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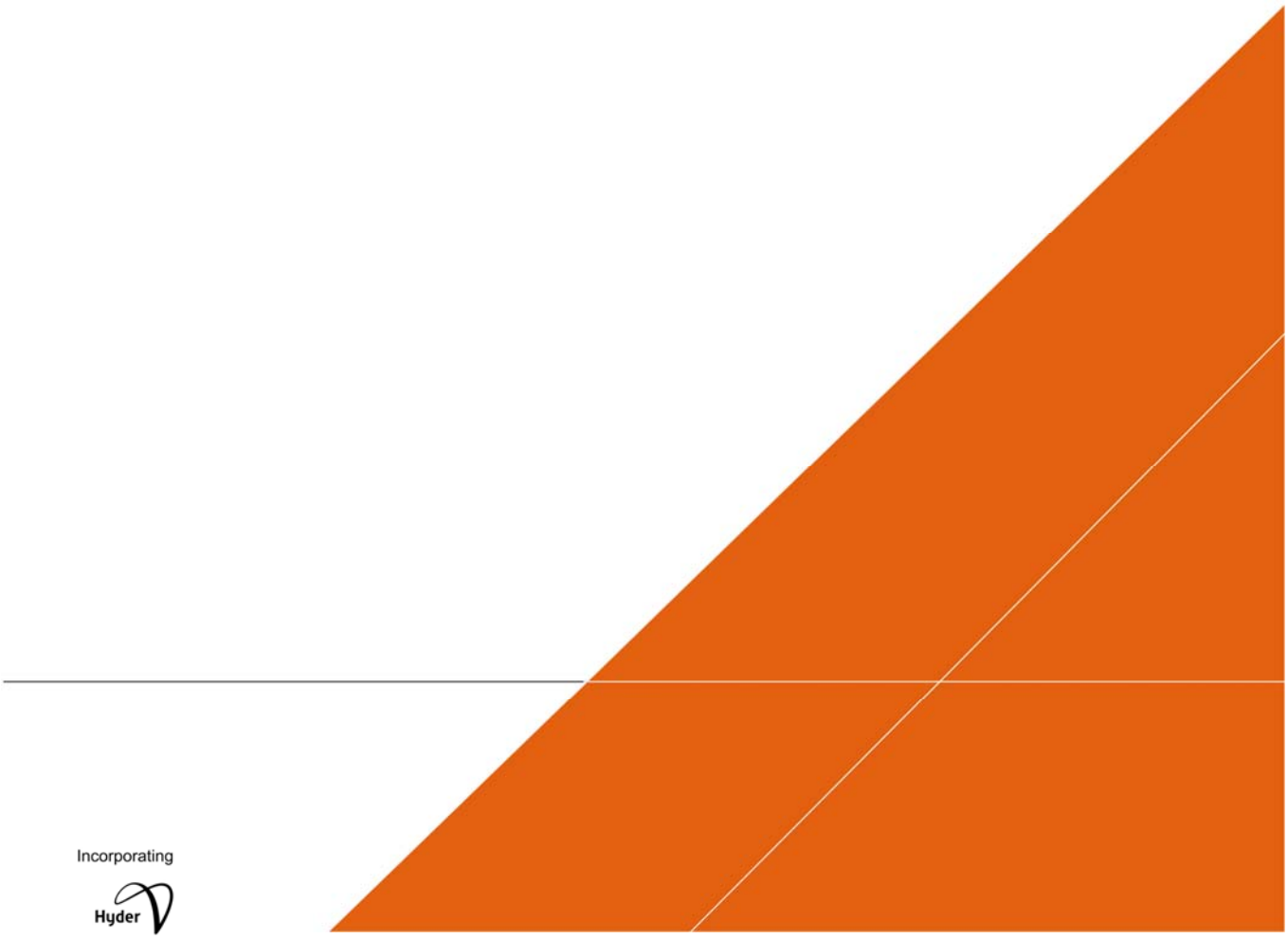
CAIRNCROSS WASTE MANAGEMENT FACILITY EXPANSION

Response to Submissions – SSD 13_5792

11 DECEMBER 2018



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PORT MACQUARIE HASTINGS COUNCIL
CAIRNCROSS WASTE MANAGEMENT FACILITY EXPANSION

Response to Submissions

SSD 13_5792

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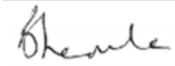
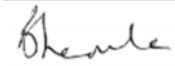
Checker	Bradley Searle	
Approver	Bradley Searle	

Report No	1
Date	11/12/2018
Revision Text	3

REVISIONS

Revision	Date	Description	Prepared by	Approved by
1	9/10/2018	Draft Chapter 1-3	CH	BS
2	14/11/2018	Final Draft Consolidated Report	CH, BF	BS
3	6/12/2018	Final Report	CH, BF	BS

CONTENTS

APPENDICES

GLOSSARY AND KEY TERMS

The table below provides a summary of the key acronyms and terms which are included within this report.

Term	Meaning
ABPP	Australian Bushfire Protection Planners
AOX	Absorbable organic halogens
ARI	Average recurrence interval
ASS	Acid sulfate soils
BAR	*Biodiversity Assessment Report*
Blue Book	Landcom (2004), *Managing Urban Stormwater: Soils and Construction Volume 2B (Waste Landfills)*
C&D	Construction and demolition
C&I	Commercial and industrial
Cairncross Landfill	Collective term for the existing and proposed landfill that is located within the Cairncross WMF
Cairncross WMF	Cairncross Waste Management Facility
Cairncross WMF Access Road	The main access road from the pacific Highway to the Proposal Site (previously known as Forest Hut Road)
CLM Act	*Contaminated Land Management Act 1997*
Concept Design Report	Concept Design Report prepared by PMHC (2017)
CRC	Community recycling centres
DA	Development application
Dangerous Goods Code	*Australian Code for Transportation of Dangerous Goods by Road and Rail* Edition 7.5
dBA	Decibels
Development Site	In this assessment, the Development Site is considered to comprise of the 3.4 hectares' area of native vegetation within the Proposal Site that is not already subject to approval for clearing.
DG	Director-General
DGRs	Director General's Requirements
Disposal Requirements Report	Cairncross Landfill Expansion: Future Disposal Capacity Requirements Report
DoE	Commonwealth Department of Environment
DoEE	Department of Energy and Environment

Term	Meaning
DPE	Department of Planning and Environment
DP&I	Department of Planning and Infrastructure
DPI	Department of Primary Industries
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regs	*Environmental Planning and Assessment Regulation 2000*
EPA	New South Wales Environmental Protection Agency
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPIs	Environmental Planning Instruments
EPL	Environmental Protection Licence
ESCP	Erosion Sediment Control Plan
FBA	*Framework for Biodiversity Assessment*
GDE	Groundwater Dependent Ecosystems
GHG	Greenhouse Gas
Guidelines	*Environmental Guidelines: Solid Waste Landfills -Second edition 2016* (NSW EPA, 2016)
GVM	Gross vehicle mass
Ha	Hectares
HDPE	High density polyethylene
Heritage Act	*Heritage Act 1977*
INP	*NSW Industrial Noise Policy*
ISEPP	*State Environmental Planning Policy (Infrastructure) 2007*
kL	Kilolitres
L	Litres
LALC	Local Aboriginal Land Council
LEMP	Landfill Environmental Management Plan
LGA	Local Government Area
Koala connectivity corridor	The approximately 50 m wide strip of land on the southern boundary proposed to be maintained in a vegetated state to provide for Koala movements around the Proposal Site

Term	Meaning
MCA	Major Catchment Area
MNES	Matters of National Environmental Significance
MHRDC	Maximum Harvestable Rights Dam Capacity
MSW	Municipal solid waste
NP&W Act	*National Parks and Wildlife Act 1974*
NPWS	National Parks and Wildlife Service
NSW AIP	New South Wales Aquifer Interference Policy
NSW EPA	New South Wales Environmental Protection Agency
OEH	Office of Environment and Heritage
OEMP	*Operational Environmental Management Plan: Cairncross Waste Management Facility* (PMHC, 2008)
OSD	On-site detention
PCT	Plant Community Type
PMHC	Port Macquarie Hastings Council
PMHC LEP	*Port Macquarie-Hastings Local Environment Plan 2011*
POEO Act	*Protection of the Environment Operations Act* 1997
POEO Waste Regulation	*Protection of the Environment (Waste) Regulation* 2014
Proposal	PMHC is seeking development approval to expand the existing landfill to cover the remaining area identified for landfilling in the Environmental Impact Statement that was prepared by ERM in 1999 to support the development application for the first stage of the landfill. The Proposal would involve the progressive construction, operation and rehabilitation of three landfill stages (Stages 1-3), following a staged approach with implementation over approximately 36 years.
Proposal Site	The site that is subject to the Proposal, as shown on Figure 1-1
PVC	Polyvinyl chloride
REF	Review of Environmental Factors
Roads and Maritime	Roads and Maritime Services
RNP	*NSW EPA Road Noise Policy*
RtS	Response to Submissions
SEARs	Secretary's Environmental Assessment Requirements

Term	Meaning
SEPPs	State Environmental Planning Policies
SEPP 44	*State Environmental Planning Policy No. 44 – Koala Habitat Protection*
SEPP 55	*State Environmental Planning Policy No. 55 – Remediation of Land*
SEPP S&RD	*State and Environmental Planning Policy (State and Regional Development)* 2011
SFAZ	Strategic Fire Advantage Zone
SSD	State Significant Development
Stage E	The current landfill operational area at the Cairncross WMF
STP	Telegraph Point Sewage Treatment Plant
Study Intersection	The intersection of the Pacific Highway and the Cairncross WMF Access Road.
TN	Total Nitrogen
TS	Threatened Species
TSC Act	*Threatened Species Conservation Act 1995*
t/pa	Tonnes per annum
WM Act	*Water Management Act 2000*
WMF	Waste Management Facility

EXECUTIVE SUMMARY

Port Macquarie Hastings Council (PMHC) are seeking development approval to expand the existing landfill at the Cairncross Waste Management Facility (The Proposal). The Proposal would involve the progressive construction, operation and rehabilitation of three landfill stages (Stages 1-3) over approximately 36 years. Stage 1 would commence construction/operation in approximately 2019/2020 respectively and Stage 3 would reach capacity in approximately 2056 with a landfill closure period to follow.

An Environmental Impact Statement (EIS) under Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) was prepared to address the Secretary's Environmental Assessment Requirements (SEARs) (SSD 13_5792) issued on 7 May 2015, and was publicly exhibited between 15 February 2018 and 16 March 2018. During this exhibition period submissions were received from five government agencies and one community member. Additional consultation was made to the Office of Environment and Heritage (OEH) with regard to biodiversity offsets.

This Response to Submission report (RtS) has been prepared in accordance with clause 85A of the *Environmental Planning and Assessment Regulation 2000*.

As a result of the submissions received, design progression, and to provide additional clarity, the Proposal has been amended (thereby referred to as the Amended Proposal). The Amended Proposal includes the following four key components that depart from the Proposal assessed in the EIS:

1. Revision to final landform slopes to align in accordance with EPA's (2016) Environmental Guidelines - Solid Waste Landfills' Second Edition.
2. Spatial consideration of permanent and physical bushfire management measures within the design to align with recommendations made within Section 6 of the Bushfire Assessment Report (Appendix Q of the EIS).
3. Revision to sediment basin volumes and layout resulting from alterations to final landform conditions and opportunities to incorporate bushfire protection measures.
4. Inclusion of a revised site groundwater management strategy consisting of a base groundwater underdrainage collection system to replace the previously proposed gravel trench design.

An assessment of environmental impacts associated with amendments made to the Proposal concluded that a negligible or positive environmental impact would result occur as a result of the proposed amended. The key findings of the assessment conclude that estimated groundwater inflow volumes into the landfill are likely to be relatively low, and the new underdrainage system proposed would safeguard against impacts caused by potentail hydrostatic uplift or wetting/softening of the base clay liner (i.e. long-term loss of hydraulic performance) during elevated head conditions. It was also concluded that biodiversity protection measures, including the Strategic Fire Asset Zone (SFAZ) and Koala Corridor, would provide sufficient connectivity, separation distance and buffer from and across the Amended Proposal Site to the Nature Reserve.

Several mitigation measures have also been amended or added as part of the proposed amendments to the Proposal. Key additional mitigation measures include:

- FF-11: Development of a Vegetation Management Plan, in accordance with OEH guidelines, to include measures for the maintenance, management and revegetation of the Koala connectivity corridor and the setback area;
- W-03: A detailed Water Management Plan would be developed to cover both construction and operation of the Amended Proposal, which would include a Surface and Groundwater Monitoring program developed in accordance with requirements outlined in technical assessment reports (provided as Appendices to this RtS) and relevant guidelines
- AB-04: Operational procedures for responses to detection of unexpected, identified or suspected Aboriginal objects would be included in the update to the 2015 OEMP.

- HR-11: The Cairncross Waste Management Facility Bush Fire and Fuel Management Plan (2001) would be updated to include the proposed bush fire mitigation measures for the Amended Proposal (HR-04 to HR-10), with consideration of the progressive development of the site.

Overall, it is concluded that the Amended Proposal would result in no substantial environmental impacts additional to those identified within the EIS, and any potential impacts can be adequately managed through the implementation of revised mitigation measures identified in Section 8 of this RtS.

1 INTRODUCTION

Port Macquarie Hastings Council (PMHC) is seeking development approval to extend the Cairncross Landfill to cover the remaining area identified for landfilling in the 1999 Environmental Impact Statement (1999 EIS)[1]. The Proposal is for the expansion of the existing landfill at the Cairncross Waste Management Facility (Cairncross WMF), and would involve the progressive construction, operation and rehabilitation of three landfill stages (Stages 1-3), following a staged approach with implementation over approximately 36 years. Stage 1 would commence construction/operation in approximately 2019/2020 respectively and Stage 3 would reach capacity in approximately 2056 with a landfill closure period to follow.

An Environmental Impact Statement (EIS) was prepared for the Proposal seeking approval under Part 4, Division 4.7 of the E*nvironmental Planning and Assessment Act 1979* (EP&A Act). In particular, the EIS was prepared to address, and be consistent with, the Secretary's Environmental Assessment Requirements (SEARs) (SSD 13_5792) for the Proposal, which were issued on 7 May 2015.

The EIS was publicly exhibited, in accordance with Clause 83 of the *Environmental Planning and Assessment Regulations 2000* (EP&A Regulations) between 15 February 2018 and 16 March 2018. During this exhibition period submissions were invited from all stakeholders, including members of the community and government agencies. The submissions received included:

- A total of five submissions from government agencies
- One submission from a member of the community.

The submissions received during public exhibition of the EIS form the subject of this report, known as the Response to Submissions (RtS), and are discussed and addressed herein. Amendments, described in Section 6 of this RtS, are now proposed based on submissions provided by government agencies and the community, as part of design progression, and to provide additional clarity where relevant. Development approval is sought for the original Proposal and its amendments (i.e. the Amended Proposal).

1.1 Amended Proposal overview

PMHC proposes to expand the existing landfill (Cairncross Landfill) at the Cairncross WMF, located at 8395 Pacific Highway, Telegraph Point, NSW on Lot 1 / DP 1202080 (the Amended Proposal Site - see Figure 1-1). PMHC is seeking development approval to extend Cairncross Landfill to cover the remaining area identified for landfilling in the EIS that was prepared by Environmental Resource Management (ERM) in 1999 to support the development application for the first stage of the landfill (the 1999 EIS).

The Amended Proposal would involve the progressive construction, operation and rehabilitation of three landfill stages (Stages 1-3), following a staged approach with implementation over approximately 36 years. Stage 1 would commence construction/operation in approximately 2019/2020 respectively and Stage 3 would reach capacity in approximately 2056 with a landfill closure period to follow.

Despite recent and expected future increases in diversion of waste to landfill, the annual waste acceptance rate would progressively increase over the life of the Proposal due to predicted population and waste generation growth per capita. These increases are predicted to be further exacerbated in the short-term by changes to China's National

[1] The 1999 EIS was developed by ERM to support the development application, and subsequent approval, for the first stage of the Cairncross landfill.

Sword Policy, until such time as effective recycling infrastructure and alternative markets are developed in NSW.

The Proposal Site is defined as the area shown on Figure 1-1 and is located south-west of Telegraph Point, approximately two kilometres west of the Pacific Highway. The Proposal Site covers an area of approximately 40.2 hectares (ha) (including the landfill and ancillary areas such as access roads and a biodiversity corridor) and is owned by PMHC. The Amended Proposal Site is within the broader Cairncross WMF which is bordered by the Rawdon Creek Nature Reserve to the south-east, by Cairncross State Forest to the north and south and by farmland to the west.

The Amended Proposal would receive waste from all areas within the Port Macquarie-Hastings local government area (LGA) including the major townships of Port Macquarie, Wauchope and Camden Haven. Waste would include general solid waste (i.e. putrescible and non-putrescible materials) and asbestos from domestic and commercial and industrial (C&I) sources.

As noted above, a number of changes have been made to the Proposal in response to submissions made during the exhibition of the EIS (specific Amendments to the Proposal are described in Section 6 of this RtS). The key components of the Amended Proposal, incorporating these changes and clarifications include:

- Progressive landfill cell construction, operation and rehabilitation of three landfill stages (Stages 1-3) including:
  - Clearing of 3.4 ha of existing vegetation
  - Construction of access tracks
  - Construction of defendable spaces for bushfire protection
  - Earthworks for cell formation including extraction and stockpiling of materials and the reapplication to form the leachate barrier (cell liner) as well as for daily, intermediate and final cover
  - Installation of leachate management structures including the leachate barrier, collection, storage and disposal system
  - Construction of a rising main to transfer leachate to the adjacent sewerage treatment plant (STP)[2]
  - Installation of a stormwater management system
  - Installation of a groundwater management system
  - Progressively increasing the annual waste acceptance rate at the landfill
  - Signage and other ancillary works
  - Rehabilitation of closed cells
- Delineation and ongoing management of an approximately 50-metre-wide Koala connectivity corridor around the south-western border of the site[3].

The Amended Proposal is expected to receive a total of approximately 3.14 million tonnes of waste over the life of the expanded landfill and would be developed in stages. The Amended Proposal location from a regional perspective is provided in Figure 1-1, while the Amended Proposal stages are shown on Figure 1-2.

[2] The STP construction is proposed to commence in 2018 and is being designed to accept leachate from Stages 1-3 (and E) of the Proposal.

[3] It is noted that Sediment Basin 2 Protrudes approximately 20 m over a minor portion of the corridor. Further detail regarding the nature, implications and potential contingencies associated with this are provided in Section 4 of this RtS.

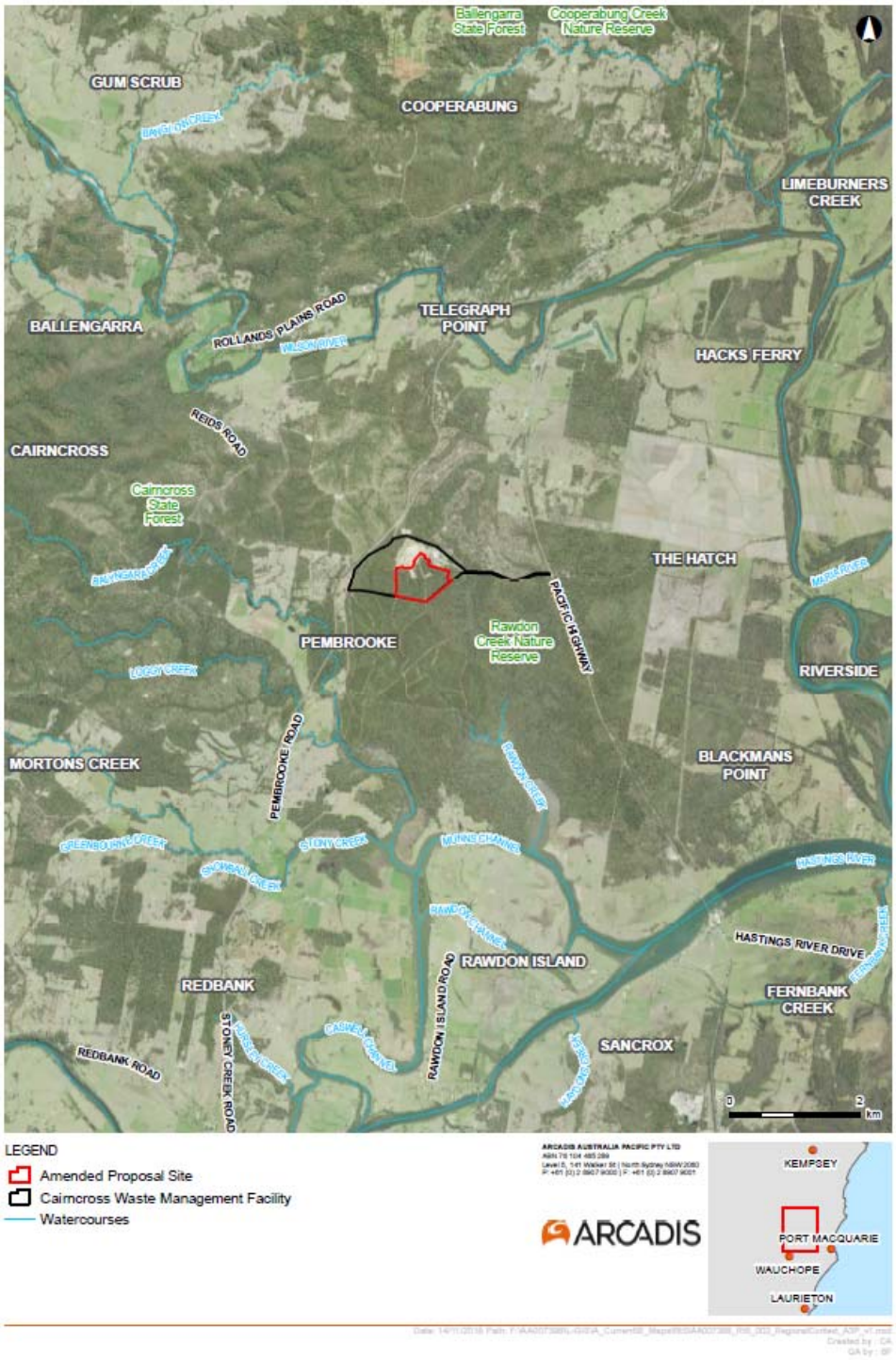


Figure 1-1 Amended Proposal Site location

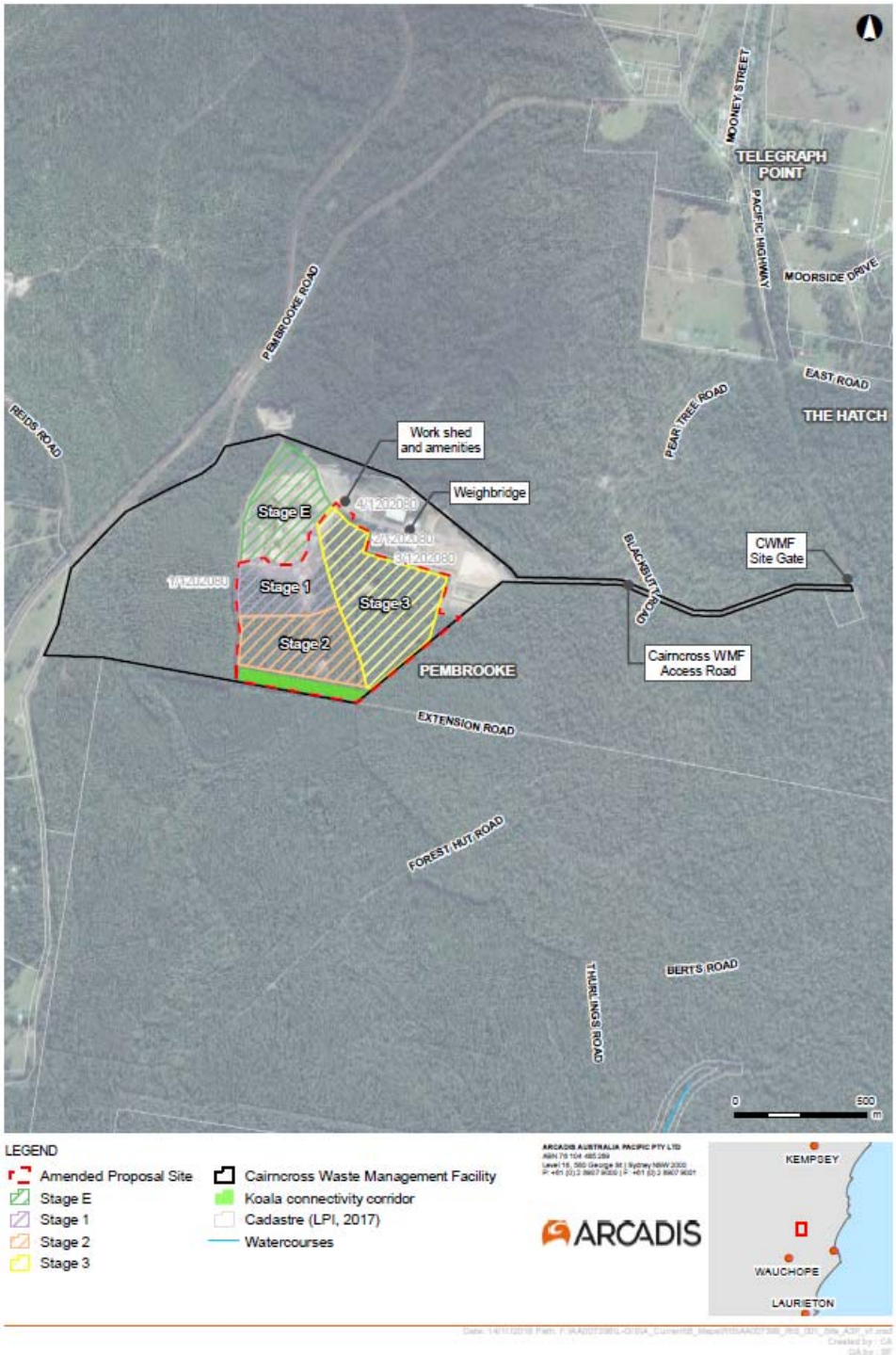


Figure 1-2 Amended Proposal Site layout

The timeframes provided in Table 1-1 for each stage of the landfill are based on indicative waste generation modelling undertaken for the PMHC LGA. The start and end dates for each stage represent the likely timeframe for accepting waste, however the preparatory and completion works for each stage (e.g. landfill cell construction, construction of leachate barrier systems, and final rehabilitation) may commence/conclude up to two years before/after the timeframes provided below. The filling rates and landfill capacity would be reviewed on an ongoing basis.

Table 1-1 Details of landfill stages

Stage	Area (ha)	Capacity (t)	Timeframe[4]	Duration (years)	Activities
Stage 1	7.9	1,231,650	2020 – 2040	20	Progressive landfill cell construction, operation and rehabilitation.
Stage 2	10.6	768,825	2040 – 2047	7	
Stage 3	16.2	1,139,850	2047 – 2056	9	
Total	**34.7**	**3,140,325**	**2020 – 2056**	**36**	

The landfill is open every day throughout the year, with the exception of Good Friday, Sunday and Christmas Day, and would continue to operate during the following hours:

- Monday to Friday: 7am – 5pm
- Saturday, public holidays: 8am – 4pm.

Site management activities, such as covering operations, may continue one hour after closure. The concept design for the Proposal has been developed in accordance with the *Environmental Guidelines: Solid Waste Landfills*, *Second edition 2016* (NSW EPA, 2016) (the Guidelines). The Revised Concept Design Report is provided in Appendix B of this RtS.

1.2 Purpose of this report

The purpose of this RtS is to respond to submissions raised by stakeholders during the exhibition of the EIS. This RtS has been prepared to satisfy the provisions of Section 4.39 of the EP&A Act and Clause 85A of the EP&A Regulations. Each of the submissions received has been collated, analysed and addressed (as relevant).

In order to respond to the issues raised, this RtS also includes amendments to the exhibited Proposal, now known as the Amended Proposal. These amendments have been undertaken to address submissions received and to reduce the overall environmental impacts of the Proposal. The RtS provides a description of the Amended Proposal and includes the further environmental assessment, including commissioned technical assessments, of the Amended Proposal undertaken to serve as an addendum to the environmental impact assessment and technical specialist reporting provided within the EIS.

Amendments made to the Proposal are described in Section 6. In addition, a consolidated Amended Proposal description is provided in Appendix A, which describes the Amended Proposal in its entirety, including the proposed amendments.

[4] Timeframes are approximate and subject to change (e.g. based on altered resource recovery and waste generation rates which would influence landfill life expectancy)

1.3 Statutory approval process

Clause 23(3) of Schedule 1 of the *State Environmental Planning Policy (State and Regional Development)* (SEPP S&RD) states that:

"Development for the purpose of regional putrescible landfills that have capacity to receive over 650,000 tonnes of putrescible waste over the lifetime of the site is classified as State Significant Development (SSD). As the Amended Proposal would be expected to receive a total of approximately 3.14 million tonnes of waste over its life the Amended Proposal is to be assessed as SSD and approval is sought under Part 4, Division 4.7 of the EP&A Act."

1.4 Structure of this report

The structure of this RtS is as follows:

- **Section 0 – Introduction**: provides an introduction to and overview of the Proposal, the relevant statutory approval pathway and the structure of the RtS
- **Section 2 – Exhibition and Consultation**: provides a description of the consultation which was undertaken as part of the EIS and following exhibition of the EIS
- **Section 3 – Overview of Submissions**: provides an analysis of the submissions received during the exhibition of the EIS and identifies the key issues raised
- **Section 4 – Response to Government Agency Submissions:** provides a catalogue of responses received from Government Agencies and responses prepared by technical specialists
- **Section 5 – Response to Community Submissions:** provides a summary of the community responses received and responses to each of these prepared by technical specialists
- **Section 6 – Amended Proposal:** provides a description of the amendments to the Proposal design, including any modifications to the built form and operational procedures presented in the EIS
- **Section 7 – Further assessment:** provides an environmental assessment of the Amended Proposal components with reference to technical specialist addendums, and provides additional environmental assessment raised in government agency and community submissions
- **Section 8 – Revised Compilation of Mitigation Measures:** provides a revised list of mitigation measures to include any changes as a result of submissions received, updated technical assessments or the Amended Proposal
- **Section 9 – Conclusion:** provides a summary and conclusion to the RtS.

The following Appendices are included in this RtS:

- Appendix A: Amended Proposal Description
- Appendix B: Revised Concept Design Report
- Appendix C: Addendum Surface Water and Groundwater Assessment
- Appendix D: Addendum Hydrogeological Assessment
- Appendix E: Maximum Harvestable Right Dam Capacity
- Appendix F: Draft Biodiversity Offset Strategy

2 EXHIBITION AND CONSULTATION

The EIS was placed on public exhibition between 15 February 2018 and 16 March 2018 in accordance with Schedule 1 Clause 9 of the EP&A Act. Hard copies of the EIS were available for public review and comment at various locations (including the following) for the duration of the exhibition period:

- Department of Planning and Environment (DPE): 320 Pitt Street Sydney
- Port Macquarie-Hastings Council Office: Corner of Lord and Burrawan Streets, Port Macquarie.

The EIS was also available to the public in electronic format on the DPE website and PMHC website during this time.

