Landscape Character and Visual Impact Assessment

Thrumster Wastewater Scheme

Port Macquarie-Hastings Council

11 July 2024

→ **The Power of Commitment**

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[Compliance statement]

Executive Summary

Port Macquarie-Hastings Council (Council) is proposing to develop the Thrumster Wastewater Scheme including a new wastewater treatment plant (WWTP), associated pipelines and infrastructure at Port Macquarie on the NSW Mid North Coast (the project). The project has been declared as a State Significant Infrastructure (SSI) and is a priority project for Council to ensure communities have access to necessary resources in a safe and reliable manner.

It is anticipated that construction of the project would commence in 2025, subject to the required planning and regulatory approvals and is anticipated to take 2-3 years. The project is estimated to be operational by 2028.

The project includes:

– New WWTP, including a recycled water plant within Lot 14, DP 1139180 on 433 Fernbank Creek Road, about 6 km west of Port Macquarie Central Business District.
– Return treated effluent pipeline (RTEP) to Kooloonbung Creek.
– Main access road to the WWTP and a flood-proof, all-weather access road.
– New sewer pump stations (SPS), sewer rising mains (SRM), recycled water mains and a potable water connection.
– Upgrade works at identified existing sewer pump stations to reduce the current load on the existing system.
– Improvements to site access, optic fibre connection and electricity supply.

This Landscape Character and Visual Impact Assessment (LCVIA) has been prepared by GHD Pty Ltd (GHD) as part of the project's Environmental Impact Statement (EIS). The LCVIA assesses both the potential landscape character impacts and the visual impacts associated with the project, and where required, recommends measures to mitigate and manage the potential impacts and addresses the Secretary's Environmental Assessment Requirements (SEARs).

The WWTP would be located within an existing wetland area, which would affect the landscape character of this environment however, views towards the WWTP would be predominantly screened from the public view by existing dense native bushland.

During construction of the network infrastructure minor potential impacts were identified. These would be temporary.

Mitigation and management measures would include the following:

– During construction works areas will be kept tidy and clear of rubbish, stockpiles appropriately contained, and equipment, plant and parking managed and contained within identified works areas.
– Any lighting during construction will be of short duration.

Cumulative impacts during construction are expected to be minor. The installation of the pipelines, electrical and communication conduits would be undertaken progressively and therefore impacts in each section being installed would be short term. Any potential cumulative impacts will be reduced through the application of individual project-specific environmental management plans.

The impacts on the landscape character and visual amenity of the project have been assessed as negligible for construction and mainly negligible during operation, with moderate impacts expected in close proximity to the WWTP.

This report is subject to, and must be read in conjunction with, the limitations set out in Section 1.4.2 and the assumptions and qualifications contained throughout the Report.

Glossary and abbreviations

Abbreviation	Definition
'Construction compound'	Construction compounds proposed for construction of the project. Each construction compound would accommodate a range of facilities which may include (but not limited to): – Laydown areas – Site offices – Amenities – Construction support facilities such as vehicle and equipment storage, maintenance sheds, chemical/fuel stores and stockpile areas – Parking
Council	Port Macquarie-Hastings Council
DPHI	Department of Planning, Housing and Infrastructure
ECS	Electricity and communications supply
EIS	Environmental Impact Statement
EPA	NSW Environment Protection Authority
EP&A Act	*Environment Planning and Assessment Act 1979*
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
FTE	Full time equivalent
GHD	GHD Pty Ltd
km	kilometres
LGA	Local Government Area
LCZ	Landscape Character Zone
LCVIA	Landscape Character and Visual Impact Assessment
'Locality'	Land within a 10 km radius of the study area
mm	millimetres
m	metres
mAHD	Metres Australian Height Datum
MG	Megalitres
NSW	New South Wales
Planning and Systems SEPP	State Environmental Planning Policy (Planning Systems) 2021
'Project area'	The area that has been assumed for the purpose of this EIS to be directly affected by the construction and operation of the project. It includes the indicative location of project infrastructure, the area that would be directly disturbed during construction and any easement required during operation.
RTEP	Return treated effluent pipeline to Kooloonbung Creek
RWM	Recycled water main
SEARs	Secretary's Environmental Assessment Requirements
'Sludge management infrastructure'	Includes the sludge, lagoons, and dewatering infrastructure
SPS	Sewer pump station
SRM	Sewer rising main

Abbreviation	Definition
‘Study area’	The proposed WWTP footprint, inclusive of a 20 metre (m) buffer, and associated pipelines, inclusive of a 10 metre (m) buffer, within the Port Macquarie-Hastings LGA (shown as “disturbance footprint” in Figure 1.1).
TfNSW	Transport for NSW
‘Treatment plant footprint’	the area of land that would be occupied by the WWTP including recycled water plant, and ancillary activities.
‘WWTP site’	Wastewater treatment plant site is the area that includes the wastewater treatment plant, ancillary structures and access roads surrounding the site. It also includes any area that would be directly disturbed during construction around the wastewater treatment plant.

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1. Introduction

1.1 Overview

1.1.1 Project background

Port Macquarie-Hastings Council (Council) is proposing to develop the Thrumster Wastewater Scheme including a new wastewater treatment plant (WWTP), associated pipelines and infrastructure at Port Macquarie on the NSW Mid North Coast (the project). The project has been declared as a State Significant Infrastructure (SSI) and is a priority project for Council to ensure communities have access to necessary resources in a safe and reliable manner.

The Port Macquarie-Hastings local government area (LGA) covers an area of approximately 3,626 square kilometres and has an estimated population of 86,762 (ABS Census, 2021) spread over 25 localities. Port Macquarie is one of the fastest growing regional cities in NSW with an additional 9,100 new homes required to meet the anticipated growth projections outlined in the North Coast Regional Plan 2041. Population forecasting has predicted that the population within the LGA will grow to 115,302 residents by 2046 (PMHC, 2024), increasing demand on the existing wastewater infrastructure and utilities.

The primary objective for the project is to support recent urban growth in the outer suburbs of Port Macquarie. The new wastewater scheme will reduce demand on the existing Port Macquarie WWTP and improve the resilience, redundancy and ongoing capacity of Council's infrastructure services, and facilitate planned future growth in the identified areas. The scheme would also minimise the environmental impact of wastewater management by implementing reuse of recycled water.

1.1.2 Key features of the project

The proposed WWTP is situated within Lot 14, DP1339180 on 433 Fernbank Rd, about 6 km west of Port Macquarie Central Business District. The project, as shown in Figure 1.3 generally includes the following:

- New WWTP, including a recycled water plant within Lot 14, DP 1139180 on 433 Fernbank Creek Road, about 6 km west of Port Macquarie Central Business District.
- Return treated effluent pipeline to Kooloonbung Creek (RTEP).
- Main access road to the WWTP and a flood-proof, all-weather access road.
- New sewer pump stations (SPSs).
- Sewer rising mains (SRM).
- Recycled water mains (RWM) and a potable water connection.
- Upgrade works at identified existing sewer pump stations (SPSs) to reduce the current load on the existing system.
- Improvements to site access and optic fibre connection.
- Electricity and communications supply (ECS).

It is anticipated that construction of the project would commence in 2025, subject to the required planning and regulatory approvals and is anticipated to take 2-3 years. The project is estimated to become operational by 2028.

Site compounds would be established within close proximity of the WWTP and would be required along the pipeline routes (these are mapped in Figure 1.3). Each site compound has been chosen as they are cleared of native vegetation, outside of natural drainage lines and do not contain known Aboriginal heritage.

The project is anticipated to be fully commissioned and operational by the end of 2028. The WWTP would have a design capacity of 40,000 EP and hydraulic loading of 9.2 ML/Day by 2039. Thrumster WWTP has been designed to be expandable in the future to an ultimate capacity of 80,000 EP and hydraulic loading of 18.4 ML/Day by 2071. The project incorporates advanced wastewater treatment technology capable of mechanical and biological nutrients reduction, equipped with UV and chlorine disinfection systems to provide multiple barriers against pathogens for the non-potable recycled water. The ultimate recycled water design capacity of 4.7 ML/Day is provisioned for the project.

