Review of Environmental Factors Addendum

North West Treatment Hub Castle Hill and Rouse Hill Water Recycling Plants Compliance Upgrade

1 Determination

This Review of Environmental Factors Addendum (REFA) assesses potential environmental impacts of North West Treatment Hub Rouse Hill Water Recycling Plant Compliance Upgrade and was prepared under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), with Sydney Water both the proponent and determining authority.

The Sydney Water Project Manager is accountable for ensuring the proposal is carried out as described in this REFA and the Review of Environmental Factors North West Treatment Hub Castle Hill and Rouse Hill Water Recycling Plants (WRP) Compliance Upgrade (August, 2021) (approved REF). Additional environmental impact assessment may be required if the scope of work or work methods described in this REFA change significantly following determination.

Decision Statement

The main potential construction environmental impacts of the proposal include impacts on flora and fauna and hazardous materials. During operation, no impacts are expected. The proposal will not be carried out in a declared area of outstanding biodiversity value and is not likely to significantly affect threatened species, populations or ecological communities, or their habitats. Therefore, a Species Impact Statement (SIS) and Biodiversity Development Assessment Report (BDAR) is not required.

Given the nature, scale and extent of impacts and implementation of the mitigation measures outlined in this REFA and the approved REF, the proposed work is unlikely to have a significant impact on the environment. Therefore, we do not require an Environmental Impact Statement (EIS) and the proposal may proceed.

Certification

I certify that I have reviewed and endorsed this REFA and, to the best of my knowledge, it is in accordance with the EP&A Act and the Environmental Planning and Assessment Regulations (EP&A Regulation). The proposal has been considered against matters listed in section 171 (Appendix A) and the guidelines approved under section 170 of the EP&A Regulation and the information it contains is neither false nor misleading.

Prepared by:	Reviewed by:	Endorsed by:	Approved by:
[redacted]			
Stuart Dundas REFA author Fulton Hogan 5/09/2023	Elissa Howie Environment Representative Sydney Water Date: 5 September 2023	Yousef Abdel Khaleq Senior Project Manager Sydney Water Date: 05/09/2023	Murray Johnson Environment and Heritage Manager Sydney Water Date: 5/9/2023

2 Proposal Summary

Aspect	Detailed description
Proposal location	The location of the proposal lies fully within the Rouse Hill Water Recycling Plant (WRP) on Mile End Road, Rouse Hill. The location of the approved REF includes the following lots: • Lot 3, DP251094 • Lot 5, DP251094. The location of the changes assessed in this REFA are within Lot 22, DP830552. The proposal is within the local government area (LGA) of The Hills Shire.
Approved REF	Review of Environmental Factors North West Treatment Hub Castle Hill and Rouse Hill Water Recycling Plants Compliance Upgrade (August, 2021)

Proposal scope	Currently, Rouse Hill WRP is operating at treatment capacity and has recorded non-compliances against EPL requirements. Amplifications to Rouse Hill WRP commenced in 2018 as phase 1 upgrades.
	
	The approved REF addresses phase 2a upgrades specific to Rouse Hill WRP. The project scope in the approved REF is to construct or upgrade the following assets:
	• inlet works, including:
	  ○ screening and grit removal
	  ○ 3x barometric loops (about 12 m high) associated with three rising main tie ins for Sydney Water's Metro North West urban renewal wastewater corridor project (Sydney Water, 2021)
	  ○ a fourth connection (less than 25 m high) adjacent the proposed inlet works and connected to SP1139 will tie into the inlet works
	  ○ temporary connection from the new inlet works to an existing flow splitter structure and to the recently upgraded (Phase 1) transfer pump station
	• wet weather (WW) PST conversion
	• reclaimed effluent (RE) system (existing) upgrade
	• OCF with 15 m vent stack and connections to the new inlet works and wet weather PST (note – existing OCF will continue to operate)

