out in its *PCB Management Plan*, a document adopted by the Environment Protection and Heritage Ministerial Council in April 2003.[18] This document, which sets out the requirements for the management of PCB wastes and stockpiles is agreed by Commonwealth, State and Territory Governments and has the status of Ministerial policy. It sets out stringent and specific requirements for the management of wastes of a concentration above 50 parts per million (ppm) and much more general requirements for wastes at concentrations between 2 and 50 ppm; wastes below 2 ppm are regarded as 'PCB-free'.[19] Of the material that remained on board the ship at the time of the hearing, none has been tested at more than 50 ppm and so the less stringent management requirements would apply. These requirements are that disposal be by "a method approved by the agency"[20] and it appears to be intended that State agencies provide guidance and regulatory approval, evidently because it is at State level that the PCB Management Plan was mainly intended to operate. We are not aware of any Commonwealth regulation or guidance that specifies management requirements for PCBs in this concentration range.

51. Australia has obligations, however, under the Stockholm Convention on Persistent Organic Pollutants[21] (the international instrument governing pollutants such as PCBs) and these may also condition the Minister's exercise of discretion. PCBs are listed in Annex A of the Convention and Parties are, under Article 3.1, obliged to take action to eliminate the use of such chemicals, subject to the provisions of the Annex and, under Art 6.1(d), obliged to ensure that such chemicals are disposed of so that the pollutant is "destroyed or irreversibly transformed". These obligations, however, are qualified: Annex A Part II sets a limit of concern at 0.005% (ie 50 ppm) and Article 6.1(d)(ii) recognises an exception for low

[18] *Polychlorinated Biphenyls Management Plan*, Revised Edition, Environment Protection and Heritage Council, April 2003. The Management Plan was not tendered as evidence, but was referred to by the State and discussed with the Tribunal during parts of the hearing, (see Transcript, 5 July 2010, pp 50 and 61).
[19] Ibid, clauses 1.17, 1.18, 1.20, 1.24, 1.25, 1.26, 1.27.
[20] Ibid, clauses 10.3, 10.4.
[21] Exhibit E – Stockholm Convention on Persistent Organic Pollutants, done at Stockholm, 22 May 2001. Australia signed the Convention on 23 May 2001 and ratified it on 20 May 2004.

concentration materials. It cannot be reasonably concluded that Australia has a binding obligation under this Convention to remove remaining PCBs from the ship, given the low quantities and concentrations involved.

52. There are no specific Australian guidelines with respect to the management of PCBs in vessels proposed for scuttling as artificial reefs. The Canadian Standard governing the preparation of ships for scuttling as artificial reefs[22] states with respect to PCBs that:

> *PCBs held in solid matrix may be difficult to detect from visual appearance. For assets constructed before 1984, the following items must be removed*
>
> *…*
>
> - *Visible copper cabling must be removed.*
> - *Open ends of electrical cables that show any evidence of fluid weeping (except for water) must be removed in their entirety*.

53. We note that cabling and related equipment likely to contain PCBs has largely been removed from the ship, that undertakings have been given that remaining material will be removed and that such removal is relatively straightforward. Although remaining quantities of PCBs are very likely below the level of significant concern, it is in our view consistent with the general thrust and intention of both the Protocol and the Stockholm Convention that the process of removal should be completed before the ship is scuttled.

LEAD (RED LEAD PAINT)

54. Lead and more specifically red lead, within the paint of the ship, became an important issue in the hearing following inspection of the ship by Mr Hoyt on 5 July 2010. Mr Hoyt offered his expert view that red lead was present in paint in significant quantities.

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[22] Exhibit JA5 to affidavit of John Polglaze, 17 May 2010 – Environment Canada (2007) *Clean-up Standard for Disposal at Sea of Vessels, Aircraft, Platforms & Other Structures*, Revision 3: Pacific and Yukon Region – herein Canadian Standard.

55. After his preliminary examination of the ship, Mr Hoyt prepared some rough calculations.[23] Mr Hoyt estimated that the vessel had an internal surface area of 24,000m^2 and that, based on a possible 70% concentration of lead in the paint on the inside of the ship, there might be as much as 28 tonnes of lead on the vessel. Mr Hoyt's estimation was based on his experience with US-built vessels and his perception that the RAN maintained their vessels so that they were not required to be stripped before repainting, unlike US vessels, which were continually cleaned of old paint and repainted both externally and internally. For that reason, lead-based paint remained present on Australian ships when US ships of similar ages had long had such paint removed.

56. Notwithstanding the initial estimate that there was some 28 tonnes of lead contained in the paint on the ship, when the issue was considered in the experts meeting, with all five experts present, a revised quantity of five to eleven tonnes was arrived at. The change was no doubt due to the time for reflection and consideration that Mr Hoyt did not have before first giving evidence, the availability of additional information and the benefit of informed debate and discussion among colleagues. All of this points up again, how unsatisfactory it was that much of the real evidence gathering on behalf of the applicant took place the day the hearing began. It is also a further reflection on the unsatisfactory nature of looking overseas for expert evidence.

