Contents

14 Waste

14.1 Chapter content

The Project impact assessment for waste was provided in Chapter 14 of the Project EIS.

This chapter provides additional information to address a submission received during the statutory public display period of the Project EIS. The key issue raised from the Project EIS submission process, relevant to the visual amenity assessment, is summarised Table 14.1.

Table 14.1 Summary of submission issue received in relation to the Project EIS waste assessment chapter

Submitter ID number (refer Appendix A)	Summary of submission issue raised	Project EIS section (public notification version)	AEIS section containing information to address submission comments	Complete replacement section for Project EIS	Supplements the Project EIS information
12.04	Potential impacts and risk assessment rating tables in each draft EIS chapter should be amended to include effective mitigation measures to assist with their interpretation	Section 14.7	Section 14.2	✓	

14.2 Risk assessment

This section replaces the Project EIS Section 14.7 (risk assessment).

14.2.1 Methodology

To assess and appropriately manage the potential waste risks to environmental values as a result of Project activities, a risk assessment process has been implemented (herein referred to as 'risk assessment'). The risk assessment methodology adopted is based on principles outlined in the:

- AS/NZS ISO 31000:2009 Risk management – Principles and guidelines
- HB 203:2012 Handbook: Managing environment-related risk.

The risk assessment identifies and assesses the potential waste impact risks to environmental values/receptors for both the establishment of the reclamation area, dredging activities, installing navigational aids and operational management of the reclamation area.

The purpose of this risk assessment is to identify potential impacts to environmental values/receptors, prioritise environmental management actions and mitigation measures, and to inform the Project decision making process.

The risk management framework incorporates the Australian/New Zealand Standard for Risk Management (AS/NZS 4360:2004) and contains quantitative scales to define the **likelihood** of the potential impact occurrence and the **consequence** of the potential impact should it occur.

An overview of the interaction between Project activities (drivers/stressors), sensitive values/receptors and the risk impact assessment process is provided in Figure 14.1.