Aspect	Detailed description
	• HV switch room, HV switch board and HV network reticulation via existing conduit • inlet works LV switch room and LV switch board and transformer kiosks • DN760 gravity pipeline • first flush tank • internal access road • new mechanical primaries (potentially part of this scope, to be confirmed during detailed design). It also includes demolition of redundant education building and microfiltration (MF) building and decommissioning of mechanical equipment within existing inlet works. The approved REF assessed the potential impacts of the proposal on the surrounding environment and concluded that the proposal is unlikely to have a significant adverse impact on the environment and an EIS is not required. Potential impacts identified included temporary erosion and sedimentation, biodiversity, noise and access changes during construction.
Proposal change	Proposed changes to project scope and/or impact area in five locations as shown in Figure 1: • Area 1 – Flow Receival and Distribution Structure. The flow splitter connection and associated impact area was not assessed in original REF. • Area 2 – Chlorine Contact Tank. No change to infrastructure but additional construction area required to allow crane access. • Area 3 – First Flush Storage Tank. Size of first flush storage tank increased which will extend beyond the impact area in the original REF. The tank is underground with a concrete slab on the surface. • Area 4 – Withers Road Access Track. A new temporary access track for construction access. • Area 5 – Inlet works, Odour Control Unit hardstand extension and high-voltage and low-voltage switch rooms. An additional internal access road, hardstand area and re-location of high-voltage switchroom. Heritage and ecological constraints in relation to these proposed changes are outlined in Figure 1 and the revised construction boundary is outlined in Figure 2.

Aspect	Detailed description
Justification for proposal change	Justification for the project changes are separated in the sections below: **Area 1 – Flow Receival and Distribution Structure** The approved REF boundary did not account for the flow splitter connection into the existing Flow Receival and Distribution Structure. This change is required as part of the core scope of the compliance project. **Area 2 – Chlorine Contact Tank** The approved REF boundary did not account for access and constructability of this portion of the core scope. This extension is required to facilitate a crane pad adjacent to the Chlorine Contact Tank to provide a site for lifting the structures in place that was not previously considered in the approved REF. **Area 3 – First Flush Storage Tank** Sydney Water have requested a larger, first flush tank be constructed which falls outside the approved REF boundary. This larger tank is to facilitate future capacity for the plant as it undergoes expansion. The size of the previously approved tank was not considered appropriate for operational integrity and future demand. **Area 4 – Withers Road Access Track** The approved proposed access track from Withers Road is no longer available for use. Therefore, to enable suitable site access, an alternate alignment will be required outside the approved REF boundary. **Area 5 – Inlet works, Odour Control Unit hardstand extension and High-voltage and low-voltage switch rooms.** After the development of the approved REF, Sydney Water have increased the scope to provide a road around the inlet works which is situated outside the assessed area. The hardstand area is proposed adjacent to the odour control unit (OCU) to enable suitable operational and safe access to the unit. This area has been chosen as it is as close as possible to the OCU and minimises the increase in vegetation removal required. The proposed location of the high-voltage switch room in front of the Biological Nutrient Removal (BNR) tank did not account for the relocation of critical subsurface infrastructure under its current design location. Constructing the switch room as its outlined in the approved REF would

Aspect	Detailed description
	cause significant disruption to the operational capacity of the plant for an extended time period while the subsurface infrastructure is relocated.

Figure 1 Proposal change overview

This information has been redacted to protect sensitive Aboriginal heritage information.