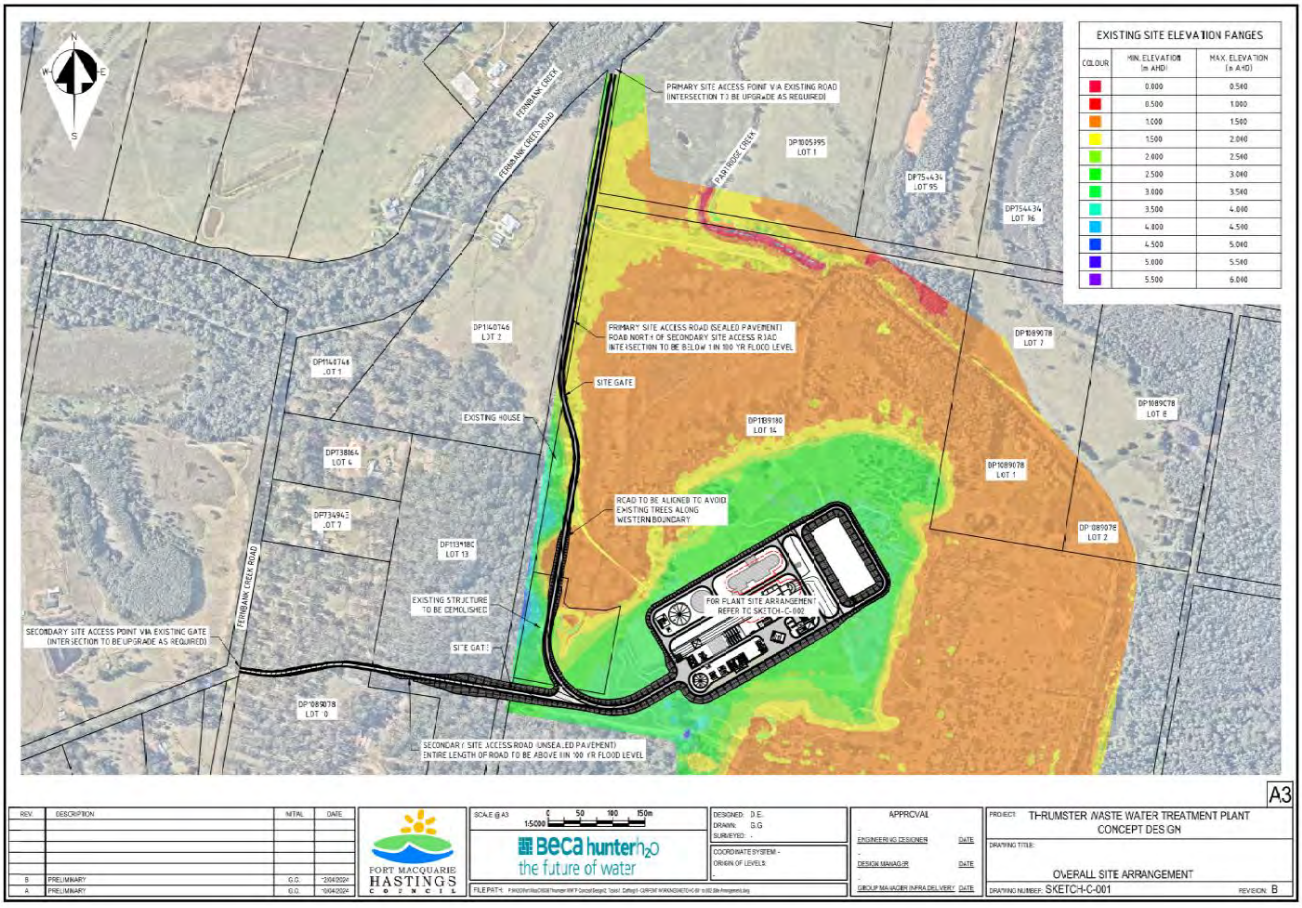


Figure 1.1 WWTP site arrangement

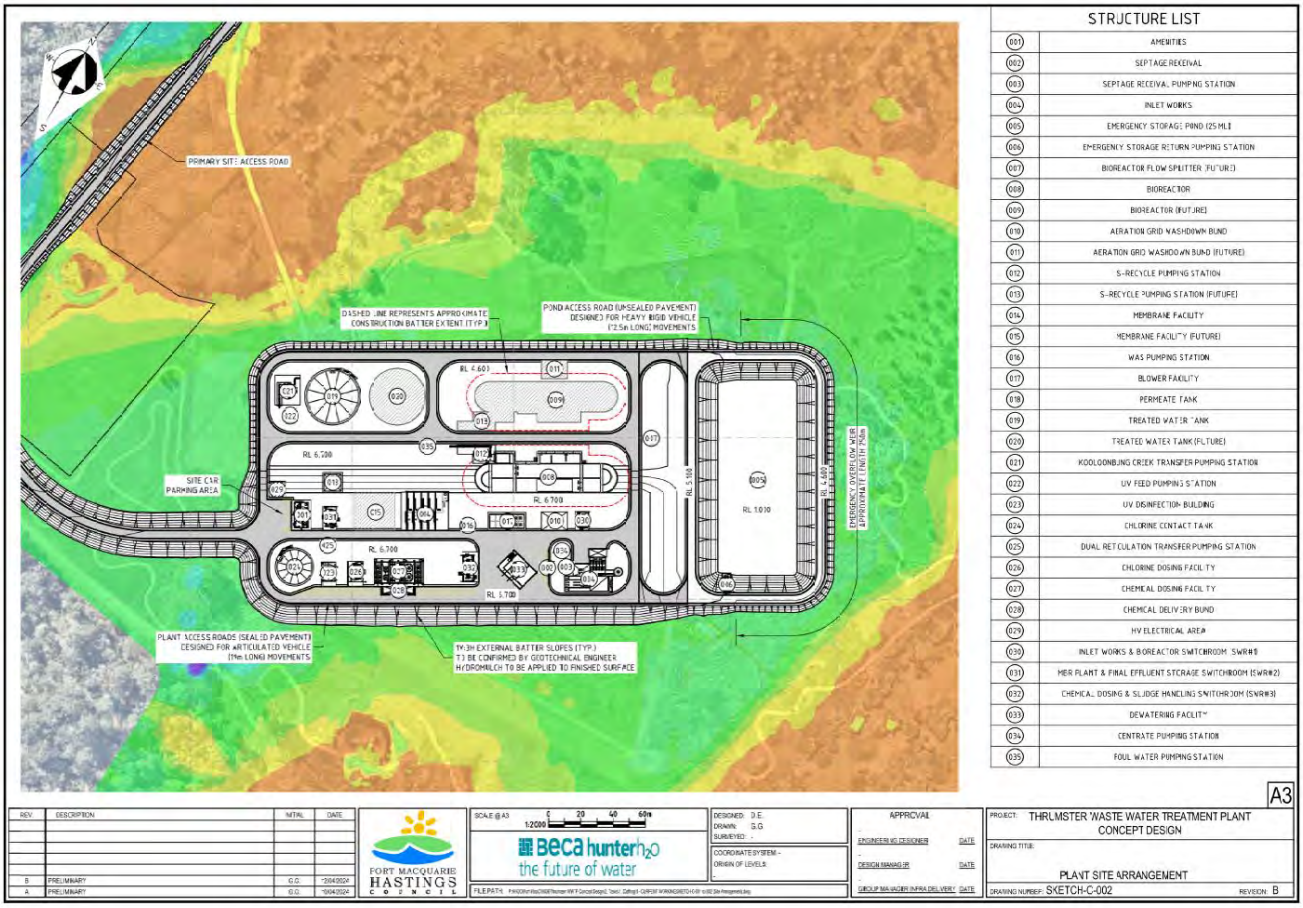
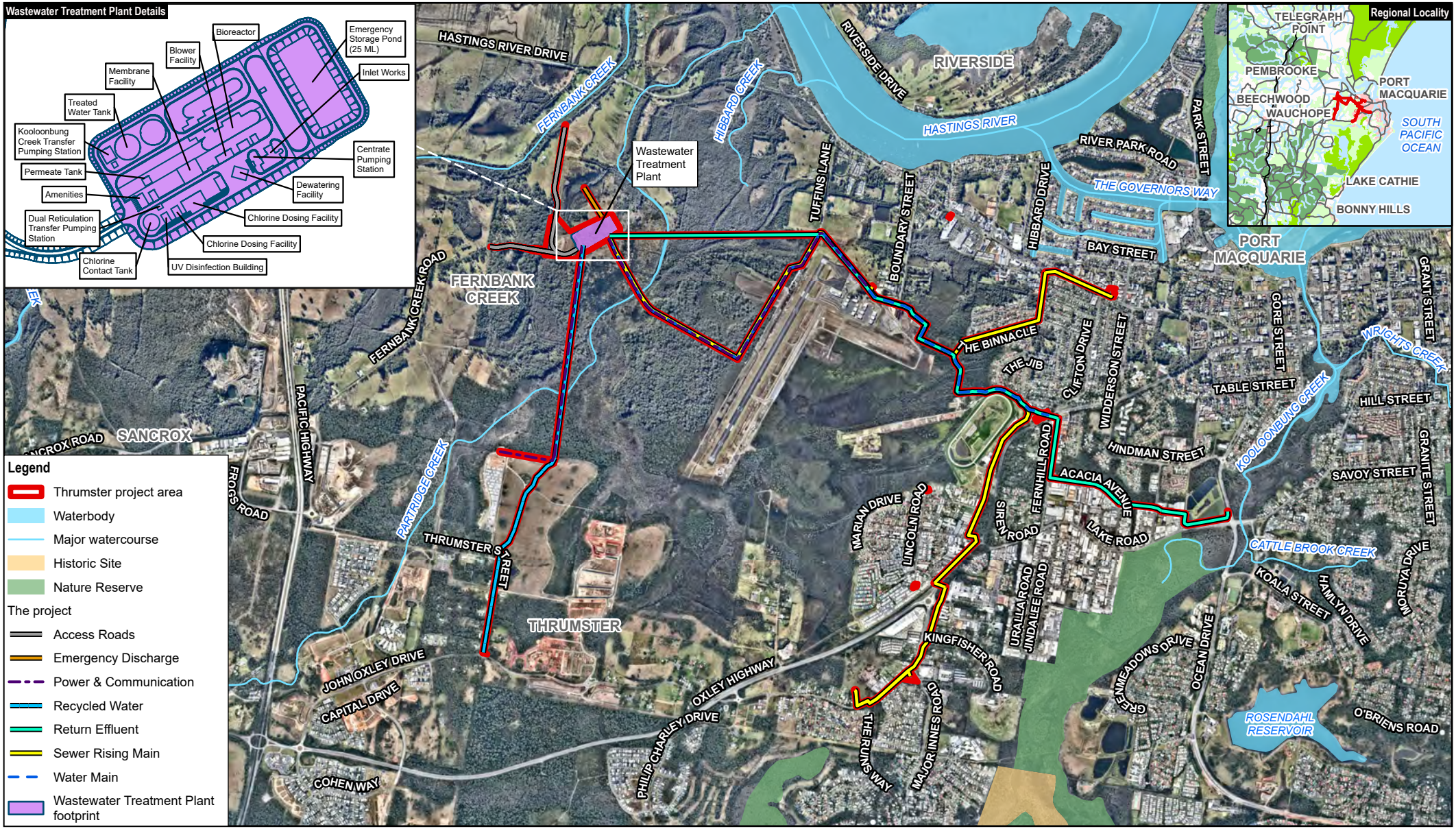


Figure 1.2 Plant arrangement



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Grid: GDA 1994 MGA Zone 56

GHD

Port Macquarie-Hastings Council
Thrumster Wastewater Scheme
Landscape and Visual Assessment

Project No. **12611129**
Revision No. **0**
Date **26/06/2024**

Project overview

FIGURE 1.1

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Print date: 26 Jun 2024 - 10:25

Data source: PMHC: Infrastructure data, 2023; BECCA: WTP Design, 2024; Geoscience Australia: 250k Topographic Data Series 3, 2006; LPI: DTDB / DCDB, 2023; Nearmap WMS Server: Aerial imagery - date extracted 12/10/2023.
Created by: fmackay

1.2 Secretary's environmental assessment requirements

This landscape character and visual impact assessment (LCVIA) report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued by the NSW Department of Planning, Housing, and Infrastructure (DPHI). Table 1.1 outlines the requirements relevant to this assessment.

Table 1.1 Relevant SEARs – Visual and Design

Visual and Design	Where it is addressed in this report
An assessment of the visual impact of the project and any ancillary infrastructure during construction and operation on: a. The existing visual environment of the area, including views. b. Key sites and buildings. c. Heritage items. d. The local community and public amenity.	Section 6
Provide details and illustrations of how the project has minimised adverse visual impacts.	Section 7 Also refer to: Concept design report by BHH2O
Address the scale and design of the proposed development, considering impacts upon the visual amenity of the sites, including: a. Identify how services and plant are integrated into the overall design of the proposed development. b. Provide details of any proposed landscaping, including the number of trees to be removed and the numbers of trees to be planted. c. Identify any services to be relocated or rerouted to facilitate the development.	Section 7 Also refer to: Concept design report by BHH2O Hazard assessment report by GHD

1.3 Purpose of this report

This report has been prepared by GHD Pty Ltd (GHD) as an input to the EIS for the proposal. The EIS has been prepared to accompany the application for approval of the proposal and addresses the environmental assessment requirements of the SEARs, which were issued on 28 April 2023.

The purpose of this report is to assess both the potential landscape character impacts (impact on the area's built, natural and cultural character or sense of place) and the visual impacts associated with the proposal (impact on views in and around the area), and where required, identify feasible and reasonable mitigation and management measures. This report:

– Addresses the SEARs listed in Table 1.1.
– Assesses the impacts from construction and operation of the project.
– Recommends measures to mitigate and manage the potential impacts identified.

1.4 Scope and limitations

1.4.1 Scope

This report includes a landscape character and visual impact assessment prepared with reference to the following:

– EIA-N04 Environmental Impact Assessment Practice Note – Landscape character and visual impact assessment (Transport for NSW, 2020).
– The Guidance for Landscape and Visual Impact Assessment (GLVIA), Third Edition (2013), prepared by Landscape Institute and Institute of Environmental Management & Assessment (IEMA, UK).
– Guidance Note for Landscape and Visual Assessment (June 2018), Australian Institute of Landscape Architects (Queensland chapter).

– AS4282-1997 Control of the obtrusive effects of outdoor lighting.