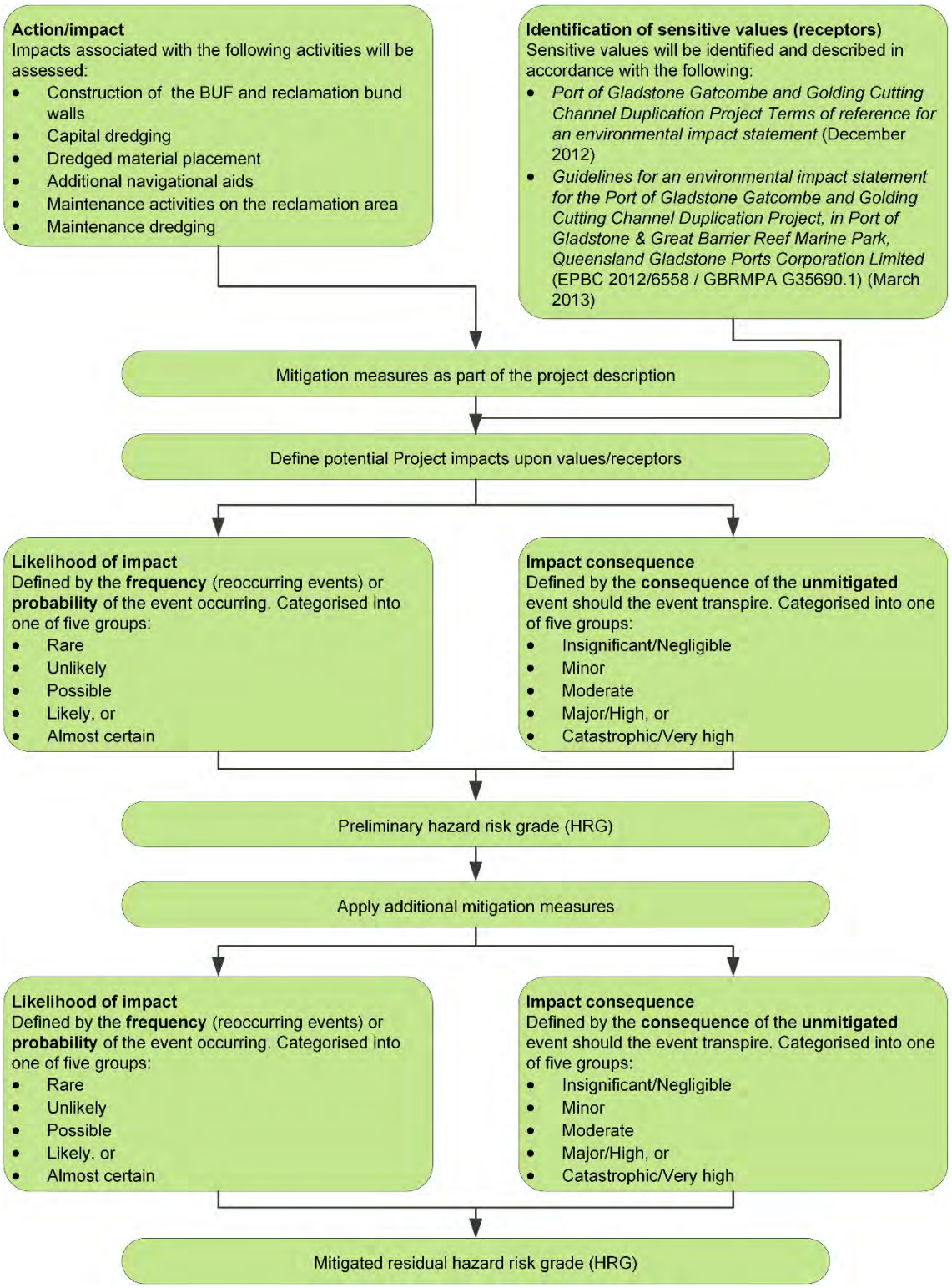

Figure 14.1 Risk assessment framework

Criteria used to rank the **likelihood** and **consequence** of potential impacts are provided in Table 14.2 and Table 14.3, respectively.

Table 14.2 Environmental (ecosystem), public perception and financial consequence category definitions (adapted from GBRMPA 2009)

Description	Definition/quantification[1]		
	Environmental*	**Public perception**	**Financial**
Negligible (Insignificant)	No impact or, if impact is present, then not to an extent that would draw concern from a reasonable person No impact on the overall condition of the ecosystem	No media attention	Financial losses up to $500,000
Low (Minor)	Impact is present but not to the extent that it would impair the overall condition of the ecosystem, sensitive population or community in the long term	Individual complaints	Financial loss from $500,001 to $5 million
Moderate	Impact is present at either a local or wider level Recovery periods of 5 to 10 years likely	Negative regional media attention and region group campaign	Financial loss from $6 million to $50 million
High (Major)	Impact is significant at either a local or wider level or to a sensitive population or community Recovery periods of 11 to 20 years are likely	Negative national media attention and national campaign	Financial loss from $51 million to $100 million
Very high (Catastrophic)	Impact is clearly affecting the nature of the ecosystem over a wide area **or** impact is catastrophic and possibly irreversible over a small area or to a sensitive population or community Recovery periods of greater than 21 years likely **or** condition of an affected part of the ecosystem irretrievably compromised	Negative and extensive national media attention and national campaigns	Financial loss in excess of $100 million

Table notes:

1 Quantification of impacts should use the impact with the greatest magnitude in order to determine the consequence category

* For Matters of National Environmental Significance (MNES) protected under the provisions of the EPBC Act the *Matters of National Environmental Significance – Significant Impact Guidelines 1.1 – Environmental Protection and Biodiversity Conservation Act 1999* (DoE 2013) are to be used to determine the consequence category

Table 14.3 Likelihood category definitions (adapted from GBRMPA 2009)

Description	Frequency	Probability
Rare	Expected to occur once or more over a timeframe greater than 101 years	0 to5% chance of occurring
Unlikely	Expected to occur once or more in the period of 11 to 100 years	6 to30% chance of occurring
Possible	Expected to occur once or more in the period of 1 to 10 years	31 to 70% chance of occurring
Likely	Expected to occur once or many times in a year (e.g. 1 to 250 days per year)	71 to 95% chance of occurring
Almost certain	Expected to occur more or less continuously throughout a year (e.g. more than 250 days per year)	96 to 100% chance of occurring

Once the likelihood and the consequence has been defined, determination of the HRG of the potential hazard will be determined through the use of a five by five matrix (refer Table 14.4).