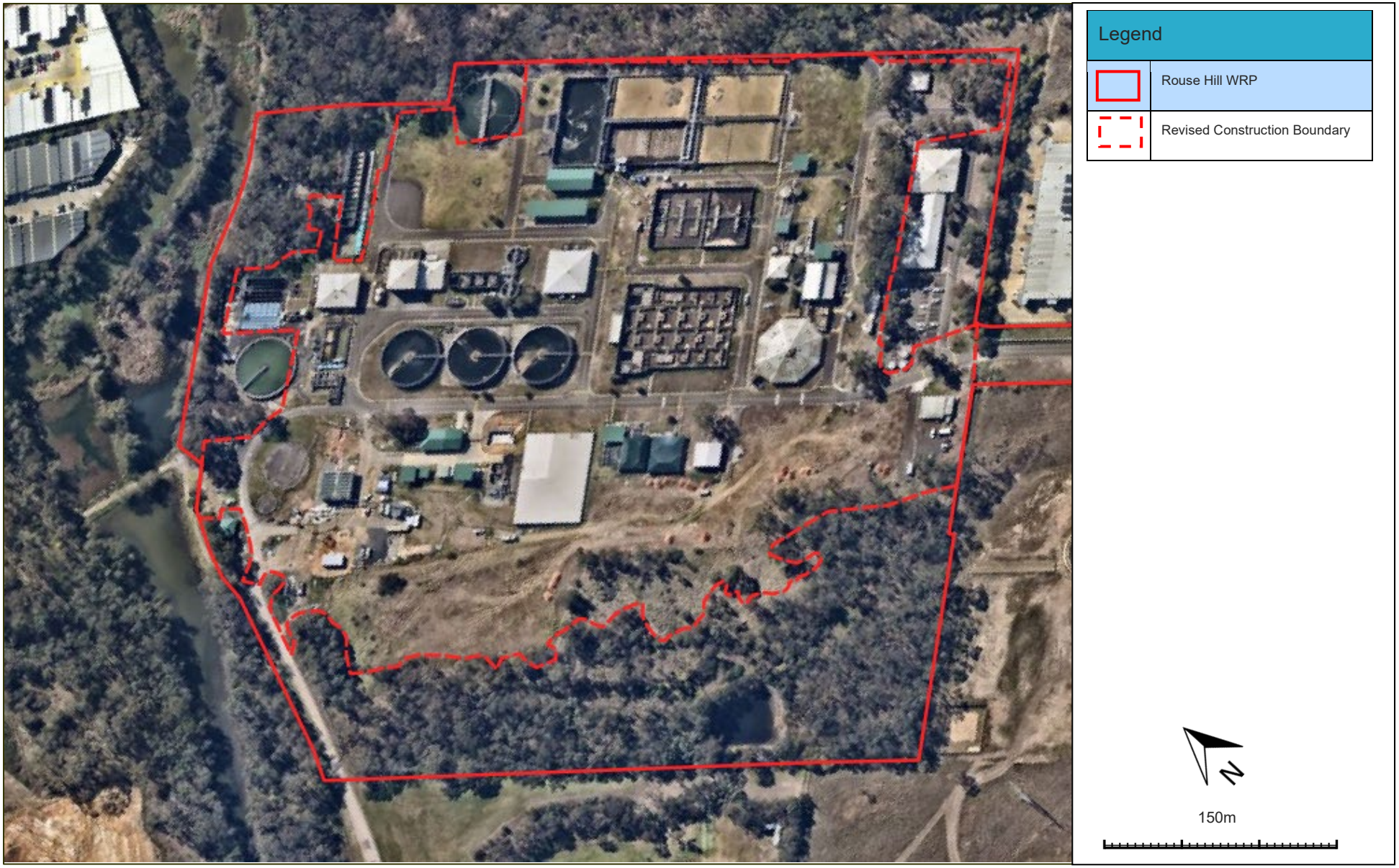

Figure 2 Revised Construction Boundary

3 Legislative consideration

There are additional legislative requirements above those already assessed in the approved REF.

Section 2.126 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (TISEPP) permits development in the prescribed circumstances (by or on behalf of a public authority) for sewage treatment plants without consent in a prescribed zone.

The proposed change involves the development of a sewerage system in land zoned E4 (General Industrial), which is considered a 'prescribed zone'. The proposed change is being performed on behalf of Sydney Water, so is in accordance with the prescribed circumstances.

The project is permissible without consent in accordance with Section 2.126 of TISEPP.

Accordingly, this REF addendum has been assessed under Division 5.1 of the EP&A Act and Sydney Water can self-determine the project.

Legislation	Additional considerations
National Parks and Wildlife Act 1974	The proposal will not directly or indirectly impact an Aboriginal archaeological site. [redacted]
Heritage Act 1977	The proposal will not directly impact any known non-Aboriginal heritage items or sites. Further assessment is provided in section 5 of this REFA.
Biodiversity Conservation Act 2016 (BC Act)	Schedules 1 and 2 of the BC Act list terrestrial species, populations and ecological communities threatened in NSW. We are required to assess impacts to the listed items and complete a 'test of significance'. Some vegetation clearing of two threatened ecological communities (TEC) at Rouse Hill WRP is needed and a test of significance has been completed (refer to Section 5). The assessment found the proposal is unlikely to have a significant impact on the TECs and a Species Impact Statement is not required.
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	The EPBC Act protects nationally significant animals, plants, habitats and places. There are nine 'matters of national environmental significance' (MNES) to be considered under the EPBC Act. One of the two TECs mentioned above, and one threatened species, are located at Rouse Hill WRP and are listed under the EPBC Act. A significance test was prepared to assess potential impacts (see Section 5) and these concluded that a significant impact is unlikely. Referral to the Commonwealth Department of Climate Change, Energy, the Environment and Water is not required.

4 Consultation

Sydney Water must consult with councils and other authorities for work in sensitive locations or where the work may impact other agencies infrastructure or land (specified in the TISEPP).

No formal consultation is required. Further detail is provided in Appendix B. The Community and Stakeholder Engagement Plan (CSEP) described in the approved REF will be followed for this proposed change.

5 Additional environmental impacts and mitigation measures

The table below lists the additional environmental impacts that could result from the proposed change compared to the approved REF and the additional mitigation measures. All other environmental impacts and mitigation measures identified in the approved REF remain the same and will be incorporated into the contractor's CEMP.