The scope of this LCVIA includes:

– **Site analysis and identification of landscape character zones** – Based on desktop and field analysis, the natural environment is identified and described as well as the human intervention and shaping of that environment, including settlements and the interaction between place and community.
– **Assessment of landscape character impacts** – The impact of the development and associated infrastructure on each zone is identified and assessed. Impacts are based on the sensitivity of the landscape character zone to change and the magnitude of the development within that landscape.
– **Assessment of the visibility of the Project** – Based on desktop and site analysis, the extent of the development that is visible is defined.
– **Identification of key viewpoints** – Based on desktop and field analysis, a schedule of key viewpoints is developed. The final list of receptors does not represent the entire number of receptors likely to be visually impacted by the Project, but rather gives an indication of the typical range of views that receptors will have.
– **Assessment of visual impacts** – The unmitigated impact of the development on each representative viewpoint is assessed. Impacts are based on a composite of the sensitivity of the view and magnitude of the development in that view, before any mitigation strategy has been put in place.
– **Development of mitigation strategy** – Principles and strategies are developed to mitigate landscape character and visual impacts in the ongoing development of the design.

1.4.2 Limitations

This report: has been prepared by GHD for Port Macquarie-Hastings Council and may only be used and relied on by Port Macquarie-Hastings Council for the purpose agreed between GHD and Port Macquarie-Hastings Council as set out in Section 1.3 of this report.

GHD otherwise disclaims responsibility to any person other than Port Macquarie-Hastings Council arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer Section 1.6 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

1.5 Structure of this report

The report is structured as follows:

– Section 1 – introduces the proposal and the assessment.
– Section 2 – provides a description of the proposal.
– Section 3 – describes the methodology for the assessment.
– Section 4 – describes the existing conditions of the proposal site and the study area.
– Section 5 and Section 6 – assesses the impacts of the construction and operation of the proposal.
– Section 7 – provides an impact assessment summary.
– Section 8 – provides mitigation measures for the impacts identified.

1.6 Assumptions

The area of investigation covered by this landscape character and visual impact assessment comprised an area within 1.5 km of the project e.g. the area that may be affected (directly or indirectly) by the proposal in a significant way. Any potential viewpoints beyond this distance would be considered distant, with no sensitivity to visual impacts. Refer to 2.2 Methodology.

2. Assessment approach and methodology

2.1 Legislative and policy context to the assessment

This section summarises the legislation, guidelines and/or policies driving the approach to the assessment.

LCVIA is by its nature not an exact science and consequently is subject to varied methodologies both in Australia and overseas. Potentially subjective assessment material and differences of opinion about how to best assess visual characteristics, qualities, degrees of alteration and viewer sensitivity often arise. As a consequence, and as identified by the NSW Land and Environment Court, the key to a robust process is to explain clearly the criteria upon which an assessment is made.

As such, the LCVIA will be undertaken in accordance with methodology provided in the NSW Roads and Maritime Services as set out in the *Environmental Impact Assessment Practice Note EIA-N04 – Guideline for landscape character and visual impact assessment* (Transport for NSW, 2020) as it provides a robust process and clearly defined criteria on which to assess the potential impacts of the project and has consistently been accepted by DPE as a valid methodology for such assessments.

Other relevant guidelines for the preparation of LCVIA include:

– The Guidance for Landscape and Visual Impact Assessment (GLVIA), Third Edition (2013), prepared by Landscape Institute and Institute of Environmental Management & Assessment (IEMA, UK).
– Guidance Note for Landscape and Visual Assessment (June 2018), Australian Institute of Landscape Architects (Queensland chapter).

The SEARs requirements relevant to the LCVIA and where these have been addressed in this report, are discussed in Section 1.2.

2.2 Methodology

2.2.1 Landscape character impact assessment

For this assessment, it is GHD's interpretation of the landscape character values and attributes that determine the rankings for the landscape character impact assessment, not an interpretation of the values or perceptions of individuals or the community.

Sensitivity and magnitude provide measures to assess impacts from the project on the landscape character. The sensitivity and magnitude for landscape character are as follows:

– Sensitivity: refers to how sensitive the character of the setting is to the proposed change and its capacity to absorb the change.
– Magnitude: refers to the scale, form, and character of a project.

A series of landscape character zones (LCZ) are identified, having a distinct character resulting from a combination of urban and landscape features that include landform, built form, vegetation, and land use.

The rankings outlined in Table 2.1 and Table 2.2 below, have been used to determine the sensitivity and magnitude of the project on each LCZ.

Table 2.1 Sensitivity ranking

Ranking	Description
High	Pristine landscape with regionally important landscape heritage or biodiversity features. Predominantly intact and very good condition landscape with distinctive character and strong sense of place.
Moderate	Locally important but undesignated landscape heritage or biodiversity features. Land use retains some of the original/intrinsic character but also reflects modern changes. Moderate condition landscape but could have some erosion or loss. Moderate level of scenic beauty.

Ranking	Description
Low	Undesignated landscape heritage or biodiversity features. Land use retains little original or intrinsic value with strong modern trends. Moderately settled with medium level of built form. Limited representation of landscape character type. Low scenic beauty.
Negligible	Undesignated landscape heritage or biodiversity features. Densely settled with some noticeable erosion/loss. Few/poor/negative perceptual and aesthetic qualities and poor representation of landscape character type.
None	No defining features or contribution to local character. Land use retains no original/intrinsic character and modern trends are widespread. Very densely settled with landscapes of very low quality and in degraded condition/derelict. Widespread erosion or loss. No sense of remoteness.

Table 2.2 Magnitude ranking

Ranking	Description
High	Substantial or total loss of key elements/features/characteristics of the landscape character and/or introduction of elements that are considered to be totally uncharacteristic.
Moderate	Partial loss of/or alteration to one or more key elements/features/characteristics of the landscape character and/or introduction of elements that may be prominent but not considered to be substantially uncharacteristic.
Low	Minor loss of/or alteration to one or more key elements/features/characteristics of the landscape character (with recovery expected in the short term 0-4 years) and/or introduction of elements that are consistent with the existing character.
Negligible	Very minor loss or alteration to one or more key elements/features/characteristics of the landscape character and/or introduction of elements that are consistent with the existing character.
None	No part of the project is discernible.

2.2.2 Visual impact assessment

The levels of potential visual impact have been assessed through consideration of the combination of magnitude of change within a viewshed and viewpoint sensitivity. The magnitude of visual change is influenced by the level of visibility of the proposal site resulting from the combination of the physical scale of the proposal, how distant it is and the contrast it presents to the existing condition.

Viewpoint sensitivity refers to the qualities of the view, the number and type of receivers, viewer distance and typical duration the view is able to be perceived. For example, people driving on a busy road and/or at high speeds are likely to be less sensitive to a change in the environment since they are focused on changes in traffic conditions and driving, compared to someone who is enjoying a recreational experience or someone who is viewing the scene from their living room.

The rankings outlined in Table 2.4 and Table 2.4 below, have been used to determine the viewpoint sensitivity and the magnitude of change from each viewpoint.

Table 2.3 Viewpoint sensitivity ranking

Ranking	Description				
	View Duration	**Viewer Numbers**	**Viewer Type**	**Viewer Distance**	**View Sensitivity**
High	Long	High	Resident	Short <150 m	Pristine
Moderate	Moderate	Moderate	Pedestrian	Medium 150 m to 600 m	Minimally Modified
Low	Short	Low	Cyclist	Long 600 m to 1km	Moderately Modified
Negligible	Glimpse	Negligible	Motorist	Distant >1 km	Significantly Modified

Table 2.4 Magnitude of change ranking

Ranking	Description
High	Substantial to total loss of key elements/features/characteristics of the existing visual character and/or introduction of elements considered to be totally uncharacteristic of the existing character.
Moderate	Partial loss of/or alteration to one or more key elements/features/characteristics of the existing visual character and/or introduction of elements that may be prominent but not considered to be substantially uncharacteristic of the existing landscape character.
Low	Minor loss of/or alteration to one or more key elements/features/characteristics of the existing visual character and/or introduction of elements that are consistent with the existing landscape character.
Negligible	Very minor loss or alteration to one of more key elements/features/characteristics of the existing visual character and/or introduction of elements that are consistent with the visual character to the existing landscape character.

2.2.3 Evaluating impact

The combination of sensitivity and magnitude provides the rating of the landscape character and visual impacts of the proposal, as set out in the *Environmental Impact Assessment Practice Note EIA-N04 – Guideline for landscape character and visual impact assessment* (Transport for NSW) (refer Table 2.5).

Table 2.5 Impact rating matrix

		Magnitude			
		High	Moderate	Low	Negligible
Sensitivity	High	High	Moderate - High	Moderate	Negligible
	Moderate	Moderate - High	Moderate	Moderate - Low	Negligible
	Low	Moderate	Moderate - Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

3. Existing environment

3.1 Project location and surrounding land uses

The project would be located on the Mid North Coast of NSW, within the Port Macquarie-Hastings Local Government Area (LGA), NSW.

The WWTP and recycled water plant footprints are located approximately 6 km west of the Port Macquarie Central Business District. Land uses around the project footprint comprise of a mixture of rural residential, environmental management (coastal wetland), and transport infrastructure (Port Macquarie Airport). The pipeline routes cover recreational land use, Crown Land (Port Macquarie Racecourse and Rifle Range), local roads, and current or future urban residential land use. New pipelines for sewer, returned effluent, and recycled water rising mains would generally be located within utility easements and road reserves (Figure 3.1 below).

Paper Size ISO A4

0 0.25 0.5 0.75 1

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

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Site location and surrounding land uses

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FIGURE 4.1

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Print date: 26 Jun 2024 - 10:25