2.1 EIS consultation

PMHC undertook ongoing consultation with government agencies throughout the preparation of the EIS, including:

- Department of Planning and Environment (DPE)
- Environmental Protection Authority (EPA)
- Office of Environment and Heritage (OEH)
- Department of Primary Industries (DPI)
- Roads and Maritime Services (Roads and Maritime)
- National Parks and Wildlife Services (NPWS)

This consultation was undertaken through a range of mediums, including emails, phone conversations, face-to-face meetings and letter submissions.

Feedback from the agencies consulted informed the preparation of the EIS and the Proposal description as it was then understood.

Key stakeholders and community members were also consulted during the preparation of the EIS through the written notifications.

2.2 Post public exhibition consultation

PHMC consulted with the Office of Environment and Heritage (OEH) during July, 2018. Recommendations were sought regarding the delivery of the Draft Biodiversity Offset Strategy (BOS), given that native vegetation clearing as part of the Amended Proposal (3.4 ha) would be undertaken as part of Stage 3, which would be unlikely to take place after 2040. Securing offsets at this stage are therefore not considered practical.

In response, the OEH noted that as potential offset sites have not been identified, they would need to be assessed at a later stage (i.e. just prior to the removal of 3.4 ha within the Stage 3 area) to determine if they can provide the required credits.

The OEH also noted that in the absence of selecting a proposed offset site at this stage, a commitment is to be made (within the BOS) either to secure an offset site (under the most relevant assessment method) that will contain the required credits, or alternatively purchase the necessary offset credits prior to the clearing of 3.4 ha of native vegetation within the Stage 3 area.

The draft BOS is provided as Appendix F of this RtS

3 OVERVIEW OF SUBMISSIONS

A number of government agency submissions and one public submission have been received during the recent exhibition of the EIS (between 15 February 2018 and 16 March 2018). An overview of the submissions and a summary of the process undertaken to ensure that the submissions have been appropriately responded to is provided below.

3.1 Submissions received

Submissions were received from a total of five government agencies, including the following:

- Department of Primary Industries (DPI)
- Environment Protection Authority (EPA)
- Office of Environment and Heritage (OEH)
- Roads and Maritime Services (Roads and Maritime)
- Rural Fire Service (RFS).

It is noted that the submission from Roads and Maritime did not raise any objections or comments and is not considered further in this document.

One submission was also received from a member of the public.

3.2 Submissions response methodology

Government agency and public submissions were provided to the Applicant's team of technical specialists. Based on the content of the submissions and the Amended Proposal description (described in Section 6), the technical specialists undertook additional technical assessments and, where relevant, provided responses to the issues raised.

The additional assessments undertaken are appended to this RtS and are summarised in Section 7. The information pertaining to relevant responses have been referenced and addressed in the response tables in Section 4 (Government Agency) and Section 5 (Public) of this RtS.

3.2.1 Government agencies

As outlined in Section 3.1, a total of five government agencies provided submissions, four of whom raised issues to be addressed. Each submission varied in terms of the number and type of items for consideration, with some agencies, depending on their function/responsibility, raising more issues than others. Each agency submission was reviewed and considered. Responses to each government agency submission have been provided in Section 4 of this RtS.

3.2.2 Public submission

As outlined in Section 3.1, only one submission was received from a member of the public. Responses to the key issues raised, primarily relating to noise and air quality, in the public submission have been provided in Section 5 of this RtS.

4 RESPONSE TO GOVERNMENT AGENCY SUBMISSIONS

Table 4-1 below provides a summary of government agency responses received as part of the public exhibition of the EIS. This includes the government authority involved, the nature of the submission and how the submission has been addressed within this report.

Table 4-1 Summary of nature of Agency submissions, aspects raised, and response provided

Agency	Summary of aspects raised	Response
Department of Primary Industries (DPI)	DPI raised the following aspects: • Hydrogeology • Surface water quality and management • Groundwater quality and management • Sediment control • Water storage and use.	The aspects raised by DPI have been analysed and detailed responses have been provided in Section 4.1.
Environment Protection Authority (EPA)	The EPA raised the following aspects: • Materials balance, batters and final landform • Landfill gas management • Noise • Groundwater quality and management • Hydrogeology • Sediment control and other water related issues • Surface water quality and management.	The aspects raised by EPA have been analysed and detailed responses have been provided in Section 4.2.
Office of Environment and Heritage (OEH)	The OEH raised the following aspects: • Biodiversity and vegetation buffers • Bushfire management • Surface water quality and management • Rawdon Creek Nature Reserve • Aboriginal cultural heritage.	The aspects raised by EPA have been analysed and detailed responses have been provided in Section 4.3.
Roads and Maritime Services (Roads and Maritime)	Roads and Maritime raised no objections or aspects for consideration.	No response required
Rural Fire Service (RFS)	The RFS raised a number of aspects related to bushfire management.	The aspects raised by RFS have been analysed and detailed responses have been provided in Section 4.4.

4.1 .Department of Primary Industries

A formal submission comprising a letter (dated 10 April 2018) was received from DPI. Several comments were provided and responded to in Table 4-2.

Table 4-2 Response to Government Agency submission – DPI

	Issue	Response	Reference
Groundwater			
Groundwater level	The hydrogeological assessment for the site predicts the peak groundwater inflow to the landfill operations of around 0.5 ML/yr. Impacts on sensitive receptors of GDEs and registered users is well within the Level 1 Minimal Impact Considerations category defined under the Aquifer Interference Policy (2012). It is noted on-going management of groundwater beneath the site is based on performance of the gravel trench. The trench is required to keep the site dry during construction and to limit the build-up of hydrostatic pressure beneath the landfill. If the hydrostatic pressure is sufficient, uplift of the HDPE line can occur, leading to perforation from content in the landfill. The generation of water level averages are indicated to be based on 15 years of water level data including both dry (2004-2011) and wet (2012-2014) weather periods (i.e. more dry years). As the area is subject to high rainfall and the data has identified a relationship with prevailing climate, water table fluctuations are potentially greater than captured over the period of record, particularly at the higher end. Managing the recovery of groundwater levels post construction will be a key issue in the operation of the facility. As stated in the EIS "In accordance with the draft Solid Waste Landfill Guidelines (NSW EPA, 2016), and to prevent high groundwater heads affecting the performance of the landfill liner, it is proposed to install a drainage trench". To add confidence in the ongoing monitoring and reporting	A hydrogeological assessment of the site was completed by Trace Environmental in October 2016 (Appendix F of the EIS). Informing this assessment was a groundwater monitoring program. The program was based on groundwater head monitoring data obtained over a 15 year period, including both dry (2004-2011) and wet (2012-2014) weather periods. The locations of these sites, along with monitoring frequency are outlined within Section 3.4 of Appendix F of the EIS, and are considered adequate in terms of sampling to accurately predict maximum groundwater heads that have potential to interact with the Landfill site, in the absence of effective mitigation. An extensive consultation process was undertaken during the preparation of the EIS, which informed a redesign of landfill floor elevations to ensure risk of hydrostatic uplift pressure to the landfill lining is practically minimised. A minimum 2-metre separation (buffer) distance between the average groundwater heads and landfill floor was adopted, based on NSW EPA Advice and VIC EPA Guidelines (*Best Practice Environmental Management Guideline for Waste Management*, EPA Victoria (2015).Section 6 of this RtS describes amendments that have been made to the Proposal based on submissions provided by government agencies and the community during the exhibition of the EIS, as part of design progression, and to provide additional clarity where relevant. A key design amendment comprises the introduction of a revised groundwater management strategy, to replace the previously proposed gravel interception trench. The revised approach would incorporate a series of groundwater collection trenches (in a herringbone pattern) beneath each landfill Stage, to drain any intersecting groundwater, via gravity, to a main header pipe and sump system for extraction. The underdrainage system would safeguard against impacts caused through hydrostatic uplift (i.e. breakage of HDPE lining) or wetting/softening of the base clay liner (i.e. long-term loss of hydraulic performance). Following installation of the collection trenches the potentiometric head would intercept the trenches and flow unencumbered through the high-permeability granular	Section 6 of this RtS – Amended Proposal Appendix D of this RtS – Addendum Hydrogeological Memorandum Appendix F of the EIS – Hydrological Assessment Cairncross Landfill Expansion

	Issue	Response	Reference
	program, further detail is recommended on the water level triggers from monitoring bores in relation to maintaining a buffer beneath the landfill to limit hydrostatic pressure, noting that bores located adjacent to the trench are likely to be lower than that beneath the adjacent parts of the landfill. The proponent should provide further detail on the proposed water level triggers from monitoring bores in relation to maintaining a buffer beneath the landfill that will limit hydrostatic uplift pressure. It is noted that observation bores located adjacent to the trench are likely to record lower water heads than that beneath the adjacent parts of the landfill. It is not clear from the EIS if groundwater level triggers are being established to protect the risk of hydrostatic pressure beneath the landfill generating lift and potential perforation of the HDPE liner.	material to the collection sumps, preventing the occurrence of any hydrostatic uplift. The need to identify groundwater level trigger values is therefore not considered necessary as the amended groundwater management system has been designed to intercept any elevated groundwater flows and fully mitigate the potential for hydrostatic upward pressure. An Addendum Hydrogeological Assessment (Appendix D of this RtS) has been prepared to further outline the proposed amended groundwater management system. Groundwater collected within the collection trenches would be discharged to surface water, subject to meeting defined trigger values protective of the receiving environments (i.e. *ANZECC values for 95 per cent protection of freshwater species*) or pumped to the nearby STP (refer Section 5.2 of Appendix D). Consequently, negligible impact to GDEs are anticipated as a result of the Amended Proposal.	
	The proponent's hydrogeological assessment recommended the installation of 4 additional groundwater bores at the south-western and south-eastern boundary of Stages 2 and 3, respectively and a monitoring point in the gravel drainage trench prior to commencement of Stage 1. The additional bores should form part of the total monitoring network and appropriate trigger levels be developed consistent with ANZECC (2000) guidelines. The proponent's hydrogeological assessment recommends groundwater trigger levels for both water quality and water levels. For water levels the maximum threshold levels are defined based on the historical maximum groundwater heads and allowing for changes due to development. Therefore, should the groundwater head within the closest monitoring bore fall below or rise above the trigger level for remedial action, alternative options will need to be implemented to maintain the heads above this level.	As reported in the Revised Concept Design Report (Appendix B of this RtS), four additional monitoring bores would be integrated into the total monitoring network, and trigger levels would be developed for the total monitoring network consistent with ANZECC (2018) guidelines. The hydrological assessment included findings of baseline monitoring to determine the average and anticipated maximum groundwater head conditions below the site. These values were used to determine estimated groundwater inflow volumes in the absence of an underdrainage system. As noted above, as part of the Amended Proposal an underdrainage management system has been developed to capture elevated ground water and relieve hydrostatic pressure during groundwater intersection with the base of the landfill liner (i.e. during periods of maximum groundwater head conditions). A detailed description and assessment of this system is provided in Sections 6 and 7 of this RtS, respectively. The revised system would incorporate a series of groundwater collection trenches beneath each Stage, to drain any intersecting groundwater, via gravity, to a main header pipe and sump system for extraction. This strategy would relieve hydrostatic pressure otherwise imposed to the HDPE liner during above average groundwater	Section 6 of this RtS – Amended Proposal Section 8 of this RtS - Revised compilation of mitigation measures Appendix B of this RtS – Revised Concept Design Report Appendix D of this RtS – Addendum Hydrogeological Assessment

	Issue	Response	Reference
	The trigger levels apply to both the excavation and operation stage of development of Stages 1 to 3.	conditions. The need to identify groundwater level trigger values is therefore not considered necessary as the amended groundwater management system has been designed to intercept any elevated groundwater flows and fully mitigate the potential for hydrostatic upward pressure. An updated mitigation measure (W-03) has been included to prepare a Water Management Plan to cover the construction and operation of the Amended Proposal, to be prepared in consultation with DoI Water. The Water Management Plan would include measures to manage impacts to, and discharge quality of, groundwater, including: • *Measures for management of groundwater flows and discharge locations* • *Groundwater discharge water quality trigger values and management measures for water not suitable for discharge* • *Contingency measures in event of contamination detected in groundwater.*	
Water quality	An assessment should be provided of the impacts due to the proposed groundwater redirection to the downstream surface water system in regards to water quality, timing and volume of flows and aquatic habitat. The EIS indicates the Proposal to install a gravel trench around the site to intercept groundwater and to allow it to discharge via natural flow to the south. This is proposed to occur during and post development. An assessment is requested of the impacts to the downstream surface water system in regards to water quality, timing and volume of flows and aquatic habitat.	As noted above, Section 6 of this RtS describes amendments that have been made to the Proposal based on submissions provided by government agencies and the community during the exhibition of the EIS, as part of design progression, and to provide additional clarity where relevant. A key component of the Amended Proposal is a revised groundwater management strategy (i.e. a base groundwater system), to replace the gravel interception trench proposed within the EIS for groundwater head management. The revised system would incorporate a series of groundwater collection trenches beneath each Stage, to drain any intersecting groundwater, via gravity, to a main header pipe and sump system for extraction. Piezometric head depth and flow direction of the existing environment is described in Section 2.3 of the Addendum Hydrogeological Assessment (Appendix D to this RtS). The capture of groundwater into the base groundwater management system would be restricted to flows during high to maximum potentiometric conditions. Predicted levels of groundwater inflow is less than 2 kL per day. As stated in Section 4.1 of Appendix D to this RtS, groundwater that meets the trigger values protective of the receiving environments (i.e. *ANZECC values for 95 per cent protection of freshwater species*) will be released as surface discharge into the catchment.	Section 6 of this RtS - Amended Proposal Section 8 of this RtS - Revised compilation of mitigation measures Appendix C of this RtS – Addendum Surface Water and Groundwater Quality Assessment Appendix D of this RtS – Addendum Hydrogeological Assessment

	Issue	Response	Reference
		To ensure that the release of groundwater discharge is of low impact the following management protocols will be employed to prevent unsuitable groundwater being discharged from site will include: • Collection of groundwater within sumps will be tested and compared against the trigger values • Groundwater that meets the trigger values protective of the receiving environments will be discharged as surface discharge into the catchment. • Groundwater that is not suitable for discharge will be used onsite for dust suppression or piped to the STP prior to disposal offsite. A surface and ground water monitoring program will be prepared and implemented as part of a broader Water Management Plan, to detect any contamination in off-site surface water bodies. An updated mitigation measure for the Amended Proposal (refer to W-03) has been included. The Water Management Plan would include: • *Measures to manage impacts to, and discharge quality of, groundwater, including:* – *Measures for management of groundwater flows and discharge locations* – *Groundwater discharge water quality trigger values and management measures for water not suitable for discharge* – *Contingency measures in event of contamination detected in groundwater.* In summary, given the low predicted volume of water interception (< 2 kL per day), testing requirements and imposed discharge limits, the risk of impact to surrounding ecology from surface water quality or flow velocity increases is considered to be low. Discharges to surrounding surface water channels would be subject to monitoring and compared with EPA best practice guidelines.	
Management plan	The proponent must update the GWMP in consultation with DoI Water prior to commencement of project	Section 8 of this RtS provides a revised compilation of mitigation measures for the Amended Proposal. An updated mitigation measure (W-03) has been included to prepare a Water Management Plan to cover the construction and operation of the Amended Proposal. The Water Management Plan would *be developed to cover both construction and operation of the Amended Proposal, including:*	Section 8 of this RtS – Revised compilation of mitigation measures

	Issue	Response	Reference
		• *Measures to manage impacts to, and discharge quality of, groundwater, including* – *Measures for management of groundwater flows and discharge locations* – *Groundwater discharge water quality trigger values and management measures for water not suitable for discharge* – *Contingency measures in event of contamination detected in groundwater* PMHC will prepare the Water Management Plan in consultation with DoI Water.	
Groundwater take	The EIS has acknowledged the requirement to licence groundwater take via purchase on the water market. The small volumes required (maximum predicted 0.53ML/yr during excavation of Stage 2) do not raise an issue in the ability to obtain the entitlement from the New England Fold Belt Coast Groundwater Source of the Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources.	Noted	

	Issue	Response	Reference
Surface water			
Management plan	The proponent must update the Surface Water Management Plan in consultation with DoI Water prior to commencement of the project.	Section 8 of this RtS provides a revised compilation of mitigation measures for the Amended Proposal. An updated mitigation measures (W-03) has been included to prepare a Water Management Plan to cover the construction and operation of the Amended Proposal. The Water Management Plan would include: • *A surface and groundwater monitoring program developed in accordance with requirements outlined in the Concept Design Report (Appendix B of the EIS), the Hydrogeological Assessment (Appendix F of the EIS) and the Guidelines.* • *Measures to manage erosion and sediment control, in accordance with the Blue Book…* • *Measure to manage impact to, and discharge of, surface water.* PMHC will prepare the Water Management Plan in consultation with DoI Water.	Section 8 of this RtS – Revised compilation of mitigation measures
Discharge velocities	The impacts of predicted increases in post development velocities from the proposed sediment basins should be assessed and mitigation measures be developed as required. The predicted increase in velocities is inconsistent with standard recommendations of DoI Water to ensure post discharge velocities do not exceed pre-discharge rates. The proposed sediment basin sizes for stage 2 is predicted to result in an increase in post development velocities by 10% for a 1 in 20yr ARI event and 18% for a 1 in 100yr ARI event. The EIS has deemed this increase not to be an issue due to the infrequent nature of such events. The impacts of such an increase on erosion and resultant sedimentation and aquatic habitat impacts have not been addressed. Where impacts are predicted, mitigating measures would need to be developed.	The predicted velocities of discharged water from the Amended Proposal Site have been identified and their impacts assessed in Section 8.4.2 of the EIS. An analysis of the performance of the sediment basins for Stages 1, 2 and 3, with respect to pre and post development flows from the site, was undertaken by PMHC using DRAINS stormwater modelling software. Section 6 of this RtS described amendments that have been made to the proposal based on submissions provided by government agencies and the community during the exhibition of the EIS, as part of design progression, and to provide additional clarity where relevant. As noted in Section 6.3.3 of this RtS, one such amendment includes an increase to the size of each of the proposed operational basin sizes of the Amended Proposal; providing additional capacity during peak storm events. A Revised Concept Design Report has been prepared for the Amended Proposal (Appendix B of this RtS). Section 7.5.2 of this report outlines revised peak flow estimates associated with the Amended Proposal. Table 18 in Appendix B of this RtS shows that generally for all storm events, the post development peak flows are estimated to generally reduce from the peak pre- development flows, with the exception of Stage 1 (North Basin) and Stage 2 (Final Stages), where minor increases (+2% to +4%) in flows	Section 8.4.2 of the EIS Section 6 of this RtS - Amended Proposal Section 8 of this RtS – Revised compilation of mitigation measures Appendix B of this RtS – Revised Concept Design Report

	Issue	Response	Reference
		are estimated during the less frequent 100 year ARI event (compared to up +18% identified in the EIS). Due to the infrequent nature of the estimated minor increases in post-development peak flow, the sediment basin design is considered appropriate in terms of providing sediment control and OSD. Spillways are to be provided to the sediment basins and designed for major storm events (up to 100 year ARI). Further, Section □ of this RtS provides a consolidated list of mitigation measures, including measure W-03, committing that: *A detailed Water Management Plan would be developed, to cover both construction and operation of the Proposal, including … in accordance with the Blue Book… measures to reduce the velocity and erodibility of surface water flows across the site.* In addition, the following mitigation measure (W-04) has been added to the compilation of mitigation measures: *Further consideration will be given to options, such as the installation of energy dissipaters, to reduce discharge velocities during detail design.*	
Water use and storage	The size of the water storages during and post the development that capture clean runoff should be assessed against the requirements of the Harvestable Rights Dam Policy. The surface water management assessment has not assessed the application of the Harvestable Rights Dam Policy for the project. Where dams are capturing runoff from clean areas their size needs to be within the Maximum Harvestable Rights Dam Capacity (MHRDC) for the property. As the site is progressively rehabilitated and after final rehabilitation, dams capturing clean runoff from rehabilitated areas are likely to need to be within the MHRDC. If the MHRDC is to be exceeded the dams would need to be resized or entitlement purchased in the relevant water source.	The Harvestable Rights Dam Policy outlines the locations, uses and dam sizes allowable with and without the need for a license. The Amended Proposal Site is located within a rural area that is subject to the Harvestable Rights Dam Policy. Dams that are built for the purpose of controlling or preventing soil erosion where no water is reticulated or pumped from them and the size of the structure is the minimum necessary to fulfil the erosion control function are excluded from the Maximum Harvestable Rights Dam Capacity (MHDRC) for the property (DPI, 2016). Therefore the only dam that would be subject to the MHRDC within the Amended Proposal site is Fire Fighting Storage Basin, as all other basins onsite are for the purpose of control and prevention of soil erosion and sedimentation and therefore excluded from the MHDRC calculation. The MHDRC is calculated based on the total area for the property that the dam will service, and must include the entire property including all parcels of land that make up the property. The total area of the Cairncross WMF is approximately 117.59ha. As shown in Appendix E of this RtS, the MHDRC for the Cairncross WMF is therefore a total dam capacity of 15.3ML. As outlined in the Site Water Balance (Appendix G of the EIS) the size of the Fire Fighting Storage Basin would change throughout the life of the	Appendix G of the EIS – Site Water Balance Appendix E of this RtS - Maximum Harvestable Right Dam Capacity

	Issue	Response	Reference
		Amended Proposal, particularly as Stage 3 is carried out. The maximum size of the Fire Fighting Storage Dam, however, would be 15.1ML, and therefore below the 15.3ML MHDRC limit. Based on the MHDRC for the Amended Proposal Site and the maximum dam capacity proposed no licence is anticipated to be required for the operation of the Amended Proposal. Notwithstanding this, should the dam capacity be amended during the operation or rehabilitation of the landfill such that it may exceed the MDHRC for the site, the need for a licence would be reconsidered.	
	Modifications to the hydrology include the capture of runoff within the disturbed area and diversion of clean water from rehabilitated areas. The dams to capture dirty runoff are within the Harvestable Right Zone and based on the dams being sized appropriately the volume will be excluded from the requirement for water licensing. The EIS indicates the proposed final landform will result in 4.3ha of one catchment being redirected into another. These two catchments flow into the same watercourse approximately 2km downstream of the site. The redirection of flow is not considered to be a significant impact to downstream environments.	Noted	
Water balance	The water balance indicates the requirement to rely on water from the fire-fighting storage during extreme drought years. The availability of water in the storage in such years is likely to be uncertain and it is recommended an alternate water source be identified.	A Site Water Balance was completed for the Proposal (Appendix G of the EIS) to estimate the water demands for operational uses and the potential availability of water to meet these demands. The water balance was determined based on the monthly average and 10 percentile rainfall data for a 30 year period. The assessment identified that the only significant water use is expected to be for dust suppressions.	Section 8.4.2 of the EIS Appendix G of the EIS – Site Water Balance
	An alternate water source for use during extreme periods should be identified	The results of the water balance (Section 1.3 of Appendix G) showed that in all months with average rainfall conditions for all stages of the landfill there would be a surplus of water available. As noted in Section 8.4.2 of the EIS the results also showed that under the 10th percentile rainfall conditions there would be a potential water deficiency during July and August in all three stages. However, as noted in Section 1.3 of Appendix G, PMHC have identified that a water deficit has not previously been experienced at the landfill, even when there have been serious rainfall	

	Issue	Response	Reference
		deficiencies. This is due to the significant water storage provided in the existing basins. The water balance concluded that a water deficit is considered unlikely to occur except in extreme drought conditions. To minimise the risk of experiencing deficit it is recommended that the capability to draw water from all basins be continued. In the highly unlikely event that a water deficit occurs that cannot be supplemented by water stored within onsite basins, water would be used from either water mains or trucked into the site if required to ensure ongoing access to water. PMHC have access to a 10,000L water transportation truck that could be used on an as-needs basis if required during extreme water deficiencies.	

4.2 Environment Protection Agency

A formal submission comprising a letter (dated 29 March 2018) was received from EPA. Several comments were provided and responded to in Table 4-3.

Table 4-3 Response to Government Agency submission – EPA

Topic	Issue	Response	Reference
General issues			
General	The EPA requests these comments be read in conjunction with our letter dated 7 February 2013, which detailed our EIS requirements. Regardless of whether the existing EPL is varied to accommodate the Proposal, or a new EPL is applied for, we recommend EPL conditions currently applying to Stage E, as contained in EPL 11189, apply to the Proposal, except as specified below.	Noted. As discussed in Section 6.3.3 of the EIS the Cairncross WMF is currently subject to EPL 11189. PMHC will seek a modification to this EPL, where required, to incorporate the construction and operation of the Amended Proposal. Requirements within the EPL will be discussed and agreed with the EPA during the modification process.	Section 6.3.3 of the EIS
OEMP	"The EIS refers throughout to a 2008 version of the 'Operational Environmental Management Plan' ("the OEMP"). The EPA notes there is a February 2015 update to the OEMP (this being the 'Operational Environmental Management Plan - Cairncross Waste Management Facility' February 2015). The Proponent should refer to and update the most recent version of the OEMP as construction and operation of the future stages of the Landfill progress. The EPL for the Proposal will reference the Operational Environmental Management Plan - Cairncross Waste Management Facility dated February 2015 where appropriate."	As noted by the EPA the Cairncross OEMP was updated in 2015. Reference to the 2008 version of the OEMP within the EIS is acknowledged as a typographical error. The 2015 version of the OEMP will be referred to and updated for the construction and operation of the Amended Proposal. Section □ of this RtS provides a summary of the amended compilation of mitigation measures. Mitigation measures have been amended as required to refer to the latest version of the OEMP.	Section 8 of this RtS – Revised compilation of mitigation measures
Landfill gas	The EIS states the extent of landfill gas ("LFG") controls to be designed and implemented for the existing and future stages of the landfill will be guided by the results of a LFG pumping trial, and that the Proponent will develop a LFG management plan based upon the findings of the trial. The EPA understands the trial has been postponed. Recommended condition: A landfill gas monitoring program must be established according to the requirements of the Environmental Guidelines - Solid Waste Landfills, Second Edition 2016.	PMHC acknowledge that the landfill gas trial has temporarily been postponed. The bores to be used in the trail have been installed across the filled areas within the existing (Stage E) landfill cell. The locations of the bores are in close proximity to the active landfill tip face which is currently rendering them ineffective. The trial will therefore recommence in approximately 12 months' time, or at such a time that the active tip face is at an appropriate separation distance from the bores. PMHC are committed to the completion of the trial and will be maintaining the bores in their current location, and continuing the existing contract to complete the trial, until the trial can be	Section 8.9.4 of the EIS Section 8 of this RtS – Revised compilation of mitigation measures

Topic	Issue	Response	Reference
		successfully completed. It is anticipated that the trial will be completed prior to the commencement of Stage 1 of the Amended Proposal. Further, as outlined in Section 8.9.4 of the EIS, PMHC are committed to the preparation of a landfill gas monitoring program to be undertaken for Stages 1 to 3 (mitigation measure GHG-02). Section 8 of this RtS provides a compilation of the amended mitigation measures for the Amended Proposal. GHG-02 has been updated to further reflect this commitment and address the recommended condition proposed: *A landfill gas monitoring program will be established in accordance with the requirements of the Environmental Guidelines - Solid Waste Landfills, Second Edition 2016, or equivalent, and be undertaken for Stages 1 to 3.*	
Noise	We note existing ambient noise levels have only been measured at one (R1) of four identified sensitive receivers (Table 2-2 on Page 7 of the 'Noise Impact Assessment' at Appendix I). The EPA considers the measurements, which have been used to establish a project-specific $L_{Aeq(1s\ minute)}$ intrusiveness criterion and a project specific $L_{Aeq(15\ minute)}$ noise level of 39 dBA, have been affected by extraneous noise. Consequently, we propose to apply the minimum $L_{Aeq(15\ minute)}$ intrusiveness noise level of 35 dBA for nearby sensitive receivers (that is, the EPL for the Premises will specify an $L_{Aeq(15\ minute)}$ intrusiveness noise limit of 35 dBA for nearby sensitive receivers). Recommended condition: Noise generated at the Premises must not exceed an $L_{Aeq(15\ minute)}$ noise level of 35dBA measured at identified sensitive receivers.	Section 3.2.1 of the Noise Impact Assessment (Appendix I of the EIS) outlines the intrusiveness criterion for the Amended Proposal Site, established in accordance with the Industrial Noise Policy (INP) (EPA, 2000). Based on the established background noise levels identified in section 2.2 of Appendix I, and in accordance with the INP, the $L_{Aeq,15min}$ Intrusiveness Criterion for residential receivers R1-R4 is 39 dBA. It is unclear within the EPA query what extraneous noise is considered to potentially be impacting background noise monitoring data. It is noted that the measured background noise levels in the night time (10pm – 7am) are 3 dBA higher than that during the daytime (7am – 6pm) and evening (6pm – 10pm), suggesting the potential for extraneous noise is likely to occur only during the night time period. As noted in Section 1.1 of the RtS (Amended Proposal Overview), the Amended Proposal would operate during the daytime hours only. It is therefore considered that any extraneous noise that may potentially be impacting background noise levels is unlikely to be of relevance to the Amended Proposal. The Noise Impact Assessment was prepared in accordance with the SEARs issued for the Proposal. It is acknowledged that since the SEARs were issued for the Proposal, the EPA released the Noise Policy for Industry (EPA, 2017). Section 2.3 of the Noise Policy for Industry specifies a minimum $L_{Aeq,15min}$ project intrusiveness criteria of	Section 1.1 of the RtS - Amended Proposal Overview Appendix I of the EIS – Noise Impact Assessment

Topic	Issue	Response	Reference
		40dBA. This noise level has been chosen as it is consistent with contemporary science and the approach in many other jurisdictions. A daytime $L_{Aeq(15\ minute)}$ noise limit of 35dBA is considered inconsistent with both the Noise Impact Assessment completed for the Proposal - prepared in accordance with the SEARs and the INP - and the current policy of the EPA as promulgated in the Noise Policy for Industry. A more appropriate condition is therefore considered to be that: *The Premises must not exceed an $L_{Aeq(15\ minute)}$ noise level of 40dBA measured at identified sensitive receivers*. Notwithstanding the above, it is noted that the worst case day-to-day site operations, would be anticipated to be a maximum $L_{Aeq(15\ minute)}$ of 27dBA at the closest residential receiver; well below the established criteria.	
Groundwater			
Groundwater quality	The environmental values of local ground waters do not appear to have been fully identified in the EIS. According to the 'Hydrogeological Assessment - Cairncross Landfill Expansion' ("the Hydrogeological Assessment") at Appendix F: "The Landfill Site has a comprehensive baseline groundwater monitoring network within and outside of the Stage E area comprising nine groundwater monitoring points" (Page 13). Some groundwater monitoring started in December 2001, so the network was installed to detect groundwater impacts from Stage E and is being used to establish baseline conditions for stages 1, 2 and 3. It appears, however, that four bores were established in 1998 to provide some baseline data for Stage E. The details of and raw data from these bores have not been provided in the EIS. Without these details and raw data, and given only five parameters (pH, iron, manganese, ammonia and phenols) appear to have been measured, it is difficult to assess the veracity of the claim made on Page 21 of the Hydrogeological Assessment that: "Compared to baseline data collected in 1998 prior to landfill operation, current groundwater quality	An Addendum Hydrogeological Assessment (Appendix D of this RtS) and Addendum Surface Water and Groundwater Assessment (Appendix C of this RtS) have been prepared to provide additional information for groundwater and surface water. Additional monitoring data and analysis of local groundwater quality has been presented in Section 3 of Appendix C of this RtS. Section 3.2.1 of the Appendix C of this RtS presents the full extent of available groundwater monitoring data prior to operation of the landfill. Since only one round of groundwater monitoring was completed prior to operation of the landfill a true baseline data-set is not available. Comparison against the 1998 data is therefore not considered appropriate. As outlined within Section 3.2.2 of Appendix C of this RtS the data used to determine local groundwater quality for the Amended Proposal is based on monitoring data collected from four locations within the Amended Proposal Site between 2001 and 2017 (i.e. post Stage E). This data is presented within Table 3-5 of Appendix C of this RtS, and analysed in the context of sampling methods used for the assessment informing the EIS (refer to Appendix F of the EIS).	Appendix F of the EIS – Hydrogeological Assessment Appendix C of this RtS – Addendum Surface Water and Groundwater Assessment Appendix D of this RtS – Addendum Hydrogeological Assessment

