



Australian Government

Department of Climate Change, Energy,  
the Environment and Water

EPBC 2010/5642

Mr Tim Deery  
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**Approval of qualified expert for South of the Embley Bauxite Mining Project (EPBC 2010/5642)**

Dear Mr Deery

Thank you for your correspondence dated 7 August 2025 to the department, requesting approval of a suitably qualified independent peer reviewer to undertake the review of the Capital Dredging Management Plan under conditions 14 and 60 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) approval 2010/5642.

I have noted the information provided, including the qualifications and experience of the nominated independent peer reviewer and the requirements specified in definitions attached to the EPBC Act approval for the above project.

As delegate of the Minister for the Environment and Water I have approved Dr James Stoddart to undertake review of the Capital Dredging Management Plan under conditions 14 and 60 of 2010/5642.

Should you require any further information please contact Cath Cooney by email to [PostApproval@dcceew.gov.au](mailto:PostApproval@dcceew.gov.au) or telephone 0466 475 032.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Rachel Short'.

Rachel Short  
Branch Head  
Environment Assessments (Vic, Tas) and Post Approvals Branch  
Environment Regulation Division

20 October 2025

This document provides an evaluation of the effectiveness of Rio Alcan (the Proponent) responses in addressing issues raised in the primary independent peer review of the Capital Dredging Management Plan for expansion of the South of Embley port facilities. This document should be read in conjunction with the original review, dated 1 October 2025. Proponent responses were provided in the following documents provided by the Proponent on 11 November 2026:

- 2025-2029 Capital Dredging Management Plan, Amrun (Boyd) Port November 2025, Rev 2 (Word Version), 11 November 2026
- Water Quality Monitor Plan – Amrun Port Capital Dredging, Rev 4, 6 November 2026
- Coral Monitoring Plan, Amrun Port Expansion, Rev 2, 10 November 2026
- Amrun Expansion CDMP Review 2025\_RT response\_251111

## Evaluation of Responses against Original Review

In summary, the responses and revisions provided adequately cover the issues raised in the initial independent peer review and I have no further outstanding issues. The remainder of this document describes how I have reached that conclusion.

The two tables below are reproduced from the original review. In Table 2, column 1 is the original finding, column 2 is the degree to which revisions correct or ameliorate the issue raised. Where an item was flagged originally as *Complies*, no further comment is provided here. It is noted that where suggestions for improvement were made in the original review for compliant items, these have been taken up in the revision of the CDMP.

**TABLE 2: Review comments by Section of the DMP: Condition 14 Assessment.**

Item & Finding	Once Revised
<p><i>Does the CDMP fulfil requirements of the National Assessment Guidelines for Dredging Australian Government (2009) to avoid or mitigate impacts on:</i></p> <ul style="list-style-type: none"> <li>a. Commonwealth Marine Area;</li> <li>b. Listed turtle species;</li> <li>c. Listed dolphin species; and</li> <li>d. Dugong (<i>Dugon dugon</i>) and Bryde’s Whale (<i>Balaenoptera edeni</i>).</li> </ul> <p>Note: Requirements of the NAGD 2009 for management plans (p.22 of NAGD) are listed below with reference to items a to d above.</p>	
<ul style="list-style-type: none"> <li>• <i>overall management framework</i> – describe how the plan integrates with the overall management framework</li> </ul> <p><b>Partial compliance</b> The managerial framework for the dredging project, including accountabilities for the CDMP, is set out clearly in Section 7.1. However, experience from past dredging projects shows that there is a risk that any environmental management measure not included in the dredging contract is unable to be enforced. There should be a</p>	<p><i>Complies</i> The CDMP is now clearly linked to the dredge contract and the dredge contractor’s responsibilities noted.</p>