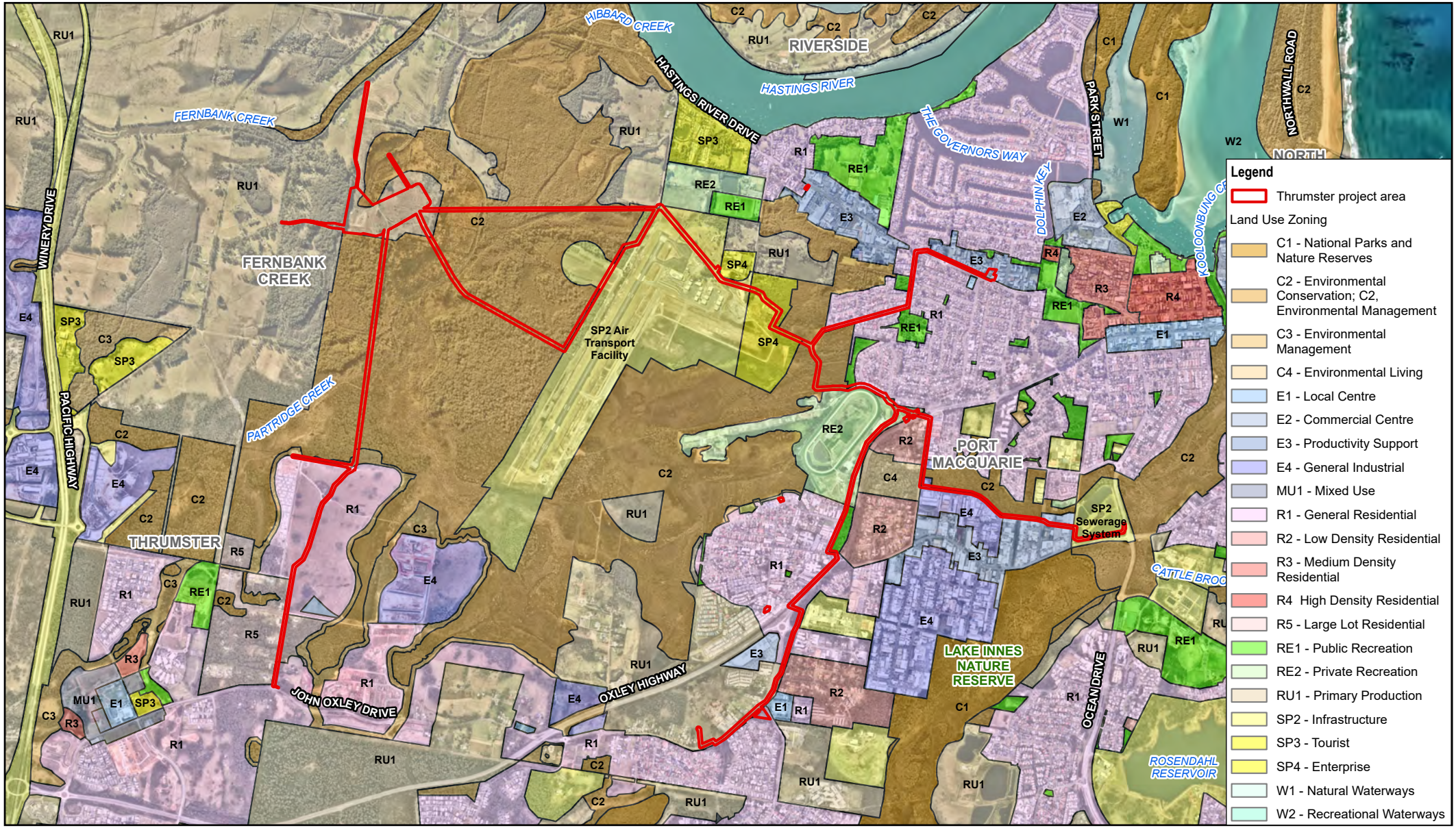
Data source: PMHC: Infrastructure data, 2023; LPI: DTDB / DCDB, 2023; Nearmap WMS Server: Aerial imagery - date extracted 12/10/2023. Created by: fmackay

3.2 Land use zoning

Land allotments and ownership proposed for the WWTP infrastructure and recycled water treatment facility are described in Table 3.1. The SRM, RWM, RTEP, and ECS pass through a number of zones, listed in order of occurrence. Refer to Figure 3.2 below.

Table 3.1 Land use and zoning for proposed WWTP

Project element	Landowner	Zoning	Current site conditions
WWTP and recycled water treatment facility	Port Macquarie Hastings Council	RU1 Primary production	Rural, surrounded by environmental conservation and management.
Recycled water main	Various	RU1 Primary Production R1 General Residential R5 Large Lot Residential C2 Environmental Conservation C3 Environmental Management	Mixed cleared and vegetated road easement, transport (road) infrastructure corridor, cleared land, utility easements, urban road easement, public open area.
Sewer rising mains and associated infrastructure	Various	RU1 Primary Production R1 General Residential R2 Low Density Residential B5 Business Development B7 Business Park SP2 Infrastructure RE1 Public Recreation RE2 Private Recreation C2 Environmental Conservation C4 Environmental Living	Mixed: cleared and vegetated road easement, transport (road and Port Macquarie Airport) infrastructure corridor, Crown Land (Port Macquarie Racecourse and Rifle Range), cleared land, utility easements, urban local road easement.



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Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

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Land use zoning

FIGURE 4.2

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Data source: NSW Government: DPE Land Use Zoning, 2023; PMHC: Infrastructure data, 2023; LPI: DTDB / DCDB, 2023; Nearmap WMS Server: Aerial imagery - date extracted 12/10/2023. Created by: fmackay

3.3 Topography, landform & vegetation

The proposed Thrumster WWTP would be located on the low-lying lands of the Hastings River floodplain within a wetland dominated by Coastal Lagoon Sedgeland. The area surrounding the WWTP location is dominated by dense native bushland, which generally screens the proposed WWTP.

The SRM, RWM, RTEP, and ECS components of the project cover a large area of flat and low undulating landform with highly fragmented vegetation including open cleared areas, scattered remnant vegetation and areas of White Stringybark, Tallowwood and Blackbutt forest.

Fragmentation has occurred through progressive historic clearing of native bushland, to accommodate rural activities, aviation activities, residential and commercial development, which in many cases are bounded in close proximity by remnant native bushland areas.

Figure 3.3 Dense native bushland surrounding the proposed WWTP, located within existing wetland

Figure 3.4 *Proposed WWTP, located on existing wetland*

Figure 3.5 *Dense native bushland surrounding the proposed WWTP, located within existing wetland*

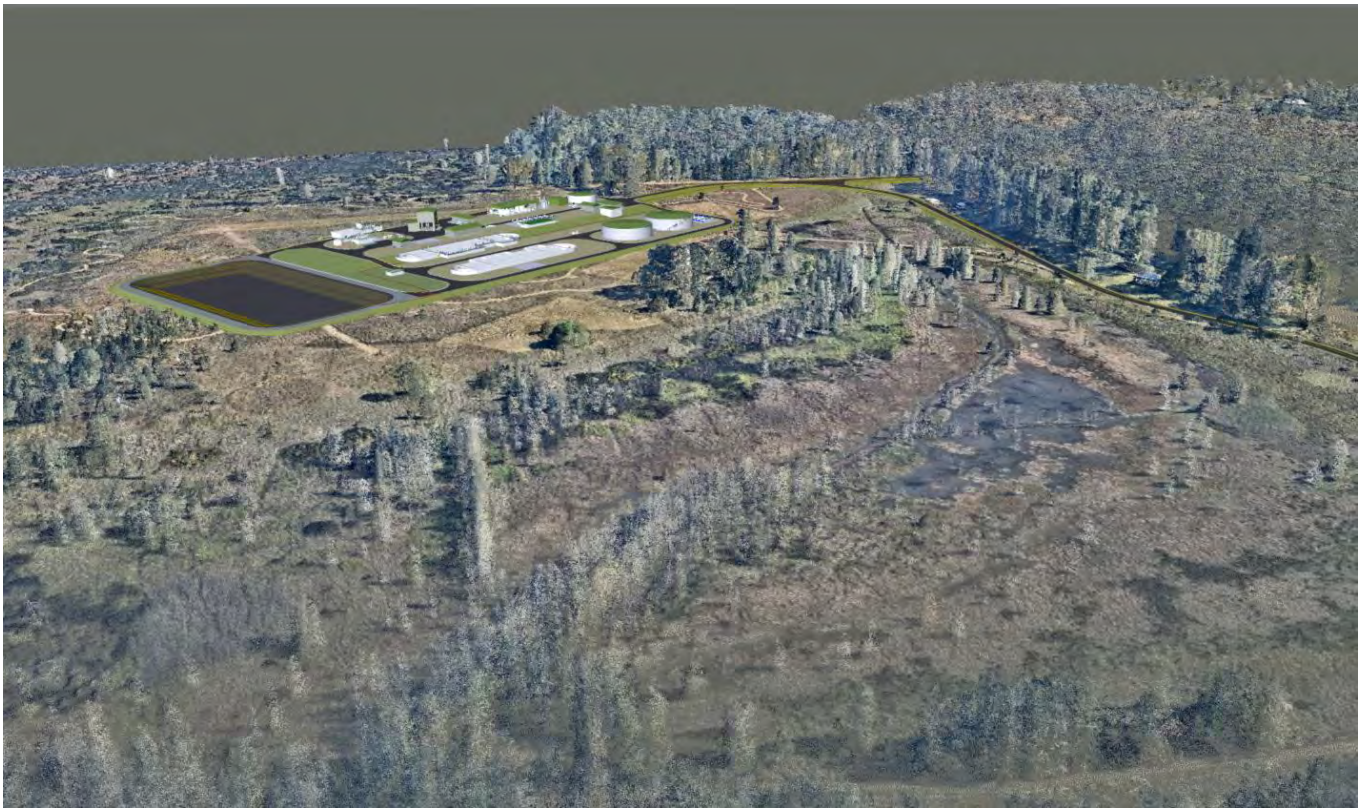


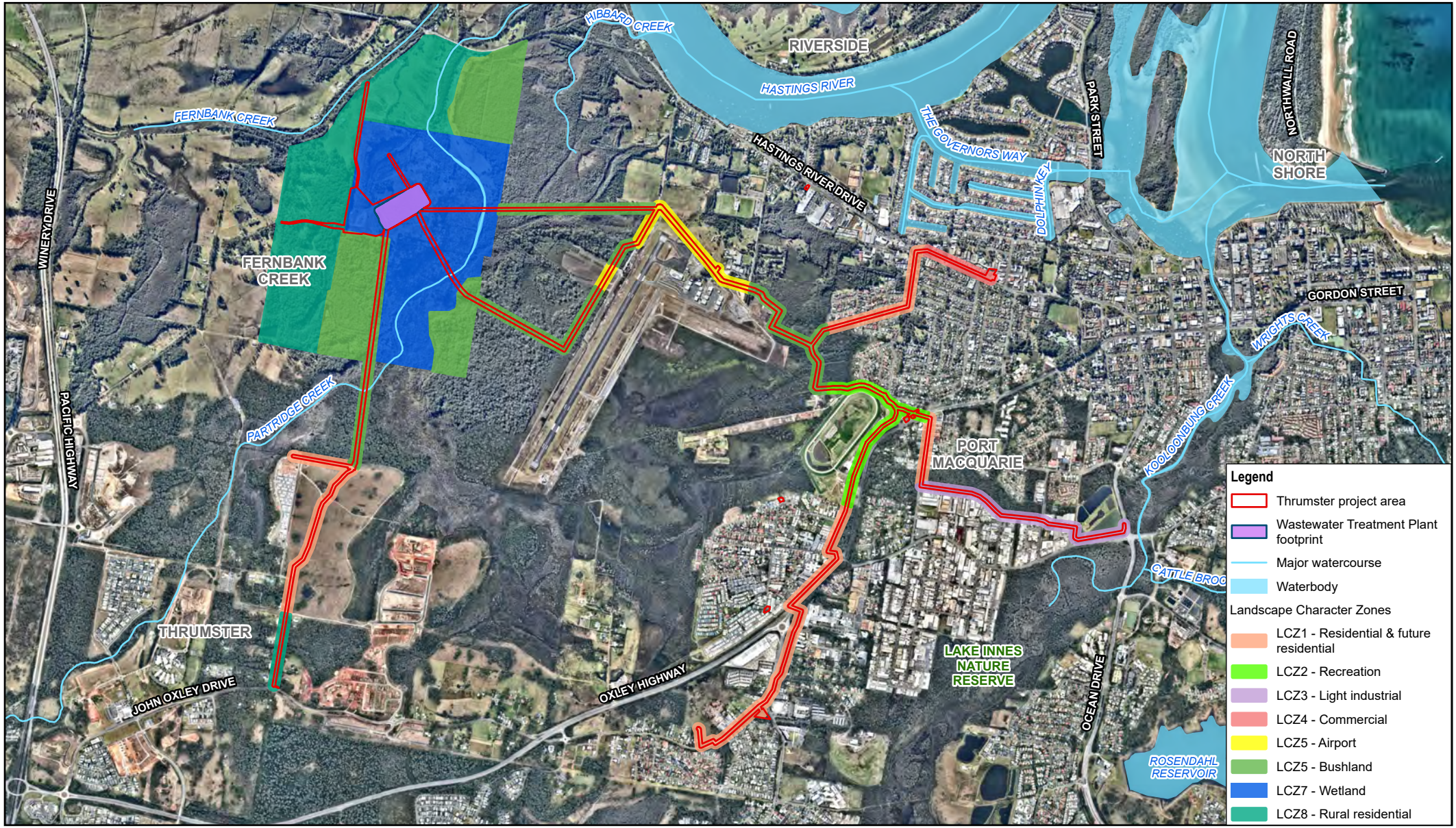
Figure 3.6 Proposed WWTP location in existing wetland environment