Environmental impacts table		
Aspect	**Additional impacts**	**Additional mitigation measures**

Flora and fauna	The proposed changes have been made with due consideration to TECs that are within and adjacent to the proposed construction footprint, and where possible, have reduced the footprint to preserve as much TEC as possible.
	An ecological assessment was conducted by Biosis in 2021 and confirmed the presence of two plant community types (PCT) at Rouse Hill WRP.
	During this original assessment, no threatened flora species were recorded and there was a low likelihood of occurrence for threatened flora species within the original impact area due to the disturbed, urban nature of the Rouse Hill WRP.
	The Dural Land Snail (*Pommerhelix duralensis*) was previously identified for historic upgrades at the site. Subsequent investigations in 2021 did not locate the species as part of the approved REF. No other threatened species were recorded during the investigation for the approved REF.
	An Ecological Impact Assessment was prepared by Blue Tongue Ecosystems ecologists in July 2023 to assess the impacts from the proposed changes. The Ecological Impact Assessment can be found in **Appendix D.**
	The proposal is within an area of remnant native vegetation with historical clearing to facilitate construction of the WRP.
	Vegetation removal for each area is outlined below:
		• Any leaf litter and associated topsoil in Area 5, close to where the Dural Land Snails were historically observed and unidentified shells found, should be carefully relocated to a nearby area underneath mature eucalypts. Relocation of topsoil to be conducted by an excavator with a flat edged mud bucket to minimise impact to individuals.
		• Retain identified habitat trees in Area 5 where possible (marked with large H on trunk). Where this is not possible, and habitat trees need to be removed, this should be done under the supervision of either:
		  ○ a trained wildlife carer or ecologist or
		  ○ an approved tree feller with an inspection camera and experience in rescuing and relocating wildlife.
		• Residual impacts to native vegetation and trees (including hollow bearing) will be offset in

Environmental impacts table		
Aspect	**Additional impacts**	**Additional mitigation measures**
	Area 1 The total area increase to the construction footprint in Area 1 is 0.087 ha, and all 0.087 ha is mapped as Urban Native / Exotic (PCT 0). The impact will be limited to maintained exotic grass species. **Area 2** The total area increase to the construction footprint (not including the approved REF) in Area 2 is 0.0136 ha and the proposed impact to Forest Red Gum -Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion (PCT 835) forming part of a component of the River Flat Eucalyptus Forest on Coastal Floodplains TEC is 0.0136 ha. The additional impact for this proposal will result in the removal of four native trees. **Area 3** The total area increase to the construction footprint (not including the approved REF) in Area 3 is 0.0311 ha, and the proposed impact to Forest Red Gum -Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion (PCT 835) forming part of a component of the River Flat Eucalyptus Forest on Coastal Floodplains TEC is 0.0311 ha. The proposal will result in impacts to the PCT 835 which include the removal of six native trees. The ecologist report states that the ground and shrub layers consist of exotic vegetation, and the PCT is in poor to moderate condition. **Area 4** The total area increase to the construction footprint (not including the approved REF) in Area 3 is 0.0875 ha. Although the approved REF identified this area as Forest Red Gum -Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion (PCT 835), the *Decision Report North West Treatment Hub Castle Hill and Rouse Hill Water Recycling Plants Compliance Upgrade January 2022* indicates that the proposed area is classified as Urban Native / Exotic (PCT 0) which has been confirmed by the ecologist during the field inspection. No native vegetation will be removed.	accordance with the Sydney Water Biodiversity Offset Guideline (SWEMS0019.13) which includes: ○ 0.405 ha - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion (PCT 835) forming part of a component of the River Flat Eucalyptus Forest on Coastal Floodplains TEC (offset area based on 3:1 replacement). ○ 2.204 ha- Grey Gum open forest of the edges of the Cumberland Plain, Sydney Basin Bioregion (PCT 1395) forming part of a component of the Shale Sandstone Transition Forest TEC (offset area based on 3:1 replacement).