Item & Finding	Once Revised
<p>commitment in this section that management actions required from the contractor (including cessation or rescheduling of dredging) should be included in the dredge contract.</p>	
<ul style="list-style-type: none"> <li><i>context</i> – put the proposal in the context of the local environment, including history of dredging and dredge material disposal at the site</li> </ul> <p><b>Partial compliance</b></p> <p>Section 4 contains a sufficient description of the local environment for the general plan and a useful treatment of items a to c in the condition dot points. However, given the specific referencing of protection for dugong and Bryde’s whale, this section should provide a more detailed description for these species. At present, the contention that they are rare in the project area (Section 5.4) requires further elaboration in this section.</p>	<p><b>Complies</b></p> <p>Sections 4.5.4 and 4.5.5 of the CDMP Rev 2 discuss the relevant species in sufficient detail.</p>
<ul style="list-style-type: none"> <li><i>description of the project</i> – provide information on dredging and disposal for the term of the plan or permit, including the location, staging, and timing of activities</li> </ul> <p><b>Complies</b></p> <p>The description of proposed dredging covers all relevant areas. However, at this stage several details are ‘best guess’ – including timing and plant. It would be useful to add a review point in Section 7.6 prior to commencing dredging to confirm that the dredging characteristics (including plant and timing) are consistent with those used in the current draft of CDMP to predict impacts.</p>	
<ul style="list-style-type: none"> <li><i>information on approvals</i> – provide details of any approvals, relevant conditions and any other statutory requirements</li> </ul> <p><b>Complies</b></p> <p>The legal framework and approvals history is described in Sections 1.1 and 1.2.</p>	
<ul style="list-style-type: none"> <li><i>description of the existing environment</i> – characterise the dredging and disposal sites and adjacent areas, including its water column, sediments, biota, resources and other uses (existing and potential) of the area</li> </ul> <p><b>Partial compliance</b></p> <p>The CDMP provides a comprehensive coverage of the environment of the project area. The amount of data provided on the physical and biological environment adequately demonstrates that the local environment has</p>	<p><b>Complies</b></p> <p>The potential impacts on the social and recreational uses of the area are now included in the CDMP.</p>

Item & Finding	Once Revised
<p>been well documented and is well understood in terms of dredging risk.</p> <p>While there is an excellent coverage of the physical environment, social use of the area is only discussed briefly. However, reference to an environmental risk assessment (Eco Logical Australia 2020) suggests that there has been an assessment of social values of the area. It would be useful to add more information on social uses of the area or append the risk assessment to support the contention of only minor temporary impacts on uses such as fishing contained in Section 5.</p>	
<ul style="list-style-type: none"> <li>• <i>description of the material for disposal</i> – provide a summary of sediment types, their status relevant to the values in these Guidelines</li> </ul> <p><b>Complies</b></p> <p>Section 3 of the CDMF provides a summary of results of a considerable past sampling of sediments. This section also notes that DCCEE have provided an exemption that further sediment sampling is not required.</p>	
<ul style="list-style-type: none"> <li>• <i>description of potential impacts</i> – address both potential short-term and long-term impacts and any uncertainties regarding the predicted impacts</li> </ul> <p><b>Complies</b></p> <p>The impacts section is a comprehensive treatment resting on an interpretation of a large amount of relevant data collected during and around previous dredging programs. Impacts are well considered based on previous experience.</p> <p>Note that there are no specific sections treating dugong (other than brief mentions) or Bryde’s whale. This should be contingent on these species being demonstrated to be rare in the area – as requested in the review above.</p>	
<ul style="list-style-type: none"> <li>• <i>management strategies and actions</i> – describe strategies and actions to mitigate impacts – including specific and auditable measures; performance indicators; monitoring requirements; corrective actions; and responsibilities and timing for management and monitoring activities</li> </ul> <p><b>Complies</b></p> <p>Environmental objectives, monitoring and management strategies are supplied for all potential impacts identified in Table 11.</p>	