Topic	Issue	Response	Reference
	results are either improved or within the range of values measured before the start of the operation." Furthermore, results for the full suite of pollutants required to be measured under EPL 11189 have not been presented or discussed in the EIS. In addition to the parameters listed in Table 5 of the Hydrogeological Assessment, EPL 11189 requires alkalinity (as calcium carbonate), calcium, chloride, fluoride, magnesium, potassium, sodium, sulfate, total organic carbon and volatile halogenated compounds to be measured, on a quarterly basis. It is unclear why results for these additional parameters have not been presented or discussed. Request for further information: The EPA requests the raw data for the groundwater monitoring undertaken in 1998 and advice as to why the full suite of pollutants required to be measured under EPL 11189 have not been presented or discussed in the EIS.	Groundwater monitoring results presented for the full suite of pollutants under EPL 11189 have been included within Table 3-5 of Appendix C of this RtS.	
	We note local ground waters have been assigned a protection level of 'slightly-to-moderately disturbed systems'. Given groundwater underlying the Site flows from elevated areas in the north and west of stages E, 1 and 2 to low-lying areas in the south, southwest and southeast (that is towards Rawdon Creek, which flows through Cairncross State Forest and vegetated private property, and Tommy Owens Creek, which flows through Rawdon Nature Reserve and a mapped SEPP 14 wetland), we consider a more appropriate protection level would be 'high conservation/ecological value systems' (necessitating application of the 99% protection level trigger values for freshwater ecosystems).	Section 8.4.1 of the EIS provides a description of the existing environment and receiving waters surrounding the Amended Proposal Site. Further context is provided within Section 2 of the Addendum Surface Water and Groundwater Quality Assessment (Appendix C of this RtS). It is noted that no discharge into the ground water aquifer is proposed as part of the Amended Proposal. Therefore the receiving waters considered within the assessment are downstream surface waters. Catchment wide water quality (summarised in Section 3.1.1 of Appendix C of this RtS) has been determined as moderately disturbed, based on the *Hastings – Camden Haven Ecohealth Project 2015: Assessment of River and Estuarine Condition. Final Technical Report* (Ryder et al. 2015). Water quality with the Hastings and Camden Haven Catchments was found to be moderately disturbed. An analysis of the applicability of, and rationale for selection of, the default *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC and ARMCANZ, 2000) (ANZECC Guideline) values for 95 per cent protection of freshwater species (ANZECC limits) is provided in Section 4 of Appendix C of this RtS. An assessment of the appropriateness of NSW Water Quality Objectives identified for the Hastings River Catchment (upon within which the Amended Proposal Site is located) as they apply for the Amended	Section 8 of this RtS (Compilation of mitigation measures) Appendix C of this RtS – Addendum Surface Water and Groundwater Quality Assessment

Topic	Issue	Response	Reference
		Proposal is provided within Table 4-1 (refer to Appendix B of this RtS). The findings of this assessment indicate that assigning trigger values for 95 per cent protection of freshwater species (ANZECC limits) is appropriate. A mitigation measure (W.04) to prepare and implement a Water Management Plan has been included in Section 8 of this RtS. This document will include trigger values for the discharge of surface and ground water from the Amended Proposal Site, along with the appropriate steps and actions to be taken should trigger values be exceeded.	
	Proposed site-specific groundwater quality trigger values, based upon up to 15 years-worth of results from Stage E monitoring, are presented in Table 9 on Page 38 of the Hydrogeological Assessment. Trigger values have not been defined for the full suite of indicator parameters required to be monitored under EPL 11189 however, including for alkalinity, calcium, chloride, fluoride, magnesium, potassium, sodium, sulfate, total organic carbon and volatile halogenated compounds. The EPA notes the site-specific trigger values have been defined to indicate whether local ground waters are being contaminated with leachate as landfilling progresses, and not to establish discharge criteria. Whilst we acknowledge discharges to local ground waters are not proposed, the apparent absence of a full consideration of the environmental values of local ground waters and the exclusion of certain indicator parameters makes it difficult for the EPA to assess the appropriateness of the site-specific trigger values presented Table 9. The EPA therefore cannot endorse the site-specific trigger values presented in Table 9 and will refer to the default trigger values in the ANZECC Guidelines for high conservation/ecological value systems to indicate whether the environmental values of local ground waters are being impacted upon. <u>Recommended condition:</u> The indicator parameters for ground waters currently listed in EPL 11189 must be	An Addendum Hydrogeological Assessment (Appendix D of this RtS) and Addendum Surface Water and Groundwater Quality Assessment (Refer to Appendix C of this RtS) have been prepared to provide additional information for groundwater and surface water. Identified values for the full suite of pollution indicators, as required under EPL 11189 for available monitoring data is provided in Table 3-5 of Appendix C of this RtS. As outlined within Section 4.3 of Appendix C, ANZECC Guidelines recommend the use of site specific water quality trigger values. They recommend site specific values are formulated based on the 80th percentile of the site-specific monitoring data and compared to an up-gradient (un-effected) reference site. In the absence of a data-set that provides this information the *95th percentile freshwater species default trigger* values are to be adopted. In regards to the existing data set (refer to Table 3-1, Appendix C of this RtS) the following is noted: • The baseline groundwater assessment (1999 EIS) was only completed over one sampling event • A baseline data-set of two years or more does not exist for either surface water or groundwater at the site prior to the Stage E cell being constructed. Therefore, it is not possible to determine baseline conditions or accumulative effects from the Stage E landfill cell. • The Amended Proposal Site is located at the top of a catchment and therefore there is no practical manner to collect a surface water reference sample.	Section 8 of this RtS – Revised compilation of mitigation measures Appendix F of the EIS – Hydrogeological Assessment Appendix C of this RtS – Addendum Surface Water and Groundwater Quality Assessment Appendix D of this RtS – Addendum Hydrogeological Assessment

Topic	Issue	Response	Reference
	monitored for comparison with the relevant ANZECC trigger values.	Given the above, the *95th percentile freshwater species default trigger* values have been adopted for the Amended Proposal. The 95th percentile is considered appropriate given the moderately disturbed nature of the receiving surface waters. An assessment of the appropriateness of the proposed trigger values is proposed in Section 4 of Appendix C of this RtS. PMHC will undertake monitoring of surface water and groundwater prior to discharge. Inclusion of additional sampling sites within the monitoring network will allow site specific values to be developed over time. In the interim both surface and groundwater waters will need to be assessed against the ANZECC (2000) guidelines for *95 per cent protection of freshwater ecosystems* prior to discharge offsite.	
Monitoring bores	Two of the existing groundwater monitoring bores - CG104 and CG105 - are licensed monitoring points (that is, they are included in EPL 11189 as monitoring points 5 and 6). It is assumed these bores will be removed to make way for Stage 1. The EPA expects at least two replacement bores will be installed according to the 'Environmental Guidelines - Solid Waste Landfills' Second Edition 2016 and included in an EPL before these bores are decommissioned. Recommended condition: The EPA must be advised in writing before monitoring bores CG104 and CG105 are decommissioned to enable suitable replacements to be included in an EPL for the Proposal.	As outlined in the Revised Concept Design Report (Appendix B of this RtS), additional groundwater bores have been included within the total groundwater monitoring bore network. The locations of additional bores within the total network, including replacement bores for those decommissioned to make way for the Staged development, would be determined through consultation with the EPA and included as part of the Water Management Plan for the Amended Proposal. PMHC will provide written notice to advise the EPA before removal of bores CG104 and CG105, or installation of their replacements.	Section 8 of this RtS – Revised compilation of mitigation measures Appendix B – Revised Concept Design Report
	Given CG102, CG103 and CG109/CG110 are hydraulically up-gradient of stages E, 1, 2 and 3, and were only installed in 2013, some of these monitoring points will be included in an EPL as licensed monitoring points. Recommended condition: Suitable hydraulically up-gradient groundwater monitoring bores must be included in an EPL for the proposal	As noted in Section 6.3.3 of the EIS the Cairncross WMF is currently subject to EPL 11189. PMHC will seek a modification to this EPL, where required, to incorporate the construction and operation of the Amended Proposal. Requirements within the EPL will be discussed and agreed with the EPA during the modification process.	Section 6.3.3 of the EIS
Groundwater levels	As stated in the EIS, the proposed excavations for stages 1, 2 and 3, particularly those for stages 1 and 2, are expected to intercept groundwater during above-average groundwater levels. According to the EIS (Page 48) "In order to avoid any	Section 6 of this RtS describes amendments that have been made to the Proposal based on submissions provided by government agencies and the community during the exhibition of the EIS, as part of design progression, and to provide additional clarity where	Section 6 of this RtS – Amended Proposal

Topic	Issue	Response	Reference
	risk of groundwater infiltration into the landfill cells, a gravel/ rubble trench is proposed around the perimeter of the landfill at locations where groundwater may be encountered ... The gravel trench will drain to the landfill low point at the southern perimeter, and prevent groundwater from entering the landfill cell during excavation and filling operations". Figure 5-8 on Page 49 of the EIS shows areas where maximum groundwater levels are above the landfill floor level, and Figure 5-9 on Page 49 indicates the trench will only be installed where the maximum groundwater level is above the landfill floor level. There appear to be areas across Stage 3 where the maximum groundwater level is expected to be above the landfill floor level (albeit typically less than 0.2 metres), and yet it is not proposed to extend the trench towards Stage 3 (there appears to be a contradiction between Figure 5-8, which suggests there are areas across Stage 3 where maximum groundwater levels are above the landfill floor level, and the statement on Page 28 of the Hydrogeological Assessment' that: " Within Stage 3 there is a very small area in which the maximum groundwater head will exceed 0.2 m above the average groundwater head (i.e. a maximum of 1.8 m below the landfill floor) ..." Additionally, Figure 5-9 indicates the trench will not be installed in areas where the maximum groundwater level is at, or above, the depth of excavation (0.5 metres) and at or below the landfill floor level (two metres). The EPA is concerned that in areas where the maximum groundwater level is between 0.5 metres and two metres above average groundwater level, upward pressure may be exerted by rising ground waters on the underside of the landfill barrier system, which may compromise the long-term integrity of the system. The EPA will consequently be requiring that the proposed gravel/ rubble trench be extended into areas where the maximum groundwater level is expected to be above the level of excavation. According to the Hydrogeological Assessment (Page 28): "ft is assumed that the drainage trench will be constructed during the development of Stages 1 and 2, and within 100 days of the start of each of the stage excavations". If the trench is only to	relevant. A key design amendment comprises the introduction of a revised groundwater management strategy, to replace the previously proposed gravel interception trench. The revised approach would incorporate a series of groundwater collection trenches (in a herringbone pattern) beneath each landfill Stage, to drain any intersecting groundwater, via gravity, to a main header pipe and sump system for extraction. The underdrainage system would safeguard against impacts caused through hydrostatic uplift (i.e. breakage of HDPE lining) or wetting/softening of the base clay liner (i.e. long-term loss of hydraulic performance). Following installation of the collection trenches the potentiometric head would intercept the trenches and flow unencumbered through the high-permeability granular material to the collection sumps, preventing the occurrence of any hydrostatic uplift. The amended proposed groundwater management system would be installed across each of the proposed landfill stages, including Stage 3. An Addendum Hydrogeological Assessment (Appendix D of this RtS) has been prepared to further outline the proposed amended groundwater management system. PMHC undertook consultation with the EPA during the preparation of the EIS, as summarised in Section 4.3 of the EIS, and will readily undertake ongoing consultation during the detailed design and construction phases of the Amended Proposal. Construction plans and technical specifications will be provided to the EPA for review and comment prior to the construction of each stage.	Appendix D of this RtS – Addendum Hydrogeological Assessment

Topic	Issue	Response	Reference
	be constructed along the western boundary of Stage 1, there may be groundwater inflows from the south of Stage 1, until the trench is constructed along the southern boundary of Stage 2. Recommended condition: Prior to construction of the gravel/ rubble trench, detailed technical specifications including full construction plans for the trench must be submitted for approval by the EPA. ·		
Groundwater discharge	It is not clear where the gravel/ rubble trench will discharge to, or whether surface or subsurface discharge is proposed. According to the EIS, the trench will discharge via natural flow to the "south" - either to the 'Koala Connectivity Corridor' to the immediate south or the 'Compensatory Habitat Area' to the immediate south-west of Stage 2. The location and manner of groundwater discharges are important because the Hydrogeological Assessment at Appendix F suggests groundwater in the vicinity of Cairncross Waste Management Facility can be naturally brackish. Discharging saline ground waters to surface environments may have unintended consequences and impact upon local ecological conditions at and near the discharge sites in the Koala Connectivity Corridor and Compensatory Habitat Area. Recommended condition: Where surface discharges of groundwater are proposed, a pollution study, as defined in Section 68(1) of the POEO Act 1997, must be completed prior to the construction of the gravel/ rubble trench to assess potential impacts of surface discharges on the local receiving environment. Management of groundwater discharge zone(s), and the impact groundwater discharges may have on local ecological values, should be considered in any updates to the 'Operational Environmental Management Plan' (for the Koala Connectivity Corridor) or the 'Compensatory Habitat Management Plan' (for the Compensatory Habitat Area).	As noted above, a revised groundwater catchment and management system is proposed as part of the Amended Proposal, replacing the gravel trench. The system is described in detail within Section 6 of this RtS and the Addendum Hydrogeological Assessment (Appendix D of this RtS). The system would consist of a collection/drainage layer comprising of the installation of collection trenches containing a high-permeability granular material and perforated pipework to transport collected groundwater and a sump housing extraction pumps to actively pump the collected groundwater either to the STP (should the water be contaminated), or to the surface water drainage system. Testing prior to groundwater discharge will be undertaken to ensure any water released is in compliance with the relevant surface water values (i.e. *ANZECC values for 95 per cent protection of freshwater species*). The management protocols employed to prevent unsuitable groundwater being discharged from site will include: • Collection of groundwater within sumps that will be tested and compared against the trigger values for key parameters outlined within Table 3-5 of the Addendum Surface Water and Groundwater Quality Assessment (Appendix C of this RtS). • Groundwater that meets the trigger values protective of the receiving environments will be discharged as surface discharge into the catchment. • Groundwater that is not suitable for discharge will be used onsite for dust suppression or piped to the STP prior to disposal offsite. The capture of groundwater into the base groundwater management system would be restricted to flows during high to maximum	Section 8 of this RtS – Revised compilation of mitigation measures Appendix C of this RtS – Addendum Surface Water and Groundwater Quality Assessment Appendix D of this RtS – Addendum Hydrogeological Assessment

Topic	Issue	Response	Reference
		groundwater conditions (i.e. levels of groundwater inflow are predicted to be less than 2 kL per day). To further ensure that the release of groundwater discharge is of low impact, an ambient surface water monitoring program would be implemented to detect any contamination in off-site surface water bodies. Details of this program, including monitoring frequency and parameters are to be included within the Water Management Plan, included as an updated mitigation measure for the Amended Proposal (refer to W-03). The Water Management Plan would include measures to manage impacts to, and discharge quality of, groundwater, including: • *Measures for management of groundwater flows and discharge locations* • *Groundwater discharge water quality trigger values and management measures for water not suitable for discharge* • *Contingency measures in event of contamination detected in groundwater.*	
Leachate			
Leachate management	We note the Proponent has committed to installing a leachate barrier system for stages 1, 2 and 3 in (general) accordance with the Environmental Guidelines. We support this commitment. We also note the Proponent proposes to use polyvinyl chloride ("PVC") pipes to collect leachate. The EPA recommends the use of high density polyethylene ("HDPE") to collect leachate, as HDPE pipes are flexible and more resistant to a greater array of chemicals than PVC pipes. Recommended condition: Prior to construction of each of stages 1, 2 and 3, detailed technical specifications including full construction plans for each stage must be submitted for approval by the EPA.	As noted in Section 5.6.2 of the EIS, a landfill cell liner (leachate barrier system) is to be constructed for Stage 1, 2 and 3 of the Amended Proposal in accordance with the Guidelines. Section 6 of this RtS summarises amendments made to the Proposal in response to submissions received and/or as a result of design refinements. As noted in Section 6 of this RtS, and Section 1.1.4 of the Amended Proposal Description (Appendix A of this RtS), the use of high density polyethylene (HDPE) pipes has been proposed as a design amendment to replace the use of previously proposed polyvinyl chloride (PVC) pipes. PMHC undertook consultation with the EPA during the preparation of the EIS, as summarised in Section 4.3 of the EIS, and will readily undertake ongoing consultation during the detailed design and construction phases of the Amended Proposal. Construction plans will be provided to the EPA for review and comment prior to the construction of each stage.	Section 4.3 and Section 5.6.2 of the EIS Section 6 of this RtS - Amended Proposal Section 8 of this RtS – Revised compilation of mitigation measures Appendix A of this RtS – Amended Proposal Description

Topic	Issue	Response	Reference
	We note leachate from Stages E, 1, 2 and 3 will be captured, collected in storage tanks and pumped via a rising main to the proposed Telegraph Point Sewage Treatment Plant ("STP"), which is expected to be built adjacent to the Proposal site in 2018. The storage tanks have been sized to accommodate two days-worth of leachate at the maximum predicted leachate flow-rate detailed in the 'Cairncross Landfill Leachate Generation Modelling Report' at Appendix H. The basis for arriving at the two-day storage capacity for the tanks is not clear from information presented in the EIS. We also note it is expected primary holding tanks within the STP will provide leachate storage capacity additional to the two-day capacity provided by proposed leachate storage tanks. The volumes of these tanks is unknown. Although the EIS implies the STP will be built, contingency arrangements for storing and disposing of leachate in the event the STP is not built have not been discussed in the EIS. Similarly, contingency arrangements for storing and disposing of leachate in the event the STP is unable to accept leachate for more than two days have not been discussed. Given there appears to have been contamination of local surface waters by leachate, as discussed previously, and that the EIS acknowledges on Page 141: "... there remains the potential for a malfunction of the leachate management system ...", we consider it important that contingency arrangements for storing and disposing of leachate be formulated in the event the STP cannot be built or is unable to accept leachate for more than two days. Request for further information: The EPA requests advice as to how the two days-worth of leachate storage capacity for the storage tanks was arrived at. We also request advice as to the expected storage capacity of the primary holding tanks at the STP. Finally, we request advice as to whether the proponent has considered contingencies in the event the STP cannot be built or is unable to accept leachate for more than two days, such as constructing leachate dams.	The leachate management system and infrastructure proposed for use during the construction and operation of the Amended Proposal are presented in the Revised Concept Design Report (Appendix B of this RtS). As noted in Section 5.2 of the Amended Concept Design Report, the leachate collection network has been design in accordance with the NSW EPA's *Environmental Guidelines, Solid Waste Landfills* (2016). Section 2 of the Guidelines stipulate that collected leachate must be stored in appropriately sized tanks and disposed of so as not to cause environmental harm. A Leachate Generation Model (Appendix H of the EIS) has been prepared for the Amended Proposal to determine the likely maximum volume of leachate that would be generated by the Amended Proposal. Based on the results of the Leachate Generation Model, as noted in Section 3.3 of the Amended Concept Design Report, the leachate tanks would be sized for two (2) days storage in two (2) x 38kL tanks at the maximum predicted leachate flow (39.45m^3/day or 1.64m^3/hr). Two days of storage capacity has been considered adequate to comply with the Guidelines to ensure that leachate is appropriately stored so as not to cause environmental harm. The capacity of the tanks has been designed to cater for a 'worst case' scenario allowing for a wet weather event to occur over a weekend period. Further, two days is a long enough period of time to ensure that contingency measures, described below, can be enacted should the STP operator alert PMHC that they cannot accept leachate volumes at a given point in time. The tank size has also considered appropriate sizing and dimensions to ensure ease of identification of leachate volumes as they fill. As identified by the EPA, leachate would be pumped from the leachate storage tanks to the proposed Telegraph Point STP. The STP is subject to a separate assessment process which would consider the required tank sizing for its infrastructure. Through consultation with the developers of the STP it is understood that it is on schedule for development, and is anticipated to commence construction within the next 12 months. It is therefore anticipated that the STP would be operational upon commencement of the Amended Proposal and therefore able to receive leachate from commencement of Stage 1.	Appendix H of the EIS – Cairncross Landfill Leachate Generation Model Appendix B of this RtS – Revised Concept Design Report

Topic	Issue	Response	Reference
		Due to the sizing of the proposed leachate storage tanks, capable of holding up to two days' worth of leachate at maximum generation rates, the proposed system is not dependent on the storage capacity or ability for leachate to be accepted at the STP. In the event where the STP is unable to accept leachate volumes for a period of time PMHC would employ contingency measures. The primary contingency option for disposal of leachate would be to transport leachate offsite to the Port Macquarie STP via a tanker. The identified tanker would have a capacity of 10,000L and would be available on an as needs basis. A round trip to the Port Macquarie STP from the Amended Proposal Site would take approximately one hours for the tanker. The tanker would therefore be capable of transporting up to 100,000L/day (on weekdays) and 80,000 L/day on Saturdays and Public Holidays; well above the maximum leachate generation rate.	
Surface water			
Water quality	The environmental values of local surface waters do not appear to have been fully considered in the EIS. The EPA uses the NSW Water Quality Objectives to identify which environmental values of water apply to a specific waterway or catchment. The environmental values of water in the vicinity of the Premises can be identified by referring to the website at: www.environment.nsw.qov.au/ieo/ According to the EIS (Page 127): "Surface water quality samples have been collected by PMHC generally on a quarterly basis over a period between September 2001 and March 2017." An analysis of surface water quality monitoring results from two existing monitoring points (CS8A and CS9 for Stage E) have been used to establish baseline surface water quality conditions for the Proposal. The monitoring points are in existing sediment basins. Results have been compared to trigger values in the 'Australian and New Zealand Guidelines for Fresh and Marine Water Quality' ("the ANZECC Guidelines") on Pages 127 and 128 of the EIS. The fact that the results have been compared to trigger values in the ANZECC Guidelines suggests surface water quality data from the general area preceding construction of the	An Addendum Surface Water and Groundwater Quality Assessment (Appendix C of this RtS) has been prepared to provide additional clarification on the existing water quality and potential water quality impacts associated with the Amended Proposal. Section 3.1.1 of Appendix C and Section 7.1 of this RtS present the environmental values for the Hastings and Camden Haven Catchments noting that they have been identified as having a score for riparian conditions of 'grade C'; indicating intermediate river health. An analysis of the of the NSW Water Quality objectives, and their applicability to the Amended Proposal are described in Section 4.1 of Appendix C. Section 4.3 of Appendix C specify the selected Site Trigger Values for the Amended Proposal. Additional baseline surface water data has been presented in Section 3.1.2 and 3.1.3 of Appendix C, including the baseline data from the 1999 EIS (presented in Table 3-1 and Table 3-2 of Appendix C). As noted by the EPA, the EIS includes a summary of surface water quality from locations CS8A and CS9, collected between 2001 and 2017. This data was compared to the ANZECC Guidelines, rather than the 1999 EIS baseline data as the data set had a greater	Section 7.1 of this RtS Appendix C of this RtS – Addendum Surface Water and Groundwater Quality assessment

Topic	Issue	Response	Reference
	existing landfill (Stage E) are not available, even though surface water quality was apparently assessed as part of the original (1999) EIS. The EPA is wary of relying on test results from surface waters that may be impacted upon by the existing Landfill to establish baseline conditions for future Landfill stages, as this approach does not allow for cumulative water quality impacts to be adequately assessed. We consider the 1999 EIS surface water quality monitoring results, if these exist, may be more appropriate for establishing baseline conditions for future Landfill stages than test results from samples taken from the sediment basins servicing Stage E. The EPA is concerned Table 8-11 'Summary of surface water quality results at the Cairncross WMF from 2001-2017' on Page 127 of the EIS shows surface waters have often been contaminated with leachate. For example, ammonia and nitrate, which are acknowledged key indicators of leachate, have reached concentrations of 146mg/L and 228mg/L respectively in proximate surface waters. Phenols have reached a concentration of 2.29mg/L. These concentrations compare to relevant ANZECC Guideline trigger values of 0.9mg/L for ammonia, 0.7mg/L for nitrate, and 0.32mg/L for phenols. According to the EIS (Page 128): "Ten out of the 44 ammonia records (23 per cent) were above the ANZECC Guideline limit. Thirteen out of the 44 nitrate records (30 per cent) were above the ANZECC Guideline limit'. Additionally, the EIS states 8 out of the 44 sampling records (18 per cent) indicated elevated concentrations of phenols. There is no indication in the EIS whether the elevated ammonia, nitrate, or phenol concentrations were from samples taken from CS8A or CS9, and there is no explanation as to when, why or how surface waters came to be contaminated with leachate. The EPA considers the 'Surface Water Management Strategy' referenced in Section 5.3.2 will not fully- address the apparent contamination of surface water with leachate. Request for further information: The EPA requests advice as to whether the 1999 EIS surface water quality monitoring results are available, and if so, why these have not been	temporal, but smaller spatial, coverage and therefore could not be directly compared to the 1999 EIS data. An investigation, provided in Section 3.1.4 of Appendix C and summarised in Section 7.1 of this RtS, into previous spikes in ammonia, nitrate and phenols has been undertaken to determine their potential cause, and the associated risk of harm to the environment. The investigation found that the spikes in pollutant concentrations were associated with a historic leachate outflow event that occurred between September 2010 and December 2011. The cause of the event was determined to likely be the result of site management practices, likely associated with the leachate recirculation system. Subsequent management improvements have resulted in reduced concentrations of ammonia, nitrate and phenol at CS8A and CS9; all of which have reduced to background (pre-event) levels since November 2011. The investigations found that the overall risk of harm to the environment based on the historical leachate event is considered low.	

Topic	Issue	Response	Reference
	compared to the results from the two existing monitoring points to assess cumulative water quality impacts.		
	Recommended Condition: Prior to the construction of Stage 1, a pollution study, as defined in Section 68(1) of the POEO Act 1997, must be completed to establish appropriate baseline water quality parameters for ambient surface waters, identify mechanisms by which surface waters were contaminated by leachate in the past, and could be contaminated in the future, define site specific trigger values for appropriate indicator parameters, and assess best management practices and best available technology to reduce the potential for surface waters to be contaminated with leachate during future landfilling activities. Note: The EPA provides further information in relation to pollution studies on its website at: http://www.epa.nsw.gov.au/publications/licensing/140732-pollution-studies.	An Addendum Surface Water and Groundwater Quality Assessment (Appendix C of this RtS) has been prepared to provide additional clarification on the existing water quality and potential water quality impacts associated with the Amended Proposal. As noted above, an investigation, provided in Section 3.1.4 of Appendix C and summarised in Section 7.1 of this RtS, into previous spikes in ammonia, nitrate and phenols has been undertaken to determine the potential cause for these spikes, and the associated risk of harm to the environment from these spikes. The investigation found that the spikes in pollutant concentrations were associated with a historic leachate outflow event that occurred between September 2010 and December 2011. The cause of the event was determined to likely be the result of site management practices, likely associated with the leachate recirculation system. Subsequent management improvements have resulted in reduced concentrations of ammonia, nitrate and phenol at CS8A and CS9; all of which have reduced to background (pre-event) levels since November 2011. The *Pollution Studies Operating Procedure* (EPA, 2014) recommends that the risk of harm to the environment is assessed for any pollution evidence. Section 3.1.4 of Appendix C provides a detailed assessment of the potential risk of harm to the environment associated with the historic leachate outflow event. The investigations found that the overall risk of harm to the environment based on the historical leachate event is considered to be low. Site specific trigger values have been determined, and are discussed in Section 4 of Appendix C of this RtS. Appendix C provides details on the baseline water quality, an investigation into historic spikes in pollutants, and identification of site water quality trigger values. The recommended Condition is therefore considered to be met and should no longer be considered necessary.	Section 7.1 of this RtS – Further assessment Section 8 of this RtS – Revised compilation of mitigation measures Appendix C of this RtS – Addendum Surface Water and Groundwater Quality Assessment
Sediment basins	Page 135 of the EIS states: " Given the proximity of the Rawdon Creek Nature Reserve (located immediately downstream of the Stage 3 landfill area), particular attention has been given to the measures to avoid water quality impacts	Section 6 of this RtS describes amendments that have been made to the Proposal based on submissions provided by government agencies and the community during the exhibition of the EIS, as part of design progression, and to provide additional clarity where	Section 6 of this RtS - Amended Proposal

Topic	Issue	Response	Reference
	on the reserve. A combined sediment basin and fire-fighting storage dam would be located on the southern boundary of the Stage 3 landfill area, adjacent to the nature reserve. The basin has been designed to capture and treat all sediment-laden runoff during a 90th-percentile 5-day rainfall event, as recommended by Managing Urban Stormwater: Soils and Construction Volume 2B Waste Landfills (the Blue Book)." The Blue Book suggests the basin should be designed to capture all sediment laden runoff during a 95th-percentile 5-day rainfall event, because the receiving environment for the basin is Rawdon Creek Nature Reserve, an identified 'sensitive' receiving environment. Recommended Condition: The proposed sediment basin/fire-fighting storage dam for Stage 3 must be designed and constructed to capture all sediment-laden runoff during a 95th percentile 5-day rainfall event.	relevant. As noted in Section 6.3.3 of this RtS, the Stage 3 basin has been relocated and re-sized for the 95th percentile 5-day rainfall event, as recommended by the Blue Book. Section 7.4 of the Revised Concept Design Report (Appendix B of this RtS) describes the sediment basin design parameters and sizes. The recommended condition has been incorporated into the Amended Proposal concept designs and should no longer be considered necessary.	Appendix B of this RtS – Revised Concept Design Report
	The 'Total Basin Volume' figures for each of the Stage 1, Stage 2 and Stage 3 sediment basins in Table 16 on Page 29 of the 'Concept Design Report: Cairncross Waste Management Facility' ("the Concept Design Report") do not align with the detailed calculations that inform Table 16 in Appendix G of the Report. The Stage 1 sediment basin is 7,761 m^3 in Table 16 versus 7,807 m^3 in Appendix G, the Stage 2 basin is 6,254 m^3 in Table 16 as opposed to 5,884 m^3 in Appendix G, and the Stage 3 basin is 9,910m ^{3} versus 8,535 m^3 in Appendix G. It is unclear why this is the case. Request for further information: The EPA requests advice as to why the 'Total Basin Volume' figures for each of the stages 1, 2 and 3 sediment basins in Table 16 of the Concept Design Report differ from the detailed calculations for each sediment basin presented in Appendix G.	Section 6 of this RtS describes amendments that have been made to the Proposal based on submissions provided by government agencies and the community during the exhibition of the EIS, as part of design progression, and to provide additional clarity where relevant. Section 6.3.3 identifies a number of proposed changes to each of the sediment basin across the Amended Proposal Site. A Revised Concept Design Report (Appendix B of this RtS) has been prepared to reflect the proposed amendments to the Proposal. Section 7.4.3 of this report specifies the amended basin sizes for each basin based on the proposed landfill staging. The basin sizings presented in Appendix B of the EIS have therefore been superseded. The figures presented in Table 16 and Appendix G of the Revised Concept Design Report are consistent and represent the amended basin sizes.	Section 6 of this RtS - Amended Proposal Appendix B of this RtS – Revised Concept Design Report
	There does not appear to have been an analysis undertaken of the ability of the existing 'Sediment Basin D' to accommodate an expanding, disturbed catchment as Stage 1 operations progress (the so called "West Catchment" in Appendix H of the Concept Design Report, which is serviced	Section 6 of this RtS describes amendments that have been made to the Proposal based on submissions provided by government agencies and the community during the exhibition of the EIS, as part of design progression, and to provide additional clarity where relevant. Section 6.3.3 identifies a number of proposed changes to each of the sediment basins across the Amended Proposal Site,	Section 6 of this RtS - Amended Proposal Appendix B of this RtS – Revised