Table 14.4 Hazard risk assessment matrix (adapted from GBRMPA 2009)

Likelihood	Consequence rating				
	Negligible (insignificant)	Low (minor)	Moderate	High (major)	Very high (catastrophic)
Rare	Low	Low	Medium	Medium	Medium
Unlikely	Low	Low	Medium	Medium	High
Possible	Low	Medium	High	High	Extreme
Likely	Medium	Medium	High	High	Extreme
Almost certain	Medium	Medium	High	Extreme	Extreme

Table note:

Hazard risk categories identified in Table 14.4 are defined in Table 14.5

Table 14.5 Risk definitions and actions associated with hazard risk categories (adapted from GBRMPA 2009)

Hazard risk category	Hazard risk grade definition
Low	These risks should be recorded, monitored and controlled. Activities with unmitigated environmental risks that are graded above this level should be avoided.
Medium	Mitigation actions to reduce the likelihood and consequences to be identified and appropriate actions (if possible) to be identified and implemented.
High	If uncontrolled, a risk event at this level may have a significant residual adverse impact on MNES, MSES, GBRWHA and/or social/cultural heritage values. Mitigating actions need to be very reliable and should be approved and monitored in an ongoing manner.
Extreme	Activities with unmitigated risks at this level should be avoided. Nature and scale of the significant residual adverse impact is wide spread across a number of MNES and GBRWHA values.

14.2.2 Summary of risk assessment.

The potential waste impacts risk assessment is summarised in Table 14.7.

The implementation of mitigation measures (refer Section 14.2.3), will result in the residual waste risks to human health and environmental values being generally assessed as low to medium.

14.2.3 Mitigation measures

It is intended that waste produced will be managed by GPC, and collected by a waste contractor and disposed of in accordance with the GPC EMS and applicable legislation and policies. Management of waste from dredging vessels will comply with the relevant waste management legislation and guidelines. It is intended that waste management services will be available upon vessel mooring for collection and removal of solid and liquid waste to a licenced facility.

14.2.3.1 Dredging works

It is intended that waste produced by dredging and other vessels will be managed via contractual arrangements with GPC, and will meet requirements of the GPC EMS as well as the relevant waste management legislation and guidelines. It is intended that waste management services will be available upon vessel mooring (or bunkering) for the collection and removal of solid and liquid waste to a licenced facility.

Any waste fuel, oils and lubricants (including oily bilge water) will be collected and managed by Nationwide Oil Pty Ltd as per DTMR's Port Procedures (DTMR 2018a).

14.2.3.2 Inert waste

The bund wall material will be sourced from a commercial quarry and solid waste generated from the quarry will be managed under a separate waste management plan, and is therefore not considered part of this Project.

Green waste generated during construction and operational management of the Western Basin and WBE reclamation areas (i.e. vegetation cleared for construction and operational management, including grass clippings and other green waste) will be used for landscaping and site stabilisation within the Western Basin and WBE reclamation areas.

14.2.3.3 Municipal waste

Minimal quantities of solid general waste will be generated by the construction compound and site office established for the construction of the reclamation area bund walls, the BUF and for the dredging unloading, placement and dewatering operations. The solid waste generated from the site office will primarily be food waste, plastic wrappings and other small waste items. It is intended that waste produced will be managed by GPC and collected by a waste contractor and disposed of in accordance with the applicable legislation and policies.

All waste areas will be kept tidy and all municipal waste is to be placed in the appropriate receptacle. Sealed bins will be used to prevent wind, animals and rain from spreading litter.

Solid waste will be temporarily stored onsite, in accordance with the relevant legislation and guidelines, and regularly collected by a licenced waste disposal contractor and, where recycling is not feasible, transferred to a licenced waste facility within the GRC area (e.g. Benaraby Landfill).

14.2.3.4 Regulated waste

Waste water generated by the dredger activities will be stored on the dredger, transferred to Auckland Point Wharf area for collection and then transported to GRC sewage treatment plant. Dredgers with on-board tertiary waste water treatment facilities will treat generated waste water within these facilities.

All sewage and greywater, generated as a result of the operation of the reclamation area construction compound and site office, will be temporarily stored onsite in accordance with the relevant waste management legislation and guidelines, and removed and transported to the GRC sewage treatment plant.

In the event of an oil or fuel spill into marine and/or terrestrial environments, vessels will adhere to the requirements of the spill-clean procedure included in the DTMR *Guide for the prevention of ship-sourced pollution and for the safe transfer of bunkers in Queensland waters, 2016.* An Environmental Incident Report and Corrective Action Report will be completed within 24 hours of the incident occurring as per the requirements set out in the Project EMP.