Item & Finding	Once Revised
<p>Monitoring and management actions for turtles, dolphins, dugong and whales (supplied as general marine mammal guidelines and not specifically directed towards Bryde's whale) are set out in detail in section 6.4.</p> <p>Note – see Table 3 of this review for comments on likely effectiveness of nominated monitoring and management actions.</p>	
<ul style="list-style-type: none"> <li><i>contingency arrangements</i> – identify corrective actions and contingency plans should undesirable or unforeseen impacts occur</li> </ul> <p><b>Partial compliance</b></p> <p>Table 11 lists corrective actions for all environmental risks – However, see Table 3 of this review for qualifications on the form of many of those corrective actions.</p> <p>While dredging is planned for the non-cyclone season, cyclones occasionally occur outside the normal period. There should be some discussion of what management would be put in place to avoid dredging when cyclonic conditions occur which could result in plume dispersal conditions outside those used in models of sediment transport.</p>	<p><b>Complies</b></p> <p>Table 11 and the contingent monitoring plans of the CDMP have been amended to include appropriate adaptive management responses. The following table describes this in more detail.</p> <p>The Proponent's Table of individual responses sets out management measures which would be enacted routinely during cyclonic conditions.</p>
<ul style="list-style-type: none"> <li><i>continuous improvement</i> – identify opportunities for continuous improvement to prevent, minimise or mitigate environmental impacts in the longer term</li> </ul> <p><b>Complies</b></p> <p>The CDMP uses results of past programs for continual improvement and commits to a substantial monitoring program directed at informing future dredging management.</p>	
<ul style="list-style-type: none"> <li><i>auditing requirements and reporting</i> – outline reporting and documentation standards, timing and responsibility of any auditing or reporting</li> </ul> <p><b>Complies</b></p> <p>Relevant auditing and reporting requirements are set out with timeframes.</p> <p>The only improvement suggested is that in 7.2 auditing is only targeted for 'minor capital dredging'. It should also occur during the major dredging works.</p>	
<ul style="list-style-type: none"> <li><i>review of management plan</i> – make provisions for a review of the management plan, including consultation with the TACC, to ensure it remains current.</li> </ul>	<p><b>Complies</b></p> <p>Firmer wording and provisions for relevant reviews have been added</p>

Item & Finding	Once Revised
<p><b>Partial compliance</b>                      Section 7.6 allows for a review of the CDMP. However, text in 7.6 advises that BPDTAG (TACC) and WCCCA 'may' review the CDMP. This is inconsistent with 'provisions for a review of'. Additionally, there is no commitment to review and update the plan should monitoring show that management actions are not working. In an extended campaign(s) such as planned here, such an update may be required.</p>	<p>to Section 7.6 of the CDMP which provide a clear and appropriate basis for future reviews.</p>

Table 3 of the original review contained items relating to 'degree of effectiveness' rather than the stricter compliance/non-compliance items. Responses are assessed here as to the degree they ameliorate issues raised in the original review as constraining effectiveness.

**TABLE 3: Review comments by Section of the DMP: Condition 61 Assessment.**

*an analysis of the effectiveness of the avoidance and mitigation measures in meeting the objectives, targets or management measures identified in the program/s, plan/s or strategies being reviewed*

**Overall:** I found the document unclear regarding adaptive management responses. In many critical areas, the management actions listed in Table 11—meant to be triggered when environmental thresholds are exceeded—consist primarily of using data to inform future management decisions. While building knowledge is valuable, and may be an appropriate response for short-term dredging campaigns, it is not an effective form of adaptive management in the context of large capital dredging programs that run for several months. In such cases, immediate responses are essential to prevent or reduce environmental impacts. I could see no references to management actions in Table 11 designed to immediately stop or reduce potentially harmful environmental stresses derived from dredging and/or disposal activity.

The document appendices do include staged triggers for harmful thresholds related to water quality and coral health, which follows best current dredging practices. In other recent large dredging projects, 'Alert' conditions lead to investigations or precautionary, low-cost interventions, while 'Alarm' conditions prompt immediate, active management to reduce environmental stress. Under 'Corrective Actions', Table 11 of the CDMP lists only using data to inform dredging management in future years.

The water quality monitoring plan (see below) states that if an Alarm level is reached then there should be "the implementation of management actions by the dredge contractor to reduce turbidity levels". This is not implemented within Table 11 of the CDMP. Coral monitoring during dredging is stated to be implemented following Alarm levels of water quality, but without any discussion of what management would occur should coral health be shown to be negatively impacted by that water quality.

In practice, effective adaptive management actions often involve significant financial costs. Therefore, it is essential that such measures are clearly defined and incorporated into the dredging contract from the outset. Without the capacity to halt dredging operations considered to cause environmental harm beyond that permitted, the CDMP is not likely to be effective were such events to occur.

**Evaluation of Revised Documents**

The CDMP and the Water Quality Monitoring Plan have been revised to specify that adaptive management aimed at reducing pressures identified through water quality exceedances will now be implemented. Table 11 and Section 6.2.3 of the CDMP discuss the inclusion of altered dredging characteristics that may be implemented via the dredging contractor’s Environmental Management Plan in response to exceedance of an Alarm level trigger.