4. Landscape character analysis

4.1 Landscape character zones

A series of LCZs were identified that have a distinct character resulting from a combination of urban and landscape features that include landform, built form, vegetation, and land use for assessment of the project. The landscape character zones have been identified and presented in Figure 4.1 as:

- LCZ 1 – Residential & future residential
- LCZ 2 – Recreation
- LCZ 3 – Light Industrial
- LCZ 4 – Commercial
- LCZ 5 – Airport
- LCZ 6 – Bushland
- LCZ 7 – Wetland
- LCZ 8 – Rural residential



Paper Size ISO A4

0 0.3 0.6 0.9 1.2

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

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Landscape character zones

FIGURE 5.1

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Print date: 26 Jun 2024 - 10:25

Data source: NSW Government: DPE Land Use Zoning, 2023 PMHC: Infrastructure data, 2023; LPI: DTDB / DCDB, 2023; Nearmap WMS Server: Aerial imagery - date extracted 12/10/2023. Created by: fmackay

4.2 Landscape character impact assessment

The following landscape character impact assessment considers both construction and operational stages of the project. The RTEP, SRM, RWM and ECS components of the project would be subterranean pipelines located within existing road reserves and utility easements, therefore any impacts to the landscape character would be during construction only.

4.2.1 LCZ 1 – Residential & future residential

The landscape character of LCZ 1 is described in Table 4.1, with photographs provided in Figure 4.2, Figure 4.3 and Figure 4.4. The measurement of impact is provided in Table 4.2.

Figure 4.2 LCZ 1 – Residential & future residential – residential homes on The Binnacle

Figure 4.3 LCZ 1 – Residential & future residential – residential homes on Tulloch Road

Figure 4.4 LCZ 1 – Residential & future residential – - cleared land for future residential development

Table 4.1 Landscape character (LCZ 1)

Summary	This landscape character zone is associated with low density residential development, much of which has been developed in the last few decades or is still being developed. Residences are sometimes bounded by remnant native bushland and rural activities and in many cases this interface is abrupt. Outlooks are inconsistent, with mostly open outlooks but are sometimes enclosed by vegetation or neighbouring homes.
Landform	– Mostly flat with some undulating hills
Vegetation	– Dense native bushland to some of the development perimeter – Scattered vegetation to street frontages and/or residential gardens
Landscape Features	– Flood prone open cleared land
Infrastructure	– Residential streets – Street lighting – Electricity transmission lines
Land Use/Built Environment	– Port Macquarie Base Hospital – Lake Innes Village Shopping Centre – Bunnings – Residential properties
Spatial Quality/Amenity	– Open cleared areas filled with low density residential development – Abrupt outlooks which are sometimes bounded by dense bushland

Table 4.2 Measure of impact (LCZ 1)

Sensitivity	Low
Magnitude	Negligible
Impact	Negligible
Comments	This landscape has few biodiversity features and retains little original or intrinsic value with strong modern trends. It is a moderately settled landscape with medium level of built form. There is some representation of the original forested landscape character type and scenic beauty on the development boundary. Construction of the new SRM, RTEP, and ECS will involve trenching and will be mostly contained within existing road reserves. There will also be a temporary compound and carpark to support the works during construction. The works will only impact these areas during construction periods will have no impact during plant operation. A new SPS will constitute a minor alteration to the existing landscape character with the introduced elements being consistent with the existing environment. Any lighting during construction will be of short duration. During operation of the SPS, lighting will be provided in accordance with AS 4282 – Control of the obtrusive effects of outdoor lighting. Both construction and operational impacts would be low.

4.2.2 LCZ 2 – Recreation

The landscape character of LCZ 2 is described in Table 4.3, with photographs provided in Figure 4.5 and Figure 4.6. The measurement of impact is provided in Table 4.4.

Figure 4.5 LCZ 2 – Recreation – Port Macquarie Racecourse, Lady Nelson Road

Figure 4.6 LCZ 2 – Recreation – associated infrastructure (stabling), Lady Nelson Road

Table 4.3 Landscape character (LCZ 2)

Summary	This area is characterised by open outlooks associated with the racecourse and other recreational facilities, with minimal built infrastructure. The land is mostly flat in the developed recreational areas, with dense vegetation and undulating hills to some parts of the boundary.
Landform	– Flat with gentle undulating hills towards the edges
Vegetation	– Mix of dense and scattered native bushland around the perimeter
Landscape Features	– Flood prone open cleared land
Infrastructure	– Lady Nelson Drive – Oxley Highway – Street lighting – Electricity transmission lines
Land Use/Built Environment	– Racecourse and associated buildings – Outdoor recreation
Spatial Quality/Amenity	– Mostly open outlooks over cleared land for recreational use occasionally bounded by native bushland or residential lots on Lady Nelson Drive

Table 4.4 Measure of impact (LCZ 2)

Sensitivity	Moderate
Magnitude	Negligible
Impact	Negligible
Comments	This landscape character zone retains some of the original native character but also reflects changes due mainly to recreational activities. This landscape is in moderate condition with a moderate level of scenic beauty. The project would be contained within road reserves and would constitute a minor loss of/or alteration of the overall character during construction of the SRM, RWM and RTEP. The new SPS will have low impacts during construction and operation as it is located within an area that already has changes to the original character and will be situated near existing small-scale buildings. It will also be partially screened by scattered native trees. Any lighting during construction will be of short duration. During operation of the pump station, lighting will be provided in accordance with AS 4282 – Control of the obtrusive effects of outdoor lighting. Both construction and operational impacts would be moderate - low.

4.2.3 LCZ 3 – Light industrial

The landscape character of LCZ 3 is described in Table 4.5, with photographs provided in Figure 4.7 and Figure 4.8. The measurement of impact is provided in Table 4.6.

Figure 4.7 LCZ 3 – Light industrial – Acacia Avenue

Figure 4.8 LCZ 3 – Light industrial – Barton Crescent

Table 4.5 Landscape character (LCZ 3)

Summary	This landscape character zone is associated with light industrial buildings of medium to large scale. The developed area retains little original character that exists in dense forested area to the perimeter of Acadia Avenue.
Landform	– Mostly flat with gentle undulating hills
Vegetation	– Large cleared open areas with dense vegetation to development perimeter – Occasional scattered planting and/or gardens to street frontages
Landscape Features	– Flood prone open cleared land
Infrastructure	– Acacia Avenue – Street lighting – Electricity transmission lines
Land Use/Built Environment	– Mid to large scale industrial offices, warehouses, and associated car parking
Spatial Quality/Amenity	– Relatively open outlooks generally bounded by native bushland to development perimeter

Table 4.6 Measure of impact (LCZ 3)

Sensitivity	Low
Magnitude	Negligible
Impact	Negligible
Comments	This landscape has few biodiversity features except along the development perimeter where it retains some original intrinsic value and scenic beauty. In the developed areas there is limited representation of the original natural environment with medium level of built form. The project would be constrained within the road reserve and would constitute a minor loss of/or alteration of the overall character for the construction of the RTEP only. Any lighting during construction will be of short duration. There would be no ongoing operational impact.

4.2.4 LCZ 4 – Commercial

The landscape character of LCZ 4 is described in Table 4.7, with photographs provided in Figure 4.9 and Figure 4.10. The measurement of impact is provided in Table 4.8.

Figure 4.9 LCZ 4 – Commercial – Hastings River Drive

Figure 4.10 LCZ 4 – Commercial – Clifton Drive

Table 4.7 Landscape character (LCZ 4)

Summary	This landscape character zone is associated with small to medium scale commercial development, situated along Hastings River Drive. It is characterised by wide road reserves with central nature strips that have introduced species.
Landform	– Mostly flat
Vegetation	– Mixture of domestic and native plantings and street trees – Scattered remnant native forest particularly to development perimeters
Landscape Features	– Wide road reserves with central nature strips
Infrastructure	– Hasting River Road – Street lighting – Overhead power transmission lines
Land Use/Built Environment	– Commercial buildings and associated carparking
Spatial Quality/Amenity	– Relatively open outlooks sometimes interrupted by domestic and native trees

Table 4.8 Measure of impact (LCZ 4)

Sensitivity	Low
Magnitude	Negligible
Impact	Negligible
Comments	This landscape has some biodiversity features and retains little original or intrinsic value with strong modern trends. It is a moderately settled landscape with medium level of built form. There is minimal representation of the original forested landscape character type and scenic beauty, which has been mostly replaced by introduced species. The project would be largely contained within the existing cleared services easement corridor and would constitute a minor loss of/or alteration of the overall character during construction of the SRM. There will be a temporary compound and carpark located nearby during construction only. Any lighting during construction will be of short duration. There would be no ongoing operational impact.

4.2.5 LCZ 5 – Airport

The landscape character of LCZ 5 is described in Table 4.9, with photographs provided in Figure 4.11 and Figure 4.12. The measurement of impact is provided in Table 4.10.

Figure 4.11 LCZ 5 – Airport – Port Macquarie Airport entrance and associated infrastructure, Boundary Street

Figure 4.12 LCZ 5 – Airport – Cleared land for aviation activities, Tuffins Lane

Table 4.9 Landscape character (LCZ 5)

Summary	This landscape character zone is associated with Port Macquarie Airport which is adjacent to Newman Senior Technical College and Tuffins Lane Sport Fields. The area is moderately developed and retains little original character that exists in the dense forested area to the airport boundaries.
Landform	– Flat
Vegetation	– Native wetland, shrubland and sedgeland vegetation along the development perimeter
Landscape Features	– Flood prone open cleared land
Infrastructure	– Aeroplane runway – Street lighting – Tuffins Lane
Land Use/Built Environment	– Port Macquarie Airport and associated carparking, access roads and sheds
Spatial Quality/Amenity	– Vast open outlooks over cleared land for airport infrastructure

Table 4.10 Measure of impact (LCZ 5)

Sensitivity	Low
Magnitude	Negligible
Impact	Negligible
Comments	This landscape has few biodiversity features except along parts of the development perimeter where it retains some original intrinsic value and scenic beauty. In the developed areas there is limited representation of the original natural environment with medium level of built form. This area is characterised by the vastly open outlooks which are framed by dense native bushland in the distance. Most of the project would be contained in the existing road reserve for the construction of the SRM, ECS, RWM, and RTEP. There will also be an associated laydown area on Tuffins Lane during construction only, which will have a low impact. Any lighting during construction will be of short duration. The new SPS is located along the boundary road and within a highly modified landscape. It will be situated close to the existing buildings of Newman Senior Technical College and will have little impact on the existing landscape character during operation.