Topic	Issue	Response	Reference
	by Sediment Basin D, will increase in size during Stage 1 works). According to Table 1 'Existing Sediment Basin Details' in the Concept Design Report, Sediment Basin D has a surface area of 800 m^2. However, in the detailed water balance in Appendix H (Page 53), the "West" pond (Sediment Basin D) has an area of 850 m^2, which rises to 1,000 m^2 during Stage 1, suggesting Sediment Basin D will be enlarged to accommodate an increasing catchment area during Stage 1. The need to increase the size of Sediment Basin D is not explicitly stated in the EIS. Recommend condition: The EPA is concerned a "temporary batter of 1V:2H', which equates to a gradient of 50%, may not allow a sufficient depth of daily cover (150 millimetres of virgin excavated material) or intermediate cover (300 millimetres of VENM) to be reliably applied to waste during landfilling.	including increases to the capacity of the Existing Basin D (shown on Figure 6-2). As noted in Section 6.3.3 the Existing Basin D has been increased in size as part of the amendments to the Proposal to account for additional flows generated from an enlarged disturbed catchment, as Stage 1 works progress. The sizing for the basin has been increased to a total basin volume of 5,214 m^3, to capture the 90th percentile 5-day rainfall event as per the requested condition. Appendix G of the Revised Concept Design Report (Appendix B of this RtS) provides an assessment of the ability of Sediment Basin D to capture and treat all sediment-laden runoff from the relevant catchment during a 90th-percentile 5-day rainfall event.	Concept Design Report
Materials and landform			
Materials balance	Table 5-2 'Materials Balance Summary' on Page 50 of the EIS may overestimate the clay balances resulting from earthworks. The Materials Balance Summary assumes the depth of topsoil over stages 1, 2 and 3 is 300 millimetres, when the 'Hydrogeological Investigation of Proposed Cairncross Landfill' (GHD-Longmac Pty Ltd in 1998) revealed topsoil depths are 0.1 to 0.2 metres deep. This may have implications in terms of the amount of topsoil available for the revegetation layer of the final cap. The EPA's expectation is that the final cap will have a 200-millimetre topsoil layer to facilitate vegetation establishment and growth.	Due to the topography of the Amended Proposal Site the soil depths differ greatly across the site. The 'Hydrogeological Investigation of Proposed Cairncross Landfill (GHD-Longmac Pty Ltd in 1998) identified soil depths within the Stage E area only and was based on relatively few bore locations. Experience excavating Stage E, including construction of the existing large sediment basin (CS8A), indicates that the higher slopes of the Amended Proposal Site have a nominal 100-200mm of topsoil. This is consistent with the 1998 hydrogeological report. It is noted that Stage E has maintained sufficient cover to achieve a 200mm topsoil layer, despite the shallower depths on the higher slopes. Topsoil depths generally deepen further down the slopes with topsoil depths in the lower gullies having been found to be in excess of 900 - 1,000mm. For the purpose of the EIS an average depth of 300mm has been adopted over the Amended Proposal Site. This is likely to underestimate the actual topsoil depth across the majority of the site.	Section 5.10.3 of the EIS Appendix A of this RtS – Amended Proposal Description Appendix B of this RtS – Revised Concept Design Report

Topic	Issue	Response	Reference
		The EPA's (2016) *Environmental Guidelines - Solid Waste Landfills' Second Edition 2016* require a 200mm topsoil layer. As noted in Section 1.10.3 of the Amended Proposal Description (Appendix A of this RtS) a 300mm topsoil (upper) layer will be placed over the clay capping layer; exceeding the minimum 200 mm requirement. Given availability of existing topsoil and likely underestimation of topsoil depths across the Amended Proposal site, a 300 mm upper topsoil layer can easily be achieved. It is noted that a revised materials balance summary has been determined for the Amended Proposal as result of amendments made to the Proposal in response to submissions received and/or as a result of design progression. The revised materials balance summary is presented in Section 4.6 of the Revised Concept Design Report (Appendix B of this RtS).	
Batters	It is proposed the final landform will have the following characteristics: • Maximum finished landform slope of 1V:4H to allow maintenance (mowing) of finished surface after capping • Minimum finished landform slope of 1V:25H (4 percent grade) to ensure rainfall sheds from the surface and does not infiltrate the landfill • A temporary batter of 1V:2H will be used between stages to ensure leachate and waste is contained appropriately and to limit the use of excess fill." (Page 50 of the EIS) The first two slope criteria do not align with the recommendations in the Environmental Guidelines. The Environmental Guidelines recommend: • A maximum finished landform slope of 1V:5H (20 percent grade) to reduce the risk of erosion. • A minimum finished landform slope of 1V:20H (five per cent grade) to defined drainage points to facilitate runoff and minimise ponding of water.	Section 6 of this RtS summarises amendments made to the Proposal in response to submissions received and/or as a result of design progression. Amendments to final landform batters have been made to the concept design for the Amended Proposal (refer to Figure 6-7 of this RtS) to include the following slope criteria in accordance with the EPA's (2016) *Environmental Guidelines - Solid Waste Landfills' Second Edition 2016.* As noted in Section 1.1.5 of the Amended Proposal Description (Appendix A of this RtS) the amended proposed final slope criteria are: • A maximum finished landform slope of 1V:5H (20 percent grade) to reduce the risk of erosion. • A minimum finished landform slope of 1V:20H (five per cent grade) to defined drainage points to facilitate runoff and minimise ponding of water. • A temporary batter of 1V:2H will be used between stages to ensure leachate and waste is contained appropriately and to limit the use of excess fill. The recommended condition has been incorporated into the Amended Proposal concept designs and should no longer be considered necessary.	Section 6 of the RtS – Amended Proposal Section 8 of this RtS – Revised compilation of mitigation measures Appendix A of this RtS – Amended Proposal Description

Topic	Issue	Response	Reference
	Recommended condition: All final capping must be installed according to specifications in the Environmental Guidelines - Solid Waste Landfills, Second Edition 2016.		
	The EPA is concerned a "temporary batter of 1V:2H', which equates to a gradient of 50%, may not allow a sufficient depth of daily cover (150 millimetres of virgin excavated material) or intermediate cover (300 millimetres of VENM) to be reliably applied to waste during landfilling. All landfilled waste must be covered regularly during operations with a suitable material to minimise emissions of odour and dust, the generation of litter, the presence of scavengers and vermin, the risk of fire, the infiltration of rainwater into the waste (and therefore the amount of leachate generated) and the emission of landfill gas. Recommended condition: All landfilled waste must be covered according to specifications in the Environmental Guidelines - Solid Waste Landfills, Second Edition 2016.	Temporary batters are used at the edge of the landfill area. Clay bunds are used to create temporary batters, with typical thickness of 1.0m. Waste is then placed against the bund, upon which daily cover is placed. The temporary batter does not refer to the exposed waste tip face. Section 5.9.4 of the EIS (and Section 1.9.4 of the Amended Proposal Description – Appendix A of this RtS) outlines the landfill process and cover requirements. As noted in Section 5.9.4, and as required by the Guidelines, waste would be covered daily and at intermediate stages of operation to minimise odour, dust, litter, the presence of scavengers and vermin, the risk of fire, rainwater infiltration into the waste (and therefore the amount of leachate generated) and the emission of landfill gas. Daily cover would comprise natural site soils and material approved under the EPL, and would be applied at a minimum thickness of 150 millimetres. It is noted that the recommended condition, and the suitable application of daily cover, is currently already achieved as part of the Stage E operations and that PMHC is committed to the ongoing application of daily cover. The temporary batter slope of 1V:2H does not refer to the waste tip face and will not inhibit the ability to achieve appropriate daily cover. PMHC are committed to covering all landfill waste in accordance with the specifications in the Environmental Guidelines - Solid Waste Landfills, Second Edition 2016.	Section 5.9.4 of the EIS Appendix A of this RtS - Amended Proposal description

4.3 Office of Environment and Heritage

A formal submission comprising a letter (dated 26 March 2018) was received from OEH. Several comments were provided and responded to in Table 4-4.

Table 4-4 Response to Government Agency submission – OEH

Topic	Issue	Response	Reference
General			
EIS	The proposal involves an expansion of the existing Cairncross Landfill site which is operated by Port Macquarie-Hastings Council. The proposal is for a three-stage expansion with the waste management operations extending to 2056. An Environmental Impact Statement (EIS) has been prepared by Arcadis (dated November 2017). The subject site is Lot 1 DP 1202080, 8395 Pacific Highway, Telegraph Point. A majority of the area in the proposed Stage 1-3 expansion is a forestry plantation that was approved in October 2004 under the *NSW Plantations and Reafforestation Act 1999*. The approval permits council to manage the plantation in accordance with the Plantations and Reafforestation Code. Once plantation areas are cleared they can be withdrawn from plantation activities to facilitate expansion of the waste management facility. An assessment has been carried out in accordance with the Framework for Biodiversity Assessment (FBA) under the NSW Biodiversity Offsets Policy for Major Projects for an area of approximately 3.4 ha located in the east of the site. This is identified as the 'Development Site'. As the clearing of vegetation within the authorised plantation area has been approved, the impacts of clearing in plantation areas have not been included in the assessment.	Noted	N/A
Heritage impacts	Thank you for your email dated 13 February 2018 about the public exhibition of the State Significant Development (SSD) application for the Cairncross Waste Management Facility seeking comments from the Office of Environment and	Noted	N/A

Topic	Issue	Response	Reference
	Heritage (OEH). I appreciate the opportunity to provide input. We have reviewed the documents on exhibition and advise that, although we have no issues to raise about historic heritage or Aboriginal cultural heritage, the adequacy of the measures to address impacts on the adjoining Rawdon Creek Nature Reserve and the adequacy of the proposed koala corridor are discussed in detail in Attachment 1 to this letter.		
	The OEH has reviewed the EIS and particularly the Cairncross Landfill Expansion Port Macquarie - Hastings LGA, NSW Mid-North Coast Aboriginal and Non-Aboriginal Cultural Heritage Assessment prepared by Adise (Dec 2016) and provides the following comments for consideration in relation to Aboriginal cultural heritage. The OEH supports the four (4) management recommendations detailed in the above assessment report and notes they were developed in consultation with Aboriginal knowledge-holders. Provided the management measures to mitigate impacts on potential unexpected finds, as detailed in Section 8.10 and Table 8.51 (page 175), is included in the Operational Environmental Management Plan: Cairncross Waste Management Facility (PMHC, 2008) the OEH has no further concerns relating to Aboriginal cultural heritage matters. This will address the potential for unexpected Aboriginal objects to be encountered during construction.	Noted. Section 8 of this RtS provides a revised compilation of mitigation measures for the Amended Proposal. An additional mitigation measure (AB-04) has been included, committing that: *Operational procedures for responses to detection of unexpected, identified or suspected Aboriginal objects would be included in the update to the 2015 OEMP.*	Section 8 of this RtS – Revised compilation of mitigation measures
Biodiversity			
Biodiversity offset strategy (BOS)	1a) A BOS should be prepared to demonstrate how the required offsets will be provided in accordance with the Framework for Biodiversity Assessment. The BOS could either commit to the retirement of the required biodiversity credits, or demonstrate that the offset would be suitable (if an offset site is proposed to be established) and identify	Section 8.2.3 of the *Cairncross Landfill Expansion Environmental Impact Statement (2017)* identifies 3.4 Ha of native vegetation that contains habitat for threatened and migratory species that will be lost due to progressive clearing as part of the Amended Proposal. This area	Section 8 of the EIS Section 2 of this RtS – Exhibition and Consultation

Topic	Issue	Response	Reference
	any supplementary measures in consultation with the OEH. The BOS should also detail the timing of offset delivery. The Biodiversity Assessment Report (BAR) identifies 3.4 ha of native vegetation to be cleared as Blackbutt Grassy Forest. It states this provides habitat for several threatened fauna species, including Koala, Green-thighed Frog and threatened microbats, all of which were recorded on or adjacent to the site. Impacts to threatened fauna species habitat from the proposal would be offset in accordance with the requirements of the NSW Biodiversity Offsets Policy for Major Projects and assessed under the FBA. The BAR calculates the credits that are required to offset the impacts of the proposal as follows: • 221 ecosystem credits for Blackbutt - Pink Bloodwood shrubby open forest of the coastal lowlands of the NSW North Coast Bioregion. • 84 species credits for koala. • 248 species credits for green-thighed frog. • 3 species credits for Southern myotis. The BAR does not include a Biodiversity Offset Strategy (BOS), as required under Stage 3 of the FBA. This step is required to demonstrate how the offset requirements will be met and should include details on the timing and delivery mechanisms for the offsets. The BAR states that a biobanking agreement will be required to secure an offset site but does not identify where the site will be, what credits it will deliver and how it will be secured. Table 7-4 includes a mitigation measure that all offset land will be funded and managed in perpetuity under the council's Public Bushland Management Programme. 'If the offset is to be provided on council-owned land then the proposed offset area needs to be assessed as required in Stage 3 of the FBA to demonstrate that the number and type of biodiversity credits will be in accordance with the FBA. Even though Stage 3 of the Waste Facility will be developed	therefore will require securement of offsets under the *NSW Biodiversity Offsets Policy* for Major Projects. The 3.4 ha area of land lies within the Stage 3 boundary for development and is not likely to be cleared until approximately 2046 (Section 1.1 of the Amended Proposal Description - Appendix A of this RtS). Biodiversity offsets for this area will therefore be secured (through a biobanking agreement or equivalent) at a later stage, to coincide with the timing for the proposed clearing associated with the Amended Proposal. The offsets would be funded and managed in perpetuity under Council's Public Bushland Management Programme. As noted in Section 2 of this RtS, PMHC consulted with OEH regarding the requirements to prepare the BOS in July 2018. In response to this consultation a commitment to securing the required future offsets has been presented in a preliminary Biodiversity Offset Strategy (BOS) (provided in Appendix F of this RtS). The BOS outlines the potential alternative options for securing future offsets. It is noted that the recently enacted *Biodiversity Conservation Act 2016* now provides a different assessment method (the Biodiversity Assessment Methodology or BAM). Mitigation Measure (FF-03) has been amended and presented in Section 8 of this RtS to reflect this, committing that: *A biobanking agreement, or equivalent, would be established to secure an offset site in accordance with applicable legislation prior to clearing the 3.4 ha of native vegetation within the Stage 3 area. The offsets site would secure the ecosystem and species credit offset requirements outlined in Section 8.2.3, or equivalent requirements identified at the time of clearing. All offset land will be funded and managed in perpetuity under Councils Public Bushland Management Programme. Management actions would include, but not be limited to, the following:*	Section 8 of this RtS - Revised compilation of mitigation measures) Appendix A of this RtS - Amended Proposal Description Appendix F of this RtS - Draft Biodiversity Offset Strategy

Topic	Issue	Response	Reference
	as the final stage, the offset for this impact should be secured within a more immediate timeframe to ensure the offset can be achieved. OEH Recommendation 1. A Biodiversity Offset Strategy (BOS) should be prepared to demonstrate how the required offsets will be provided in accordance with the Framework for Biodiversity Assessment. The BOS could either commit to the retirement of the required biodiversity credits, or demonstrate that the offsets will be suitable (if an offset site is proposed to be established) and identify any supplementary measures in consultation with the OEH. The BOS should also detail the timing of offset delivery.	• *Identification of type and location of weeds of concern within the site* • *Identification of sensitive receivers (such as native vegetation and waterways) within or adjacent to the Proposal Site* • *Management and disposal of weeds (including declared noxious weeds) in accordance with requirements of the Noxious Weeds Act 1993.*	
Compensatory habitat	A compensatory habitat area of approximately 44 ha in size is located along the western edge of the site. This was an outcome of the original forestry agreement and it provides a potential habitat link between bushland to the north-west through the koala corridor to the NR. The compensatory habitat area has a management plan but is still zoned for a waste facility site (SP2 Special Infrastructure). Although it is noted that this is intended to be managed in perpetuity by council this zoning provides little long-term conservation security. OEH Recommendation 1. The proponent should consider securing the compensatory habitat area in the west of the site as shown in Figure 8-7 of the BAR, the 50m wide koala connectivity corridor and the 50m wide buffer to the Rawdon Creek Nature Reserve with a Biodiversity Stewardship Agreement under the *Biodiversity Conservation Act 201*6. Such an agreement could generate some or all of the biodiversity credits required to offset the impacts of the proposal. Alternatively, the proponent should commit to rezoning these areas to E2 Environmental Conservation as part of the next standard instrument amendment to provide greater long-term conservation security for these areas.	As noted in Section 8.2.3 of the EIS the proposed Koala connectivity corridor, as well as the compensatory habitat to the west (shown in Figure 8-7 of the EIS) are under Council's ownership and will be managed in perpetuity and rezoned for environmental protection. This commitment is reaffirmed in Section 8.2.4 of the EIS, and Section 8 of this RtS, as per mitigation measure FF-10: *The Koala connectivity corridor will be managed in perpetuity and rezoned for environmental protection with the next standard LEP instrument amendment by Council.* It is noted that the compensatory habitat to the west of the Amended Proposal site forms part of the existing operations and approval for the Cairncross WMF and does not form part of the Amended Proposal. Biodiversity offsets will be secured at a later stage, to coincide with the timing for the proposed clearing associated with the Amended Proposal. The potential offset value for the proposed Koala connectivity corridor and the buffer zone will be considered at this stage when suitable offsets are identified. As per mitigation measure FF-03 Council have committed that a*ll offset land will be funded and managed in perpetuity under Councils Public Bushland Management Programme.*	Section 8.2 of the EIS Section 8 of this RtS – Revised compilation of mitigation measures

Topic	Issue	Response	Reference
Vegetation Management Plan	2. Once recommendation 1 has been addressed, the following should be included as conditions of consent: a. An Environmental Management Plan, that includes a Vegetation Management Plan, should be prepared in consultation with the OEH that describes how the impacts arising from the operation of the waste management facility on the Rawdon Creek Nature Reserve will be managed and mitigated to address the OEH Guidelines for developments adjoining OEH land and water (http://www.environment.nsw.gov.au/topics/parks-reserves-and-protected-areas/ development-guidelines) and how the vegetated buffer will be managed. This could be required as a condition of consent. A koala connectivity corridor is proposed to be established to partially offset the impacts to koala habitat as identified in Figure 8-7 of the BAR. The corridor would be approximately 50m wide and would run along the southern boundary of the subject land. The BAR suggests the koala connectivity corridor will be managed to encourage use by native species, specifically koalas, as well as other species likely to impacted by the Proposal including Green-thighed Frog and several threatened microbats. The proposed koala corridor area appears to be within the existing blackbutt plantation according to the mapping available to the OEH and as described in Figure 2-1 of the EIS. The BAR suggests the koala corridor will be embellished with koala feed trees but gives no timing or other details for this work. The OEH considers trees and other native vegetation needs to be established in cleared areas in the short-term so that this area can provide adequate habitat for koalas when the adjoining blackbutt forest is cleared. It is noted the adjoining State Forest land has been logged and there is a high likelihood it will be logged again in the future. OEH Recommendation	Section 8 of this RtS provides a revised compilation of mitigation measures for the Amended Proposal. Within this section, the following mitigation measure (FF-11) has been added: *'A Vegetation Management Plan will be prepared in consultation with OEH and in accordance with the OEH Guidelines for development on adjoining land managed by the Office of Environment and Heritage (2013). The Vegetation Management Plan will include measures for the maintenance, management and revegetation of the Koala connectivity corridor and the setback area, including:* • *Clear objectives for management outcomes* • *A remediation and revegetation strategy* • *Management measures for existing plantation vegetation* • *Environmental and noxious weed management actions* • *Implementation strategies for the hollow replacement program* • *Vegetation management in accordance with the Cairncross Waste Management Facility Bush Fire and Fuel Management Plan* • *Roles, responsibilities and timing for implementation'* The VMP, once prepared, would be issued to OEH for review prior to finalisation. The preparation and implementation of this plan would promote facilitation of optimal conditions as efficiently as possible for movement of both koalas and other potential threatened species likely to occur in the area. The plan would also promote rehabilitation and remediation with the objective to optimise habitat complexity (i.e. not compromise the ecological integrity of existing vegetation while promoting connectivity).	Section 6 of the EIS Section 8 of this RtS - Revised compilation of mitigation measures

Topic	Issue	Response	Reference
	7. A vegetation management plan (VMP) should be prepared and implemented for the 50m wide koala connectivity corridor. This should include the following: a) A primary objective to create and maintain the area for native fauna habitat, particularly koalas b) A remediation and revegetation plan for currently degraded areas to establish native trees, shrubs and groundcovers within the first five years of the project approval c) Management measures for the existing plantation vegetation including allowing native understorey regeneration d) Environmental and noxious weed management actions e) Details on the hollow replacement mitigation measure (i.e. hollows to be replaced at 1:1 ratio to offset the impacts to 1 small hollow, 10 medium hollows and 5 large hollows) f) A description of any bushfire protection measures that will be required and how these will be achieved in accordance with the VMP objective g) A timeframe and schedule of actions with accountable parties for implementation of the VMP.		
	<u>OEH Recommendations</u> 3. An Environmental Management Plan, that includes a Vegetation Management Plan, should be prepared in consultation with the OEH that describes how the impacts arising from the operation of the waste management facility on the Rawdon Creek Nature Reserve will be managed and mitigated to address the OEH Guidelines for developments adjoining OEH land and water http://www.environment.nsw.gov.au/topics/parks-reserves-and-protected-areas/development-guidelines and how the		

Topic	Issue	Response	Reference
	vegetated buffer will be managed. This could be required as a condition of consent.		
Rawdon Creek Nature Reserve			
Buffer to Rawdon Creek Nature Reserve	1b) A 50 m wide vegetated buffer should be required between the boundary of the waste management facility footprint and the Rawdon Creek Nature Reserve. All infrastructure, including the Strategic Fire Advantage Zone, should be located outside this buffer. 1c) The Strategic Fire Advantage Zone in the vicinity of the south-eastern boundary of the subject land, including any fencing or fire trails, should be established outside the 50m wide vegetated buffer to the Rawdon Creek Nature Reserve, in consultation with the National Parks and Wildlife Service. The subject site adjoins the Rawdon Creek Nature Reserve (NR). Two watercourses flow through the site into Rawdon Creek and eventually the Hastings River through the NR. A Strategic Fire Advantage Zone (SFAZ) is proposed along the boundary adjacent to the adjoining nature reserve. The National Parks and Wildlife Service (NPWS) has reviewed the proposal and has raised issues about the lack of a buffer between the Stage 3 (final expansion) and the NR, insufficient details on the composition and management of the SFAZ, and the adequacy of measures to contain runoff into the NR. The impacts arising from the establishment and operation of a waste management facility, such as clearing, airborne litter, noise, vibration, runoff and lighting, may affect NR values and could also introduce weeds and increase access to the NR by feral animals To protect the values of the NR, a vegetated buffer should be provided between the NR and the development footprint to accept these impacts. Given the scale of the proposal and that it occurs upslope of the NR, the vegetated buffer should	Section 6 of this RtS describes amendments that have been made to the Proposal based on submissions provided by government agencies and the community during the exhibition of the EIS, as part of design progression, and to provide additional clarity where relevant. Amendments have been made to the concept design for the Amended Proposal (Refer to Figure 6-1 – 6-6 and Figure 6-8 of this RtS) to more clearly show the koala corridor as well as 24-metre wide vegetated SFAZ, which would buffer the Amended Proposal Site directly from the Nature Reserve. An additional 50-m wide vegetated buffer separating the SFAZ from the Rawdon Creek Nature Reserve was considered during the Concept Design Phase. Key consideration was given to optimising available landfill space in accordance with the strategic need for the Amended Proposal to necessitate PHMC's future waste disposal needs (refer to Section 3 and Appendix C of the EIS). The SFAZ would result in minimised impacts from the operation of the Amended Proposal on the adjoining Nature Reserve. Consideration for how the SFAZ and fire trail will adequately mitigate potential environmental impacts generated by the Amended Proposal is provided below: • **Visual:** The 30 metre-wide area would be maintained such that only understory canopy of the SFAZ would be cleared. This would maintain the visual amenity of the SFAZ area, and provide adequate screening of the Landfill site to recreational users of the Nature Reserve. • **Litter:** Regular maintenance of the SFAZ (to be outlined within the Vegetation Management Plan – refer to revised mitigation measure FF-11), and inspection of	Section 3 of the EIS Section 6 of this RtS – Amended Proposal Section 8 of this RtS – Revised compilation of mitigation measures Appendix C of the EIS – Future Disposal Capacity Requirements Report

Topic	Issue	Response	Reference
	be in the order of 50m wide. Weed and feral animal control programs may also be required. The OEH has prepared Guidelines for developments adjoining OEH land and water (http://www.environment.nsw.gov.au/topics/parks-reserves-and-protected-areas/development- guidelines) and these should be considered for this development. OEH Recommendations 2. A 50m wide vegetated buffer should be required between the boundary of the waste management facility footprint and the Rawdon Creek Nature Reserve. All infrastructure, including the Strategic Fire Advantage Zone, should be located outside this buffer.	fencing, would include removal of litter originating from the landfill site within this area. • **Weeds:** The risk of spread of pest and noxious weeds from the landfill site into the adjoining Nature Reserve would be minimised through regular maintenance of the SFAZ to be detailed within the Vegetation Management Plan (refer to mitigation measure FF-11) • **Fauna habitat:** Although some understorey vegetation clearing would be required within the SFAZ. This area would remain largely undisturbed and provide an additional area and connection for fauna species (particularly bird species) compared to areas proposed initially within the EIS. • **Water:** No surface discharges into the Nature Reserve are anticipated as part of the Amended Proposal. Surface water would be directed to one of the many operational sediment basins located around the Amended Proposal Ste, before naturally discharging via existing flow regimes. Release of tested, clean captured groundwater, as per methods described within the responses above would be undertaken downstream of the Amended Proposal Site. Ambient water monitoring would also be undertaken to ensure that water quality surrounding the Amended Proposal Site is not compromised as a result of the development. Details of this plan would be outlined within the Water Management Plan (refer to revised Mitigation Measure FF-11, Section 8 of this RtS). The width of the SFAZ is considered adequate to minimise impacts to the adjoining Nature Reserve. Provision of an additional vegetated buffer is not considered likely to increase the extent of mitigation potential. The inclusion of an additional 50 m buffer is therefore considered unnecessary. Further, it would directly inhibit the objectives of the Amended Proposal; to maximise landfill airspace. Calculations determined that the inclusion of an additional 50 m vegetated buffer would result in approximately 43,000 m^3 of lost landfill airspace. This would effectively reduce	

Topic	Issue	Response	Reference
		the operational capacity of the Amended Proposed landfill facility by 1-2 years. Within this context, it was concluded that the establishment and maintenance of the SFAZ and access trail (totalling 30 m in width) would provide sufficient separation distance and buffer from the Amended Proposal Site to the Nature Reserve.	
Fire and access trails	1d) Fencing and fire trail access in the vicinity of the southern boundary of the subject land should be located outside the 50m wide area to be retained and managed as a koala connectivity corridor.	Section 6 of this RtS summarises amendments made to the Proposal in response to submissions received and/or as a result of design progressions. Amendments have been made to the concept design for the Amended Proposal (refer to Figures 6-1 - 6-6 of this RtS) to more clearly show the koala corridor and associated infrastructure, including the perimeter fire access. As shown within Figures 6-1 - 6-6 of this RtS, external fire trails are located along the external perimeter of the Amended Proposal Site. This external perimeter runs outside of the koala corridor and Nature Reserve (i.e. extension road) (refer to Figure 6-8), which links to the internal fire access network between the SFAZ and koala corridor. The internal fire trail access road network and associated fencing is located inside of the koala corridor and SFAZ to the south of Stages 2 and 3 of the Amended Proposal (refer to Figure 6-8 for typical cross section). This is to prevent unauthorised entry and the movement of fauna into the landfill site, allow authorised vehicles access in and around the landfill site in the event of an emergency, while also maintaining open access for fauna into both the koala corridor and SFAZ area adjoining the Nature Reserve and State Forest. This arrangement is in accordance with Section 7.1.3 of the EIS.	Section 7 of the EIS Section 6 of this RtS – Amended Proposal
	The Bushfire Assessment states a 30m wide SFAZ will be provided and maintained along the south- eastern boundary with the adjoining NR as mapped in Figure 12 of the EIS. An existing fire trail will be upgraded and maintained to provide	Section 6 of this RtS summarises amendments made to the Proposal in response to submissions received and/or as a result of design progressions. Amendments have been made to the concept design for the Amended Proposal to	Section 6 of this RtS – Amended Proposal

Topic	Issue	Response	Reference
	an all-weather access having a width of 4m within a 6m corridor kept clear of shrubs and grasses. The Bushfire Assessment also identifies that an all-weather access along the southern boundary of the subject land (i.e. that adjoins the State Forest) will be provided. There is an existing fire trail (identified as Extension Road) along the southern boundary but it is not clear if this is on the subject site (as shown in Figure 12) as it appears to be on the adjoining State Forest land according to information available to the OEH. This should be confirmed by survey. For the south-eastern boundary, a chain wire fence is proposed along the boundary to the NR with the fire trail adjacent to the fence. The NPWS has advised it does not want to be in a position where it would be required to clear vegetation within the NR to either protect fence assets or defend the waste facility. The NPWS preference is for the SFAZ and associated fencing and fire trails to be wholly located on the waste facility site such that there is no requirement for clearing of the NR. <u>OEH Recommendations</u> 4. The Strategic Fire Advantage Zone in the vicinity of the south-eastern boundary of the subject land, including any fencing or fire trails, should be established outside the 50m wide vegetated buffer to the Rawdon Creek Nature Reserve, in consultation with the National Parks and Wildlife Service. 5. Fencing and fire trail access in the vicinity of the southern boundary of the subject land should be located outside the 50 m wide area to be retained and managed as a koala connectivity corridor.	more clearly show the koala corridor and associated infrastructure, including the perimeter fire access. As shown within Figure 6-6 of this RtS, external fire trails are located along the external perimeter of the Amended Proposal Site. This external perimeter runs outside of the koala corridor and Nature Reserve (i.e. extension road), which links to the internal fire access network between the SFAZ and koala corridor. The existing fire trail to the south is not located within the Amended Proposal Site, but rather is on the adjoining State Forest land. The existing external fire trails do not form part of the Amended Proposal. The internal fire trail access road network and associated fencing is located inside of the koala corridor and SFAZ to the south of Stages 2 and 3 of the Amended Proposal (refer to Figure 6-8).	
Sediment basin locations	1e) The proposed detention basins for Stage 2 and 3 should be located outside the 50m wide vegetated buffer to Rawdon Creek Nature Reserve, and outside the koala connectivity corridor. The EIS identifies the risks for water quality impacts on the sensitive receiving environments downstream including the	As noted above, Section 6 of this RtS describes amendments that have been made to the Proposal. Section 6.3.3 identifies a number of proposed changes to each of the sediment basins across the Amended Proposal Site. As noted in Section 6.3.3 of the EIS, the Stage 3 sediment basin has been relocated slightly to the north and west to	Section 6 of the EIS Section 6 of this RtS – Amended Proposal Section 8 of this RtS - Revised compilation of mitigation Measures

Topic	Issue	Response	Reference
	NR, Rawdon Creek and the Hastings River. A Stormwater Management Strategy is proposed which includes measures to minimise erosion, manage sedimentation and avoid surface water being contaminated by leachate. The OEH supports the recommendations for water quality monitoring including for leachates, groundwater and surface water. Nevertheless, the approval of OEH will be required if any discharge of stormwater into the NR is proposed. The Stage 2 and Stage 3 Concept Plans for the landfill layout and stages show detention basins within the koala connectivity corridor and hard up to the NR. These structures should all be located outside the 50m wide vegetated buffer to the NR and outside the koala connectivity corridor. The Plan refers to a future sewage treatment plant next to the NR that will be part of a separate approval. No further details have been provided and it is expected this will be referred to the OEH for comment at a future date. However, the OEH reiterates its advice that a buffer needs to be provided between proposed development areas and the NR. <u>OEH Recommendation</u> 6. The proposed detention basins for Stages 2 and 3 should be located outside the 50m wide vegetated buffer to the Rawdon Creek Nature Reserve, and outside the koala connectivity corridor.	ensure it is located outside the Strategic Fire Advantage Zone (refer Figure 6-5 to Figure 6-6 of this RtS); which would act as a vegetated buffer between the Stage 3 cell and the Rawdon Creek Nature Reserve. The Stage 2 sediment basin is located outside the koala connectivity corridor, with the boundary fencing and access/fire trail located between the basin and the koala corridor. It is noted however that the Stage 2 sediment basin will likely need to encroach into the koala corridor by 30 m, over a length of approximately 140 m. It has been identified that this effect would create a localised 'squeeze point' within the corridor. It is however expected that the remaining 20 m would provide sufficient area for fauna movement, for the following reasons: • The portion of corridor that would be narrowed under the Amended Proposal would be limited to areas bordering the sediment basin. This basin would naturally provide an additional buffer to the corridor from potential impacts associated with active landfill activities, including noise and vibration, litter migration, light spill, odour and the introduction of weeds. • The extent of narrowing is considered to be minor (30 m reduction over a 140 m span), and the remaining corridor area would be subject to ongoing management within the Vegetation Management Plan (refer to Mitigation Measure FF.11). • The koala corridor is unfenced on the southern side, and the Extension Road is a forest track that rarely has traffic. While this road has no vegetation, this track could be used if necessary, thereby effectively reducing the 'squeeze point' generated through presence of the basin. It is also noted that this sediment basin will decrease in size over time and will be removed following rehabilitation of the landfill. The sediment basin sizing can potentially be refined to extend the width of the koala corridor post-closure (i.e. once Stage 2 is rehabilitated).	