SAMPLING OF RED LEAD PAINT

57. The Tribunal suggested that testing of the ship should be undertaken to ascertain the exact quantities of lead present in the ship. Mr Coyle calculated the relevant paint surface area of the ship (ie internal surfaces; external surfaces being painted with zinc chromate paint) at 23,922m^2.[24] Based on Mr Coyle's calculations, Mr McFarland developed a plan for sampling the lead on the ship and sampling was undertaken by X-ray fluorescence by Ms Bodle. On the basis of her measurements, Mr McFarland calculated the quantity of lead on the ship. The results of the sampling suggested the ship contained approximately 754.8kg of lead, with a significant error margin. Thus the estimate of total lead went from 28 tonnes to

[23] Exhibit G.
[24] Affidavit of David Coyle, 14 July 2010, para 12.

about one tonne over the course of the hearing. There was considerable debate on whether the sampling process provided an accurate estimate of the total lead. Some of the surfaces were covered with insulation and these were not included in the sampling process. As these areas had not been stripped of insulation during the life of the ship, it might be assumed that the probability of these surfaces being painted with lead-based paint is high. Whether or not that is the case, Mr McFarland agreed during his evidence that the sample did contain an element of bias because of the way the choice of surfaces was dictated to him. A worst case outcome was a lead content as much as three times that which he calculated, ie about 2.3 tonnes (in a total tonnage of metal of about 4,100 tonnes[25]).

LEAD IN THE MARINE ENVIRONMENT

58. The experts produced the following memorandum (at the time the estimated lead loading was five to eleven tonnes) as a result of their conference:

> *Statement of Issue: 3(d)(vi)*
>
> *'Whether the marine environment is likely to be polluted because of leaching of the following heavy metal from the ex-HMAS Adelaide':*
>
> *Lead:*
>
> *Bjorn Bjorkman:*
>
> *Does not consider that the marine environment is likely to be polluted because of leaching of lead from the ex-HMAS Adelaide.*
>
> *Dr Peter deFur:*
>
> *Considers that the question of whether the marine environment is likely to be polluted because of leaching of lead from the ex-HMAS Adelaide cannot be determined because of uncertainties.*
>
> *Werner Hoyt:*
>
> *Considers that with respect to the question of whether the marine environment is likely to be polluted because of leaching of lead from the ex-HMAS Adelaide, lead environmental concentrations are unlikely to exceed current ANZECC lower limit*

[25] Affidavit of Ian Donoghue, 19 May 2010, para 34.

interim sediment quality guidelines, however there are uncertainties in the biological studies.

John Polglaze:

Does not consider that the marine environment is likely to be polluted because of leaching of lead from the ex-HMAS Adelaide even assuming lead is present in the ship in the quantities discussed in the conclave.

Dr Garry Smith:

Does not consider that the marine environment is likely to be polluted because of leaching of lead from the ex-HMAS Adelaide with respect to risk to the environment.

59. The experts all offered their evidence in the context of the Protocol's definition of "Pollution" (Art 1.10) which requires that there be some form of deleterious impact or harm before the introduction of a contaminant is regarded as pollution. The amount of lead on the ship, therefore – although it may appear high in absolute terms at between 0.75 and 2.3 tonnes – must be assessed in terms of its capacity to cause harm in the marine environment. Lead is a well-known problem pollutant. The experts mentioned the problems associated with lead as an air pollutant (especially from the leaded fuel used in the past) and the lead carbonate (white lead) used in terrestrial house paints, again in the past. Dr deFur noted that the developing vertebrate brain and nervous system is particularly at risk from lead and that the kidney and gill functions of fish can also be affected.

60. The experts also noted, however, that the lead used in red lead primer for protection of steel surfaces from marine corrosion is lead tetroxide (Pb_3O_4), which is a far more inert compound than those associated with the problems mentioned above. Mr Bjorkman, who, as an ecotoxicologist, was the best qualified of the experts to offer a view on this point, stated that in the marine environment lead is "moderately toxic" and that in the tetroxide form it is of very low bioavailability. Mr Bjorkman further said that lead does not biomagnify and it bioaccumulates moderately. The experts agreed that the lead, because of its low solubility, would eventually flake off from the painted surfaces and migrate inside the hull and into the sediment around the ship. In the context of an estimated total lead loading of five to eleven tonnes, Mr Bjorkman took the view that the accumulation of lead in sediment

around the sunken vessel, while it might exceed the ANZECC sediment guideline trigger levels,[26] would not be a major concern, because of the low bioavailability of lead tetroxide.[27] Dr deFur was of a different opinion. He noted the toxicity of lead to human beings and suggested that its behaviour in the marine environment was "not well understood". Dr deFur also suggested that if marine organisms were to ingest lead from the ship, it could be converted to more bioavailable forms and enter the food chain.

61. The experts agreed that the release of lead would occur over a long timescale (20 to 50 years) and that the movement of this lead, either into the inside of the ship's hull or into sediment, could not be accurately predicted. The marine environment at the site for scuttling was described as one of high energy, suggesting that significant dispersal of material resulting from breakdown of the ship's structure would occur, although none of the experts was prepared to be definite. Mr Hoyt also suggested that the levels of lead would be above ANZECC guidelines in possibly 100 years (this conclusion was based on an estimated lead loading of five to eleven tonnes).