Environmental impacts table		
Aspect	**Additional impacts**	**Additional mitigation measures**
	Area 5 The total area increase to the construction footprint (not including the approved REF) in Area 3 is 0.387 ha, and the proposed impact to Broad-leaved Ironbark - Grey Gum open forest of the edges of the Cumberland Plain, Sydney Basin Bioregion (PCT 1395) forming part of a component of the Shale Sandstone Transition Forest TEC is 0.265 ha. The remaining 0.117 ha is mapped as Urban Native/Exotic. During the field investigation, the condition of PCT 1395 was described as moderate. **Proposed Impacts to TECs** The proposed impact to EECs, CEECs and species are outlined below: **River Flat Eucalyptus Forest on Coastal Floodplains – 0.1347 ha** 0.0447 ha (including 10 trees) will be impacted for the proposal changes in Area 2 and Area 3. This is in addition to 0.09 ha approved impacts to this TEC in the approved REF and decisions report. The condition of the vegetation is described in the Ecological Impact Assessment as 'poor to moderate', noting that there was a healthy, diverse canopy layer but the shrub layer is missing and ground layer is mostly exotic. A Test of Significance (ToS) under Section 7.3 of the BC Act was undertaken to address the approved impacts combined with these additional impacts. This concluded that the removal of this vegetation would not constitute a significant impact on the EEC. Additionally, during the field investigation, Area 4 lacked diagnostic species for the EEC, therefore, in conjunction with the data provided in *Decision Report North West Treatment Hub Castle Hill and Rouse Hill Water Recycling Plants Compliance Upgrade January 2022,* it is considered not to be part of that community and is not included in the tests of significance. **Shale Sandstone Transition Forest (Cumberland Plain Woodland) – 0.7347 ha** 0.2647 ha will be impacted for the proposed changes. This is in addition to 0.47 ha approved impacts to this TEC in the approved REF and decisions report. The condition of the vegetation is described in the Ecological Impact Assessment as 'moderate', noting that there was naturally regenerating native species such as Eucalypts,	

Environmental impacts table		
Aspect	**Additional impacts**	**Additional mitigation measures**
	acacias and other species typically found in Shale Sandstone Transition Forest. Exotic Shrub and Ground layer species were also found within the area. A ToS under Section 7.3 of the BC Act was undertaken to address the approved impacts combined with these additional impacts. This concluded that the removal of this vegetation would not constitute a significant impact on the CEEC. Given that the area to be removed is on an existing edge of vegetation in a heavily fragmented community, it is considered unlikely to have significant impact to the community. A Significant Impact Criteria assessment was conducted and concluded that the proposal is unlikely to result in a significant impact to the Shale Sandstone Transition Forest TEC as the impact is not considered to be of significance having regard to its context and intensity. **Dural Land Snail (*Pommerhelix duralensis*)** A pre-clearance inspection of the approved REF boundary for the Dural Land Snail was conducted in February 2023 by Blue Tongue Ecosystems and identified four possible Dural Land Snail shells. These shells were collected and sent to a specialist for analysis and positive identification. Due to the degraded nature of the shells, they could not be positively identified as Dural Land Snail shells. The Dural Land Snail Pre-Clearance Inspection can be found in **Appendix E.** As potential habitat for the Dural Land Snail is to be cleared, ToS under Section 7.3 of the BC Act were undertaken and revealed that a loss of 0.7347 ha of the Shale Sandstone Transition Forest (Cumberland Plain Woodland) CEEC would not constitute a significant impact on the Dural Land Snail. It is expected that removal of the small patch of Shale Sandstone Transition Forest would have minimal impact to a very limited number of individual Dural Land Snails. The proposal is unlikely to substantially interfere with the recovery of this species. Consequently, no further impact assessments in the form of a SIS is required. Dural Land Snail is a land snail endemic to NSW and is listed as Endangered under the EPBC Act. As such, an	

Environmental impacts table		
Aspect	**Additional impacts**	**Additional mitigation measures**
	assessment against the Significant Impact Criteria (endangered species) has been undertaken and concluded that the proposal is unlikely to lead to a significant impact on Dural Land Snail.	
Waste and hazardous materials	The proposal in Area 4 – Withers Rd access track will require excavation of known asbestos contaminated material (ACM). This known ACM is located south of the plant operational area as outlined in the Contamination Assessment (Progressive Risk Management, November 2017).	• Works to be conducted under the Asbestos Management Plan June 2023, prepared by Progressive Risk Management, Section 5; Asbestos management during excavation works. This includes: ○ An Asbestos Work Area (restricted area) is to be established. ○ The restricted Asbestos Work Area (proposed excavation/loading zones) should be demarcated with appropriate warning signs to prevent unauthorised access. ○ Prior to the first removal of the sub surface, dampening with water of the proposed excavation area should occur. ○ Prior to movement of stockpiled soils (if required), dampening with water across the stockpile surface should occur. ○ During soil movements, material should be monitored to ensure it is appropriately dust suppressed to reduce the likelihood of dust generation. ○ All machinery (if required) working within