Topic	Issue	Response	Reference
		The STP, identified as proposed to be located adjacent to the Nature Reserve, is subject to a separate assessment process and does not form part of the Amended Proposal. Through consultation with the developers of the STP it is understood that it is on schedule for development, and is anticipated to commence construction within the next 12 months.	

4.4 Rural Fire Service

A formal submission comprising a letter (dated 7 March 2018) was received from RFS. Several comments were provided and responded to in Table 4-5.

Table 4-5 Response to Government Agency submission – RFS

Topic	Issue	Response	Reference
Bushfire management	The NSW RFS, based on the information submitted, cannot provide suitable recommendations for any approval. The exhibited Environmental Impact Assessment recommendations do not appear to align to the submitted Bushfire report recommendations.	Section 6 of the Bushfire Assessment Report (Appendix Q of the EIS) describes the recommended protection measures to be implemented to reduce the bushfire risk to the Amended Proposal. Section 5.2.4 of the EIS (and Section 1.2.4 of the Amended Proposal Description – Appendix A of this RtS) and Section 8.13.3 outline the protection measures proposed to be incorporated into the built form and operation of the landfill. Design refinement and site optimisation undertaken as part of this RtS has led to a clearer delineation of the proposed elements within the Amended Proposal concept designs (described and shown in Section 6.3 of this RtS) to ensure appropriate incorporation of the proposed bushfire mitigation measures. The clearer delineation of proposed bushfire mitigation measures has resulted in a minor change to the layout of Stage 3 to adequately incorporate the proposed Strategic Fire Advantage Zone (SFAZ), as well as other minor layout changes across the Amended Proposal Site. Section 6 of this RtS summarises the amendments made to the Proposal in response to submissions received and/or as a result of design progression. Amendments have been made to the concept designs for the Amended Proposal (shown in Figure 6-1 to Figure 6-6) to more clearly show the proposed bushfire management features, including: • The Strategic Fire Advantage Zone (SFAZ) • External (perimeter) fire access trails • Internal access / fire trails • Relocated firefighting storage dam. In addition to the incorporation of the above features within the Amended Proposal concept designs, Section 8 of this RtS provides a revised compilation of mitigation measures for the Amended Proposal. An updated mitigation measure (HR-11) has been included committing that: *The Cairncross Waste Management Facility Bush Fire and Fuel Management Plan (2001) will be updated to include the proposed bush fire mitigation measures for the Amended Proposal (HR-04 to HR-11), with consideration of the progressive development of the site.* The provision of the above items is aligned with, and will ensure the implementation of, the bushfire management measures recommended within Section 6 of the Bushfire Assessment	Section 5.2.4 and 8.13.3 of the EIS Appendix Q of the EIS - Bushfire Assessment Report Section 6 of this RtS – Amended Proposal Section 8 of this RtS – Revised compilation of mitigation measures Appendix A of this RtS – Amended Proposal Description

<table>
<tr><th>Topic</th><th>Issue</th><th>Response</th><th>Reference</th></tr>
<tr><td></td><td></td><td>Report (Appendix Q of the EIS). A summary of how each recommendation within Appendix Q of the EIS has been applied to the Amended Proposal is provided in the table below.
<table>
<tr><th>Recommended Measure</th><th>How addressed</th></tr>
<tr><td>6.1 Provision of Defendable Space to the Leachate Tanks
A 20 metre wide Defendable Space shall be provided to each Leachate Tank.
The Defendable Space shall be maintained by regular slashing to limit vegetation [grass] height to 150 mm during the Bushfire Danger Period.</td><td>The Stage 2 leachate tanks (refer Figure 6-3) would be adjacent to the 50 m wide koala corridor. Management of the koala connectivity corridor and setback area will be undertaken in accordance with the Cairncross Waste Management Facility Bush Fire and Fuel Management Plan (refer mitigation measure FF-11 in Section 8 of this RtS).
The Stage 3 leachate tank (refer Figure 6-5) is adjacent to the 30 m wide SFAZ. As such appropriate allowance of Defendable Space has been allowed for.
Mitigation measure HR-04 (refer Section 8 of this RtS) commits that:
Defendable Spaces would be maintained by regular slashing to limit vegetation (grass) height to 150 mm during the Bushfire Danger Period.</td></tr>
<tr><td>6.2 Provision of SFAZ adjacent to the south east boundary of the Landfill
A 30 metre wide Strategic Fire Advantage Zone shall be provided and maintained along the boundary with the adjoining Nature Reserve.
This zone shall be managed in accordance with the prescriptions provided by the NSW Rural Fire Service’s ‘Environmental Assessment Code 2006’.</td><td>Figure 6-1 to Figure 6-6 of this RtS show the location and dimension of the proposed SFAZ.
Mitigation measure HR-05 (refer Section 8 of this RtS) commits that:
The Strategic Fire Advantage Zone adjacent to the adjoining nature reserve would be provided and maintained along the boundary. This zone would be managed in accordance with the prescriptions provided by the NSW Rural Fire Service’s ‘Environmental Assessment Code 2006’.</td></tr>
</table></td><td></td></tr>
</table>

Topic	Issue	Response		Reference
		6.3 Provision of temporary fire break to landfill cells. A 10 metre wide temporary cleared fire break shall be provided to the outer edge of the incremental landfill cells.	The koala corridor and the SFAZ will be implemented from the commencement of the Amended Proposal providing a permanent 50 m fire break to the south and 30 m fire break to the south-east.	
		6.4 Management of the residual vegetation with the Stage 1, 2 & 3 Landfill precincts.	Mitigation measure HR-06 (refer Section 8 of this RtS) commits that: *The forest vegetation retained within each landfill stage, being the residual vegetation beyond the operating cell, would be fuel managed by hazard reduction burning in accordance with the prescriptions provided by the NSW Rural Fire Service's 'Environmental Assessment Code 2006'.* *Management of the combustible fuels would be undertaken to maintain a Low – Moderate Overall Fuel Hazard, pursuant to the DSE Overall Fuel Hazard Guide.*	
		6.5 Management of the risk of fire ignition with the landfill operation: • The Landfill facilities such as Water Tankers and heavy earth moving plant shall be maintained on 'stand-by' readiness during days of Total Fire Ban status. • Work practices shall be established in recognition of the likely risk of ignition of the vegetation on the adjoining land and the vegetation retained on site by the operation of machinery such as slashers etc. • These should include the provision of potable fire extinguishers during	Mitigation measure HR-07 (refer Section 8 of this RtS) commits that: *The Landfill plant and equipment such as Water Tankers and heavy earth moving plant would be maintained on 'stand-by' readiness during days of Total Fire Ban status.* Mitigation measure HR-08 (refer Section 8 of this RtS) commits that: *Work practices would be established in recognition of the likely risk of ignition of the vegetation on the adjoining land by the operation of machinery such as slashers etc. These would include the provision of portable fire extinguishers during maintenance*	

Topic	Issue	Response		Reference
		maintenance activities that involve cutting, grinding, welding and slashing	*activities that involve cutting, grinding, welding and slashing etc.* Mitigation measure HR-09 (refer Section 8 of this RtS) commits that: *To mitigate the risk of ignition of the surrounding vegetation, contractors undertaking drilling, cutting, grinding, welding and slashing operations on the site would not undertake such works without the provision of a portable fire extinguisher.*	
		6.6 Access • The existing fire trail adjacent to the south-eastern boundary shall be upgraded and maintained to provide an all-weather access, having a width of four-metres within a six-metre corridor kept clear of shrubs and grasses. The trail would be located within the Strategic Fire Advantage Zone and shall be constructed to provide access for a fully laden 15 tonne [GVM] Rural Fire Service/State Forests Category 1 Tanker • The existing Fire Trail to the west of Stage 1 & 2 and between Stages 2 & 3 shall be retained and maintained to provide an all-weather access for a fully laden 15 tonne [GVM] Rural Fire Service/State Forests Category 1 Tanker • There would be provided to the perimeter of each incremental landfill cell a temporary fire trail which connects to the existing/proposed perimeter/internal fire trail network. The temporary trail would be capable of carrying a fully laden NSW Rural Fire Service/State Forests Category 1 Tanker.	The proposed access trails are described in Section 6.3.2 of this RtS and comply with the recommended access requirements. Access trails have been included in the Amended Proposal concept designs and are shown on Figure 6-1 to Figure 6-6.	

Topic	Issue	Response		Reference
		6.7 Provision of Portable Fire Fighting Equipment To mitigate the risk of ignition of the surrounding vegetation, contractors undertaking drilling, cutting, grinding, welding and slashing operations on the site shall not undertake such works without the provision of a potable fire extinguisher.	Mitigation measure HR-09 (refer Section 8 of this RtS) commits that: *To mitigate the risk of ignition of the surrounding vegetation, contractors undertaking drilling, cutting, grinding, welding and slashing operations on the site would not undertake such works without the provision of a portable fire extinguisher.*	
		6.8 Works on Total Fire Ban Days Contractors should not undertake drilling, cutting, grinding, welding and slashing operations on Total Fire Ban days – unless during an emergency in which case a firefighting appliance should be on stand-by at the facility	Mitigation measure HR-12 (refer Section 8 of this RtS) commits that: *Contractors will not undertake drilling, cutting, grinding, welding and slashing operations on Total Fire Ban days – unless during an emergency.*	
		6.9 Firefighting Water Supplies The volume of the existing fire-fighting water storage dam is approximately 3000 m^3. This storage dam will remain in its current location during Stage 1 and 2, being relocated to the eastern side of Stage 3 prior to the commencement of landfilling in the Stage 3 area. This volume satisfies the fire-fighting water supply requirements	As noted in Section 5.2.3 of the EIS (and Section 1.2.3 of the Amended Proposal description – Appendix A of this RtS) The volume of the existing fire-fighting water storage dam is approximately 3000m^3. This storage dam would remain in its current location during Stage 1 and 2, being relocated to the eastern side of Stage 3 prior to the commencement of landfilling in the Stage 3 area. Section 6.3.3 of this RtS describes the amended basin volumes for the Amended Proposal. For Stage 3 the final fire-fighting storage basin volume would be approximately 3,800 m^3.	
		6.10 Ongoing Fire Management For the purpose of fuel reduction from hazard reduction burning, the following should be part of the ongoing management:	Mitigation measure HR-10 (refer Section 8 of this RtS) commits that:	

Topic	Issue	Response		Reference
		• All perimeter trails clear and maintained • Internal trails maintained to allow for mosaic burning • Asset Protection Zones/Defendable Spaces to be constructed and maintained around infrastructure • Provide and maintain temporary fire trails, Asset Protection • Zones/Defendable Spaces adjacent to each stage.	*For the purpose of fuel reduction from hazard reduction burning, the following should be part of the ongoing management:* • *All perimeter trails clear and maintained;* • *Internal trails maintained to allow for mosaic burning;* • *Asset Protection Zones/Defendable Spaces to be constructed and maintained around infrastructure;* • *Provide and maintain temporary fire trails, Asset Protection Zones/Defendable Spaces adjacent to each stage.*	
	The NSW RFS requires the proponent to submit a draft Fire Management Plan (FMP) for the land. The FMP shall incorporate the proposed bush fire mitigation treatments, as recommended in the submitted Bush Fire report and the on-site fire management strategy, as proposed in the Operations Environmental Management Plan. The FMP shall also address the proposed progressive development of the site, to ensure fire mitigation treatments are implemented at each development stage of the landfill cells.	The Cairncross WMF is currently already subject to the *Cairncross Waste Management Facility Bush Fire and Fuel Management Plan* (PMHC, 2001). The Plan prescribes actions for the management of bushfire risk for the Cairncross MWF inducing: • Fuel management • Access • Fire protection zones • Water supply • Emergency contacts. Section 8 of this RtS provides a revised compilation of mitigation measures for the Amended Proposal. An updated mitigation measures (HR-11) has been included committing that: *The Cairncross Waste Management Facility Bush Fire and Fuel Management Plan (2001) will be updated to include the proposed bush fire mitigation measures for the Amended Proposal (HR-04 to HR-10), with consideration of the progressive development of the site.* PMHC will update the *Cairncross Waste Management Facility Bush Fire and Fuel Management Plan* in consultation with the NSW RFS. It is noted that the Plan will address the proposed progressive development of the site, to ensure fire mitigation treatments are implemented at each development stage of the landfill cells.		Section 8 of this RtS – Revised compilation of mitigation measures Appendix Q of the EIS - Bushfire Assessment Report

5 RESPONSE TO COMMUNITY SUBMISSIONS

This section provides a summary of the submission raised by a community member. The submission has been provided and responded to within Table 5-1.

Table 5-1 Response to community submission

Topic	Issue	Response	Reference
Noise	I am making this submission as a neighbour of the Cairncross Waste Management Facility. My farm and home are located approximately 2.5km from the facility in a direct line. In my experience I can attest that the facility has been well run and has had limited detrimental impacts on myself or our local community. I can see no reason to deny the development approval. I would like to request three issues to be considered. 1) From time to time we can hear the reversing warning beacons from mobile plant operating at the facility. Without measuring the sound level I am confident that it is most likely below EPA requirements. However given that the noise is irregular- that is the beacon cycles between sound and silence every second or so, and that the background noise here is rural, It is somewhat of a minor disturbance. I appreciate the need for these warning beacons, but ask that when replacing beacons or plant could consideration be made to installing warning beacons from which the noise is less likely to travel this far or is more continuous in nature.	Noise impacts from the Amended Proposal have been assessed in section 8.7 of the EIS and the Noise Impact Assessment (Appendix I of the EIS). The assessment considered the potential for noise impacts on a number of residential receivers within close proximity (the closets being at a distance of 850m) to the Amended Proposal Site. The impact assessment concluded that noise levels from day-to-day operational activities within the Amended Proposal Site are predicted to comply with the established criterion at all nearby residential receivers. In accordance with the *Vehicle Standard (Australian Design Rule 42/04 – General Safety Requirements) 2005* some vehicle types are required to be fitted with reversing alarms. Notwithstanding this and the results of the noise impact assessment, section 8.7.3 of the EIS (and Section 8 of this RtS) commit to a number of proposed mitigation measures to further reduce noise emissions, including (N-01): *Implement requirements for on-going maintenance of fixed and mobile plant in accordance with manufacturers specifications, ensuring silencers are fitted where reasonably practicable and considering replacing tonal reversing alarms with broadband devices on all site-owned plant.*	Section 8.7 of the EIS Appendix I of the EIS - Noise Impact Assessment Section 8 of this RtS – Revised compilation of mitigation measures
Odour	2) From time to time we have detected odours from the site, often after rain events. We inquired once and were told the odour actually came from a tea tree plantation to the east of the facility. I remain unconvinced as the odour I smell at home is the same as I smell on site when delivering material, yet I do not smell it on approach or over closer to the Ti-tree farm. I cannot confirm the exact source, but suspect the most likely to be the stockpiles of green waste material or composted material. I would like to see the facility to be more accountable for odours and more proactive in ensuring best practice management of them.	Air quality impacts, including odour impacts, have been assessed in section 8.6 of the EIS and the Air Quality and Odour Impact Assessment (Appendix K of the EIS). The assessment considered the potential for odour impacts on a number of residential receivers within close proximity (the closest being at a distance of 850m) to the Amended Proposal Site. Section 8.6.1 of the EIS acknowledges that the most significant potential odour sources in the vicinity of the sensitive receptors are the existing activities at the Cairncross WMF. The existing OEMP details the Complaints Register in place for the Cairncross WMF used to register and manage complaints and feedback received to ensure that any concerns raised by the public	Section 8.6 of the EIS Appendix K of the EIS - Air Quality and Odour Impact Assessment Section 8 of this RtS – Revised compilation of mitigation measures

Topic	Issue	Response	Reference
		are promptly and effectively addressed. Existing odour levels at sensitive receptors are understood to be negligible, as during site visits no sources of offensive or nuisance odours were detected at sensitive receptors and Cairncross WMF has no history of odour complaints. The odour impact assessment for the Amended Proposal found that the predicted 99th percentile odour concentrations comply with the impact assessment criteria at all sensitive receptors. As noted in Section 8.6.3 of the EIS (and Section 8 of this RtS) the complaints register will be updated for the Amended Proposal for the future landfill stages, including maintenance of the existing Complaints Register.	
Other	3) This item does not relate to the operation of the facility, but is a request for added benefits to the Pembrooke and neighbouring communities. Access to the facility is currently off Telegraph Point Rd (Ex Pacific Hwy). From the rear of the tip site at Pembrooke Rd this is approximately a 6.8km journey for any vehicle travelling to the facility via Pembrooke Rd (and from Reid's Rd). A short extension of the facility access rd around the perimeter of the site (approx. 1km) would reduce this travelling distance by 5.8km. Further to this if the gates at the facility access Rd were moved from the intersection with Telegraph Point Rd back to the weighbridge at the site entry this road could then be used by residents to travel into Port Macquarie, removing the need to travel 2 long sides of a triangle via Telegraph Point with a resultant reduction in trip distance of approximately 3km.	This suggestion has been noted by PMHC, however is outside the scope of the Amended Proposal.	N/A

6 AMENDED PROPOSAL

The Proposal involves the extension of the Cairncross Landfill to cover the remaining area identified for landfilling. Amendments are now proposed to the Proposal based on submissions provided by government agencies and the community, as part of design progression, and to provide additional clarity where relevant.

Further detail on the amendments to the Proposal has been provided to supplement the Proposal description as provided in the EIS. These amendments represent an addendum to that Proposal description and together form the Amended Proposal. Approval is sought for the Amended Proposal, in accordance with Part 4, Division 4.7 of the EP&A Act.

This section of the RtS provides a description of the amendments to the Proposal and associated changes to the form of the Proposal. Where no amendment has been made to the Proposal there has been no further discussion within this RtS. This section also provides additional clarity on items included in the original Proposal, but where additional information has been requested during the exhibition period of the EIS.

An assessment of the potential environmental impacts of the Amended Proposal based on the detail provided below, is included within Section 7 of this RtS.

A consolidated description of the Amended Proposal, including the Proposal (as presented in the EIS) and taking into consideration amendments to the Proposal (as detailed in this section) is provided in Appendix A.

6.1 Overview of the amendments

Amendments to the Proposal, for which approval is sought as part of the Amended Proposal include:

1. **Revision to final landform slopes**: The Proposal originally retained the same final landform slope criteria as the existing landfill cells (Stage E) for site management. These criteria have been slightly revised, to align in accordance with EPA's (2016) *Environmental Guidelines - Solid Waste Landfills' Second Edition*.
2. **Inclusion of bushfire protection measures:** The Amended Proposal includes spatial consideration of permanent and physical bushfire management measures within the design, as recommended within Section 6 of the Bushfire Assessment Report (Appendix Q of the EIS).
3. **Revision to sediment basin volumes and layout**: Changes from what was proposed in the EIS to the location and size of several sediment basins is proposed as part the Amended Proposal, resulting from changes to revised final landform conditions, and opportunities to optimise land to incorporate bushfire protection measures.
4. **Revision to the site groundwater management strategy:** A review of potential impacts resulting from maximum groundwater head conditions, where the surface of the aquifer Is above ground surface, has informed a revised strategy to groundwater management for the Amended Proposal consisting of a base groundwater underdrainage collection system.

Justification for the abovementioned amendments is provided in the following section.

6.2 Justification

Strategic justification for the Proposal is presented in Section 3 of the EIS. This section provides an update to that analysis in the context of the Amended Proposal.

The amendments to the Proposal described and assessed in this RtS:

- Are in response to the submissions received and consultation undertaken regarding the Proposal, and/or
- Are a result of design progression which recognises opportunities to optimise the operation of the facility whilst minimising environmental impacts.

The specific need for each of the amendments to the Proposal is discussed in Table 6-1 below.

Table 6-1 Justification for the amendments to the Proposal

Amendment to the Proposal	Justification
Final Landform Batter Slopes	The Proposal initially adopted the final landform slope criteria proposed within the *Cairncross Waste Management Facility Landfill Environment Management Plan (LEMP) (2001)*, as this document presented criteria for the existing landfill area. It was therefore originally proposed to maintain a similar landscape profile and management methods to the existing LEMP. Agency submissions raised concerns with respect to final landform slopes and compliance with the most up to date environmental guidelines. The batter slopes for the finished landforms have therefore been revised to comply with EPA's (2016) *Environmental Guidelines - Solid Waste Landfills' Second Edition*.
Bushfire Protection Measures	Agency submissions received during the EIS exhibition period outlined concerns that bushfire mitigation and protection recommendations made within the Bushfire Assessment Report (EIS, Appendix Q) were not adequately reflected within the Proposal design or bushfire mitigation measures for the Proposal. A review of bushfire protection measures has therefore resulted in the integration of additional permanent bushfire protection measures into the Amended Proposal design.
Sedimentation basin location and volumes	Initial sediment basin dimensions and locations were based on catchment boundaries, site features and perceived final landform flow regimes at the time of writing the EIS. A refined understanding of these factors, resulting from both submissions provided by government agencies and design progression/optimisation, has led to changes in sediment basin configuration and size. Justification of individual basins are as follows: • Existing Basin (Basin D): The volume of this basin has been increased to account for additional flows generated from an enlarged disturbed catchment, as Stage 1 works progress. • Stage 1 Basin (Basin A): The volume of this basin has been adjusted to reflect minor changes to final landform slope conditions. • Stage 2 Basin: The volume of this basin has been adjusted to reflect minor changes to final landform slope conditions, and

Amendment to the Proposal	Justification
	to optimise land used for the koala habitat corridor to the south of the Stage 2 landfill cell. • Stage 3 Basin (and new fire-fighting storage basin): The basin has been re-sized for the 95th percentile 5-day rainfall event, following a review of receiving conditions. The location of this basin has been relocated slightly to the west to account for the fire access trail and setback area.
Groundwater Management Strategy	Agency submissions received during the EIS exhibition period identified potential concerns with the proposed groundwater management measures presented in the EIS; namely the installation of a gravel trench to be installed along the western boundary of Stage 1 and Stage 2 and southern boundary of Stage 2. Subsequent investigation has determined that the installation of a groundwater trench may not adequately mitigate potential impacts generated by upward hydrostatic pressure during the maximum potentiometric head conditions. Consequently, the Amended Proposal provides an alternate conceptual design for groundwater underdrainage and collection from that originally proposed in the EIS in the form of an underdrainage collection / control layer

6.3 Amendments to the Proposal

The amendments to the Proposal are detailed in Section 6.3.1 to Section 6.3.4 below. Revised Amended Proposal Concept Designs are shown in Figure 6-1 to Figure 6-6 and provided in Appendix B to this RtS. Further environmental assessment has been undertaken to determine the environmental impact of these amendments as detailed in Section 7 of this RtS.