4.2.6 LCZ 6 – Bushland

The landscape character of LCZ 6 is described in Table 4.11, with photographs provided in Figure 4.13 and Figure 4.14. The measurement of impact is provided in Table 4.12.

Figure 4.13 LCZ 6 – Bushland – The Binnacle Trail, The Binnacle

Figure 4.14 LCZ 6 – Bushland – Native bushland, John Oxley Drive

Table 4.11 Landscape character (LCZ 6)

Summary	This landscape character zone is associated with distinctive native bushland with minimal development or disruption to the original environment.
Landform	– Mostly flat with gentle undulating hills
Vegetation	– Native wetland, shrubland, sedgeland and dense forest vegetation
Landscape Features	– Native dense bushland
Infrastructure	– Overhead power transmission lines – Access roads – The Binnacle Trail
Land Use/Built Environment	– Council owned – Nature reserve
Spatial Quality/Amenity	– Distinctive native bushland character, a strong sense of place and high amenity – Enclosed screened outlooks

Table 4.12 Measure of impact (LCZ 6)

Sensitivity	High
Magnitude	Negligible
Impact	Negligible
Comments	This is a diverse and natural landscape with mostly enclosed and screened outlooks. It has regionally important landscape heritage or biodiversity features and is predominantly intact with distinctive character and a strong sense of place. The project will impact the landscape during the construction of the SRM, ECS, RWM, and RTEP. Where possible the trenching follows existing access roads and would constitute in a minor loss of/or alteration of the overall character during construction. A new SPS will be located on the boundary street and will have a minimal impact on the existing landscape character during operation.

4.2.7 LCZ 7 – Wetland

The landscape character of LCZ 5 is described in Table 4.13, with photographs provided in Figure 4.15 and Figure 4.16. The measurement of impact is provided in Table 4.14.

Figure 4.15 LCZ 7 – Wetland – Native wetlands, off Fernbank Creek Road

Figure 4.16 LCZ 7 – Wetland – Surrounding native vegetation, off Fernbank Creek Road

Table 4.13 Landscape character (LCZ 7)

Summary	This landscape character zone is associated with distinctive native wetlands and vegetation with minimal development or disruption to the original environment. It is bounded by dense native forest and Partridge Creek.
Landform	– Flat
Vegetation	– Native wetland and sedgeland vegetation
Landscape Features	– Partridge Creek – Flat wetlands prone to flooding
Infrastructure	– Overhead power transmission lines – Unsealed access roads – Partridge Creek weir – Previously installed incoming sewer mains
Land Use/Built Environment	– Council owned – Small remnant rural structures (house and shed)
Spatial Quality/Amenity	– Distinctive native wetland character, a strong sense of place and high amenity – Open outlooks framed by dense bushland

Table 4.14 Measure of impact (LCZ 7)

Sensitivity	High
Magnitude	Moderate
Impact	Moderate-High
Comments	This is a diverse and natural landscape with a combination of both open and enclosed outlooks. It has regionally important landscape heritage or biodiversity features and is predominantly intact with distinctive character and a strong sense of place. The WWTP will be located in the cleared area adjacent to the wetlands. Although it won't have a direct impact on the wetlands, the introduction of uncharacteristic elements to the environment will result in a partial loss to the existing landscape character.

4.2.8 LCZ 8 – Rural residential

The landscape character of LCZ 5 is described in Table 4.15, with photographs provided in Figure 4.17, Figure 4.18 and Figure 4.19. The measurement of impact is provided in Table 4.16.

Figure 4.17 LCZ 8 - Rural residential – Residential property, Fernbank Creek Road

Figure 4.18 LCZ 8 – Rural Residential – Cleared land for rural properties, Fernbank Creek Road

Figure 4.19 LCZ 8 – Rural residential – Residential property, Thrumster Street

Table 4.15 Landscape character (LCZ 8)

Summary	This landscape character zone is associated with low density rural residential development and open cleared with scattered remnant vegetation. Residential dwellings are minimal and spaced out on large lots. This area is bounded by dense native bushland and areas of native wetland.
Landform	– Mostly flat with some gentle undulating hills
Vegetation	– Dense native bushland to some of the development perimeter – Bounded in parts by native wetland – Remnant native vegetation scattered across the vast cleared land – Introduced species on residential properties and gardens
Landscape Features	– Flood prone open cleared land bounded by dense native forest
Infrastructure	– Access roads – Electricity transmission lines
Land Use/Built Environment	– Rural residential properties
Spatial Quality/Amenity	– Open outlooks interrupted by scattered vegetation or residential dwellings – Enclosed outlooks screened by vegetation along road reserves

Table 4.16 Measure of impact (LCZ 8)

Sensitivity	Moderate
Magnitude	Low
Impact	Moderate - Low
Comments	This is a diverse and natural character zone with mostly open outlooks across a moderately altered landscape. The original native bushland has already been cleared for rural residential purposes and has therefore already lost most of its distinctive character and biodiverse features. However it does hold some remnant characteristics and a moderate sense of place. The construction of the WWTP will result in a minor loss and/or alteration to the existing landscape character.

5. Visual impact assessment

5.1 Key viewpoints

Twelve key viewpoints have been selected as a representation only, of a view or potential views from a particular public visual catchment area (refer to Figure 5.1 below). The viewpoints have been selected due to their proximity to the project. Impact assessment considers both construction and operational stages of the project. The RTEP, SRM, RWM and ECS components of the project would be subterranean pipelines located within existing road reserves and utility easements, therefore any impacts to the landscape character would be during construction only. Key viewpoints include the following:

- Viewpoint 1 – Fernbank Creek Road
- Viewpoint 2 – Fernbank Creek Road near residential home
- Viewpoint 3 – Hastings River Drive
- Viewpoint 4 – Tuffins Lane
- Viewpoint 5 – Tuffins Lane near residential homes
- Viewpoint 6 – The Binnacle
- Viewpoint 7 – Clifton Drive
- Viewpoint 8 – Lady Nelson Drive
- Viewpoint 9 – Acacia Avenue
- Viewpoint 10 – John Oxley Drive
- Viewpoint 11 – Intersection of The Ruins Way & John Oxley Drive
- Viewpoint 12 – Thrumster Street

The viewpoints have been determined based on-site investigations and desktop analysis including 3D topographic information and aerial photographs. Analysis illustrates what is visible from a height of 1.7 metres at that location (i.e. from average eye height) and is therefore largely subject to topography and vegetation which in most cases screens the viewshed and obscures views of the project site.

The location of the project's key elements are identified on the following key viewpoint images by a solid red pin. Where the nature of topography, surrounding buildings and trees screen the elements, open red pins signify their approximate location.

Paper Size ISO A4

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Kilometres

N

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

GHD

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Date **26/06/2024**

Key viewpoints

FIGURE 6.1

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Print date: 26 Jun 2024 - 10:25

Data source: NSW Government: DPE Land Use Zoning, 2023 PMHC: Infrastructure data, 2023; LPI: DTDB / DCDB, 2023; Nearmap WMS Server: Aerial imagery - date extracted 12/10/2023. Created by: fmackay

5.2 Visual impact assessment

5.2.1 Viewpoint 1 – Fernbank Creek Road

The current view of the project (secondary site access road) from the viewpoint is shown below in Figure 5.2. **This view would be affected during construction and operation**. The viewpoint sensitivity and impact ratings are provided in Table 5.1 and Table 5.2.

Figure 5.2 Viewpoint 1 – Fernbank Creek Road, Fernbank Creek looking towards WWTP

Table 5.1 Viewpoint 1 Sensitivity

Criteria	Description	Ranking
View Duration	Short	Low
Viewer Numbers	Moderate	Moderate
Viewer Type	Motorist	Negligible
Viewer Distance	Short	High
View Sensitivity	Minimally modified	Moderate

Table 5.2 Viewpoint 1 Impact

Sensitivity	Moderate
Magnitude	Negligible
Impact	Negligible
Comments	This view represents mainly motorists, travelling at speed. The view sensitivity is moderate within moderately modified environment, which includes roads and associated infrastructure and partial clearing of native bushland. The proposed access road would be located on or adjacent to an existing informal road, utilising an existing entry way. Any lighting during construction will be of short duration.

5.2.2 Viewpoint 2 – Fernbank Creek Road near residential home

The current view of the project (WWTP) from the viewpoint is shown below in Figure 5.3. **Dense native bush and tall trees between the road and the WWTP would screen the majority of the project.** The viewpoint sensitivity and impact ratings are provided in Table 5.3 and Table 5.4.

Figure 5.3 Viewpoint 2 – Fernbank Creek Road, Fernbank Creek near residential home looking towards WWTP

Table 5.3 Viewpoint 2 Sensitivity

Criteria	Description	Ranking
View Duration	Glimpse	Negligible
Viewer Numbers	Moderate	Moderate
Viewer Type	Motorist	Negligible
Viewer Distance	Long (600m to 1km)	Low
View Sensitivity	Minimally modified	Moderate

Table 5.4 Viewpoint 2 Impact

Sensitivity	Moderate
Magnitude	Low
Impact	Moderate - Low

Comments	This view represents mainly motorists, travelling at speed along Fernbank Creek Road and one rural residential dwelling. The view sensitivity is moderate within moderately modified environment, which includes roads and associated infrastructure, partial clearing of native bushland and rural residences. This view would be affected during construction and operation, however the WWTP would be mainly screened by existing vegetation and would therefore have negligible impacts. Any lighting during construction will be of short duration. During operation of the WWTP, lighting will be provided in accordance with AS 4282 – Control of the obtrusive effects of outdoor lighting.

5.2.3 Viewpoint 3 – Hastings River Drive

The current view of the project (WWTP) from the viewpoint is shown below in Figure 5.4 **Dense native bush and tall trees between the road and the WWTP would completely screen the project.** The viewpoint sensitivity and impact ratings are provided in Table 5.5 and Table 5.6.

Figure 5.4 Viewpoint 3 – Hastings River Drive, Fernbank Creek looking towards WWTP

Table 5.5 Viewpoint 3 Sensitivity

Criteria	Description	Ranking
View Duration	Glimpse	Negligible
Viewer Numbers	Moderate	Moderate
Viewer Type	Motorist	Negligible
Viewer Distance	Distant >1km	Negligible
View Sensitivity	Minimally modified	Moderate

Table 5.6 Viewpoint 3 Impact

Sensitivity	Moderate
Magnitude	Negligible

Impact	Negligible
Comments	This view represents mainly motorists, travelling at speed along Hasting River Drive. The view sensitivity is moderate within moderately modified environment, which includes roads and associated infrastructure, partial clearing of native bushland and rural residences. This view would be affected during construction and operation, however the WWTP would be screened by existing vegetation and would therefore have negligible impacts. Any lighting during construction will be of short duration. During operation of the WWTP, lighting will be provided in accordance with AS 4282 – Control of the obtrusive effects of outdoor lighting.

5.2.4 Viewpoint 4 – Tuffins Lane

The current view of the project (SRM, RTEP, and ECS) from the viewpoint is shown below in Figure 5.5. **This view would be affected during construction only**. The viewpoint sensitivity and impact ratings are provided in Table 5.7 and Table 5.8.

