Port of Gladstone
Gatcombe and Golding Cutting Channel Duplication Project

Environmental Impact Statement

Gladstone Ports Corporation
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Appendix D
Independent Review of the Port of Gladstone

Appendix D

Table 1 Key recommendations from the Independent Review of the Port of Gladstone

	Description of findings and recommendations	Channel Duplication Project response	EIS section containing additional information
Recommendations			
14	That proponents of developments within the Port of Gladstone ensure that any voluntary independent audits are conducted consistent with best practice standards and seek to obtain the department's agreement to the criteria	The Project EMPs contain a requirement for independent audits. Commonwealth and Queensland Government agencies will be involved in the review and approval of the Project EMPs prior to the commencement of construction. The department's agreement to the criteria for independent audits will be addressed during this review process.	Appendix Q1 (Dredging EMP), Sections 6.11 and 6.12 Appendix Q2 (Project EMP), Sections 6.11 and 6.12
15	That all confirmed cases of non-compliance be publicly announced on both the department's and proponent's website along with details of any remedial actions	The Project EMP and Dredging EMP will operate within the framework provided by the existing GPC EMS, which is an overarching framework for managing environmental risk at all GPC managed sites. GPC staff and relevant contractors are directed to follow reporting, incident and record keeping procedures outlined in the EMS, while also following the site specific management actions and monitoring outlined in the Project EMP and Dredging EMP.	Appendix Q1 (Dredging EMP), Section 6.14 Appendix Q2 (Project EMP), Section 6.14
18	That, as dredging operations transition from capital to maintenance works, monitoring and reporting be continued in a transparent and consistent manner	Maintenance dredging will generally be required annually for the Gatcombe and Golding Cutting duplicated channels, and the Project barge access channel following the Project dredging works as the sediments stabilise. The Port-wide maintenance dredging and offshore placement will be subject to the relevant Commonwealth Government approval process (e.g. Sea Dumping Permit) and other approvals as required at the time of dredging.	Chapter 2 (Project description), Section 2.11.4 GPC contribute to the monitoring undertaken by PCIMP within the Port of Gladstone. This monitoring program continues between capital and maintenance dredging programs.

Source: Australian Government (2013)

Table 2 **Key findings and recommendations from independent review of the bund wall performance (design, construction and functioning of the outer bund wall)**

	Description of findings and recommendations	Channel Duplication Project design response	EIS section containing additional information
Findings			
1	Modelling to understand potential consequences of the change in size and shape of the reclamation area on tidal velocities, bed shear stress and associated sediment transport should have been undertaken prior to final approval of the design and commencement of construction	Hydrodynamic and coastal processes modelling have included the WBE reclamation area detailed in the EIS Project description. If the size and/or shape of the reclamation area changes post EIS approval, additional modelling will be undertaken and mitigation measures adopted to minimise the potential changes to environmental impacts	Chapter 7 (coastal processes and hydrodynamics) Appendix G (coastal processes and hydrodynamics) Appendix Q2 (Project EMP)
2	The overall design of the bund wall was consistent with industry best practice for addressing the known geological and/or geomorphic variation of the adjacent seabed	The detailed design phase of the WBE reclamation area and BUF bund walls will adopt industry best practice and incorporate the findings of the Project EIS geotechnical investigation into the design and construction methodology process An additional geotechnical investigation will be undertaken for the WBE reclamation area and BUF during the detailed design phase of the Project	Chapter 7 (coastal processes and hydrodynamics) Appendix G (coastal processes and, hydrodynamics) Appendix Q2 (Project EMP)
3	While additional groundwater modelling could have been undertaken by the proponent to better understand the likely consequences of piping to inform the final design and construction method of the bund wall, it would have been difficult for the designers to anticipate the observed piping failure	The Project EIS geotechnical investigation for the WBE reclamation area found no evidence of palaeo channels within the reclamation area footprint	Appendix E2 (DMPA geotechnical investigations) Appendix Q2 (Project EMP)
4	The design of the bund wall with respect to the technical specifications of the geotextile liner did meet industry best practice and/or recognised industry standards	The detailed design phase of the WBE reclamation area and BUF bund walls will adopt industry best practice and incorporate the findings of the Project EIS geotechnical investigation into the design and construction methodology process	Chapter 7 (coastal processes and hydrodynamics) Appendix G (coastal processes and, hydrodynamics) Appendix Q2 (Project EMP)
5	The design of the bund wall with respect to the placement and restraint of the geotextile liner did not meet industry best practice and/or recognised industry standards	The detailed design phase of the WBE reclamation area and BUF bund walls will adopt industry best practice and incorporate the findings of the Project EIS geotechnical investigation into the design and construction methodology process	Chapter 7 (coastal processes and hydrodynamics) Appendix G (coastal processes and, hydrodynamics) Appendix Q2 (Project EMP)