62. A critical issue in the assessment of lead is its bioavailability. None of the experts contested the very low bioavailability of lead tetroxide, but there were some differences regarding its potential to be transformed in the environment into more bioavailable forms. Dr deFur and Mr Hoyt suggested that in sediment or in anaerobic conditions under the growth of marine life on the hull of the vessel, lead tetroxide might be transformed into other chemical forms of lead, potentially increasing its bioavailability. Mr Bjorkman suggested that the environment where the ship was to be scuttled will not offer much opportunity for transforming environments – such as anaerobic environments – to arise. If it were to do so, the most likely outcome was that the lead would be transformed into even more insoluble and unavailable forms such as lead sulfide. Mr Hoyt's evidence is unpersuasive, as his expertise is in marine engineering. Dr deFur has experience in ecotoxicology (mainly relating to organic pollutants) but he was unspecific about the prospects of environmental transformation of lead, and we found his evidence on the latter point

[26] Australian and New Zealand Environment Conservation Council – *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (2000).
[27] Exhibit 10; Transcript of Evidence, 7 July 2010, pp 200-204.

unconvincing. On this issue we prefer the evidence of Mr Bjorkman: he is better qualified on these issues, his evidence was more specific and it is more inherently plausible.

63. There was significant reliance by the State on papers relating to the impacts of lead on the marine environment.[28] In particular, there was reference to papers relating to the *HMAS Swan, HMAS Hobart* and *HMAS Perth*. These studies were focused mainly on corrosion of the wrecks, but the limited monitoring carried out of other metals showed levels of lead and copper in the sediment around the ships which were slightly elevated but, with the exception of a small number of apparently anomalous results, were well under screening levels. In evidence, Mr Polglaze noted that these ships were "a different class and a different generation of ship as well",[29] but he subsequently provided an affidavit with attached exhibits establishing that red lead paint did appear to have been used on the *Perth, Brisbane, Hobart* and *Canberra*. Mr Polglaze's affidavit suggests that the *Swan* was probably also painted with red lead primer. Monitoring of these vessels after their sinking may therefore throw light on the fate of the lead from the *Adelaide*.

64. We note, however, that sediment monitoring was undertaken[30] on these ships a very limited time after scuttling. If, as Mr Polglaze suggested, there was lead paint on the *Swan* and *Perth,* then, allowing time for the paint to degrade (and for any fabric and insulation covering, that may have remained, also to degrade) it is highly unlikely that the limited sediment sampling within about a year after scuttling provides a reliable guide to the levels of lead that are likely to be observed over longer periods. We also note that the sampling was confined to the sediment and did not include the inside of the hulls.

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[28] Exhibit 5 – T78: MacLeod, I., Morrison, P., Richards, V., West, N., 2004 "Corrosion monitoring and the environmental impact of decommissioned naval vessels as artificial reefs", *Proceedings of Metals 2004*, National Museum of Australia pp 53-74; T 80: Richards, V., MacLeod, I., Morrison, P., 2010 "Corrosion monitoring and the environmental impact of decommissioned naval vessels as artificial reefs" *In-Situ Conservation of Cultural Heritage: Public, Professionals and Preservation*, ed V. Richards and J. McKinnon, PAST Foundation Publications pp 50-67.

[29] Transcript of Evidence, 7 July 2010, p 188.

[30] Transcript of Evidence, 7 July 2010, p 195; MacLeod, et al (2004); Richards, et al (2010). Sediment around the Swan was monitored at one month, five months and 12 months and the sediment around the Perth was monitored at nine days, six months and at 388 days.

65. The State also relied on some American studies, examining the release of pollutants from ships sunk as artificial reefs (including naval vessels). These studies provided somewhat mixed results. They showed only moderate levels of pollutants of concern, in general, but some studies indicated that lead was taken up by organisms around sunken naval ships over time.[31] The utility of these studies was also limited by uncertainties over the extent to which the ships studied were comparable with the *Adelaide,* and by uncertainties arising from the construction of the studies themselves. Nevertheless, we note that none of the studies, Australian or US, provided evidence that lead pollution from naval ships sunk as wrecks presents a significant problem in the marine environment.

66. Much, but by no means all, of the lead-based paint is located under canvas covering and some form of insulation. The Project Plan for the preparation for scuttling of the ship includes the removal of insulation in the hull.[32] Further, the Initial Ship Inspection report deals with this as follows:

> *Insulation and lining of bulkheads and deckheads in usually a form of a synthetic material similar to fibreglass, normally in the form of batts. The batts, typically retained in place by a textile-type overlay and studs, present a concern that they may detach from the structure of the ship and generate a debris field, although it is unlikely that they will float. The Proponent was advised that these batts need to be removed... if it is considered likely that they will detach over time.*[33]

Mr Polglaze's report immediately goes on to say:

> *It is noted that this was the approach adopted for the preparation of the ex HMAS Ships* Swan, Perth, Hobart, Brisbane *and* Canberra*.*

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[31] See Martore, R. M., Mathews, T. D., and Bell, M., (1997) "Levels of PCBs and Heavy Metals in Biota Found on ex-Military Ships Used as Artificial Reefs" Contribution No. 419 from the South Carolina Marine Resources Center, Marine Resources Division, South Carolina Department of Natural Resources, Charleston, South Carolina, pp23 – see p 7.
[32] Affidavit of Andrew John Levett, 20 May 2010, para 61.
[33] T 70: Polglaze, J., URS Australia Pty Ltd "ex-*HMAS Adelaide* – Initial Ship Inspection", Letter to Ports and Marine Section, DEWHA, 26 November 2009, p 3.