14.2.3.5 Quarantine waste

All vessels arriving at the Port of Gladstone are required to follow the DTMR's *Port Procedures and Information for Shipping, Port of Gladstone, 2017,* which details quarantine requirements.

Upon arrival within the Port of Gladstone, all wastes, including quarantine waste, from the dredging vessels will be assembled for collection and disposal. Quarantine waste will be kept in sealed plastic bags on board until collection by a licenced contractor (DTMR 2018a). Quarantined waste will be sterilised prior to disposal at a licenced facility.

14.2.3.6 Summary

Where feasible the waste management hierarchy, as per the *Waste Reduction and Recycling Act 2011* will be implemented during the Project.

- AVOID unnecessary resource consumption
- REDUCE waste generation and disposal
- RE-USE waste resources without further manufacturing
- RECYCLE waste resources to make the same or different products
- RECOVER waste resources, including the recovery of energy
- TREAT waste before disposal, including reducing the hazardous nature of waste
- DISPOSE of waste only if there is no viable alternative.

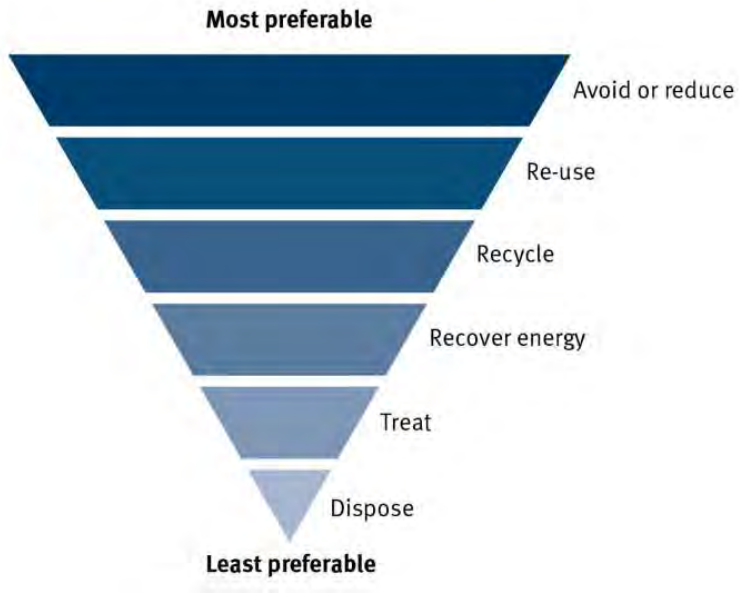

Figure 14.2 The waste and resource management hierarchy

Source: EHP (2013a)

A summary of mitigation measures to reduce the impacts of waste generation during the Project is provided in Table 14.6.

Table 14.6 Mitigation measures for waste management of the Project activities

Waste type	Waste characteristics	Mitigation measures
Hydrocarbons, oils and other lubricants (including oily bilge)	Regulated	■ Removal of solid and liquid waste to a licenced facility ■ Waste bulk oils will be stored on dredgers and directly transferred to existing Port wharves or via work boats ■ No truck and vehicle maintenance permitted at the reclamation area. All maintenance to occur offsite at either the quarry, GPC or contractor facilities ■ Powered Mobile Equipment (PME) will be suitable and rated for the task and kept in good working order ■ A PME preventative maintenance regime will be implemented ■ Temporary storage of hydrocarbons will occur in bunded areas that are appropriately sized for the application and capacity maintained (i.e. kept free of rain water) ■ Wash bilges with biodegradable degreasers or detergents and dispose of cleaning residue ashore ■ Use absorbents to mop up excess oil or fuel ■ Undertake checks and preventative maintenance of plant and equipment to minimise leaks and spills ■ Spill response procedures implemented and staff are suitably trained ■ Spill equipment (including hydrocarbon absorbent booms) is available and staff are familiar with its use ■ Regular maintenance of work areas, storage areas, transfer equipment and spill equipment ■ Call emergency services to assist with hazardous material spills. ■ Appropriate handling of absorbent material (including absorbent booms) where these have been used to clean up spills
Hazardous and potentially hazardous waste	Regulated	■ Maintain inventory and safety data sheets for hazardous substances ■ Tracking records to be kept when regulated waste is removed from the dredger or a GPC wharf facility. All regulated waste transported by licenced contractors and disposed at a licenced place. ■ Bring only the minimum quantity of substance required ■ Store full and empty drums and/or containers in bunded areas ■ Collect empty drums for re-use or recycling ■ Waste not disposed of by burning ■ Hazardous substances handled and stored in a manner that prevents environmental harm ■ Any spills to be cleaned up as soon as practicable ■ Call emergency services to assist with hazardous material spills ■ Complaints or incidents to be reported to GPC.
Sewage/grey water	Regulated	■ Waste water from dredger and ablution facilities to be collected then transported to GRC sewage treatment plant ■ With the help of a licenced contractor determine the number of ablution facilities required at the site offices for the duration of the Project ■ Dredgers with tertiary treatment facilities will treat generated waste water on board.