The timing and process to be followed in implementing adaptive management is set out in Section 7.9 of the revised Water Quality Monitoring Plan.

While the exact form of dredging management to be implemented to reduce pressure on water quality remains only as a series of options, this is aligned with current practice. Effective management is best developed in conjunction with the Proponent and dredging contractor. That is consistent with the revised CDMP commitment to shape adaptive monitoring via the dredging contractor’s EMP and the results of exceedance investigations.

FINDING	COMMENTS ON REVISION
<p><b><u>Water Quality Monitoring:</u></b>                      The intent and methods of the water quality monitoring plan (WQ Plan) are well described. However, the effectiveness of the program should consider the following suggested improvements.</p> <p><b>Site Selection:</b>                      Monitoring at the sensitive receptors provides a sound basis for evaluating whether water quality conditions at these sites are meeting requirements. Some extra sites between the source of impact and the sensitive receptors would act as early warning sentinels, provide ground truthing for plumes observed in satellites, allow more confidence in assigning an origin to any exceedances and provide data to validate predictions of sediment dispersion in the impact hypothesis.</p> <p><b>Thresholds:</b>                      Development of water quality thresholds requires further review against current science to confirm that the triggers selected are appropriate. Trigger development to safeguard coral health appears to be based on three studies: PCS (2020), Advisian (2016) and Erfteimeijer et al. (2012) and is based ultimately on the risk of reducing light levels at the seabed. I agree with the use of light levels and an</p>	<p><b><u>Site Selection</u></b>                      Rather than adopt sentinel sites, the revised water quality plan takes the approach of using satellite imagery to identify early warning signs of plumes and capacity to determine the origin of plumes affecting sensor-recorded data. While satellite imagery may miss plumes occurring at depth, it has the advantage of covering the entire area of interest and has a history of successful use in similar dredging programs.</p> <p><b><u>Triggers</u></b>                      The water quality monitoring plan now includes an appendix which describes the development of triggers in much greater detail and includes a more thorough use of recent benchmark</p>

FINDING	COMMENTS ON REVISION
<p>intensity-duration-frequency approach (IDF), but consider that the studies used have the potential to lead to incorrect IDF prescriptions.</p> <p>The PCS study was focussed directly on seagrass in the shallow flats around the Port of Weipa and not coral. It excluded treatment of water quality data from the instrument sited near the current project area and dealt with effects on seagrass at 5-10 m depth (depth being a major influence on light at the seabed) within an estuarine environment.</p> <p>The Advisian study cautions on the use of its triggers for coral health and the Erftemeijer study is now dated.</p> <p>The Western Australian Marine Science Institute’s multi-million-dollar study of the effects of dredging on tropical and subtropical benthos, conducted over 8 years by researchers from AIMS, CSIRO and universities has provided a broad range of relevant, peer reviewed, publications on the issue. Researchers from these programs have also worked with North Queensland Bulk Ports to ensure that the results can be extrapolated to Queensland conditions. The results of that study are not referenced.</p> <p>The thresholds developed here should be reviewed in context with the papers and reports from the WAMSI studies. In particular:                      Jones R, Fisher R, Bessell-Browne P, et al (2019) : <i>WAMSI Dredging Science Node Theme 4 Synthesis Report: Defining Thresholds and Indicators of Coral Response to Dredging-Related Pressures</i>. Theme 4 Final Synthesis Report. Prepared for the WAMSI Dredging Node, Perth, WA</p> <p>Adaptive Management (Sect 7.9):                      The Alert and Alarm staging of triggers is useful and complies with current best practice. Currently, the first response to an Alarm trigger is to evaluate whether the exceedance is dredging related before any action occurs. As this evaluation may be time consuming and evaluating whether an exceedance is dredging related is always problematic, this process should have a stated timeframe and some clear guidance as to what criteria will be used to make that decision. Any extended period of investigation of past events may mean an unacceptable stress lasts for longer than desirable before mitigation action is implemented.</p>	<p>studies in developing water quality triggers for dredging.</p> <p>The basis of triggers now appears sound.</p> <p><u>Adaptive Management</u>                      Comments above have dealt with the revised adaptive management strategy in general form. The timing and form of exceedance investigations is now outlined in sufficient detail in the Water Quality Plan to confirm its likely effectiveness.</p> <p>FINDING                      The revised Water Quality Monitoring Plan is fit for purpose in supporting the CDMP objectives.</p>