Mr Polglaze finally recommends that:

> *[T]his aspect of the vessel preparation be closely monitored, and the potential for generation of debris post-scuttling and methods for its management be addressed as a specific condition in any Artificial Reef Permit which may be issued.*

67. Some leaded paint would be exposed to the marine environment once the ship is scuttled, other leaded paint is covered by insulation and canvas and would presumably degrade less quickly. From the evidence of Dr Smith, it is likely that the canvas cover will deteriorate over time, lasting about five to six years. Once the canvas cover is gone, the insulation batts will become exposed to the elements and it is likely that they will also degrade and/or detach over time. This will result in exposure of the remainder of the leaded paint to the marine environment.

68. The US Guidelines for *Best Management Practices for Preparing Vessels Intended to Create Artificial Reef*,[34] under the section on "Paint", requires removal of exfoliating (peeling) and exfoliated paint. The US Guidelines specifically recognise that "lead compounds, such as red lead tetraoxide (sic) (Pb_3O_4) and lead chromate, have been used extensively in marine paint." They also note that paints applied to vessels above the waterline are for preventing corrosion and are not designed to have biocidal properties. The Guidelines on paint, at 42, conclude:

> *Removal of intact paints generally is not necessary. Topside paint may contain other constituents, such as trace metals or biocides. Unlike underwater hull paint containing high concentrations of biocides designed to leach rapidly, topside paints are designed for long life. They also may contain significantly lower levels of these substances than hull coatings. However, exfoliating paint (paint that is blistering, peeling, and pitting) and exfoliated paint (paint chips and flakes) should be removed.*

[34] Exhibit JP4 to affidavit of John Polglaze, 17 May 2010 – US Environmental Protection Agency and the US Maritime Administration (May 2006) *National Guidance: Best Management Practices for Preparing Vessels Intended to Create Artificial Reef* – herein US Guidelines.

69. The Canadian Standard says, in relation to paint (at 20):

> *Loose and flaking paint must be removed from painted surfaces. "Loose and flaking" is defined as paint that may be removed with application of reasonable force using a wire brush.*

70. The Gulf and Atlantic States Marine Fisheries Guidelines note that concerns have been raised about leaded paint on ships to be scuttled as artificial reefs, but conclude that the human health and environmental risks are low, quoting advice from experts (including from the United States Environment Protection Authority) on the low solubility of lead in the marine environment.[35] The Guidelines quote a statement that "Lead in paint used on vessels deployed as artificial reefs [is not considered to be] a significant environmental or human health risk."

LEAD ASSESSMENT

71. In undertaking this assessment we have taken into account the aims of the Protocol and the precautionary approach contained in the Protocol.

72. The impacts on human systems from release of the lead are likely to be below harmful levels: the experts agreed that divers are not likely to come into direct contact with lead released from the paint and the low bioavailability suggests that lead will not make its way into the food chain in measurable levels. We reject Dr deFur's evidence on this point; his hypothesis would require a sequence of transformations and occurrences each sufficiently unlikely that the scenario as a whole is in our view verging on the fanciful. The impact on natural systems is less certain, but limited by the low solubility and bioavailability of lead tetroxide. Lead is not highly bioaccumulative and does not biomagnify and the evidence for the potential for the lead tetroxide to be transformed into more bioavailable forms is weak. Overall, we believe that all the information available to us points to a conclusion that there is no risk of harm to human health or the environment. There

[35] Exhibit JP8 to affidavit of John Polglaze, 17 May 2010 – Gulf and Atlantic States Marine Fisheries Commissions (January 2004) *Guidelines for Marine Artificial Reef Materials*, p 19.

is no risk of harm to local residents, not even those who dive at the site, from direct exposure to lead or from lead having been ingested by fish or other marine life.

73. Uncertainties mostly attach to the risk to ecological systems. Any threat from lead pollution will be localised to the sea bed near the ship and the bottom of the hull. The local sea bed environment, while of no special physical or biological importance, is clearly important to the local community. The temporal scale of possible impacts of lead remaining within the site is in decades rather than years; lead is likely to accumulate in the sediment (although the extent of dispersion through natural processes is unclear). On the one hand, the slow release of lead suggests that acute impacts are likely to be low; on the other, that chronic impacts, if they occur, may be found over a long period, given that metals, as elements, are inherently persistent. Nevertheless, there is no risk of harm to human health.

74. While the potential impact is localised and the known and projected impacts are limited, there are some uncertainties and the timescale is extremely protracted. Overall, however, we are led to conclude that the lead will not be likely to be present at any stage of the degradation process in forms which are bioavailable at levels that are likely to be harmful. Accordingly, we do not have any reason to believe that release of the lead is likely to cause harm and we find that the uncertainties relating to the impacts and fate of the lead in the marine environment are not so significant as to warrant greater caution. We agree with the conclusions of all of the experts, other than Dr deFur and, in part, Mr Hoyt, as expressed in their written document.