	Description of findings and recommendations	Channel Duplication Project design response	EIS section containing additional information
6	The observed elevated turbidity in the vicinity of the bund wall was due to a combination of factors, including changed water velocities that occurred as a result of the bund's presence, the poor initial sealing of the bund resulting from the structurally compromised geotextile liner, the unexpected piping resulting from the physical characteristics of paleochannels, and the erosion of mud on the outside of the bund wall	The detailed design phase of the WBE reclamation area and BUF bund walls will adopt industry best practice and incorporate the findings of the Project EIS geotechnical investigation into the design and construction methodology process The Project EIS geotechnical investigation for the WBE reclamation area found no evidence of palaeo channels within the reclamation area footprint Groundwater modelling and piping investigation to be undertaken during the detailed design phase of the Project. The findings of the modelling and investigation will be incorporated into the design and construction methodology and specification.	Chapter 7 (coastal processes and hydrodynamics) Appendix G (coastal processes and, hydrodynamics) Appendix Q2 (Project EMP)
7	The observed impacts of constructing and sealing the bund were greater than predicted during the environmental impact statement phase of the project	Project EIS has addressed potential water quality and ecological impacts of constructing and sealing of the bund walls. The detailed design phase of the WBE reclamation area and BUF bund walls will adopt industry best practice and incorporate the findings of the Project EIS geotechnical investigation into the design and construction methodology process Hydrodynamic modelling will be undertaken during the detailed design phase to determine the least impact options for construction of the bund walls and sealing of the enclosure	Chapter 8 (water quality) Chapter 9 (nature conservation) Appendix I1 (Ecology Technical Report) Appendix Q2 (Project EMP)
8	Gladstone Ports Corporation consulted in a timely and extensive manner with stakeholders, consultants and the Dredge Technical Reference Panel once turbidity exceedances were observed	GPC has consulted with Government stakeholders and community representatives during the preparation of the Project EIS	Appendix N2 (engagement report)
9	Gladstone Ports Corporation's response to seal the inside of the bund wall with settled dredged material was appropriate under the circumstances	Core material (up to 300mm) and dredged material to be used against the outer bund wall geotextile material	Section 2.5.8
Recommendations			
1	For the construction of bund walls in coastal environments with high geological and/or geomorphic variation, governments should require proponents to explicitly assess the risk of piping and to implement appropriate controls	The potential geological and geomorphic variation within and adjoining the WBE reclamation area have been addressed in the EIS geotechnical investigations and reporting	Appendix E2 (DMPA geotechnical investigation) Appendix Q2 (Project EMP)

	Description of findings and recommendations	Channel Duplication Project design response	EIS section containing additional information
2	For constructions of bund walls in coastal environments, any geotextile materials designed to filter sediment should: ■ be placed on the inner bund wall material and then be overlaid and secured by core material ■ be keyed into the rock armour material to prevent slippage and deformation from occurring prior to placement of the core material ■ be laid on the bund wall such that no wrinkles, gaps, folds or deformations occur in the material, with all joints sewn to create seams and to conform to the requirements of Australian Standards 3706: Geotextiles – Methods of Test. Overlaps in the fabric should be directed vertically down the slope of the armour material	The geotextile material design and installation requirements have been incorporated into the EIS project description (refer Section 2.5) and Project EMP These design requirements will be incorporated into the detailed design and construction specifications for the reclamation component of the Project	Chapter 2 (Project description, Section 2.5.8) Appendix Q2 (Project EMP)
3	Governments should require proponents of bund wall structures to ensure that potential impacts on sediment transport from the construction phase of a bund wall be understood prior to final approval	The potential impacts from the establishment of the WBE reclamation area and BUF bund walls have been addressed in the Project EIS. Additional hydrodynamic and coastal processes modelling will be undertaken during the detailed design phase of the Project. The findings of this modelling will be incorporated into the design and updating of the Project EMP.	Chapter 9 (nature conservation) Appendix I1 (Ecology Technical Report) Appendix Q2 (Project EMP)
4	Gladstone Ports Corporation, its contractors and the Queensland and Australian Governments should publish in the peer-reviewed literature the lessons from an engineering perspective on the construction of the bund wall to inform future design and impact assessment	Not applicable to Project EIS	

Source: Australian Government (2014)