FINDING	COMMENTS ON REVISION
<p><b>Coral Health Monitoring:</b>                      Given the patchy/sparse nature of corals in the area, the management triggers suggested here seem excessive. At present, the monitoring program is unlikely to deliver the stated capacity to test the impact thresholds it establishes without an unacceptably high Type II error rate. With coral communities described as being patchy and existing at 4-6% cover in this area (CDMP Table 6), coral monitoring using transect/quadrat methods is likely to be subject to extreme variability. It is highly unlikely that the claim of a high power of detecting a 10% change can be met with the suggested methods (N.B. a 10% change in 4-6% cover means detecting a 0.4% change in real cover, when sampling variance of coral cover within a site over time is likely to be higher than estimated mean cover).</p> <p>Rather than using precise changes in coral cover, benthic monitoring would be better to address all sessile benthos (note that Table 6 of the CDMP lists other benthic categories at equal or greater abundance than corals) and use a multiple lines of evidence approach to employ all indicators of dredging impacts (Table 1 of the coral monitoring plan) in a holistic trigger scheme.</p> <p>The current coral monitoring plan is quite high level at this stage. One area where it needs elaboration is in the method of establishing the ‘fixed’ transects and how data will be collected. Should the plan’s intent to capture coral data in a highly repeatable manner be maintained, it will be critical to have the “fixed” transects and quadrats physically marked and recorded by divers and not remote methods. Experience shows that despite claims of remotely deployed cameras recording ‘fixed’ areas, these techniques invariably introduce considerable variance as to exactly what area is recorded and the angle it is recorded at.</p> <p>Additionally, remotely deployed cameras are inefficient at recording coral recruitment. Small coral recruits are not discernible from images and often settle on vertical or inverted surfaces which are unable to be photographed. Comprehensive recording of recruitment occurring over timeframes such as envisaged here requires intensive diver-based observations.</p>	<p><b>Revised Coral Monitoring</b>                      As noted in the original review, effective coral monitoring of low-cover, patchy coral communities on fragmented reefs, such as occur adjacent to the project area is not possible with high precision. Indeed in such communities where disturbance and change are frequent, high precision monitoring can be misleading.</p> <p>The coral monitoring program has been revised to present a more realistic set of tests of impact. Higher effect sizes for decline in cover and the relegation of other parameters to semi-quantitative lines of evidence has improved the ability of the program to make useful inferences.</p> <p>In its revised form the methodology of the program and its analyses provide an effective tool to evaluate whether the dredging program has caused any significant impacts on the coral community of this area.</p>

FINDING	COMMENTS ON REVISION
<p><b>Marine Megafauna Management:</b>                      The CDMP uses numbers of dead or injured turtles recorded as its indicator of the effectiveness of management in avoiding such impacts. In some cases, it uses the term 'entrained' to indicate the method of injury. Detecting turtles that have been entrained by a cutter suction or trailer dredge is almost impossible. In either case, the turtle is in pieces and deposited in the dredge hopper together with large amounts of spoil. Thus, detection of damaged turtles will be confined to those found in project waters. That statistic will depend on what systematic program is used to look for dead or injured turtles. The current description of 'daily monitoring' (CDMP Section 6.4.1) should be more precise on the resources used and areas surveyed each day to demonstrate a reasonable chance of finding injured/dead turtles.</p> <p>Section 6.4.1 of the CDMP states that where monitoring identifies more than two marine turtles killed within 24 hours, dredging will stop until an investigation is completed. However, Section 6.4.3 is more equivocal about what management would be implemented in such an event. Neither management response discusses what conditions would need to occur before dredging was restarted in an event where the investigation showed current dredging practice was responsible for the turtle deaths. Effectiveness would be improved if the above were rectified.</p>	<p>Sections 6.4.1 and 6.4.3 of the CDMP have been amended to provide further detail on monitoring for turtle injuries and how responses to incidents would be managed. These sections now redress the original lack of detail.</p> <p>Exactly what management measures might be implemented to ameliorate dredging procedures causing mortalities (if found) is left unspecified. With no history of turtle mortalities from previous dredging programs here, it is difficult to identify how these might arise and what management measures might be required. Thus, making the identification of appropriate management contingent on investigations to be conducted at the time of the incident (as specified in the revised text) is appropriate.</p>