Figure 5.5 Viewpoint 4 – Tuffins Lane, Fernbank Creek looking towards major trenching intersection

Table 5.7 Viewpoint 4 Sensitivity

Criteria	Description	Ranking
View Duration	Moderate	Moderate
Viewer Numbers	Low	Low
Viewer Type	Pedestrian / Motorist	Moderate
Viewer Distance	Short	High
View Sensitivity	Moderately Modified	Low

Table 5.8 Viewpoint 4 Impact

Sensitivity	Low
Magnitude	Negligible
Impact	Negligible
Comments	This view represents mainly pedestrians using Tuffins Lane Sport Fields. The environment is moderately to significantly modified for recreational purposes and the Port Macquarie Airport beyond, which includes a vast open area of cleared bushland. This view would be affected during construction of the SRM, RTEP, ECS only, with negligible impacts. Any lighting during construction will be of short duration.

5.2.5 Viewpoint 5 – Tuffins Lane near residential homes

The current view of the project (SRM, RTEP, ECS, and SPS) from the viewpoint is shown below in Figure 5.6. **This view would be affected during construction and operation**. The viewpoint sensitivity and impact ratings are provided in Table 5.9 and Table 5.10.

Figure 5.6 Viewpoint 5 – Tuffins Lane, Fernbank Creek near residential homes looking towards trenching and SPS

Table 5.9 Viewpoint 5 Sensitivity

Criteria	Description	Ranking
View Duration	Short	Low
Viewer Numbers	Moderate	Moderate
Viewer Type	Motorists	Negligible
Viewer Distance	Short	Low
View Sensitivity	Moderately Modified	Low

Table 5.10 Viewpoint 5 Impact

Sensitivity	Low
Magnitude	Moderate

Impact	Moderate-Low
Comments	This view represents mainly motorists accessing the Port Macquarie Airport entry and carpark. The environment is moderately to significantly modified for rural purposes and the Port Macquarie Airport, which includes vast open areas of cleared bushland. This view would be moderately affected during operation, as the SPS would be visible from the road. During operation of the SPS, lighting will be provided in accordance with AS 4282 – Control of the obtrusive effects of outdoor lighting. The SRM, RTEP, and ECS will only impact the view during construction with lasting impacts being negligible. Any lighting during construction will be of short duration.

5.2.6 Viewpoint 6 – The Binnacle

The current view towards the project (SRM) from the viewpoint is shown below in Figure 5.7. **This view would be affected during construction only**. The viewpoint sensitivity and impact ratings are provided in Table 5.11 and Table 5.12.

Figure 5.7 Viewpoint 6 – The Binnacle, Port Macquarie looking towards SRM

Table 5.11 Viewpoint 6 Sensitivity

Criteria	Description	Ranking
View Duration	Short	Low
Viewer Numbers	Moderate	Moderate
Viewer Type	Residents	High
Viewer Distance	Short	High
View Sensitivity	Moderately Modified	Low

Table 5.12 Viewpoint 6 Impact

Sensitivity	Moderate
Magnitude	Negligible
Impact	Negligible
Comments	This view represents residents and therefore sensitive receptors within close proximity to the SRM component of the project. The environment is however moderately to significantly modified, represented by the large areas of cleared bushland, to make way for medium density residential development and associated infrastructure. This view would be affected during construction only, with negligible impacts. Any lighting during construction will be of short duration.

5.2.7 Viewpoint 7 – Clifton Drive

The current view towards the project (SRM and SPS) from the viewpoint is shown below in Figure 5.8 **This view would be affected during construction and operation**. The viewpoint sensitivity and impact ratings are provided in Table 5.14 and Table 5.13.

Figure 5.8 Viewpoint 7 – Clifton Drive, Port Macquarie looking towards proposed SPS, compound and carpark

Table 5.13 Viewpoint 6 Sensitivity

Criteria	Description	Ranking
View Duration	Short to moderate	Moderate
Viewer Numbers	High	High
Viewer Type	Motorists and some residences	Moderate
Viewer Distance	Medium	Moderate
View Sensitivity	Significantly Modified	Negligible

Table 5.14 Viewpoint 6 Impact

Sensitivity	Moderate - Low
Magnitude	Negligible
Impact	Negligible
Comments	This view represents mainly motorists on Clifton Drive and Hastings River Drive and some residences and business owners along Hastings River Drive, within a significantly modified environment, associated with commercial land uses and associated infrastructure. The SRM and temporary works compound would be visible during construction only. Any lighting during construction will be of short duration. During operation the SPS would be indiscernible within the environment. Any lighting will be provided in accordance with AS 4282 – Control of the obtrusive effects of outdoor lighting.

5.2.8 Viewpoint 8 – Lady Nelson Drive

The current view towards the project (SRM, RWM, and RTEP) from the viewpoint is shown below in Figure 5.9. **This view would be affected during construction only.** The viewpoint sensitivity and impact ratings are provided in Table 5.15 and Table 5.16.

Figure 5.9 Viewpoint 8 – Lady Nelson Drive, Port Macquarie looking towards proposed laydown area and carparking

Table 5.15 Viewpoint 6 Sensitivity

Criteria	Description	Ranking
View Duration	Long	High
Viewer Numbers	Moderate	Moderate
Viewer Type	Residents	High
Viewer Distance	Short	High
View Sensitivity	Moderately Modified	Low

Table 5.16 Viewpoint 6 Impact

Sensitivity	Moderate - High
Magnitude	Negligible
Impact	Negligible
Comments	This view represents residents on Lady Nelson Drive, within close proximity to the SRM, RWM, RTEP, laydown area and carpark components of the project and to a less extent, visitors to the racecourse. The environment is moderately to significantly modified, represented by the large areas of cleared bushland, to make way for medium density residential development and associated infrastructure and the racecourse. This view would be affected during construction only, with negligible impact. Any lighting during construction will be of short duration.

5.2.9 Viewpoint 9 – Acacia Avenue

The current view towards the project (RTEP) from the viewpoint is shown below in Figure 5.10 This view would be affected during construction only. The viewpoint sensitivity and impact ratings are provided in Table 5.17 and Table 5.18.

Figure 5.10 Viewpoint 9 – Acacia Avenue, Port Macquarie looking towards RTEP

Table 5.17 Viewpoint 6 Sensitivity

Criteria	Description	Ranking
View Duration	Short	Low
Viewer Numbers	Low	Low
Viewer Type	Motorists and business owners	Low
Viewer Distance	Short	High
View Sensitivity	Moderately Modified	Low

Table 5.18 Viewpoint 6 Impact

Sensitivity	Low
Magnitude	Negligible
Impact	Negligible
Comments	This view represents motorists and business owners on Acacia Avenue within a moderate to significantly modified environment, for light industrial uses. Construction of the RTEP will require trenching along the northern side of the road, which would likely involve the removal of some trees adjacent and near the road edge. These trees are however, on the edge of a larger (approximately 120m wide) forested buffer between the light industrial area and residences further to the north. While the initial removal of vegetation during construction would have an initial visual impact, considering the density and depth of the forested buffer, the overall ongoing impact during operation, would be negligible. Any lighting during construction will be of short duration.

5.2.10 Viewpoint 10 – John Oxley Drive

The current view towards the project (SRM and construction compound and parking area) from the viewpoint is shown below in Figure 5.11. **This view would be affected during construction and operation**. The viewpoint sensitivity and impact ratings are provided in Table 5.19 and Table 5.20.

Figure 5.11 Viewpoint 10 – John Oxley Drive, Port Macquarie looking towards proposed compound and parking area

Table 5.19 Viewpoint 6 Sensitivity

Criteria	Description	Ranking
View Duration	Short to Moderate	Moderate
Viewer Numbers	High	High
Viewer Type	Motorists and residents	Moderate
Viewer Distance	Short	High
View Sensitivity	Moderately Modified	Low

Table 5.20 Viewpoint 6 Impact

Sensitivity	Moderate
Magnitude	Low
Impact	Moderate - Low
Comments	This view represents motorists on John Oxley Drive, visitors to Village Shopping Centre and some adjacent residential dwellings. The environment is already moderately to significantly modified for commercial and residential use and major roads. The construction compound and parking area would have a moderate to low impact on the view during construction. Construction of the SRM would require trenching along the eastern side of John Oxley Drive, further south of the construction compound and parking area. This would likely involve the removal of some trees within the approximately 15m wide existing vegetated buffer between John Oxley Drive and adjacent residences further to the east. Considering the density of the vegetated buffer, the overall ongoing magnitude of change during operation, would be low. The overall impact on residences backing onto the vegetated buffer has been assessed as moderate to low. Any lighting during construction will be of short duration.

5.2.11 Viewpoint 11 – Intersection of The Ruins Way & John Oxley Drive

The current view towards the project (SRM, SPS) from the viewpoint is shown below in Figure 5.12. **This view would be affected during construction only**. The viewpoint sensitivity and impact ratings are provided in Table 5.21 and Table 5.22.

Figure 5.12 Viewpoint 11 – Intersection of The Ruins Way & John Oxley Drive, Port Macquarie looking towards proposed SPS

Table 5.21 Viewpoint 6 Sensitivity

Criteria	Description	Ranking
View Duration	Short to Moderate	Moderate
Viewer Numbers	Moderate	Moderate
Viewer Type	Motorists and residents	Moderate
Viewer Distance	Short	High
View Sensitivity	Moderately Modified	Low

Table 5.22 Viewpoint 6 Impact

Sensitivity	Moderate
Magnitude	Negligible
Impact	Negligible
Comments	This view mostly represents motorists travelling John Oxley Drive. The SRM and would be visible during construction only, with negligible impact. Any lighting during construction will be of short duration. During operation the SPS would be indiscernible within the moderately modified environment. Any lighting will be provided in accordance with AS 4282 – Control of the obtrusive effects of outdoor lighting.

5.2.12 Viewpoint 12 – Thrumster Street

The current view towards the project (RWM) from the viewpoint is shown below in Figure 5.13. **This view would be affected during construction only**. The viewpoint sensitivity and impact ratings are provided in Table 5.23 and Table 5.24.

Figure 5.13 Viewpoint 12 – Thrumster Street, Thrumster looking towards and along the RWM

Table 5.23 Viewpoint 6 Sensitivity

Criteria	Description	Ranking
View Duration	Short	Low
Viewer Numbers	Moderate	Moderate
Viewer Type	Motorists and residents	High
Viewer Distance	Short	High
View Sensitivity	Moderately Modified	Low

Table 5.24 Viewpoint 6 Impact

Sensitivity	Moderate
Magnitude	Negligible
Impact	Negligible
Comments	This view represents residents and therefore sensitive receptors within close proximity to the RWM component of the project. The environment is however moderately modified, represented by the large areas of cleared bushland, to make way for rural residential development and associated infrastructure. This view would be affected during construction only, with negligible impacts. Any lighting during construction will be of short duration.