Environmental impacts table		
Aspect	**Additional impacts**	**Additional mitigation measures**
		the restricted area will need to be approved in the ARCP and decontaminated before it leaves the restricted area ○ If a haulage truck is required to enter the restricted area, the wheels of the truck and the sides of the body should be decontaminated before the truck leaves the restricted area. ○ All asbestos related works are to be undertaken by a NSW SafeWork Licenced Class B Asbestos removal contractor.
Visual impact	The size of the first flush tank at Area 3 is proposed to increase. The first flush tank is a sub-surface structure with a concrete slab visible from the surface. No visual impacts are expected for this change as a concrete slab was captured in the approved REF. Vegetation removal proposed in this addendum would have negligible additional visual impact. Visual impacts of clearing will be limited as the majority of the clearing is behind 3 m high walls on the south-eastern boundary and towards the centre of the site.	• No additional mitigation measures required.

6 Conclusion

This REFA outlines potential environmental impacts associated with boundary extensions as part of the North West Treatment Hub Castle Hill and Rouse Hill Water Recycling Plants Compliance Upgrade Project. Any additional environmental impacts are considered minor and potential impacts can be mitigated through implementation of the measures outlined in this REFA and the approved REF. The proposal is not likely to significantly impact the environment.

Appendix A – Section 171 checklist

Requirements in addition to the approved REF are considered in the table below.

Section 171 checklist	REF finding
Any environmental impact on the ecosystems of the locality	The proposal will result in a minor increase in environmental impacts to ecosystems of the locality. There will be environmental improvements by ensuring a reliable wastewater service will collect and treat wastewater, minimising any impacts on the ecosystem.
Any impact on the habitat of any protected animals (within the meaning of the *Biodiversity Conservation Act 2016*)	The proposed work will involve additional clearing of threatened ecological communities listed under the BC Act and EPBC Act, which includes potential habitat for threatened species. The removal has been assessed to be not significant (Appendix D). We will offset this residual impact.
Any endangering of any species of animal or plant or other form of life, whether living on land, in water or in the air	The proposal will not be endangering any species of animal, plant or other form of life, whether living on land, in water or in the air.
Any long-term effects on the environment	The proposal will not have any long-term impacts on the environment but will have a long-term benefit by providing a reliable and modern wastewater service for the area.
Any degradation of the quality of the environment	The proposed work will not cause the degradation of the quality of the environment.
Any cumulative environmental effect with other existing or likely future activities	The proposed work will have minor cumulative environmental impacts with other existing or likely future activities. The North West Treatment Hub Growth project is also in construction at the same time at Rouse Hill with a similar footprint to this proposal, so there may be minor cumulative impacts related to noise, visual amenity, and traffic, and from increased vegetation removal.

Appendix B – Consideration of TISEPP consultation

TISEPP section	Yes	No
Section 2.10, council related infrastructure or services – consultation with council		
Will the work:		
Potentially have a substantial impact on stormwater management services provided by council?		X
Be likely to generate traffic that will strain the capacity of the road system in the LGA?		X
Connect to, and have a substantial impact on, the capacity of a council owned sewerage system?		X
Connect to, and use of a substantial volume of water from a council owned water supply system?		X
Require temporary structures on, or enclose, a public space under council's control that will disrupt pedestrian or vehicular traffic that is not minor or inconsequential?		X
Excavate a road or a footpath adjacent to, a road for which the council is the roads authority that is not minor or inconsequential?		X
Section 2.11, local heritage – consultation with council		
Is the work likely to affect the heritage significance of a local heritage item, or of a heritage conservation area (not also a State heritage item) more than a minor or inconsequential amount?		X
Section 2.12, flood liable land – consultation with council		
Will the work be on flood liable land (land that is susceptible to flooding by the probable maximum flood event) and will works alter flood patterns other than to a minor extent?		X
Section 2.13, flood liable land – consultation with State Emergency Services		
Will the work be on flood liable land (land that is susceptible to flooding by the probable maximum flood event) and undertaken under a relevant provision*, but not the carrying out of minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance? * (e) Div.14 (Public admin buildings), (g) Div. 16 (Research/ monitoring stations), (i) Div. 20 (Stormwater systems)?		X
Section 2.14, development with impacts on certain land within the coastal zone– council consultation		
Is the work on land mapped as coastal vulnerability area and inconsistent with a certified coastal management program?		X
Section 2.15, consultation with public authorities other than councils		
Will the proposal be on land adjacent to land reserved under the *National Parks and Wildlife Act 1974* or to land acquired under Part 11 of that Act*? If so, consult with DPIE (NPWS).*		X
Will the proposal be on land in Zone E1 National Parks and Nature Reserves or on a land use zone that is equivalent to that zone? *If so, consult with DPIE (NPWS)*		X
Will the proposal include a fixed or floating structure in or over navigable waters? If so, consult *TfNSW*		X
Will the proposal be on land in a mine subsidence district within the meaning of the *Coal Mine Subsidence Compensation Act 2017*? *If so, consult with Subsidence Advisory NSW.*		X
Will the proposal be on land in a Western City operational area specified in *the Western Parkland City Authority Act 2018,* Schedule 2 and have a capital investment value of $30 million or more? *If so, consult the Western Parkland City Authority*.		X
Will the proposal clear native vegetation on land that is not subject land (ie non-certified land)? *If so, notify DPIE at least 21 days prior to work commencing. (Requirement under s3.24 Chapter 3 Sydney Region Growth Centres - of the SEPP (Precincts – Central River City) 2021).*		X