Waste type	Waste characteristics	Mitigation measures
Municipal and office waste (food waste, plastics and paper)	General	▪ Provide facilities for the appropriate separation and storage of waste. Adequate storage capacity to be maintained and no waste to remain at the completion of works ▪ Ensure that waste is removed and disposed of by a licenced contractor on a regular basis to a licenced waste facility ▪ Educate staff to recycle waste ▪ All waste areas will be kept tidy and all municipal waste is to be placed in the appropriate receptacle ▪ Use sealed bins to prevent wind, animals and rain from spreading litter ▪ Waste is not to be disposed of in the marine environment or incinerated in vessels at sea ▪ Ensure that bins/bags used on the dredgers to store waste are secure ▪ Retrieve litter that does enter the water.
General building material	Inert	▪ Store waste separately to avoid contamination with other waste ▪ Where possible reuse excess materials on site alternatively remove to recycling facility.
Dunnage and quarantine waste	Quarantine	▪ Not to be disposed of in the marine environment or incinerated in vessels at sea ▪ Waste to be kept in sealed plastic bags on board until collection by a licensed contractor ▪ Waste to be sterilised prior to disposal ▪ Record the movement and quantities of regulated and quarantine wastes.
Green waste (grass clippings and landscaping)	Inert	▪ Chipped and used onsite for landscaping.

Table 14.7 Potential waste impacts and risk assessment ratings

Potential impact	Project phase					Preliminary HRG			Post mitigation HRG		
	Reclamation area and BUF establishment	Dredging	Navigational aids	Demobilisation	Maintenance	Likelihood	Consequence	HRG	Likelihood	Consequence	HRG
Hydrocarbons, fuels, oils and lubricants (including oily bilge)											
■ Contamination of soil and sediment through leaching ■ Contamination of water ■ Toxicity to marine and/or intertidal flora and fauna ■ Odour	✓	✓	✓			Likely	Moderate	High	Unlikely	Moderate	Medium
Hazardous and potentially hazardous waste											
■ Public health risks ■ Contamination of soil and sediments through leaching ■ Toxicity to marine and/or intertidal flora and fauna ■ Contamination of water	✓	✓				Possible	Moderate	High	Unlikely	Moderate	Medium
Sewage/grey water											
■ Contamination of soil and sediments through leaching ■ Odours ■ Public health risks ■ Contamination of water	✓	✓				Possible	Low	Medium	Unlikely	Low	Low

Potential impact	Project phase					Preliminary HRG			Post mitigation HRG		
	Reclamation area and BUF establishment	Dredging	Navigational aids	Demobilisation	Maintenance	Likelihood	Consequence	HRG	Likelihood	Consequence	HRG
Municipal and office waste (food waste, plastics and paper)											
▪ Degradation of visual amenity ▪ Injury to terrestrial or intertidal animals ▪ Introduction or increase of feral or pest species	✓	✓		✓		Likely	Low	Medium	Unlikely	Low	Low
General building material											
▪ Degradation of visual amenity ▪ Injury to terrestrial or intertidal animals ▪ Potential to encourage pests and mosquito breeding	✓			✓		Likely	Low	Medium	Unlikely	Low	Low
Dunnage and quarantine waste											
▪ Introduction of foreign pest species (terrestrial or marine) ▪ Environmental, economic and community impacts		✓				Possible	Medium	High	Unlikely	Medium	Medium
Green waste (grass clippings and landscaping)											
▪ Potential to encourage pests and mosquito breeding ▪ Potential fire hazard	✓				✓	Possible	Low	Medium	Unlikely	Low	Low