6. Impact assessment summary

Table 6.1 Landscape character impact assessment summary

Landscape Character Impact Assessment	
Landscape Character Zone – LCZ	**Impact**
LCZ 1 – Residential & Future Residential	Negligible
LCZ 2 – Recreation	Negligible
LCZ 3 – Light Industrial	Negligible
LCZ 4 – Commercial	Negligible
LCZ 5 – Airport	Negligible
LCZ 6 – Bushland	Negligible
LCZ 7 – Wetland	Moderate - High
LCZ 8 – Rural Residential	Moderate - Low

Table 6.2 Visual impact assessment summary

Visual Impact Assessment	
Key Viewpoint	**Impact**
Viewpoint 1	Negligible
Viewpoint 2	Moderate - Low
Viewpoint 3	Negligible
Viewpoint 4	Negligible
Viewpoint 5	Moderate - Low
Viewpoint 6	Negligible
Viewpoint 7	Negligible
Viewpoint 8	Negligible
Viewpoint 9	Negligible
Viewpoint 10	Moderate - Low
Viewpoint 11	Negligible
Viewpoint 12	Negligible

6.1 Construction and operational impacts

A summary of the landscape character and visual impact assessment findings is provided in Table 6.1 and Table 6.2 above.

The landscape character and visual impact assessments considers both construction and operational stages of the proposal, as the impacts for the WWTP, SPSs, SRM, RWM, RTEP, and ECS will be noticed differently.

The impacts of the SRM, RWM, RTEP, and ECS have been assessed as negligible for all LCZs and viewpoints. This is largely due to the fact that impact of these works would be short term for the duration of construction only and indiscernible during operation.

The impact of the WWTP component of the project would have an impact on the Wetland LCZ by introducing uncharacteristic elements to the environment which would have a moderate to high impact on the landscape character within immediate proximity to the proposal.

Views towards the WWTP from adjacent roads and low numbers of residents, are mostly screened by the existing dense vegetation and would have moderate to low impacts. The proposed access roads would be used solely to support this infrastructure and follow existing informal roads.

Construction of the RTEP and SRM would require trenching, which in some locations would likely require the removal of some trees. In instances where there are residences adjacent, impacts have been assessed as moderate to low, as the magnitude of change to the current dense vegetation, would be considered low.

6.2 How the project has minimised adverse visual impacts

As detailed in the design report by Beca HunterH2O (BHH2O), several investigations were undertaken to inform the WWTP concept design and alignment for the SRM, RWM, RTEP, and ECS. Whilst the project design has not been driven by visual impact reduction, several factors in determining the design have concurrently minimised impacts. These are detailed below.

SRM, RWM, and RTEP alignment

Several alignment options were assessed. The preferred option:

– Avoids busy state-owned roads
– Avoids proximity to an Aboriginal heritage sites
– Aligns within existing road corridors
– Avoids aligning through residential roads

ECS alignment

Four discharge options were assessed. The preferred option, confirmed by stakeholder workshops:

– Utilises an existing discharge location at Kooloonbung Creek
– Takes advantage of a combined discharge and improvement in water quality
– Has close proximity to the river mouth

WWTP

The WWTP will be located on the low-lying cleared grassland adjacent to the biodiverse wetlands. The proposed access roads extends from Fernbank Creek Road and mostly use existing informal road easements, thus reducing additional clearance of trees.

A Sustainability Innovation and Opportunity Register was produced by BHH2O to reduce the overall impacts of the development. Of the opportunities identified to have the largest impact on the projects' overall sustainability outcomes, the following have additional visual impact minimisation advantages:

– Design layout to minimise footprint and associated land clearing
– Optimise lighting use to reduce light spillage where possible
– Regenerative planting to improve visual appeal and promote biodiversity in the wetlands

Services to be relocated or rerouted to facilitate the development

The following buried assets can be anticipated along the SRM, RWM, RTEP, and ECS alignment:

– Essential Energy high voltage cables (John Oxley Drive)
– NexGEN cables (John Oxley Highway)
– AARnet cables (John Oxley Highway)
– Telstra cables (east of the Pacific Highway)
– Optus fibre options (predominantly east of the Pacific Highway)

An assessment of potential impacts on public infrastructure, utilities, and services, will be provided at the detailed design stage of the project.

Tree removal and proposed landscaping

The proposed WWTP site is approximately 500 metres from Fernbank Creek Road located within native bushland.

The Bushfire Assessment Report recommends an APZ minimum 20 metres wide as measured from the nearest part of built structures to the nearest point of grassland hazard to each structure. Under the current design, this APZ zone is able to be fully incorporated within the proposed cleared, filled and built area, and will not require any clearing. Refer to Figure below depicting the APZ footprint in pink.

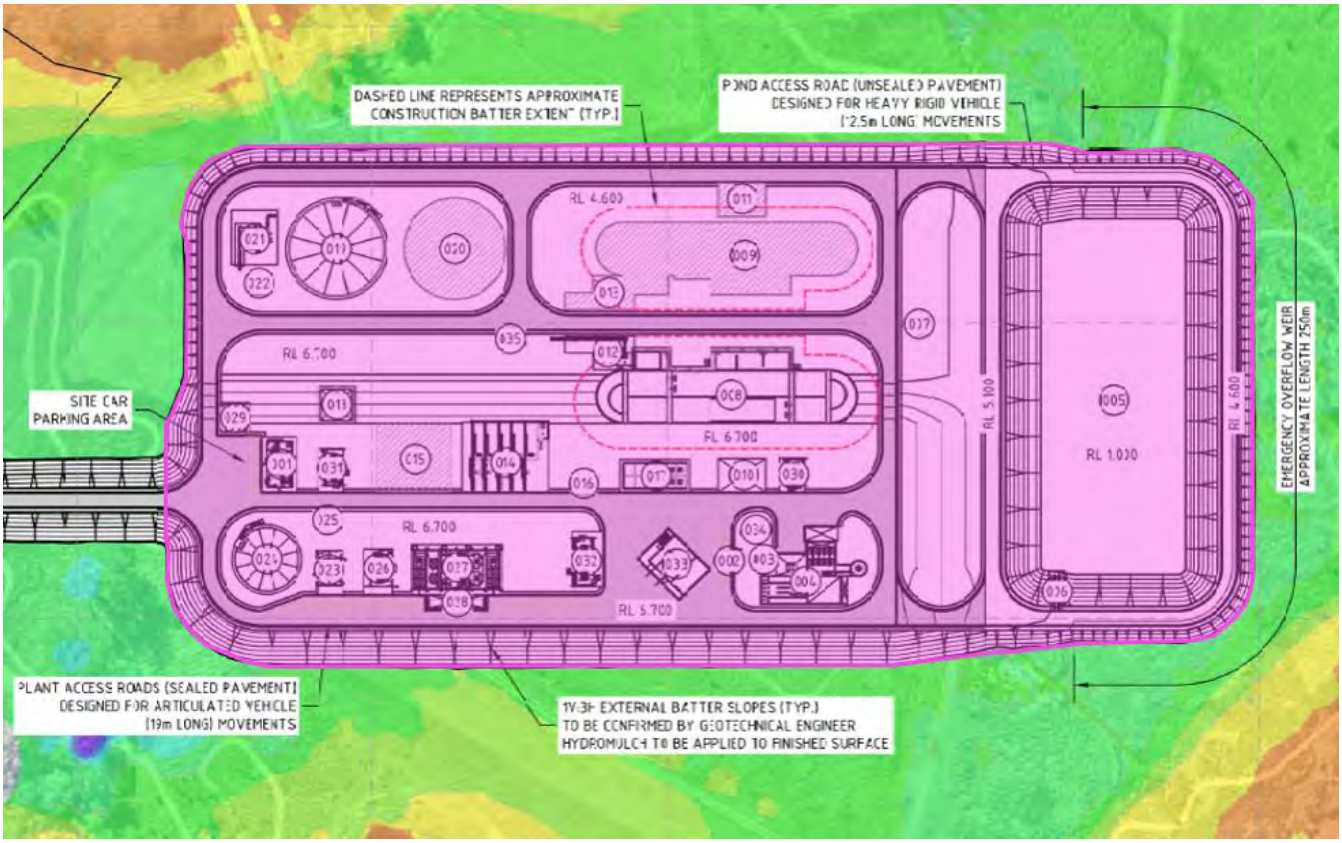

Figure 6.1 APZ footprint (pink)

Landscaping will be incorporated to minimise maintenance works and to protect the embankment. Further requirements will be determined by BHH2O, through consultation with geotechnical subconsultant RGS.

6.3 Cumulative impacts

A search of the major projects register was undertaken on 27 March 2023 to identify other major projects that may contribute to cumulative impacts. A search was completed for the Port-Macquarie-Hastings LGA, which identified 10 SSD projects and no SSI projects. The Cowarra Water Supply Scheme is a complimentary scheme for Council located in the LGA, subject to a separate SSI application and being developed concurrently with this Infrastructure Approval application.

Cumulative impacts of the WWTP, SRM, RWM, RTEP, and ECS would not be significant if the construction of this project coincides with the construction of the Cowarra Water Supply Scheme (or any other major projects in the area), as the WWTP is located in a reasonably isolated location surrounded by dense native bushland, exotic grassland areas and *Coast Sands Baumea articulata Sedgeland*. It is therefore unlikely that there would be any other major projects within the vicinity.

Cumulative impacts during construction are generally expected to be minor. The installation of the SRM, RWM, RTEP, and ECS would be undertaken progressively along the route and therefore impacts in each section being installed would be short term. Any potential cumulative impacts will be reduced through the application of individual project-specific environmental management plans.

7. Mitigation and management of impacts

Management and mitigation measures that would be implemented to minimise potential hazard and risk impacts of the project are detailed in Table 7.1.

Table 7.1 Landscape character and visual impact management measures

ID	Impact	Environmental safeguard	Responsibility	Timing
L1	Lighting	Any lighting during construction will be of short duration. Lighting will not be directed or spill into any adjoining landholding. Occupants of adjoining landholdings will be advised of any unlikely night-time construction and the proposed lighting requirements.	Contractor	Pre-construction
L2	Lighting	During operation of the WWTP and SPSs, lighting will be provided in accordance with AS 4282 – *Control of the obtrusive effects of outdoor lighting*. This Standard specifically refers to the potentially adverse effects of outdoor lighting on nearby residents. Design of outdoor lighting will be required to control any obtrusive effects to an acceptable degree.	Operator	Operation
C1	Works areas during construction	During construction, work areas will be kept tidy and clear of rubbish, stockpiles appropriately contained, and equipment, plant and parking managed and contained within identified works areas.	Contractor	During construction

8. Conclusion

The purpose of this report is to assess both the potential landscape character impacts and the visual impacts associated with the project, and where required, identify feasible and reasonable mitigation and management measures.

This report:

– Addresses the SEARs listed in Table 1.1.
– Assesses the impacts from construction and operation of the project.
– Recommends measures to mitigate and manage the potential impacts identified.

The impacts on the landscape character and visual amenity of the project have been assessed as negligible for construction and mainly negligible during operation, with moderate impacts expected in close proximity to the WWTP.

The WWTP would be located within an existing wetland area, which would affect the landscape character of this environment however, views towards the WWTP would be predominantly screened from the public view by existing dense native bushland.

During construction of the SPSs, SRM, RWM, RTEP, and ECS, minor potential impacts were identified. These would be temporary.

Mitigation and management measures would include the following:

– During construction works areas will be kept tidy and clear of rubbish, stockpiles appropriately contained, and equipment, plant and parking managed and contained within identified works areas.
– Any lighting during construction will be of short duration.

Cumulative impacts during construction are expected to be minor. The installation of the SPSs, SRM, RWM, RTEP, and ECS would be undertaken progressively and therefore impacts in each section being installed would be short term. Any potential cumulative impacts will be reduced through the application of individual project-specific environmental management plans.

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