Appendix C – Aboriginal Due Diligence Assessment

This information has been removed to protect sensitive Aboriginal heritage information.

Appendix D – Ecological Impact Assessment

Rouse Hill Water Recycling Plant Compliance Project

Ecological Impact Assessment

August 15

Blue Tongue Ecosystems

Authored by: Kirsty Reynolds

Contents

Document Control

Issued	Project Name	Version	Prepared by
17/07/2023	Rouse Hill Water Recycling Plant Compliance Project- Ecological Impact Statement	1	Kirsty Reynolds
21/07/2023	Rouse Hill Water Recycling Plant Compliance Project- Ecological Impact Statement	2	Kirsty Reynolds
04/08/2023	Rouse Hill Water Recycling Plant Compliance Project- Ecological Impact Statement	3	Kirsty Reynolds
15/08/2023	Rouse Hill Water Recycling Plant Compliance Project- Ecological Impact Statement	4	Kirsty Reynolds

Report Certification

I, Kirsty Reynolds (BA Env Sc) Managing Director of Blue Tongue Ecosystems Pty Ltd hereby state that this report, which comprises a Rouse Hill Water Recycling Plant Compliance Project- Ecological Impact Statement has been prepared in accordance with the requirements of the project brief provided by Fulton Hogan for Sydney Water (July 2023).

Rouse Hill Water Recycling Plant Compliance Project

Ecological Impact Assessment

Project Information	
Project location	Mile End Road, Rouse Hill NSW 2155
Project Scope	This report presents the consistency assessment for a change in scope for the vegetation clearing at the construction area at The Rouse Hill WRP
Proposal Summary	Originally patches of *Shale Sandstone Transition Forest* (0.47 ha) and *River-Flat Eucalypt Forest* (0.07 ha) were to be removed for the construction of upgrades to the Rouse Hill WRP. The upgrades are outlined in the Review of Environmental Factors. *North West Treatment Hub, Castle Hill and Rouse Hill Water Recycling Plants Compliance Upgrade (August, 2021).* Extensions to the approved REF boundary and additional impacts are outlined below **Area 1 - Flow Receival and Distribution Structure** Area 1 is not mapped with any Endangered ecological community. No trees or shrubs to be removed. **Area 2 - Chlorine Contact Tank** Area 2 is partially mapped in the REF as River Flat Eucalyptus Forest on Coastal Floodplains Endangered Ecological Community (EEC), during the field inspection, it was observed that a mown grass ground layer with 3-4 mature trees with no habitat features would be impacted. Area 2 River Flat Eucalyptus Forest on Coastal Floodplain ECC is considered to be in poor condition. **Area 3 - First Flush Storage Tank** Area 3 is mapped in the REF as River Flat Eucalyptus Forest on Coastal Floodplains ECC. The ground layer consists of exotic vegetation with serveral eucalypts to be removed. **Area 4 - Withers Road Access Track** Area 4 is partially mapped River Flat Eucalyptus Forest on Coastal Floodplains ECC, but during the field inspection, is was observed that no native vegetation was present in the area. **Area 5 - Inlet works, Odour Control Unit hardstand extension and High-voltage and low-voltage switch rooms**. Area 5 is partially mapped as Shale Sandstone Transition Forest Critically Endangered Ecological Community (CEEC) and was observed to consist of a diverse mix of Eucalypts and native shrub species and a mix of exotic

	and native groundlayer species. This area was also previously identified as a Dural Land Snail Habitat (*Pommerhelix duralensis).* The total impact on PCTs for the project is; • 7,347 m^2 of Narrow-leaved Ironbark - Broad-leaved Ironbark - Grey Gum open forest of the edges of the Cumberland Plain, Sydney Basin Bioregion forming part of a component of the Shale Sandstone Transition Forest TEC • 1,347m^2 of Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion forming part of a component of the River Flat Eucalyptus Forest on Coastal Floodplains TEC. All other impacted areas are classified as the Urban Native/Exotic.
Assessed by	Kirsty Reynolds (Ba EnvSc) from Blue Tongue Ecosystems
Client	Fulton Hogan for Sydney Water