75. We do consider, however, that, consistent with the Canadian Standard and US Guidelines, any exfoliating or exfoliated paint must be removed as a condition of the permit. Therefore, consistent with the Project Plan and the Initial Ship Inspection, the canvas covering and insulation must be removed to enable all paint surfaces to be examined and, where necessary, treated.

76. Further, as there is limited understanding of the specific impacts of lead on the marine environment, especially over the long term and in marine sediments, additional monitoring is appropriate. Clearly the most useful course would be for data to be recorded and made available publicly. The Permit already provides for this. We note that lead based primer has not been used on ships for some years

and that applications to scuttle any ships with red lead primer aboard are unlikely to come forward after a further fifteen or so years.

ANTI-FOULING COATING

77. The experts produced the following memorandum as a result of their conference:

> *Statement of issue: 3(e).*
>
> *'Whether Antifouling paint on the ex-HMAS Adelaide contains contaminants that are likely to pollute the marine environment':*
>
> *Bjorn Bjorkman:*
>
> *Does not consider the antifouling paint on the ex-HMAS Adelaide contains contaminants that are likely to pollute the marine environment.*
>
> *Dr Peter deFur:*
>
> *Considers that there is a possibility and perhaps probability that the antifouling paint on the ex-HMAS Adelaide contains contaminants that are likely to pollute the marine environment and that there is uncertainty.*
>
> *Werner Hoyt:*
>
> *Considers the antifouling paint on the ex-HMAS Adelaide to contain contaminants of concern that will enter the environment but considers effect likely to be negligible.*
>
> *John Polglaze:*
>
> *Does not consider the antifouling paint on the ex-HMAS Adelaide contains contaminants that are likely to pollute the marine environment.*
>
> *Dr Garry Smith:*
>
> *Does not consider the antifouling paint on the ex-HMAS Adelaide contains contaminants that are likely to pollute the marine environment with respect to risk to the environment.*

78. The *Adelaide* was dry docked on 23 March 2002 and again in late July 2003.[36] New anti-fouling was applied on both occasions, this being Intershield ENA300, Intergard 263 and Intersmooth 360. Mr Sissons indicated that the hull was cleaned with a grit sweep in 2002 and an ultra high pressure wash in 2003 that, together, removed any residue tributyl-tin (TBT). The hull was then painted with a new copper based system with zinc pyrithione booster. We are confident that any TBT was removed by this time.

79. There was conflicting evidence as to various types of anti-fouling and the length of time that the anti-fouling may remain active. Mr Polglaze indicated that paint described as "self-polishing" anti-fouling had a forecast life of 60 months and that the *Adelaide's* anti-fouling coating, which was of this kind, was therefore fully depleted.[37] We note, however, that this 60 month life is unlikely to be related to whether or not copper was being released into the environment; it is inherently more likely to be related to the amount of marine growth on the hull which would affect the speed of the ship and the amount of fuel it would use. The presence of marine growth on the hull, particularly in its early stages, would not be associated with a complete cessation of release of copper.

80. The US Guidelines and Canadian Standard treat anti-fouling paint as having a lifetime of twelve years. Mr Polglaze suggested that different kinds of anti-fouling were used in North America and Australia. He said that "ablative" (rather than "self-polishing") anti-fouling was used in North America, and that this form of anti-fouling typically had a longer lifetime. He said that none of the RAN ships were antifouled with ablative paints. In contrast, Mr Sissons gave evidence that self polishing and ablative anti-fouling were the same, and that "self-polishing" was simply the name sometimes used in an earlier period for anti-fouling containing TBT.[38] There is a degree of inconsistency in these statements, if the description "self-polishing" continued to be used after the use of TBT ceased. This does not, however, affect our finding that the anti-fouling on the *Adelaide* contains no TBT. The safer course in assessing the evidence is to accept that nothing depends upon the label given to the paint on the *Adelaide.* We do note, however, that the RAN dry docks and

[36] Affidavit of Andrew John Alistair Sissons, 20 May 2010, paras 7, 15.
[37] Affidavit of John Polglaze, 17 May 2010, para 94.
[38] Transcript of Evidence, 8 July 2010, p 307.

repaints the hulls of its ships more frequently than the US Navy. Logically, this would not occur unless the hulls needed repainting, whether for operational, cost or other reasons.

81. Mr Sissons gave evidence that a coat of anti-fouling of the kind applied to the *Adelaide* was 400 microns thick. He further stated that if a vessel steamed 8,000 nautical miles a month,[39] it would lose about 6 microns a month. If a vessel were to undertake such activity, it would wear down the anti-fouling in about 5.5 years. It is perhaps unlikely that the ship did 8,000 nautical miles every month for more than five years, but it did have an active service life. There was no evidence before us, however, regarding how many nautical miles the ship covered over the period in question.

82. While there are no specific Australian guidelines, the US Guidelines, at p 41, state that:

> *If there is minimal active biocide remaining on the vessel, no preparation to the underwater hull area is necessary. It can be assumed that biocide activity is minimal if the anti-fouling coating on a candidate vessel is more than twelve years old* ***and*** *essentially all the underwater hull area is covered with marine growth* (original emphasis).