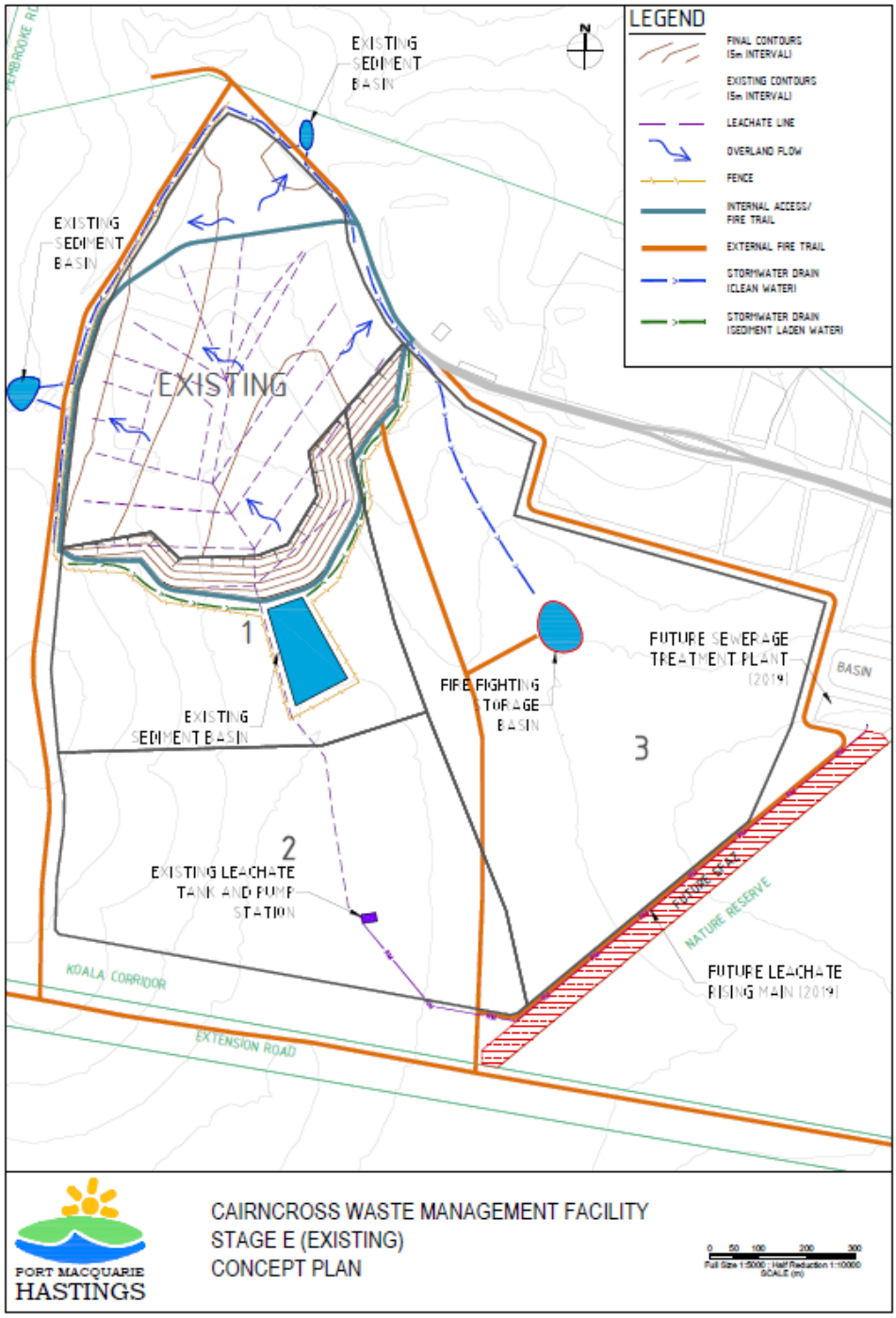


Figure 6-1 Stage E (existing) layout

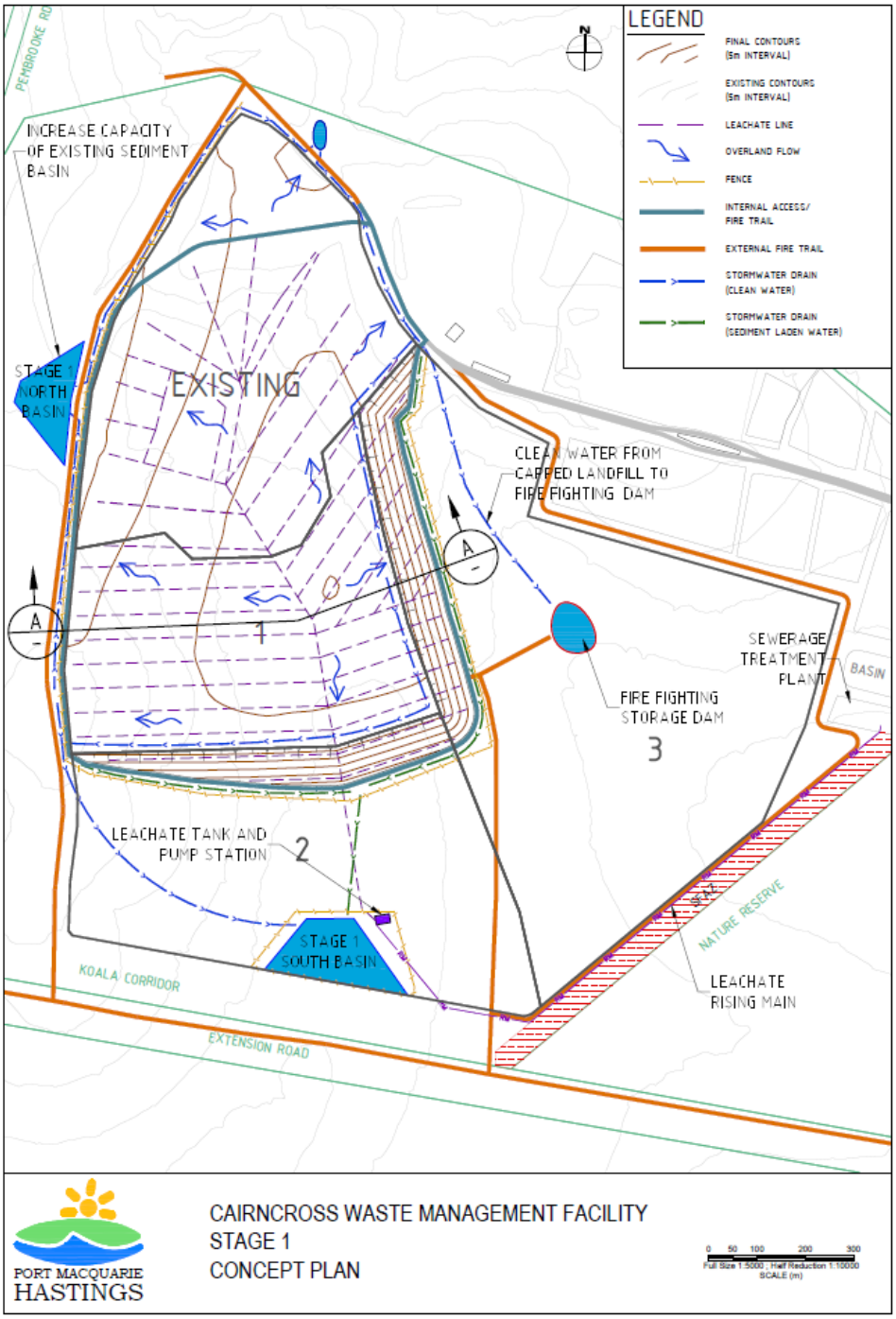


Figure 6-2 Amended Proposal layout Stage 1

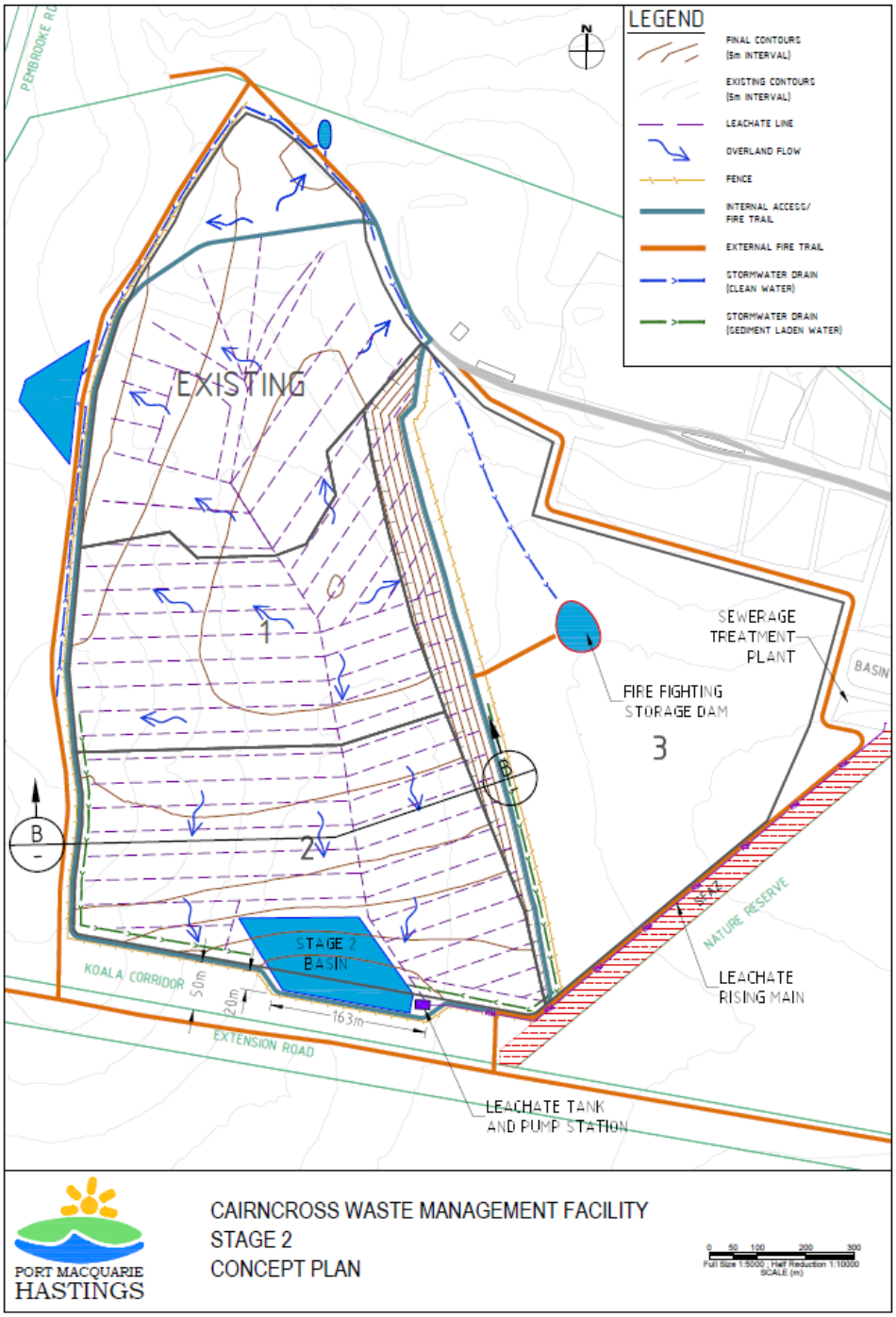


Figure 6-3 Amended Proposal layout Stage 2

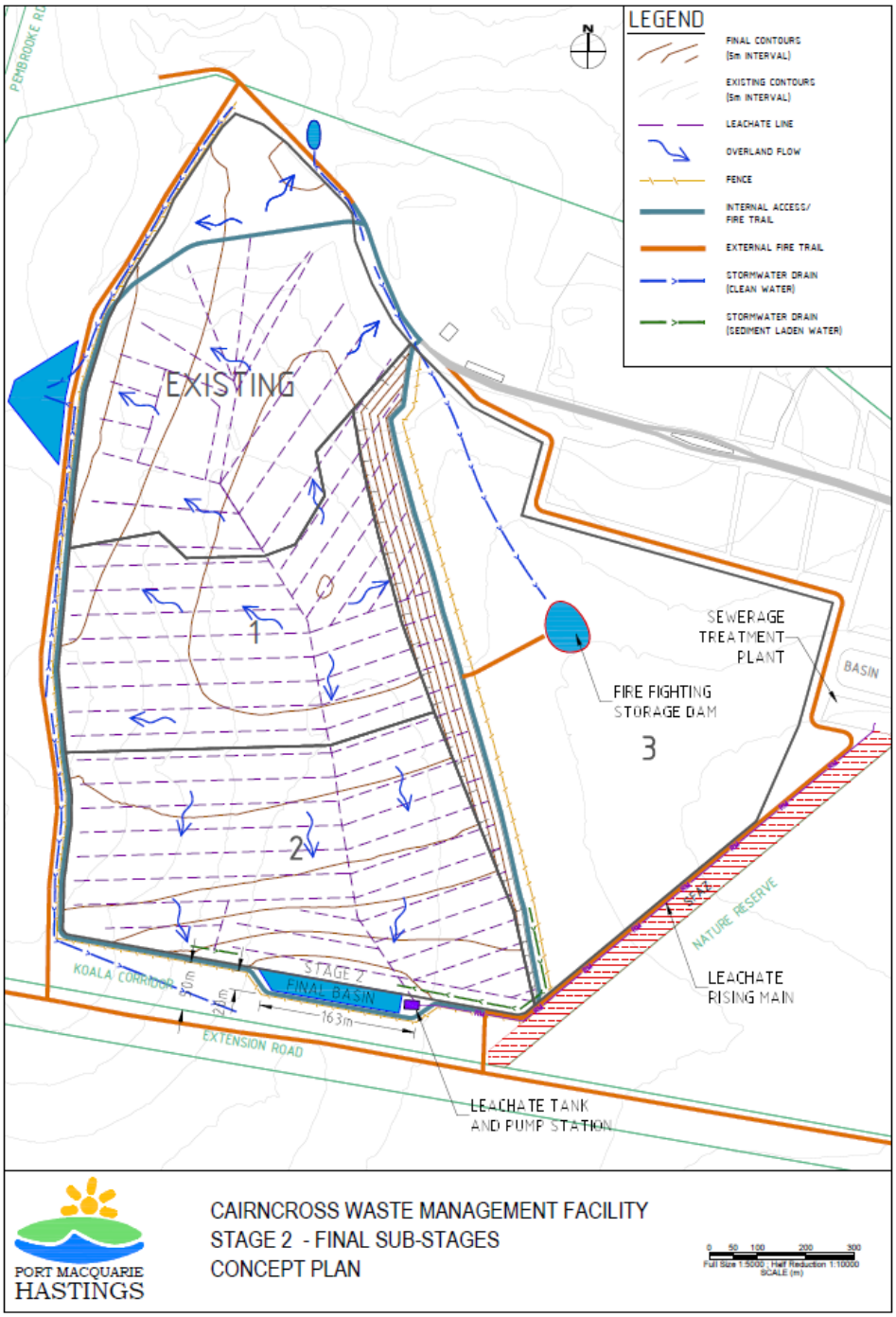


Figure 6-4 Amended Proposal layout Stage 2 Final Sub-Stages

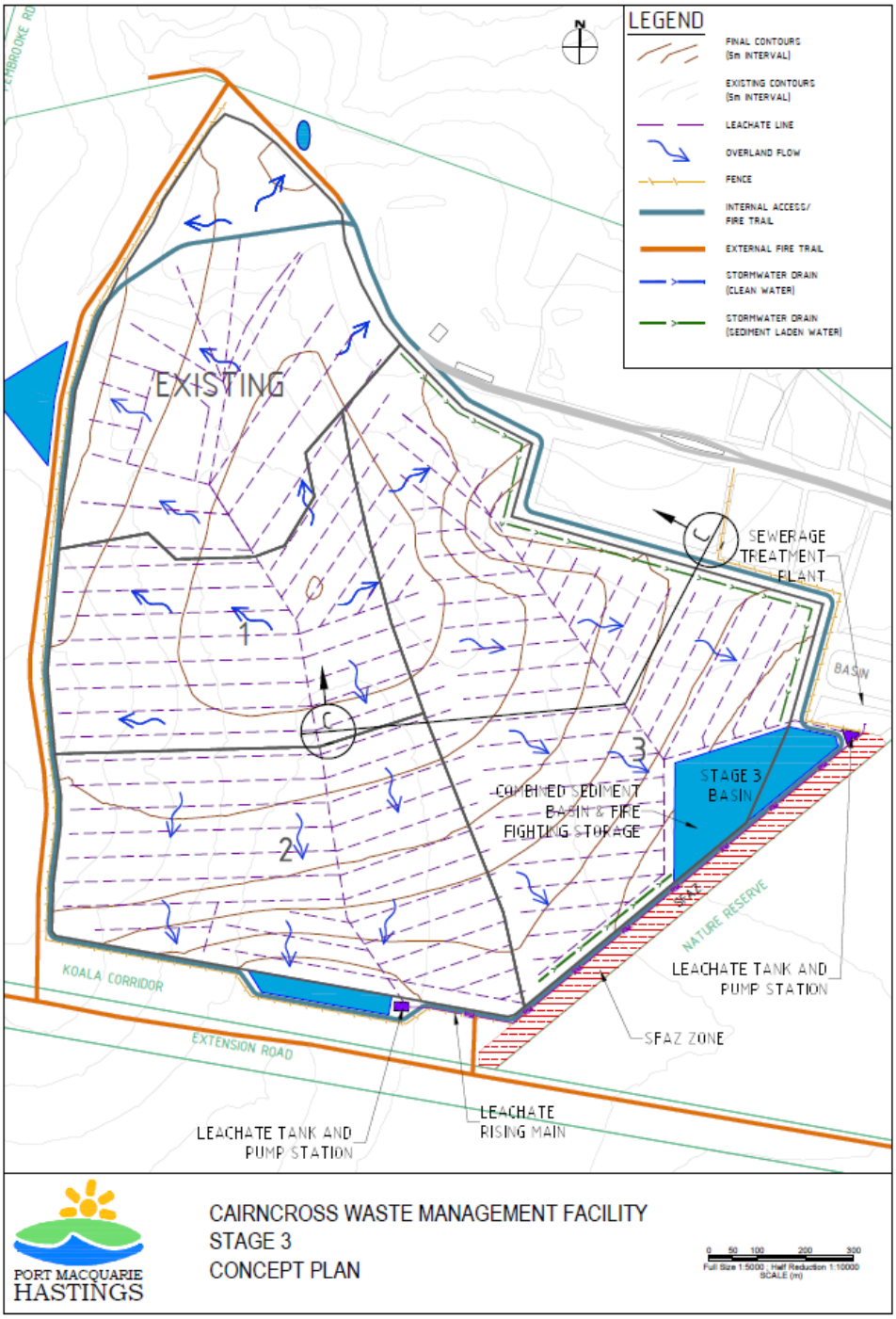


Figure 6-5 Amended Proposal layout Stage 3

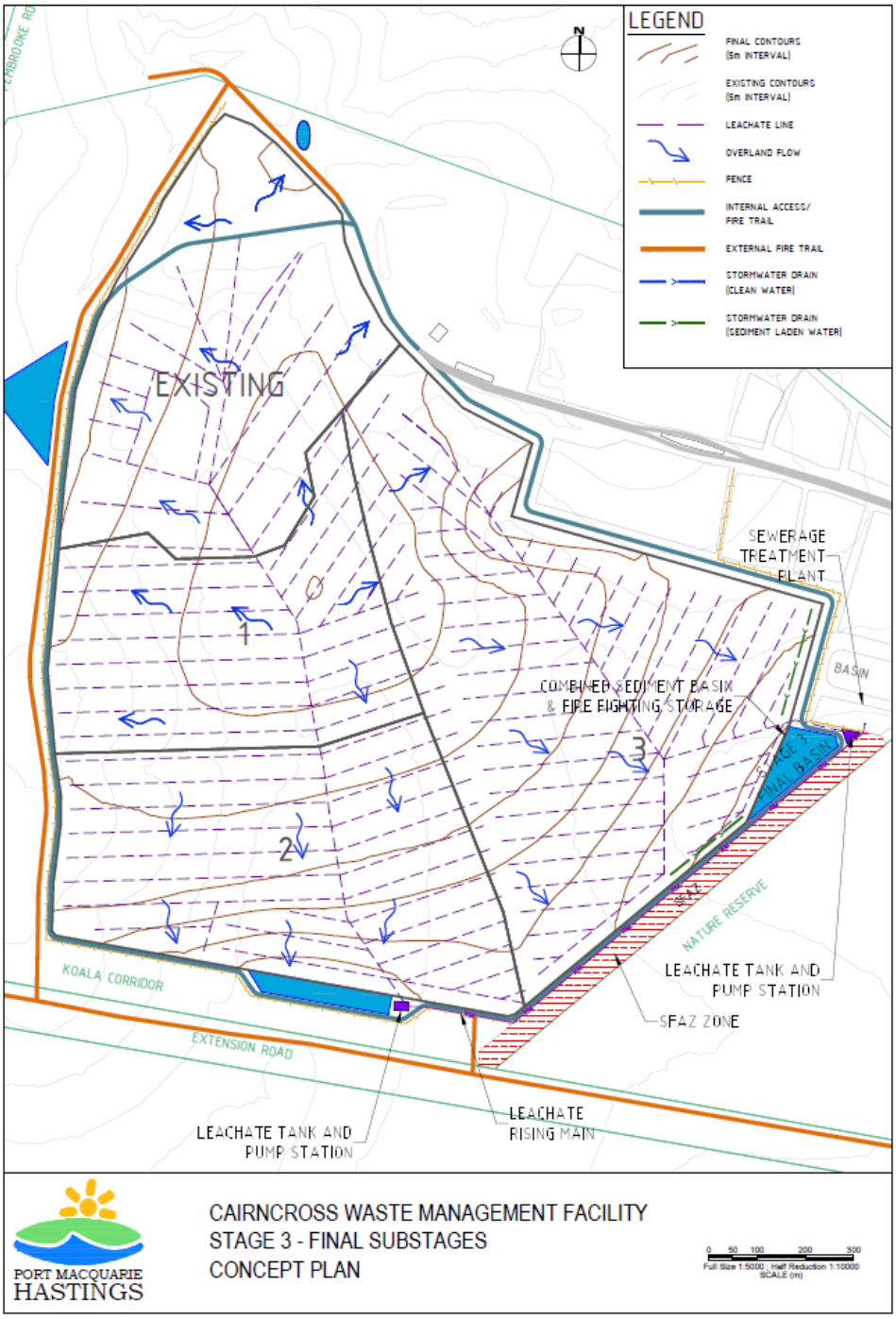


Figure 6-6 Amended Proposal layout Stage 3 (Final Sub Stages)

As a result of the proposed amendments shown in Figure 6-1 to Figure 6-6 and described in detail below, the total earthworks and landfill void space has also been amended. The consolidated Amended Proposal Description (Appendix A of this RtS) incorporates all changes to the Proposal description as a result of the proposed amendments. In particular, Table 6-2 provides the updated materials balance summary for the Amended Proposal. It is noted that the total landfill void space has not materially altered as a result of the amendments to the Proposal, and therefore the expected life expectancy of each landfill cell has not changed. Further detail is provided in the Amended Concept Design Report (Appendix B of this RtS).

Table 6-2 Materials Balance Summary

Stage	E	1	2	3
Area (m^2)	101,921	79,453	105,840	161,894
Topsoil Stripping Volume (m^3)[5]	30,576	23,836	31,752	48,568
Clay Excavation Volume (m^3)	554,219	288,437	290,822	692,350
Leachate Barrier Clay Vol (m^3)	91,729	79,453	105,840	161,894
Cap Clay Volume (m^3)	81,537	127,125	169,344	259,030
Vegetation Layer Topsoil Vol (m^3)	30,576	23,836	31,752	48,568
Landfill Void Volume (m^3)	1,438,196	1,610,290	1,005,030	1,490,289
Day Cover Clay Required (m^3) (10% of void)[6]	143,820	161,029	100,503	149,029
Actual Landfill Void Volume (m^3) (less day cover volume)	1,294,376	1,449,261	904,527	1,341,260
Total Clay Required (m^3)	317,085	367,607	375,687	569,953
Clay Balance (m^3) (-ve = deficit)	237,133	-76,170	-84,865	122,397

[5] Assumes 300 mm depth of topsoil.

[6] Based on actual measured volumes within Stage E needed to achieve 150 mm daily cover.

6.3.1 Final Landform Batters

The design proposed in the EIS adopted the final landform slope criteria detailed within the *Cairncross Waste Management Facility Landfill Environment Management Plan, (LEMP) (2001).* The criteria listed within this document, which was applied to the Existing cell (Stage E), was intended for use in future landfill stages, given the similarities of materials processed within the landfill, and profile to the surrounding landscape.

Submissions received during the exhibition period noted the criteria are slightly misaligned to best-practise environmental guidelines recently published in 2016. Final landform slope criteria, in accordance with EPA's (2016) *Environmental Guidelines - Solid Waste Landfills' Second Edition*, are therefore proposed under the Amended Proposal as follows:

- A maximum finished landform slope of 1V:5H (20 percent grade) to reduce the risk of erosion and enable maintenance (mowing) of finished landfill surface.
- A minimum finished landform slope of 1V:20H (five per cent grade) to defined drainage points to facilitate runoff and minimise ponding of water.

The Amended Proposal final landform levels are shown on Figure 6-7 below.

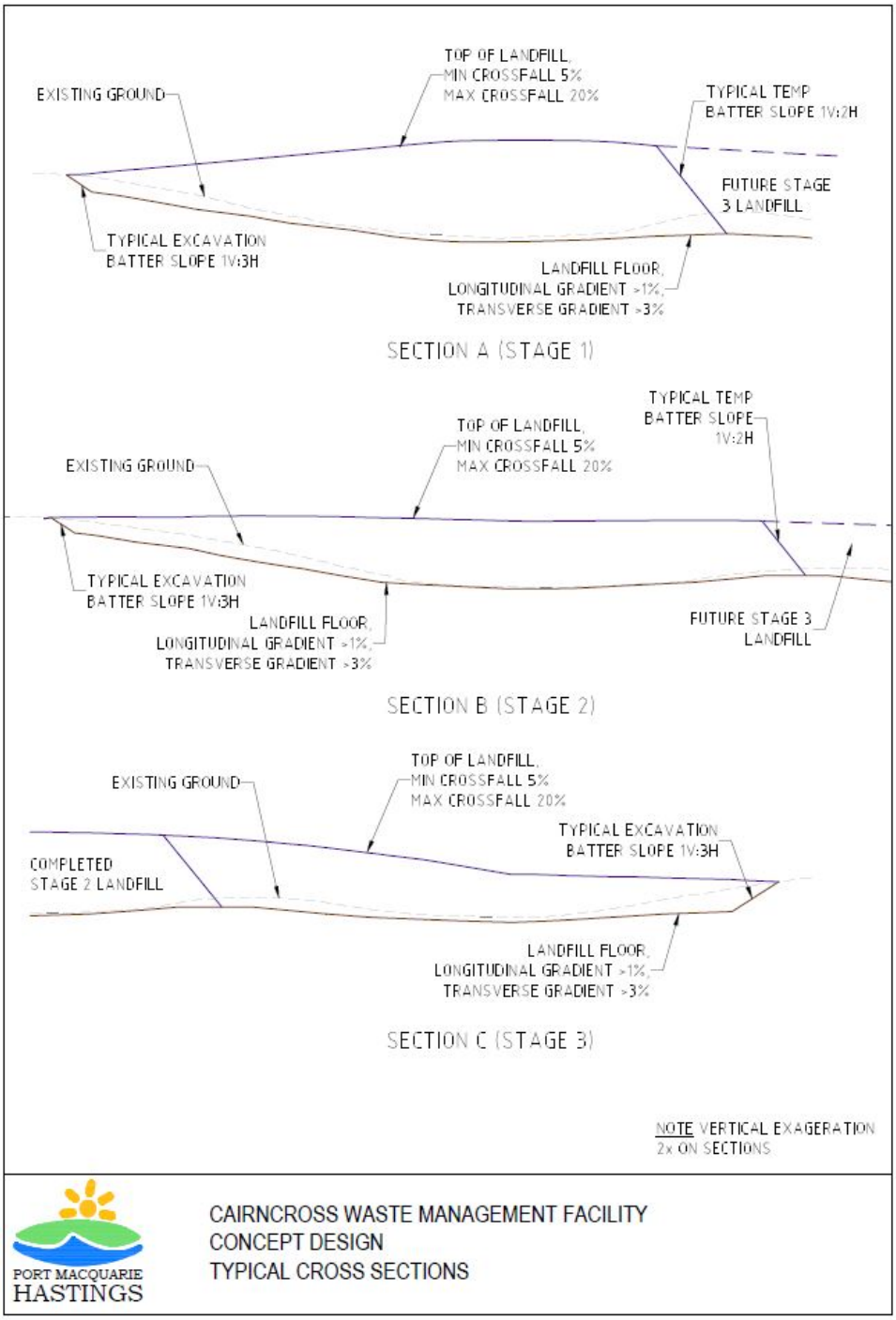


Figure 6-7 Proposed typical landfill cross section

6.3.2 Inclusion of Bushfire Protection Measures

Section 8.13 of the EIS included a bushfire assessment, underpinned by a Bushfire Assessment Report prepared by the Australian Bushfire Protection Planners (ABBP), 2017 (refer to Appendix Q of the EIS). The report included a bushfire hazard assessment, which concluded:

- The Amended Proposal Site area is located in an area of high natural bushfire hazard. This rating is based on the vegetation index classification (forest bushfire prone vegetation on the land adjoining the site) multiplied by the slope index.
- The bushfire threat to the Amended Proposal Site is high, as the adjoining forest vegetation has the potential to produce high intensity fires that could develop into crown fires and impact the site by causing injury to workers and ignite exposed waste and equipment.

As such, bushfire protection measures outlined in Section 6 of the Bushfire Assessment Report should be implemented where practicable and feasible.

Section 8.13.3 of the EIS outlines bushfire mitigation measures (*HR04 - HR10*) that are to be implemented for the Amended Proposal, as adapted from Section 6 of the Bushfire Assessment Report. As per mitigation measure HR-05 and HR-10, permanent and physical bushfire management measures (i.e. defendable spaces/setbacks, strategic fire advantage zone) would be cleared and maintained as per the recommendations outlined in the Bushfire Assessment Report. These elements are also described within Section 5.2 (Built Form Description) of the EIS as follows:

- A 20-metre-wide defendable space would be provided to each Leachate Tank
- The existing fire trail adjacent to the south-eastern boundary would be upgraded and maintained to provide an all-weather access, having a width of four-metres within a six-metre corridor kept clear of shrubs and grasses. The trail would be located within the Strategic Fire Advantage Zone and shall be constructed to provide access for a fully laden 15 tonne [GVM] Rural Fire Service/State Forests Category 1 Tanker
- The existing Fire Trail to the west of Stage 1 & 2 and between Stages 2 & 3 shall be retained and maintained to provide an all-weather access for a fully laden 15 tonne [GVM] Rural Fire Service/State Forests Category 1 Tanker
- A 30-metre-wide Strategic Fire Advantage Zone (SFAZ) would be provided and maintained along the boundary with the adjoining Nature Reserve
- There would be provided to the perimeter of each incremental landfill cell a temporary fire trail which connects to the existing/proposed perimeter/internal fire trail network. The temporary trail would be capable of carrying a fully laden NSW Rural Fire Service/State Forests Category 1 Tanker.
- All roads will be graded and drained through silt traps and sedimentation ponds before discharge from the site.

No changes to the above bushfire mitigation measures are proposed as part of the Amended Proposal. Notwithstanding this, design refinement and site optimisation has led to a clearer delineation of the above elements within the Amended Proposal concept designs (as shown in Figure 6-1 to Figure 6-6) to ensure appropriate incorporation of the proposed bushfire mitigation measures. This has resulted in a minor change to the layout of Stage 37 to adequately incorporate the proposed SFAZ (refer to Figure 6-8), as well as other minor layout changes across the Amended Proposal Site.

[7] Spatial design aspects of the Proposal (such as landfill airspace) have also been updated under the Amended Proposal to accommodate the inclusion of such site features.

The Cairncross Waste Management Facility is currently subject to the *Cairncross Waste Management Facility Bush Fire and Fuel Management Plan (FMP)* (PMHC, 2001). The Plan prescribes actions for the management of bushfire risk for the Cairncross MWF including fuel management, access, fire protection zones, water supply and emergency contacts. To ensure that all bushfire management and protection procedures and measures are considered and implemented where necessary, the following mitigation measure has been included within the Amended Proposal (refer to Section 8 of this RtS):

- *The Cairncross Waste Management Facility Bush Fire and Fuel Management Plan (2001) will be updated to include the proposed bush fire mitigation measures for the Amended Proposal (HR-04 to HR-10), with consideration of the progressive development of the site.*

The inclusion of this mitigation measure will ensure that the existing FMP is updated to include recommended fire protection and management measures from the Bushfire Assessment Report (Section 6), and that fire mitigation treatments are implemented progressively in line with each stage of landfill development. A revised compilation of mitigation measures is provided in Section 8 of this RtS.

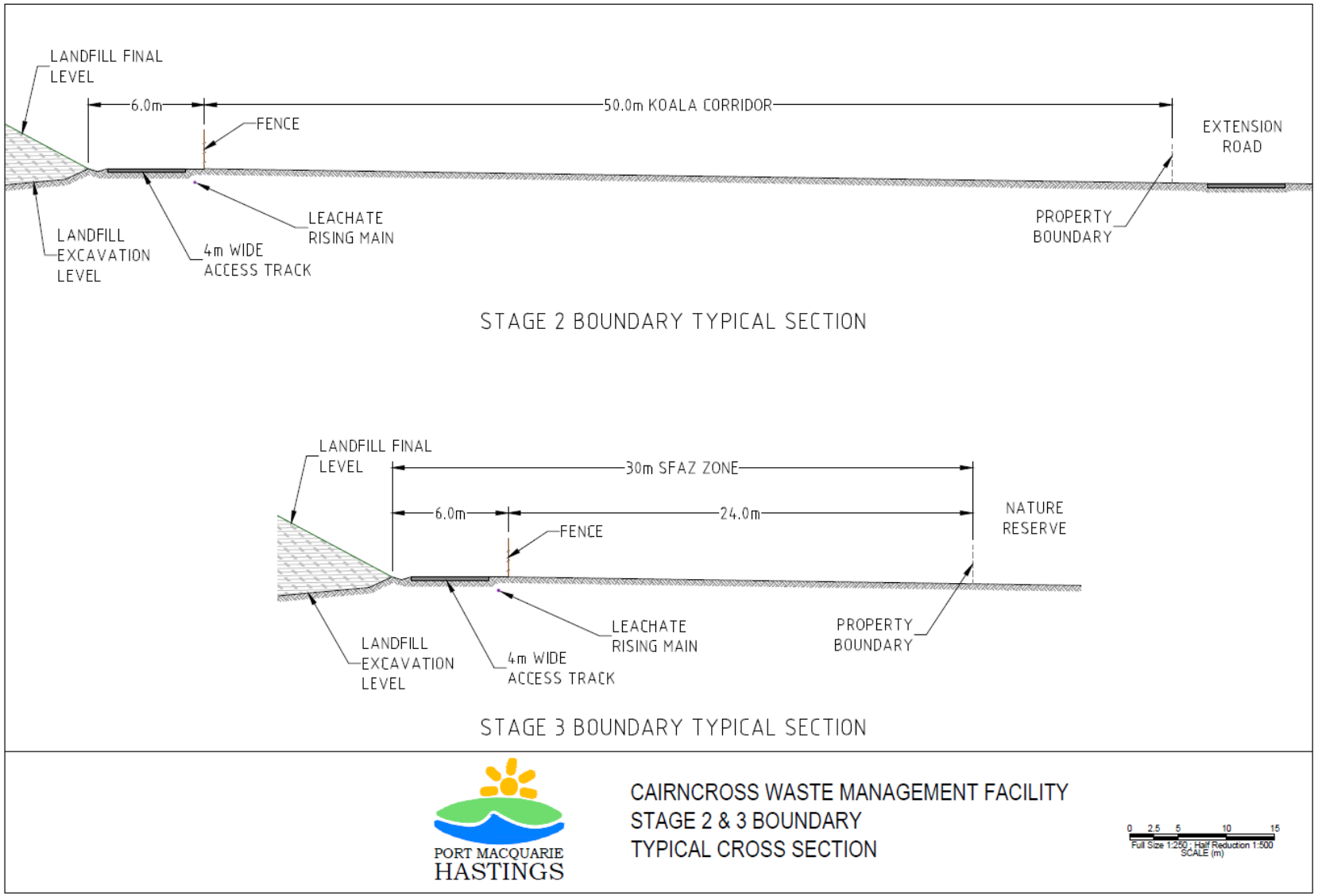


Figure 6-8: Stage 2 and Stage 3 Boundaries (typical cross section)

6.3.3 Sediment Basin Location and Volumes

The Amended Proposal includes changes to both the location and volume of sediment basins throughout various Stages of the Project. Table 6-3 provides a summary of the sediment basin sizes for the Amended Proposal. Additional information is provided in the Concept Design Report (Appendix B of this RtS).