83. The Canadian Standard states (at p 20):

> *Underwater hulls that are more than 80% covered with marine growth will be assumed to have non-active anti-fouling coatings.*

84. Mr Polglaze advised that he had not inspected the underwater hull to establish whether it was covered with growth, and apparently no-one else had thought to do so. It is unfortunate that we are compelled to arrive at a decision when a simple inspection of the hull would have provided the basis for a more informed decision.

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[39] From Fremantle to the Persian Gulf in a straight line is approximately 5,000 nautical miles.

85. The papers reporting on release of metals from Australian naval wrecks[40] are of little help: the new copper anti-foulants were not used on those vessels and, although copper was used in conjunction with the tin-based TBT anti-foulant, we cannot assume that the release of copper into the environment will be comparable to that resulting from the *Adelaide*.

86. Dr deFur referred to studies into the impacts of copper on marine ecosystems in support of his concerns.[41] These, however, related mainly to the impacts in enclosed waters and around marinas where boats and ships were moored. The conclusion of one of those papers, a survey of copper biocides in the marine environment, is that "the overall impact of copper in the marine environment is low",[42] and it notes that harbours and marinas with high berthing densities are the areas of highest environmental risk. That does not describe the site where scuttling of the *Adelaide* is proposed.

87. Copper is a known biocide in the marine environment; indeed that is the basis for its incorporation in anti-fouling paints, which operate (at least in part) through the toxicity of the coating discouraging colonisation by marine organisms. The experts agreed that remaining copper would either be lost to the anti-fouling coating and rapidly oxidised to insoluble forms, or come off the hull as flakes of paint; in either case, insoluble forms of copper will migrate to sediment. The experts also agreed on the toxicity of copper but, with the exception of Dr deFur, did not see the remaining anti-fouling on the ship as presenting a significant environmental risk. Dr deFur believed that, given the toxicity of copper and what he saw as the uncertainties associated with the impacts of copper from a ship sunk as an artificial reef, caution was needed.

88. We note that the anti-fouling was always intended to end up in the marine environment. The scuttling of the ship may mean that there is some limited increase in the concentration of copper in the vicinity of the wreck, but the copper will be

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[40] Above, n 28.
[41] Parks, R., Donnier-Marechal, M., Frickers, P., Turner, A., Readman, J., 2010 "Antifouling biocides in discarded marine paint particles" *Marine Pollution Bulletin* 60(8) pp 1226-1230; Brooks, S., Waldock, M., "Cooper Biocides in Marine Environments" in *Ecotoxicology of Antifouling Biocides* eds Arai, T., Harino, H., Ohji, M., Langston W. J., Chapter 24 (pp 413-428), Springer Japan, 2009.
[42] Brooks et al, p 425.

dispersed in the active environment around the wreck. It is clear that there has been significant depletion of the copper from the active service life of the vessel.

89. We find that the anti-fouling is seven years old, that the majority of the anti-fouling coating is already depleted and that the risks to the environment from the loss of the remaining anti-fouling coating into the active environment surrounding the sunken ship are not significant.

RECYCLING

90. If the application to sink the ship is subject to Annex 2 of the Protocol, the application must be assessed against alternatives to that course of action. The ship which is subject to that assessment is the ship as prepared for scuttling. If we were to conclude that the ship should be subject to some other fate than the scuttling proposed, the only decision open to us would still be simply to refuse to grant a permit.

91. Annex 2 covers a wide range of possible sea dumping activities, not only the creation of artificial reefs: it is clear that its main focus is to encourage contracting parties, when faced with proposals to dump particular wastes at sea, to consider a wider range of possibilities, including avoiding the creation of the waste stream in the first place. Such an approach, while clearly attractive in general policy terms, is not necessarily relevant to every kind of waste, and in particular is probably not relevant to proposals to sink a naval ship as an artificial reef at the end of its useful life.

92. The recycling of ships is evidently a matter of some international debate and controversy at present. There is a body of opinion[43] that the sinking of ships as artificial reefs is in some general sense poor practice environmentally and a screen for the cheap and convenient disposal of vessels. Such a position holds obvious attraction as a principle, but it is not – or perhaps not yet – reflected in international instruments, nor in Australian law or policy. For that reason we have not attempted to go beyond the provisions of the Protocol in weighing these considerations.

[43] Most clearly reflected in the affidavit of Jim Puckett, 23 June 2010.

93. The Action Group suggested that the ship should be recycled (eg dismantled piece by piece and the metal used for scrap) rather than being scuttled, referring to the IMO Guidelines on Ship Recycling and the significant reductions in greenhouse gas emissions that could be secured by recycling the metal on the ship. The State argued that the Annex should not apply; (and in the alternative that the ship had already been partly recycled); that it would be serving a positive environmental purpose as a wreck; that it would also serve economic, scientific and social purposes through its contribution to the local economy and the community; and that the cost and inconvenience of recycling would be prohibitive.

94. We have decided to test the proposed scuttling against para 5 of Annex 2. It is true that much of the material has been removed from the ship and recycled, but the comparison we need to make, as noted above, concerns the ship as she is now: we must consider whether the preferred option for the ship, as she is, is to sink her or to adopt some other course. This means we should not take into account the recycling that has already occurred. Some options, such as recycling the ship overseas, are unavailable because the ship is not seaworthy (and cannot be towed to an overseas location) and because of the military specification materials used in its construction. Mr Coyle gave evidence regarding the cost of recycling compared with the cost obtained for the recycled material.[44] The State offered a considerable body of evidence to support the economic, scientific and community case for the dive wreck[45] while the Action Group attempted to undermine the strength of that case.[46] The State also pointed to the environmental benefits of an artificial reef by offering evidence that there would be substantial colonisation of the wreck by marine life.[47]

95. As noted above, the drivers of decision-making on permits under the Act are essentially environmental. Annex 2 of the Protocol outlines the preferred waste management options in familiar terms, with reuse and recycling higher in the hierarchy than disposal options, as would be expected. Reuse is preferred to off-site recycling. Consideration of the proposal for an artificial reef, however, raises

[44] Affidavit of David Coyle, 3 July 2010.
[45] Affidavits of Richard Arthur, Leslie Graham, Rick Parsons, Wayne Green, Oliver Philpot, John Asquith, Paula Bradly, William Kilpatrick and David Powter.
[46] Affidavits of Scott Fortey, Malcolm Poole, Quentin Riley and Benjamin Smith; cross-examination of Oliver Philpot.
[47] Exhibit 2 – Report of William Gladstone, 20 May 2010.

particular issues. The use of the word ‘mere’ in Art 1.4.2.2 of the Protocol (“other than the mere disposal thereof”) clearly contemplates that at times there will be what might be termed “mixed purposes” at work, ie something is to be disposed of and at the same time placed in the sea for some other purpose. In considering it against the hierarchy in Annex 2 Para 5 we take the view that its place in the hierarchy will be determined by the merits of these “other purposes” – that the proposal must be more than simply a screen for dumping; it should not have significant environmental impacts other than those associated with the dumping itself; and it should deliver genuine economic social, environmental, educational, scientific or other benefits, benefits that make it appropriate to regard the proposal as clearly something other than disposal.

96. In the case of the *Adelaide*, while the Department of Defence may have been principally interested in disposing of a vessel (scrapping options being inconvenient and possibly expensive in Australia), it also had at least some interest in creating an artificial reef. The State, on the other hand, had no interest in merely disposing of the ship, as it had no responsibility for it: its purposes, whether economic, environmental or even political, were entirely in “other than the mere disposal” of the ship. There are other environmental impacts associated with the use of the ship as an artificial reef, namely the greenhouse gases generated in producing metal that otherwise could have come from recycling the ship. We regard these as small in scale and insufficient to affect the merits of the case. The State has made a case for economic, scientific and community benefit from the dive wreck, as well as the environmental advantages that will result from its colonisation by biota. Although the Action Group has done its best to discredit the benefits, we believe that, while no doubt the State has exaggerated them somewhat, they are real, if modest. We conclude that in terms of the hierarchy set out in Annex 2 Para 5, scuttling the *Adelaide* is not the bottom entry in the hierarchy, “disposal on land, in air and in water”, but is more accurately described by the top entry of the hierarchy, namely “reuse”.

CONCLUSIONS

97. We therefore find that the scuttling of the *Adelaide* for the purpose of an artificial reef is in part at least a reuse of the ship. There are benefits to the environment from the resulting marine habitats generated, as well as more general benefits to the community. The level of pollutants now aboard the ship is low, and those that remain are either in very low quantities or inert and unlikely to cause any environmental problem especially after the further conditions for removal of the PCBs and lead are complied with. Given the low levels of environmental risk we have found, we conclude that the reuse of the ship through its scuttling as a dive wreck is consistent with the aims of the Protocol.

98. The first matter for our consideration is whether the proposal is contrary to the aims of the Protocol. We have decided that it is not. The proposal is not mere dumping. We find, for the reasons given above, that it will not result in "Pollution" as defined in the Protocol. The ship has been, or will be, when further work is completed, sufficiently stripped of harmful matter so that it will not "result or be likely to result in such deleterious effects as harm to living resources and marine ecosystems, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities".

99. Having come to this conclusion we must still consider the provisions of the Act and exercise our discretion in accordance with s 19.

100. The consequence of finding that the proposal is not contrary to the aims of the Protocol is that the proposal is for an "artificial reef placement" as defined in s 4. That means that an application for a permit under s 10E is appropriate. It further means that s 19(5) does not apply, although s 19(8A) does. We are still required to have regard to the Protocol. We will also have regard to the Guidelines under the Protocol and the IMO Guidelines on Ship Recycling.

101. Because we find that the proposal is for a purpose (placement of an artificial reef), which is recognised by the Act as a proper purpose where, as here, it is not contrary to the terms of the Protocol, our *prima facie* conclusion is that a permit

should be granted. There remain discretionary considerations which might, nevertheless, lead to a permit being refused. Alternative uses such as recycling, should be considered. We do not think that any debate or controversy as to whether the scuttling of ships as artificial reefs is good practice or not should affect us, certainly not while the Act recognises this as legitimate.