Table 6-3: Sediment basin size summary

Volume	Stage 1 South Basin	Stage 1 North Basin	Stage 2 Basin	Stage 2 Final Basin	Stage 3 Basin	Stage 3 Final Basin
2 month sediment storage volume (m3)	615	134	615	137	234	134
12 month sediment storage volume (m3)	3,690	804	7,380	1,644	2,808	1,608
Settling Zone Volume (m3)	3,990	4,410	6,125	1,750	12,319	2,230
Total Basin Volume (m3)	7,680	5,214	13,505	3,394	15,127	3,838

Detailed descriptions of the changes proposed to each sediment basin under the Amended Proposal is provided below:

- **Stage 1 North Basin** The volume of this existing basin has been increased to account for additional flows generated from an enlarged disturbed catchment, as Stage 1 works progress.
- **Stage 1 South Basin:** The volume of this basin has been adjusted to reflect minor changes to final landform slope conditions.
- **Stage 2 Basin:** The volume of this basin has been adjusted to reflect minor changes to final landform slope conditions, and to optimise land used for the koala habitat corridor to the south of the Stage 2 site.
- **Stage 2 Final Basin:** The volume of this basin has been reduced to account for a reduced disturbed catchment as Stage 1 and Stage 2 areas are capped and revegetated.
- **Stage 3 Basin (and new fire-fighting storage basin):** The basin has been re-sized for the 95th percentile 5-day rainfall event, following a review of receiving conditions. The location of this basin has been relocated slightly to the west to account for the fire access trail and SFAZ area.
- **Stage 3 Final Basin:** The volume of this basin has been adjusted to account for a reduced disturbed catchment generated by the progressive capping and revegetation of the previously disturbed Stage 3 areas.

Figures showing the Amended Proposal sediment basin layout is provided on Figure 6-1 to Figure 6-6

6.3.4 Groundwater Management Strategy

The EIS noted that groundwater flows entering areas beneath the landfill site would be managed via the installation of a gravel trench along the western boundary of Stages 1 and Stage 2 and the southern boundary of Stage 2. The trench was designed to divert groundwater entering recharge areas to the south and east of the Stage 1 and Stage 2 cells, and allow natural discharge of this water via natural flow regimes to the south.

Subsequent investigations and review of groundwater data indicates that despite the landfill base being approximately two metres above the average potentiometric head conditions, there would be potential for upward hydrostatic pressure to occur during the maximum potentiometric head across each of the proposed stages forming the Amended Proposal.

Consequently, a base groundwater underdrainage collection and control system is proposed under the Amended Proposal instead of the previously proposed gravel trench. The system would be installed beneath each of the proposed landfill stages, and designed to manage groundwater in the event of elevated potentiometric head conditions (resulting in groundwater-landfill interaction in the absence of any mitigation, particularly in areas lacking overlying clay material). The underdrainage system would safeguard against impacts caused through hydrostatic uplift (i.e. breakage of HDPE lining) or wetting/softening of the base clay liner (i.e. long-term loss of hydraulic performance).

The underdrainage groundwater collection system is described in detail in Appendix D of this RtS. In summary it would comprise the following key elements:

- Installation of groundwater collection trenches
- Installation of a geotextile layer (if required)
- Installation of collection pipes
- Installation and operation of sups and risers

These elements are described in greater detail below.

Collection/drainage layer

The purpose of the collection/drainage layer would be to manage groundwater inflow rates and resulting hydrostatic upward pressure under the predicted maximum potentiometric head conditions, while allowing for enough capacity to prevent clogging of the system. The most likely design option for the collection/drainage layer is through the installation of collection trenches containing a high-permeability granular material and perforated pipework (Figure 6-9). A herringbone pattern of trenches would use gravity to drain the groundwater to a main header pipe and sump system for extraction.

The granular material would be comprised of predominantly rock (gravel/ cobbles) of greater than 25 mm diameter. In line with NSW EPA (2016), the drainage material would exhibit a coefficient of permeability K > 1 x 10-3 ms-1 and the gravel should be rounded, smooth surfaced and non-reactive in mildly acidic conditions. The material should be relatively uniform in grain size and free of carbonates that could form encrustations around collector pipes.

The collection trenches would be encased within a non-woven needle punched or heat bonded / pressed geotextile to prevent silting of the drainage material. The pipework would need to be designed to ensure that the critical buckling stresses and deflection characteristics are in line with the pipework material properties. It is anticipated that HDPE pressure rated slotted pipework would be required where trench corridors are placed beneath the base lining system.

The longitudinal gradient on the landfill base would be greater than one per cent, and a transverse gradient of greater than three percent to ensure good drainage towards the

header pipes and underdrainage collection sumps. The existing quarry floor already has sufficient fall. Trenches should also fall inwardly toward the main drainage pipe corridor. The hydraulic conductivity of the granular material would be sufficient to transport groundwater to the sump within a limited period of time (less than one day) from its appearance in the collection system.

In concept, the make-up of the trench system is a relatively uniform gradation stone (for example, a nominally 30-40 mm “single-size”). Such a stone would allow for high horizontal permeability and thus high velocities to the piping network; thus reducing retention time within the system and discouraging the development of biofilm and reducing the potential for biological clogging.

The suitability of the collection pipe design will be confirmed within the detailed design phase. An alternate option, using geo-composite drainage nets is also considered suitable (described in Appendix D of this RtS). In addition, a geotextile layer can be placed between the base of the landfill and underside of the clay capping layer if the groundwater properties are found to be likely to result in clogging of the proposed system.

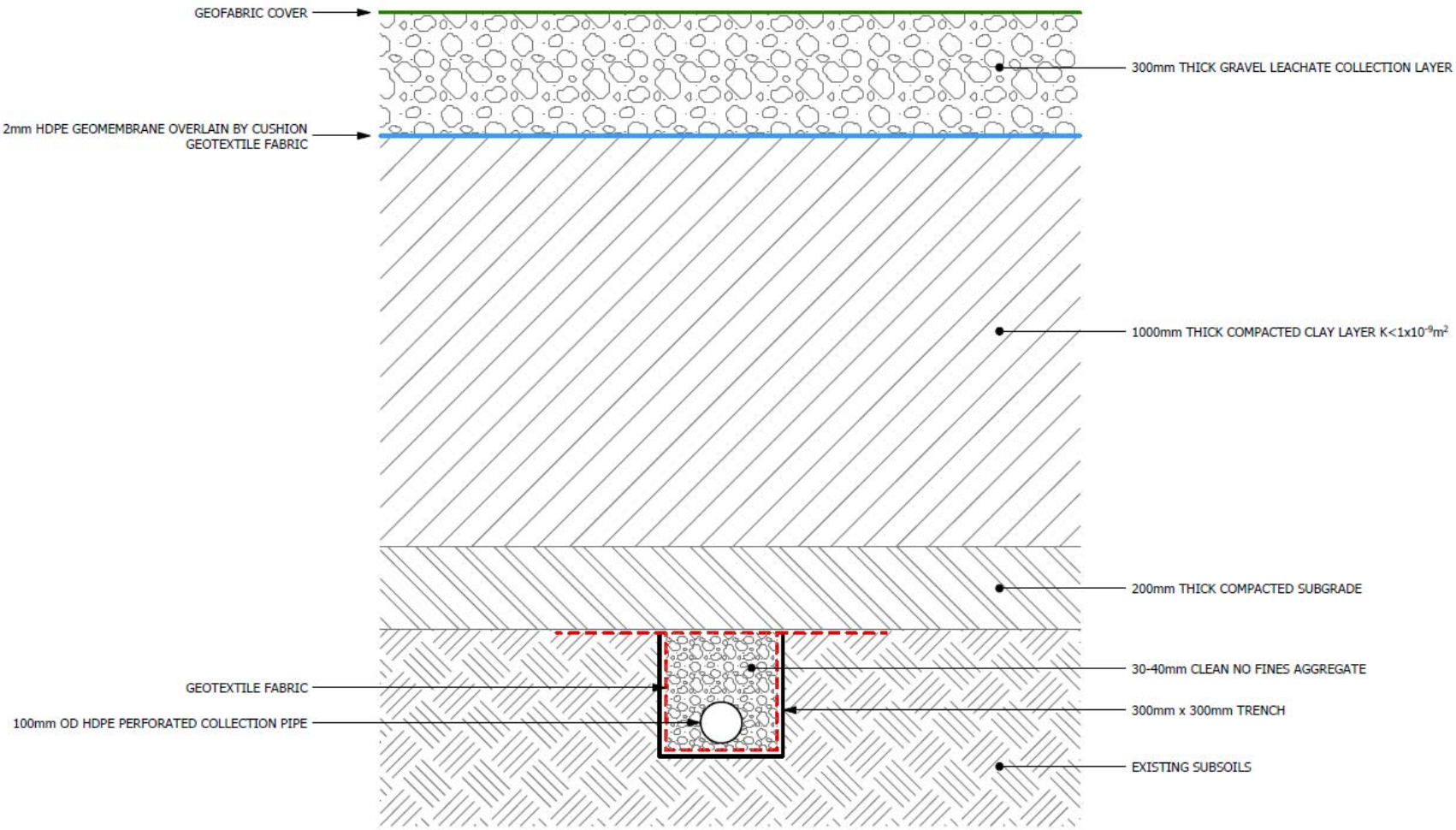


Figure 6-9 Proposed landfill base typical cross section

Collection pipework

To ensure sufficient transport time (including allowance for redundancy) a network of collection pipes in a chevron/herringbone pattern would be installed (refer Figure 6-10). The collection pipes would comprise 100 mm HDPE diameter laterals spaced nominally 50 m on centre, and a central 200 mm diameter header pipe. Trench size and spacing will be confirmed by the engineer in the detailed design stage. Detailed design considerations for the collection pipes is described in Section 3.2.3 of Appendix D of this RtS. This section also provides specific considerations for the nature of the collection pipework.

Sumps and risers

A sump would be located at the lowest elevation of the base, serving to collect the groundwater in preparation for removal.

The sump would contain two risers and a housing for extraction pumps. The groundwater extraction pumps would be sized with a capacity to maintain a hydraulic head that will be determined during detailed design and would correlate to a level below the base of the landfill liner. A single pump would operate in one riser under normal conditions, while a second pump would serve as standby, for use if unusually high flow rates are reported (such as under high rainfall events) or during malfunction of the primary pump. As the landfill cell sub-stages progress, the collection sump would be relocated along the main header trench/pipe to maintain the operation of the collection system. The sumps would also provide an accessible sampling point to test groundwater quality during landfilling operations and prior to discharge.

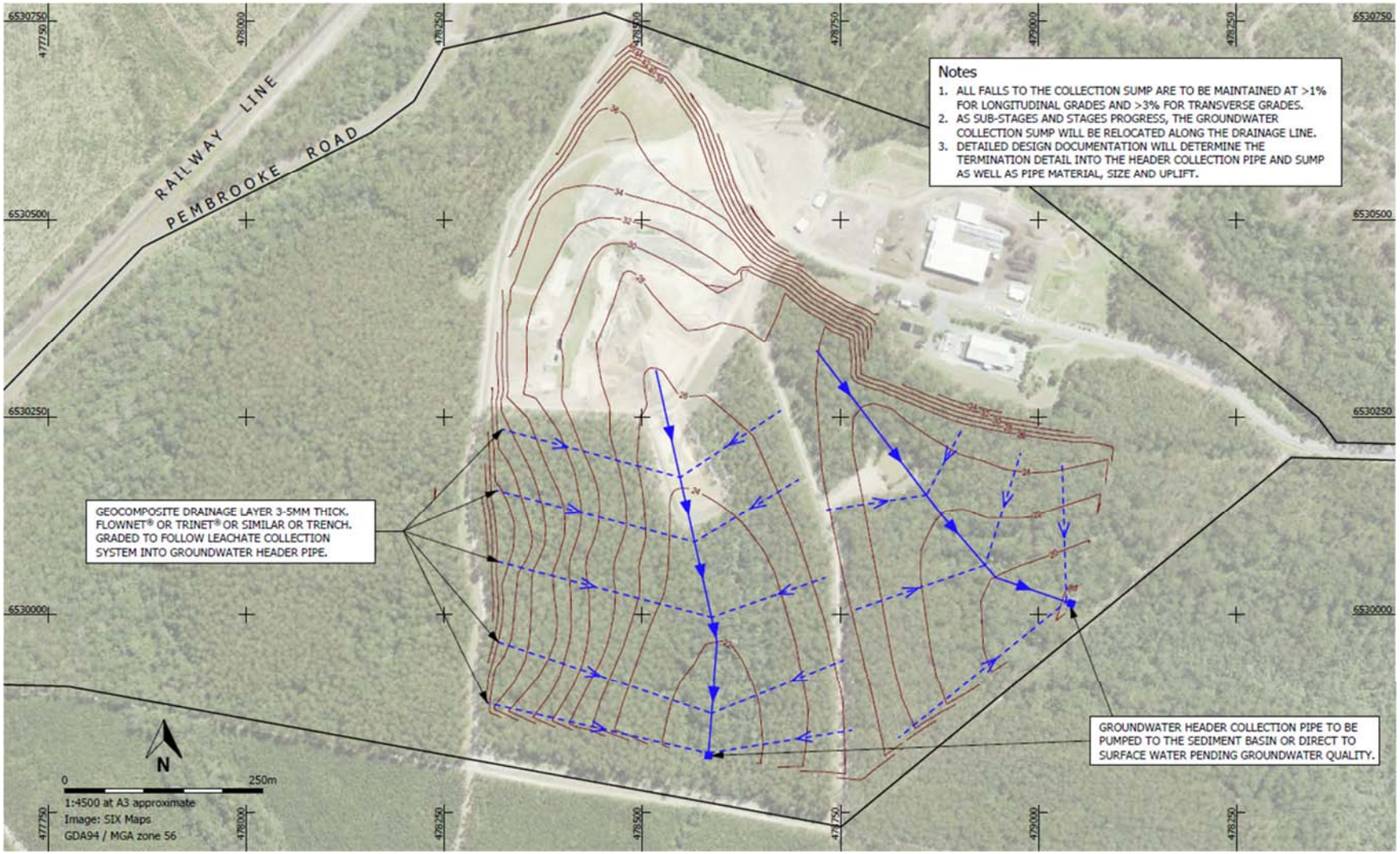


Figure 6-10 Proposed landfill groundwater management system base site layout

7 FURTHER ASSESSMENT

This section of the report assesses the potential environmental impacts associated with items included in the Amended Proposal. The assessment is based on the description of the modifications included in the Amended Proposal provided in Section 6 of this RtS.

For each environmental aspect, outcomes arising from the environmental assessment undertaken to support the EIS and the impacts associated with the Amended Proposal are discussed below.

7.1 Water

Section 8.4 of the EIS provides an assessment of potential surface and ground water impacts associated with the Amended Proposal. In response to submissions raised during the exhibition of the EIS additional assessment has been undertaken to further clarify the potential impacts of the Amended Proposal to receiving waters. The additional assessment, presented in Appendix C of this RtS, and summarised below has been prepared to provide additional detail on the existing water quality and potential water quality impacts, and to assess the amendments made to the Proposal, described in Section 6.

7.1.1 Existing environment

Surface water quality has been considered for the receiving catchment; the Hastings Catchment, as well as the localised surface water quality at the Amended Proposal Site. Existing water quality is summarised in Section 8.4.1 of the EIS. Additional water quality parameters have been determined based on the following key information sources:

- Catchment wide water quality (summarised in Section 3.1.1) has been determined based on the *Hastings – Camden Haven Ecohealth Project 2015: Assessment of River and Estuarine Condition. Final Technical Report* (Ryder et al. 2015).
- Water quality at the Amended Proposal Site has been determined based on available data sourced from the:
  - The 1999 EIS
  - The EIS prepared for the original Proposal
  - Subsequent water quality monitoring conducted by PMHC.

Hastings and Camden Haven Catchments water quality

The Riparian Condition and Water Quality of the Hastings and Camden Haven Catchments were assessed in the Ecohealth (2017) report, and can be summarised as follows:

- The 2015 Ecohealth score for riparian condition in the Hastings and Camden Haven Catchments were 65.9, a grade of C. The Hastings and Camden Haven Catchments were therefore assessed as moderately disturbed.
- Areas of moderate riparian condition were generally those areas of the Catchment that had been partially cleared of vegetation and subjected to long-term land use yet retained remnant riparian vegetation, such as upland freshwater reaches and estuaries surrounded by low lying floodplains.
- The main stressors to riparian condition included historic clearing of vegetation resulting in isolation from larger patches of remnant vegetation and promotion of weed establishment due to site disturbance, the dominance and regeneration of invasive weed species particularly in the mid-storey and understory structural layers,

trampling and grazing of riparian vegetation by livestock and a reduction in large woody debris.

- Water quality generally declined in freshwater and estuarine reaches of the Hastings and Camden Haven Rivers from an average grade of C+ in 2011, to C- in 2014-15.
- The poorest water quality in both river systems was recorded from the sites closest to the tidal limit, highlighting their role as depositional environments for both freshwater and estuarine contaminants.
- Water quality scores declined due to persistently elevated nutrient levels, especially TN and NOx, with exceedances of TN in the estuaries more than 50% of the time and exceedances of NOx in the estuaries more than 75% of the time. There was no consistent longitudinal pattern throughout systems of increasing nutrient concentrations with distance downstream.
- Observed increases in nutrient concentrations and pH, and reduced dissolved oxygen, which contributed to a change in condition and subsequent decline in water quality from 2011 to 2014-2015, may have been due to prolonged periods of low flow. This suggests that localised sources of nitrogen and phosphorus are regulating nutrient processes, as low flow conditions were experienced throughout the Catchment during much of the 2014-15 study period.

Baseline data

Existing water quality data has been reviewed to determine a baseline for surface water quality. Baseline surface water quality data has been determined as follows:

- Baseline surface water monitoring was conducted at seven locations throughout the receiving water catchment during 1998, summarised in the 1999 EIS. The monitoring occurred across two different receiving water types (marine/brackish and freshwater streams). Section 3.1.2 of Appendix C of this RtS (Surface and Groundwater Quality Addendum) provides the detailed baseline data from the 1999 EIS for a range of water quality parameters for each receiving water type.
- Additional surface water quality data was collected on a quarterly basis over a period between September 2001 and March 2017. Compared to the locations sampled in the 1999 EIS, this data set has greater temporal coverage but less spatial coverage of the catchment. Direct comparison to the 1999 EIS data set would therefore not be appropriate. Instead, a comparison of this data (presented in Section 3.1.3 of Appendix C) has been provided against the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, August 2018), *(ANZECC Guidelines[8])* values for 95 per cent protection of freshwater species (ANZECC limits).

In summary, the maximum values detected for key water quality parameters (pH, nitrate, ammonia and phenols) have on occasion been detected to be in exceedance of the ANZECC limits for the 95 per cent protection of freshwater species. A description of potential causes of these exceedances and their potential harm is provided below.

In addition to provision of additional surface water quality data, additional data pertaining to groundwater quality has also been provided in Appendix D of this RtS. In summary this data comprises:

- Baseline groundwater monitoring data, analysed as part of the 1999 EIS, from three locations. The 1999 data indicated background concentrations of dissolved metal species, absorbable organic halogens (AOX), fluoride and ammonia were present in the groundwater. It is noted that given only one round of groundwater monitoring

[8] *The Australian Water Quality Guidelines for Fresh and Marine Waters* (ANZECC, October 2000), are replaced as of 29 August 2018 by *the Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, August 2018), subject to the same terms with the exception of the water quality for primary industries component which still refer to the ANZECC 2000 guidelines.

was completed prior to operation of the landfill a true baseline data-set is not available. Notwithstanding, the water quality parameters identified during the 1999 EIS are presented in Section 3.2.1 of Appendix C of this RtS.

- Additional groundwater monitoring has been conducted at four locations within the Amended Proposal Site between 2001 and 2017. The data collected during this period, presented in Section 3.2.2 of Appendix C of this RtS, identified elevated concentrations of dissolved metal species, absorbable organic halogens (AOX), fluoride and ammonia. The concentrations of these contaminants are considered typical of a shale bedrock system. The presence of ammonia in background groundwater samples is likely due to the deposition of organic matter within the shale which decomposes under anaerobic conditions creating ammonia. A by-product of this decomposition can include, AOX compounds and ammonia.

Previous leachate outflow

Between June 2009 and February 2010 there were spikes in the ammonia, nitrate and phenols within existing surface water dams (CS8A and CS9), indicating leachate may have entered the dams. Following discussion with PMHC it was concluded the likely cause of the spike in nitrate, ammonia and phenols was previous site management practices which may have resulted in the surface water sampling locations inadvertently receiving leachate. The specific cause is un-known however it was likely to be related to the management of the leachate recirculation system at the time. This caused leachate to pond around the infiltration wells and potentially run-off into the site stormwater dams.

Between September 2010 and December 2011 site management practices were reviewed and improved to prevent leachate from entering the surface water system. This included improvement to the monitoring and operation of the existing leachate extraction and re-circulation system. The improvements included the pump-out of excess leachate by a liquid waste contractor and lawful offsite disposal to ensure the re-circulation system does not pool leachate. In addition to these improvements further modifications to the existing leachate collection system will connect the existing landfill stage (E) directly to the STP.

Following implementation of the management improvements, concentrations of ammonia, nitrate and phenols at the two monitoring locations (CS8A and CS9) all reduced to levels within the ranges reported prior to the identified elevated levels. The concentrations have remained at background (pre-event) levels since November 2011. This suggests the management improvements were successful at preventing the leachate entering the surface water dams.

The overall risk of harm to the environment based on the historical leachate event is described in detail in the Addendum Surface Water and Groundwater Quality Assessment (Appendix C of this RtS) and is considered low.

7.1.2 Impact assessment

An assessment of potential water quality impacts is presented in Section 8.4.2 of the EIS. To ensure minimal impacts to receiving surface waters discharge water quality trigger values have been identified for the Amended Proposal, described in Section 4 of the Addendum Surface Water and Groundwater Quality Assessment (Appendix C of this RtS). Both site surface water and groundwater should meet the default *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, August 2018)*(ANZECC Guideline)* values for 95 per cent protection of freshwater species (ANZECC limits) trigger values prior to discharge from the Amended Proposal Site to ensure no adverse impacts to surface water quality. If discharged water meets the specified trigger values, no adverse impact is anticipated as a result of the operation of the Amended Proposal.

PMHC will undertake monitoring of surface water and groundwater prior to discharge. Inclusion of additional sampling sites within the monitoring network will allow site

specific values to be developed over time. In the interim both surface and groundwater waters will need to be assessed against the ANZECC (2018) guidelines for 95 per cent protection of freshwater ecosystems prior to discharge offsite. If determined to be within the trigger values, surface water and groundwater can safely be discharged from the site.

7.1.3 Mitigation measures

In addition to the mitigation measures presented in Section 8.4.3 of the EIS the following measures have been proposed or amended. Section 8 of this RtS provides a consolidated compilation of mitigation measures for the Amended Proposal.

The management protocols employed to prevent unsuitable groundwater being discharged from site will include:

- Collection of groundwater within sumps that will be tested and compared against the trigger values
- Groundwater that meets the trigger values protective of the receiving environments will be discharged as surface discharge into the catchment.
- Groundwater that is not suitable for discharge will be used onsite for dust suppression or piped to the STP prior to disposal offsite.

A detailed Water Management Plan would be developed to cover both construction and operation of the Amended Proposal, including:

- A surface and groundwater monitoring program will be developed in accordance with requirements outlined in the Concept Design Report (Appendix B of the RtS), the Hydrogeological Assessment (Appendix F of the EIS) and the EPA's *Environmental Guidelines, Solid Waste Landfills*. The monitoring program will include:
  - Surface water and groundwater monitoring locations
  - Frequency of monitoring to be undertaken
- Measures to manage erosion and sediment control, in accordance with the Blue Book, including:
  - Installation of erosion and sediment controls prior to construction commencing
  - Separation of clean and dirty water
  - Minimisation of ground disturbance and areas of exposed soils, where possible
  - Stabilisation and revegetation of exposed soils as soon as practicable
- Avoidance/minimisation of clearing and earthworks during periods of heavy rain
  - Measures to reduce the velocity and erodibility of surface water flows across the site
  - Measures for management of stockpiles and sediment basins
  - Requirements for classification of surplus excavated materials under the *NSW EPA Waste Classification Guidelines* 2014.
- Measures to manage impact to, and discharge of, surface water, including:
  - Surface water discharge water quality trigger values in accordance with the ANZECC methodology and management measures for water not suitable for discharge
  - Contingency measures in the event of contamination detected in surface water
- Measures to manage impacts to, and discharge quality of, groundwater, including:
  - Measures for management of groundwater flows and discharge locations

- Groundwater discharge water quality trigger values and management measures for water not suitable for discharge
- Contingency measures in event of contamination detected in groundwater.

7.2 Hydrogeology

Section 8.4 of the EIS provides an assessment of the hydrogeological conditions surrounding the Amended Proposal Site and measures to manage groundwater associated with the Amended Proposal, supported by a *Hydrological Assessment Report* (2016), prepared by Trace Environmental (Appendix F of the EIS). In response to submissions raised during the EIS exhibition period, a review of groundwater conditions and the potential impacts generated by upward hydrostatic pressure during above average potentiometric conditions was undertaken.

Resulting from this review, a revised groundwater management strategy is included as part of the Amended Proposal, supported by the *Groundwater Collection System – Cairncross Landfill* report included as Appendix D of this RtS, and described in Section 6 of this RtS. This section has therefore been prepared to provide an updated assessment of existing hydrogeological conditions, as well as to assess the revised groundwater management strategy proposed as part of the Amended Proposal.

7.2.1 Existing Environment

Existing site hydrogeological conditions are described in detail within Section 8.4.1 and Appendix F of the EIS. A summary of existing conditions for the Amended Proposal site is provided below, as summarised from Appendix C of this RtS.

Local hydrogeology

The Amended Proposal Site has been defined by two distinct hydrogeological units:

- **Clay/colluvium:** spatially discontinuous comprising silty medium to high plasticity clay. Its major characteristic is the retardation of recharge to the underlying aquifer.
- **Weathered and fractured rock:** associated with siltstone and shale.

Groundwater recharge occurs via minor seepage through the clay or lateral flow through the shale/siltstone unit. Further detail regarding analysis of unit profile and hydraulic permeability/conductivity is provided in Appendix C of this RtS.

Regional Hydrogeology

Ten registered groundwater bores exist within three km from the Amended Proposal Site, all of which are located at distances greater than approximately two km from the Amended Proposal Site.

The bores are installed to depths ranging from 23 to 67 m and their purpose is mainly water supply. All bores are installed in hard rock aquifers either shale or basalt, with the yield ranging from 0.5 to 2.5 L/s. The water quality is fresh to slightly saline to brackish, ranging from 700 to 2500 mg/L.

Piezometric Surface and Flow Direction

Groundwater monitoring was undertaken across both dry (2004-2011) and wet (2012-2014) weather periods, since 2001, for nine monitoring points across the existing landfill and Amended Proposal Site. Monitoring was undertaken to determine piezometric head depths, groundwater directional flow and velocity. This information is required to adequately assess the risk of potential impacts associated with upward hydrostatic pressure and groundwater inflows associated with the Amended Proposal.

Bore locations and data are provided in Appendix B of this RtS. Conclusions from the monitoring data indicates that:

- Groundwater heads/pressures range from 2.8 MBGL in CG108 to just over 10 MBGL in CG103.
- Deepest piezometric heads are found at the ridges and the shallowest in the low laying areas.
- Groundwater appears to generally flow in an easterly and south-easterly direction, in accordance with ground contours.
- Long term records indicate that the groundwater bores respond in a similar manner to natural climate conditions, with a rise following the rainfall event and decline in head after a drier period with natural dissipation.
- The hydraulic gradient is relatively steep (1 m fall over 50 m).

Based on the hydraulic conductivity, gradient and estimated shale porosity of 10 per cent; the average groundwater velocity is approximately 0.0008 m/day.

7.2.2 Assessment of Impacts

The key potential impact requiring management is infiltration of leachate into the groundwater system, generated by a perforation of the HDPE landfill liner due to the build-up of upward hydrostatic pressure beneath the landfill under elevated piezometric conditions. A second potential impact to be considered is groundwater inflows during the construction (i.e. excavation phase), which may result in wetting or softening of the base clay liner leading to loss of hydraulic performance.

Groundwater monitoring data was therefore used to measure piezometric head depths from bores monitored around the Amended Proposal Site, to predict areas potentially susceptible to groundwater intersection of the landfill floor as a proxy for hydrostatic uplift pressure, in the absence of an effective mitigation strategy.

The footprint and landfill floor level of the Amended Proposal has remained largely unchanged for the Proposal assessed within the EIS. Therefore, information from previous assessment documentation (i.e. Section 8.4.2 and Appendix F of the EIS) has been used where relevant.

Estimated Groundwater Inflow

Based on monitoring data and interpreted maximum groundwater contours, the EIS reported that the landfill floor level will generally be (approx. 2 m) above the maximum groundwater head during average piezometric head conditions. This means that no groundwater inflow to any proposed landfill Stages is expected during periods of average (i.e. regular) groundwater heads.

However, should above average groundwater heads occur (i.e. during an extended wet weather period), the groundwater table may intersect the floor of the landfill, likely resulting in groundwater inflow. The extent of this potential interception is shown in Figure 7-1.

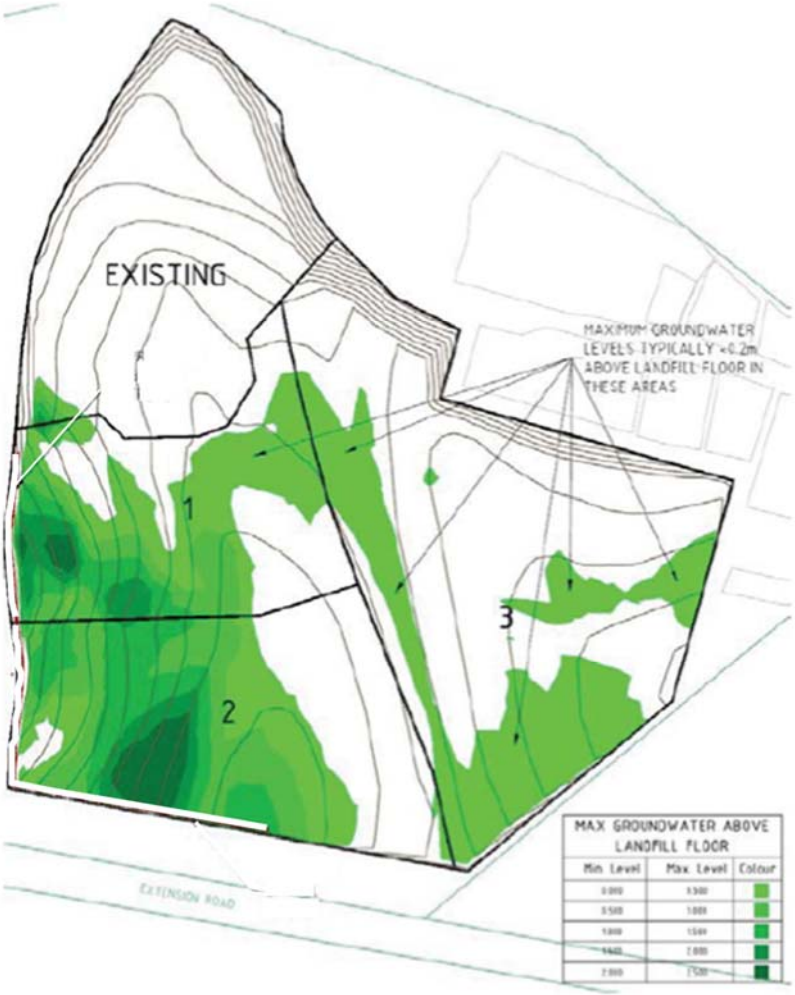


Figure 7-1: Elevation of Maximum Groundwater Heads above landfill floor for Amended Proposal Site (no mitigation)

As indicated by Figure 7-1, areas at risk of encountering groundwater interception during maximum piezometric conditions are shaded green. Areas shaded light-green above the maximum groundwater heads are likely to be generally <0.2 m above the floor level, and are therefore considered lower risk of groundwater interception. Areas of dark-green in the western area of Stage 1 and south of Stage 2 indicate that the maximum groundwater head may exceed the landfill floor elevation by up to 2 m. These areas represent topographically elevated areas sloping to the east.