102. Our foregoing analysis has addressed the detailed matters which we need to consider. Before coming to our decision, however, there is sense in looking at the matter overall. The *Adelaide* is to be scuttled in the ocean at a distance of one and a half kilometres from the shore. Access to the ship and the surrounding ocean bed will be limited to divers wearing underwater breathing apparatus. Any lead carrying flaking paint will be confined to a small area or dispersed. In either case there will be no harm to human health. The copper on the ship's hull has already leached into the ocean, as it was intended to do, or the process will be completed in a short while.

103. There are, no doubt, Terrigal and Avoca residents who object to the idea that a ship should be sunk in their bay at all, who object to the idea of seeing power boats going to the area of the reef and hovering over it, who think that the presence of the ship may in some way affect the sand and wave movements at their beach. These are all reasons which might motivate someone to oppose the scuttling. There was evidence before us that some residents did hold opinions of this kind. There is, however, little room for these kinds of arguments under the legislation which must guide us. The Action Group did not rely upon these matters directly, except to the extent that they were minor elements of the recycling argument. The Action Group confined its arguments to arguments of potential harm linked to lead and copper. We have found that although lead and copper are potentially harmful they will not cause harm by reason of their being present in the *Adelaide* scuttled and placed as an artificial reef in the ocean.

104. The preferable decision as to whether a permit should be granted under s 10E of the *Environment Protection (Sea Dumping) Act 1981* (Cth) for the placement of the former *HMAS Adelaide* as an artificial reef off Terrigal and Avoca is accordingly that the permit should be granted with conditions. We agree with the conditions imposed by the permit under consideration by us, but we consider that additional conditions, relating to the removal of canvas and insulation, the removal of

exfoliating or exfoliated red lead-based paint, the removal of remaining wiring which may be associated with PCBs and the conduct of a more extensive monitoring program, should be added.

105. The Long Term Monitoring and Management Plan provides for sediment sampling, including for lead and copper, at one month, six months, eighteen months and five years. The Management Plan notes that further sediment quality monitoring will be considered based on results and when the plan is reviewed after five years. The majority of the Tribunal considers that these proposals are adequate, providing that the power to require additional sampling is expressly reserved to the Minister and providing that the sampling for lead includes two sites in the hull as well as the sites on the sea floor. We confirm that the results of all sampling, as required by para 23 of the Permit, must be reported on the New South Wales Land and Property Management Authority's website for the *Adelaide*.

106. Member Wulf was of a different opinion as to the timing of the sediment sampling. Consistent with the other members of the Tribunal, Member Wulf noted that there was very little information as to the long term effects of lead on the marine environment. The studies by MacLeod and Richards provided no assurances that lead would not be an issue in the future.[48] Also the experts agreed that it would be 20 to 50 years until lead became an issue, if at all and we have investigated this in our assessment of lead. Accordingly Member Wulf was of the view that additional sampling should be provided for now, over the long term, above what is prescribed in the Management Plan, these being:

(a) 120 months (10 years) post scuttling;

(b) 180 months (15 years) post scuttling;

(c) 240 months (20 years) post scuttling;

(d) 600 months (50 years) post scuttling.

Member Wulf considered it appropriate to have these additional sampling periods as ex RAN ships that still contain lead might be proposed for scuttling as an artificial

[48] MacLeod, et al (2004); Richards, et al (2010)

reef over the next 15 years and this data from this sampling could provide a guide for future applications under the Act. The final sampling period was considered appropriate as the permit was only valid for 50 years.

107. On 14 September 2010 a newly appointed Minister for Sustainable Population, Communities, Environment and Water became the Minister responsible for the *Environment Protection (Sea Dumping) Act 1981* (Cth). The name of the respondent has, with the consent of the parties, been changed accordingly.

DECISION

108. The decision under review is varied by:

1. Adding the following to condition 2 to the permit as originally granted:

(e) the ship must be cleaned of all remaining wiring, including junction boxes, which might be associated with polychlorinated biphenyls;

(f) the ship must be cleaned of all canvas and insulation; and

(g) the ship must be cleaned of all exfoliating and/or exfoliated red lead paint;

2. Adding to the section on Sediment Quality in the Long Term Monitoring Plan and Management:

(a) a provision that two sites within the hull are to be added to the sites to be sampled for lead; and

(b) a provision that the Minister for Sustainability, Environment, Water, Population and Communities (or the Minister's successor) or delegate may require additional sampling of lead if the results of sampling already provided for make that appropriate.

I certify that the 108 preceding paragraphs are a true copy of the reasons for the decision herein of Justice Downes, President, Mr P Wulf, Member and Mr M Hyman, Member.

Signed: .....[sgd].....
Joselyn Lakin, Associate

Dates of Hearing:	5-8, 16 July 2010
Date of Decision:	15 September 2010
Solicitor for the Applicant:	Environmental Defender's Office NSW
Counsel for the Applicant:	Mr Nigel Cotman SC and Mr Geoffrey Kennett
Solicitor for the Respondent:	Australian Government Solicitor
Counsel for the Respondent:	Mr Andras Markus
Solicitor for the Joined Party:	NSW Crown Solicitor's Office
Counsel for the Joined Party:	Ms Jane Needham SC