Short-term predicted groundwater inflows during maximum piezometric conditions for each stage of the Amended Proposal, during both excavation (construction) and operation without groundwater capture were generated in the Trace Environmental (2016) report (refer to Appendix F of the EIS). The assumptions used are based on site specific and published data that was collected during the hydrogeological assessment and therefore provides a suitable estimation of inflow rates for the Amended Proposal. A summary of results from the assessment is provided below:

Groundwater inflow volumes during excavation:

- **Stage 1** = 0.44 ML/year = 50.2 L/hr
- **Stage 2** = 0.53 ML/year = 60.5 L/hr
- **Stage 3** = <0.03ML/year = <3.4 L/hr

Groundwater inflow volume**s during operation:**

- **Stage 1** = 0.03 to 0.3 ML/year = 3.4 to 34.2 L/hr
- **Stage 2** = 0.03 to 0.3 ML/year = 3.4 to 34.2 L/hr
- **Stage 3** = <0.03 ML/year = <3.4 L/hr

Actual inflow rates that will be observed during construction may vary, however the estimated volumes are likely to be relatively low and the proposed groundwater capture system (described in Section 6 of this RtS) is designed to manage any encountered variances. The level of redundancy will to be provided within the detailed design documentation.

Base Groundwater Collection System

As discussed in Section 6.3.4 of this RtS, a base groundwater management system is proposed as part of the Amended Proposal. The underdrainage system would safeguard against impacts caused through hydrostatic uplift (i.e. breakage of HDPE lining) or wetting/softening of the base clay liner (i.e. long-term loss of hydraulic performance). The system would consist of a collection/drainage layer comprising of the installation of collection trenches containing a high-permeability granular material and perforated pipework to transport collected groundwater and a sump housing extraction pumps to actively pump the collected groundwater either to the STP (should the water be contaminated), or to the surface water drainage system.

Following installation of the collection trenches the potentiometric head would intercept the trenches and flow unencumbered through the high-permeability granular material to the collection sumps, preventing the occurrence of any hydrostatic uplift.

7.2.3 Mitigation Measures

An updated mitigation measure (W-03) has been included to prepare a Water Management Plan to cover the construction and operation of the Amended Proposal, to be prepared in consultation with DoI Water.

The Water Management Plan would include measures to manage impacts to, and discharge quality of, groundwater, including:

- *Measures for management of groundwater flows and discharge locations*
- *Groundwater discharge water quality trigger values and management measures for water not suitable for discharge*
- *Contingency measures in event of contamination detected in groundwater.*

7.3 Other Environmental Aspects

Table 7-1 provides an assessment of all other remaining environmental aspects in the context of incremental environmental impacts generated by the Amended Proposal as departed from Section 8 of the EIS.

Table 7-1: Environmental Impact Assessment for other issues

Environmental Aspect	Amended Proposal Impact Assessment	Environmental impact (positive, negative or neutral)
Strategic land use planning	Section 8.1 of the EIS outlines the site selection process, and strategic land use planning aspects that were considered in determining the suitability of the Proposal. The Amended Proposal would utilise the same land footprint and operate under the same local and regional planning aspects as proposed within the EIS. There would therefore be no change in impact for the Amended Proposal when compared to the strategic land use planning impact assessment as presented within the EIS.	Neutral
Flora and Fauna	Section 8.2 of the EIS presents a summary of potential impacts to biodiversity as a result of the Proposal, as assessed in the *Biodiversity Assessment Report* (BAR – refer to Appendix P of the EIS). The Proposal assessment area, referred to within the EIS as the 'Development site' relates to a 3.4-hectare area of land in the south-eastern portion of the site, comprising of native vegetation. The remainder of vegetation clearing within the Proposal site is already approved as an authorised plantation area (i.e. subject to authorised clearing permit) under the *NSW Plantations and Reafforestation Act 1999* (refer to Appendix O of the EIS). Further, the EIS included desktop mapping of the Proposal Site to determine potential impacts associated with Groundwater Dependent Ecosystems (GDEs). This assessment determined that an area within approximately three km of the Amended Proposal Site is classified as having moderate to high potential for groundwater interaction with the presence of surface GDEs that rely on the subsurface expression of groundwater. The Amended Proposal site boundary, as depicted on Figure 1.2, does not result in any changes to the disturbed Development site footprint as depicted and assessed as part of the EIS (i.e. 3.4 hectares). As such, the assessment of ecological values pertaining to this site remains relevant. A key change when comparing the Amended Proposal to the Proposal is the inclusion of a 30-metre-wide Strategic Fire Advantage Zone (SFAZ) established along the south-east boundary of the Amended Proposal site (refer to 6-5 of this RtS) which would be provided and maintained along the boundary with the adjoining Nature Reserve. The impacts to habitat connectivity of the Amended Proposal would be commensurate to those identified within the EIS, as the disturbed Development site would not change, and the area designated to accommodate inclusion of the SFAZ would be substituted from previously identified landfill cell area corresponding to Stages 2 and 3. Further the inclusion of the SFAZ may result in the retention of mature trees within this area, resulting in a reduced impact on biodiversity compared to that previously approved.	Neutral

Environmental Aspect	Amended Proposal Impact Assessment	Environmental impact (positive, negative or neutral)
	A second component of the Amended Proposal when compared to the Proposal presented in the EIS is the inclusion of a base groundwater collection and distribution system, which may result in slight changes to the surface water volumes entering surrounding catchments and ecological systems. As outlined within Appendix D of this RtS, groundwater collected and determined to be of suitable quality, may be pumped and distributed as surface water via overland flows, resulting in a minor increase in water volumes for receiving ecological systems. The anticipated impacts to surrounding ecology as a result of these amendments are predicted to be negligible when compared to impacts originally nominated within the EIS.	
Soil	Section 8.3 of the EIS provides an assessment of potential impacts to surrounding soils as generated by the Proposal. These potential impacts include: • The exposure of soil generated by earthmoving equipment; and • The generation of significant leachate volumes that may result in soil contamination if not managed appropriately. Based on the site history, the assessment presented in the EIS, and amended assessment undertaken for the Amended Proposal, there remains a very low likelihood for existing soil contamination on the Amended Proposal site. The Amended Proposal would result in a minor change to final landform batters (to comply with relevant guidelines), the removal of the groundwater trench, and a revised layout and sizing of basins to accommodate for these changes. Earthmoving activities, the generation of surplus soil (to be stockpiled) or leachate volumes as part of the Amended Proposal would not substantially change when compared to the Proposal assessed as part of EIS, which would be managed under safeguards and mitigation measures outlined within Section 8.3.3 of the EIS.	Neutral
Air Quality and Odour	Section 8.6.2 of the EIS provides an assessment of potential impacts to air and odour associated with the Proposal. The assessment determined that all odour and dust generated from the Proposal are predicted to comply with the impact assessment criteria at all sensitive receptors. The Amended Proposal, which departs from the EIS proposal by way of Proposal amendments described in Section 6.3 of this RtS, would generate air and odour impacts commensurate with those described within the EIS. Safeguards and mitigation measures outlined in 8.6.3 of the EIS remain relevant for the Amended Proposal.	Neutral
Noise and Vibration	Section 8.7 of the EIS provides an assessment of potential noise and vibration impacts generated by the construction and operation of the Proposal. Operational noise levels associated with the Proposal are predicted to comply with the established noise criteria during the proposed hours of operation at all nearby receivers. Road noise levels are predicted to exceed the RNP assessment criteria at the most potentially affected receivers in the year of opening and closing. However, the increase in road noise levels due to the Proposal is less than 2db therefore no mitigation of traffic noise levels is warranted. The Amended Proposal, which departs from the EIS proposal by way of Proposal amendments described in Section 6.3 of this RtS, would not result in any additional noise and vibration impacts, or changes to established criteria, when	Neutral

Environmental Aspect	Amended Proposal Impact Assessment	Environmental impact (positive, negative or neutral)
	compared to outcomes of the Proposal assessment presented within the EIS. Safeguards and mitigation measures outlined in 8.7.3 of the EIS remain relevant for the Amended Proposal.	
Traffic	Section 8.8.2 of the EIS provides an assessment of impacts to local traffic generated by the Proposal. The Amended Proposal would not result in any changes to access to or from the landfill site from the local road network. The total landfall volume has reduced slightly when compared to that assessed within the EIS, potentially resulting in a minor reduction anticipated numbers of trips over the entire life of the Amended Proposal. Mitigation measures outlined within Section 8.8.3 of the EIS are therefore considered appropriate in managing potential traffic impacts associated with the Amended Proposal.	Neutral or slightly positive
Greenhouse Gas	Section 8.9.3 of the EIS provides an assessment of GHG emissions arising from the construction and operation of the Proposal. Emissions were predicted to peak in the year 2057 at approximately 126,000 tonnes. The Amended Proposal would not result in a minor reduction in the total landfill volume and therefore total waste tonnages to be received. This would result in a minor reduction in total GHG emissions produced over the lifetime of the Amended Proposal. Mitigation measures outlined within Section 8.9.4 of the EIS are therefore considered appropriate in managing potential impacts associated with the Amended Proposal.	Neutral or slightly positive
Aboriginal Heritage	An Aboriginal Heritage assessment was undertaken and presented within Section 8.10.2 of the EIS. The assessment identified two Aboriginal heritage sites that were located within the Amended Proposal Site, each assessed as having low level of archaeological potential. The assessment determined that both sites have recently been subject to further disturbance through road upgrades (unrelated to the Project), and would be destroyed during construction. Mitigation for the proposal, as outlined in the EIS, would focus on a procedure for the management of unexpected archaeological finds and would be documented within the OEMP. The Amended Proposal would retain the existing site footprint as that assessed within the EIS, and would therefore result in the same impacts to Aboriginal Heritage as those presented within the EIS. Mitigation measures outlined within Section 8.10.3 of the EIS are therefore considered appropriate in managing potential impacts associated with the Amended Proposal.	Neutral
Non-Aboriginal Heritage	Section 8.11.2 of the EIS provides an assessment of non-Aboriginal Heritage as it relates to the Proposal. The assessment concluded that due to the distance between the Amended Proposal Site and the nearest non-Aboriginal heritage items, no direct physical impacts on any items of non-Aboriginal heritage are anticipated. Furthermore, the Amended Proposal Site has been assessed as having a negligible chance of containing any non-Aboriginal relics or artefacts. The Amended Proposal would retain the existing site footprint as that assessed within the EIS, and would therefore result in the same impacts to non-Aboriginal Heritage as those presented within the EIS. Mitigation measures outlined within	Neutral

Environmental Aspect	Amended Proposal Impact Assessment	Environmental impact (positive, negative or neutral)
	Section 8.11.3 of the EIS are therefore considered appropriate in managing potential impacts associated with the Amended Proposal.	
Landscape and Visual	Section 8.12.2 of the EIS provides an assessment of visual amenity as it relates to the Proposal. The assessment concluded that there would be no visual impacts to sensitive receivers as topography and vegetation blocks views between the Proposal Site and sensitive receivers. The Amended Proposal would retain the existing site footprint, elevation and surrounding site features as that assessed within the EIS, and would therefore result in the same impacts to visual amenity as those presented within the EIS. Mitigation measures outlined within Section 8.12.3 of the EIS are therefore considered appropriate in managing potential impacts associated with the Amended Proposal.	Neutral
Hazards and Risk	An Assessment of Hazards and Risks associated with the Proposal was provided in Section 8.13.2 of the EIS. The assessment determined that the only hazardous material likely to be accepted and stored onsite is asbestos, which does not fall within classification of the Dangerous Goods Code. The predicted volumes of incoming asbestos to the Proposal are well below the require EPL limits established under the existing facility (EPL 11189). Other potential hazards and risks identified for the Proposal are outlined below: • Fire and explosion caused by a number of factors including encroachment of bushfire, fires in waste, methane accumulation and ignition, or fires reaching the gas generator and gas flare infrastructure • The Proposal Site has been assessed as having a high bushfire risk • Liquid and solid spills may arise from situations such as potential loss of putrescible loads • Health and respiratory impacts from vehicle exhaust, dust, microbial or gases/odours, and asbestos • Safety of pedestrians and drivers at risk from vehicle movements on site The Amended Proposal, as described in Section 6, includes physical bushfire protection measures, such as defendable spaces and fire trails for access which previously were not shown in concept plans presented for the Proposal. The inclusion of such items, in addition to the adoption of mitigation and management measures included within Section 8, would result in a reduced risk of bushfire impacts to the Amended Proposal site across the life of the asset. Other impacts associated with Hazards and Risks would remain as per the reporting of the EIS.	Positive
Cumulative Impacts	Section 9.3 of the EIS concludes that there are no current or planned future developments within the surrounding area that would result in significant adverse cumulative impacts in combination with the Proposal. As such, it is unlikely the Proposal will cumulatively impact on the biophysical environment.	Neutral

Environmental Aspect	Amended Proposal Impact Assessment	Environmental impact (positive, negative or neutral)
	None of the Amended Proposal components would result in amendments to this assessment, and as such no additional mitigation measures are proposed for the Amended Proposal in addition to those prescribed within the EIS regarding cumulative impacts.	

8 REVISED COMPILATION OF MITIGATION MEASURES

The EIS for the Proposal identified a range of environmental impacts and recommended management and mitigation measures to avoid, remedy or mitigate the identified impacts (Section 10 of the EIS). These mitigation measures have been revised in response to submissions received during the public exhibition period and to address the impacts of the amendments to the Proposal.

For ease of reference, words proposed to be deleted are showing in ~~***bold italic strike through***~~ and words to be inserted are shown in ***underline bold italics.*** The revised mitigation measures represent the final mitigation measures for the Amended Proposal and are provide in Table 8-1 below.

Table 8-1 Revised compilation of mitigation measures

#	Measure	Timing
Flora and Fauna		
FF-01	Clearing of vegetation and excavation activities would not be undertaken during overland flow events (where there is surface runoff present after rainfall and prior to entering a waterway).	Construction / operation
FF-02	Stabilisation of disturbed areas adjacent to retained native vegetation, including revegetation where appropriate, would be undertaken as soon as feasible and reasonable after disturbance.	Construction / operation
FF-03	A biobanking agreement, ***or equivalent***, would be established to secure an offset site ~~***Under the NSW Biodiversity Offsets Policy for Major Projects***~~ ***in accordance with applicable legislation*** prior to clearing the 3.4 ha of native vegetation within the Stage 3 area. The offsets site would secure the ecosystem and species credit offset requirements outlined in Section 8.2.3. All offset land will be funded and managed in perpetuity under Councils Public Bushland Management Programme. Management actions would include, but not be limited to, the following: • Identification of type and location of weeds of concern within the site • Identification of sensitive receivers (such as native vegetation and waterways) within or adjacent to the Proposal Site • Management and disposal of weeds (including declared noxious weeds) in accordance with requirements of the *Noxious Weeds Act 1993*.	Pre-construction / construction / operation Note: the offset site would need to be established prior to clearing the 3.4 ha of native vegetation within the Stage 3 area.
FF-04	Fauna microhabitat, such as logs, would be removed from areas to be cleared and relocated to suitable nearby habitat.	Pre-construction / construction
FF-05	Extent of clearing would be fenced with highly visible temporary fencing to ensure that clearing does not extend beyond the area necessary.	Pre-construction / construction

#	Measure	Timing
FF-06	A hollow replacement program would be implemented in the Koala corridor and on any proposed offset site. Hollows would be replaced at 1:1 ratio to offset the impacts to one small hollow, 10 medium hollows and five large hollows.	Pre-construction / construction
FF-07	All injured fauna to be reported to the site manager. Contact details would be kept on site for the local animal rescue group (Fawna Wildlife Rescue, Port Macquarie) and veterinarian if any fauna are injured on site or require capture and/or relocation.	Pre-construction / construction / operation
FF-08	A two-stage clearing process will be implemented in areas of the Proposal site containing hollow-bearing trees. An experienced ecologist would be present on site to supervise all stages of removal of hollow bearing trees, as well as relocation of any fauna.	Pre-construction / construction / operation
FF-09	If feasible and reasonable, vegetation clearing should not be undertaken during the breeding seasons for threatened fauna species with potential habitat on the Development Site. This will not be possible for all identified threatened species as breeding seasons collectively span a large portion of the year. In order of preference of avoidance, the breeding periods are: • Koala – September to February (breeding season) • Glossy Black Cockatoo – March to August (breeding season) • Spotted-tail Quoll – June to January (maternal den season) • Grey-headed Flying Fox – October to March (breeding season) • Southern Myotis – November to February (breeding season) Scheduling the vegetation removal for Autumn months would generally avoid the breeding season of most species that could occur on site.	Pre-construction / construction
FF-10	The Koala connectivity corridor will be managed in perpetuity and rezoned for environmental protection with the next standard LEP instrument amendment by Council.	Construction / operation
FF-11	***A Vegetation Management Plan will be prepared in accordance with the OEH Guidelines for development adjoining land managed by the Office of Environment and Heritage (2013) and will include measures for the maintenance, management and revegetation of the Koala connectivity corridor and the setback area, including:*** • ***Clear objectives for management outcomes*** • ***A remediation and revegetation strategy*** • ***Management measures for existing plantation vegetation***	***Construction / operation***

#	Measure	Timing
	• ***Environmental and noxious weed management actions*** • ***Implementation strategies for the hollow replacement program*** • ***Vegetation management in accordance with the Cairncross Waste Management Facility Bush Fire and Fuel Management Plan*** • ***Roles, responsibilities and timing for implementation***	
~~Soil~~		
~~***S-01***~~	~~***A detailed ESCP would be developed, to cover both construction and operation of the Proposal, in accordance with the Blue Book, including:***~~ ~~***Installation of erosion and sediment controls prior to construction commencing***~~ ~~***Separation of clean and dirty water***~~ ~~***Minimisation of ground disturbance and areas of exposed soils, where possible***~~ ~~***Stabilisation and revegetation of exposed soils as soon as practicable***~~ ~~***Avoidance/minimisation of clearing and earthworks during periods of heavy rain***~~ ~~***Measures to reduce the velocity and erodibility of surface water flows across the site***~~ ~~***Measures for management of stockpiles and sediment basins***~~ ~~***Requirements for classification of surplus excavated materials under the NSW EPA Waste Classification Guidelines 2014.***~~	~~***Pre-construction, construction and operation***~~
Water		
W-01	Measures to minimise the water demand for dust generation would be implemented (e.g. minimising vehicle movements on unsealed roads and minimising excavation/earth moving during windy periods, where possible).	Construction / operation
~~***W-02***~~	~~***A surface and groundwater monitoring program would be developed in accordance with requirements outlined in the Concept Design Report (Appendix B, the hydrological Assessment (Appendix F) and the Guidelines.***~~	~~***Pre-construction / construction / operation***~~
~~***W-03***~~ ***W-02***	A groundwater assessment report would be prepared at least once every five years, or should the groundwater monitoring program detect a possible failure of the leachate containment system.	Pre-construction / construction / operation
W-03	***A detailed Water Management Plan would be developed to cover both construction and operation of the Amended Proposal, including:***	***Preconstruction/ Construction/ Operation***

#	Measure	Timing
	• ***A Surface and Groundwater Monitoring program developed in accordance with requirements outlined in the Hydrogeological Assessment (Appendix F of the EIS), Section 8 of the Revised Concept Design Report (Appendix B of the RtS), the Hydrogeological Addendum Assessment (Appendix C of the RtS) and the Guidelines. The monitoring program would include:*** – ***Monitoring period*** – ***Surface water and groundwater monitoring locations*** – ***Testing parameters*** – ***Frequency of monitoring to be undertaken*** • ***Measures to manage erosion and sediment control, in accordance with the Blue Book, including:*** – ***Installation of erosion and sediment controls prior to construction commencing*** – ***Separation of clean and dirty water*** – ***Minimisation of ground disturbance and areas of exposed soils, where possible*** – ***Stabilisation and revegetation of exposed soils as soon as practicable*** – ***Avoidance/minimisation of clearing and earthworks during periods of heavy rain*** – ***Measures to reduce the velocity and erodibility of surface water flows across the site*** – ***Measures for management of stockpiles and sediment basins*** – ***Requirements for classification of surplus excavated materials under the NSW EPA Waste Classification Guidelines 2014.*** • ***Measures to manage impact to, and discharge of, surface water, including:*** – ***Surface water discharge water quality trigger values in accordance with the ANZECC methodology and management measures for water not suitable for discharge*** – ***Contingency measures in event of contamination detected in surface water*** • ***Measures to manage impacts to, and discharge quality of, groundwater, including:*** – ***Measures for management of groundwater flows and discharge locations*** – ***Groundwater discharge water quality trigger values and management measures for water not suitable for discharge***	

#	Measure	Timing
	– ***Contingency measures in event of contamination detected in groundwater***	
W-04	***Further consideration will be given to options, such as the installation of energy dissipaters, to reduce discharge velocities during detail design.***	***Pre-construction/ Construction/ Operation***
Leachate		
L-01	Consideration of, and recommendations regarding, a leachate extraction and level-control system (including a collection sump and leachate risers) would be developed to facilitate extraction of leachate from each cell.	Pre-construction
L-02	A leachate monitoring program would be developed in accordance with the requirements outlined in the ***Revised*** Concept Design Report (Appendix B ***of the RtS***) and Leachate Assessment (Appendix S ***of the EIS***)	Pre-construction / operation
Air quality and odour		
A-01	Procedures and training for staff would be developed to report the presence of strong odours around the perimeter of the Proposal Site	Operation
A-02	The active tipping face would be kept as small as practicable.	Pre-construction / construction / operation
A-03	Vehicles will be maintained and serviced according to the manufacturer's specifications and engines will be switched off when not in use	Construction / operation
A-04	All trucks entering and leaving the premises carrying loads must be covered at all times, except during loading and unloading	Construction / operation
A-05	Vehicles would be limited to a speed limit of 20 km/h	Construction / operation
A-06	Appropriate dust management practices would be maintained, including use of washing down as required and reducing drop heights from loading and handling equipment, where possible.	Construction / operation
A-07	The complaints management procedures currently in place at the Cairncross WMF would be continued for the future landfill stages, including maintenance of the existing Complaints Register.	Construction / operation

#	Measure	Timing
Noise and vibration		
N-01	Implement requirements for on-going maintenance of fixed and mobile plant in accordance with manufacturers specifications, ensuring silencers are fitted where reasonably practicable and considering replacing tonal reversing alarms with broadband devices on all site-owned plant.	Construction / operation
N-02	Awareness training would be provided for staff and contractors for managing environmental noise issues including: • Ensuring that vehicles don't queue at the site entrance prior to opening • Limiting unnecessary idling of plant • Minimising the use of horn signals and maintaining a low volume.	Pre-construction / construction / operation
Traffic		
T-01	Standard Operating Procedures (SOPs) to educate waste collection contractors/ heavy-vehicle drivers about appropriate exit procedures and avoidance of corner-cutting when exiting the Cairncross WMF Access Road would be developed	Operation
Greenhouse gas		
GHG-01	Project planning would be undertaken to ensure that on-site vehicle movements and construction activities are efficient, avoid double handling of materials and avoid unnecessary fuel use.	Pre-construction / construction / operation
GHG-02	A landfill gas monitoring program ***would be established in accordance with the requirements of the Environmental Guidelines – Solid Waste Landfills, Second Edition 2016, or equivalent, and*** would be undertaken for Stages 1 to 3	Pre-construction / construction / operation
GHG-03	A landfill gas management plan based on the findings of the 2017 landfill gas pumping trial would be developed. The extent of landfill gas controls to be designed and implemented for the existing and proposed stages of the landfill would be guided by the results of the gas pumping trial. If feasible, the implementation of a gas capture or flaring system will be considered.	Pre-construction / construction / operation
Aboriginal heritage		
AB-01	Prior to their on-site involvement, all personnel engaged for tree clearing and topsoil stripping would undergo a general site induction prior to their on-site involvement that provides information on legal obligations with respect to Aboriginal objects, including 'stop-work' conditions applicable in the event that any identified or suspected heritage objects are discovered at any time	Pre-construction / construction / operation

#	Measure	Timing
AB- 02	In the event that any identified or suspected Aboriginal objects are detected at any time, all disturbance work should immediately cease within 20m of the find and temporary protective fencing erected around this 'no-go zone 'pending further management advice from the OEH (Planning and Aboriginal Heritage Section, North Coast Region). If the find consists of or includes human remains, the NSW Police Department and NSW Coroner's office would be contacted. If the burial is identified as being of Aboriginal origin a heritage professional and NSW OEH would be contacted to determine the subsequent course of action.	Pre-construction / construction / operation
AB-03	PMHC would provide the OEH AHIMS Registrar with Aboriginal Site Impact Recording Forms for sites CWD 3 and CWD 4 once these sites are affected by the Proposal.	Pre-construction / construction / operation
AB-04	***Operational procedures for responses to detection of unexpected, identified or suspected Aboriginal objects would be included in the update to the 2015 OEMP.***	***Pre-construction / construction / operation***
Non-Aboriginal heritage		
NA-01	Prior to their on-site involvement, all personnel engaged for tree clearing and topsoil stripping would undergo a general site induction prior to their on-site involvement that provides information on legal obligations with respect to archaeological relics, including 'stop-work' conditions applicable in the event that any identified or suspected heritage relics are discovered at any time.	Pre-construction
NA-02	In the event that any identified or suspected historical relics are detected at any time, all disturbance work should immediately cease within 20m of the find and temporary protective fencing erected around this 'no-go zone 'pending further management advice from the OEH (Planning and Aboriginal Heritage Section, North Coast Region). If the find consists of or includes human remains, the NSW Police Department and NSW Coroner's office would be contacted.	Pre-construction / construction / operation
Hazards and risks		
HR-01	Operational procedures for responses to fire would be included in the update to the ***~~2008~~ 2015*** OEMP in accordance with: • *AS 3745 - 2010 Planning for emergencies in facilities* • *AS 1815 Maintenance of Fire Suppression System and Equipment* • *AS 2419.1-2005 Fire hydrant installations - System design, installation and commissioning.*	Operation
HR-02	The existing Cairncross WMF emergency response plan will be updated to include the Proposal Site	Construction / operation
HR-03	The following safe operating procedures would be adopted:	Construction / operation

#	Measure	Timing
	• Clear signage and road markings (speed limits, give way signs, directions, no access areas and disposal areas) • Limited number of heavy vehicles to be onsite at any one time • Ensure all personnel operating vehicles on site are licenced and competent • Inspection of trucks entering facility to ensure any hazardous waste is identified prior to entering the site • Excavator operators will receive training	
HR-04	Defendable Spaces would be maintained by regular slashing to limit vegetation (grass) height to 150 mm during the Bushfire Danger Period.	Operation
HR-05	The Strategic Fire Advantage Zone adjacent to the adjoining nature reserve would be provided and maintained along the boundary. This zone would be managed in accordance with the prescriptions provided by the NSW Rural Fire Service's 'Environmental Assessment Code 2006'.	Construction / operation
HR-06	The forest vegetation retained within each landfill stage, being the residual vegetation beyond the operating cell, would be fuel managed by hazard reduction burning in accordance with the prescriptions provided by the NSW Rural Fire Service's 'Environmental Assessment Code 2006'. Management of the combustible fuels would be undertaken to maintain a Low – Moderate Overall Fuel Hazard, pursuant to the DSE Overall Fuel Hazard Guide.	Construction / operation
HR-07	The Landfill plant and equipment such as Water Tankers and heavy earth moving plant would be maintained on 'stand-by' readiness during days of Total Fire Ban status.	Construction / operation
HR-08	Work practices would be established in recognition of the likely risk of ignition of the vegetation on the adjoining land by the operation of machinery such as slashers etc. These would include the provision of portable fire extinguishers during maintenance activities that involve cutting, grinding, welding and slashing etc.	Construction / operation
HR-09	To mitigate the risk of ignition of the surrounding vegetation, contractors undertaking drilling, cutting, grinding, welding and slashing operations on the site would not undertake such works without the provision of a portable fire extinguisher.	Construction / operation
HR-10	For the purpose of fuel reduction from hazard reduction burning, the following should be part of the ongoing management: • All perimeter trails clear and maintained;	Construction / operation

#	Measure	Timing
	• Internal trails maintained to allow for mosaic burning; • Asset Protection Zones/Defendable Spaces to be constructed and maintained around infrastructure; • Provide and maintain temporary fire trails, Asset Protection Zones/Defendable Spaces adjacent to each stage.	
HR-11	***The Cairncross Waste Management Facility Bush Fire and Fuel Management Plan (2001) will be updated to include the proposed bush fire mitigation measures for the Amended Proposal (HR-04 to HR-10), with consideration of the progressive development of the site.***	***Construction / operation***
HR-12	***Contractors will not undertake drilling, cutting, grinding, welding and slashing operations on Total Fire Ban days – unless during an emergency.***	***Construction / operation***

9 CONCLUSION

Port Macquarie Hastings Council are seeking approval to extend the Cairncross Landfill to cover the remaining area identified for landfilling at the Cairncross Waste Management Facility. The Environmental Impact Statement (EIS) for the Proposal was publicly exhibited between 15 February 2018 June and 16 March 2018

This RtS has been prepared in accordance with clause 85A of the *Environmental Planning and Assessment Regulation 2000*, to address comments raised by both government agencies and the community during the public exhibition of the EIS. This RtS provides further information and justification for the Proposal in order to respond to and address the submissions received.

This RtS also included amendments to the exhibited Proposal, now known as the Amended Proposal. These amendments have been undertaken to address submissions received, reflect progression in design development since lodgement of the EIS, provide additional clarity, and also to minimise the overall environmental impact of the Proposal.

The mitigation measures provided within the EIS have been updated to respond to the submission received (refer to Section 8 of this RtS) and address the scope of the Amended Proposal. Overall, the assessment identifies that the Amended Proposal would, subject to the implementation of updated mitigation measures, result in no substantial environmental impacts in addition to those identified within the EIS.

REFERENCES

Australian and New Zealand Environment and Conservation Council (ANZECC) & Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ), 2000

Australian and New Zealand Guidelines (ANZG) for Fresh and Marine Water Quality, August 2018

NSW EPA Waste Classification Guidelines: Part 1 Classifying Waste. State of NSW, Environment Protection Authority, 2014

NSW EPA Environmental Guidelines: Solid Waste Landfills, Second Edition. State of NSW, Environment Protection Authority, 2016

EPA's (2016) *Environmental Guidelines - Solid Waste Landfills' Second Edition*

Ryder et al. (2015) *Hastings – Camden Haven Ecohealth Project 2015: Assessment of River and Estuarine Condition. Final Technical Report*