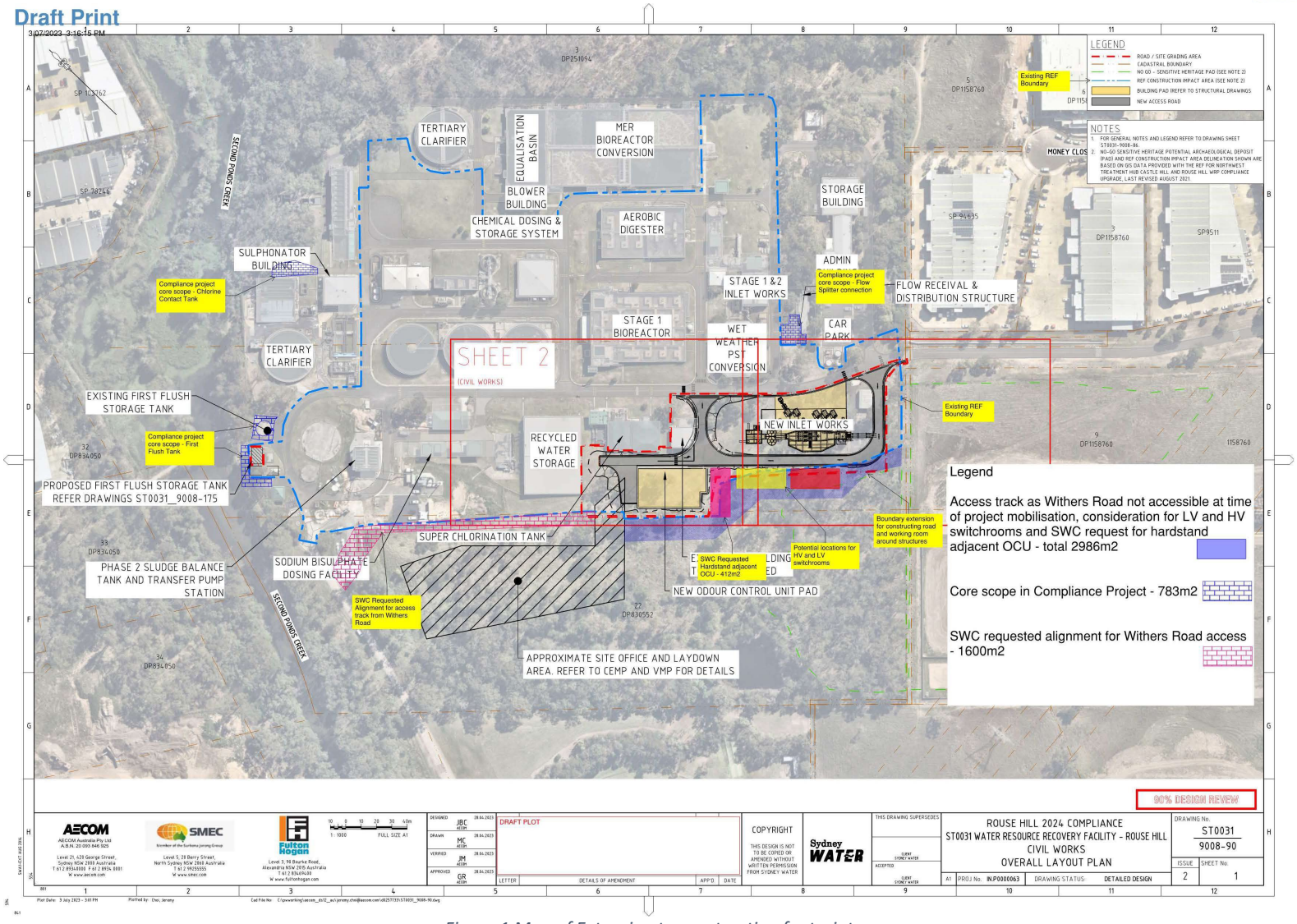

Figure 1 Map of Extension to construction footprint

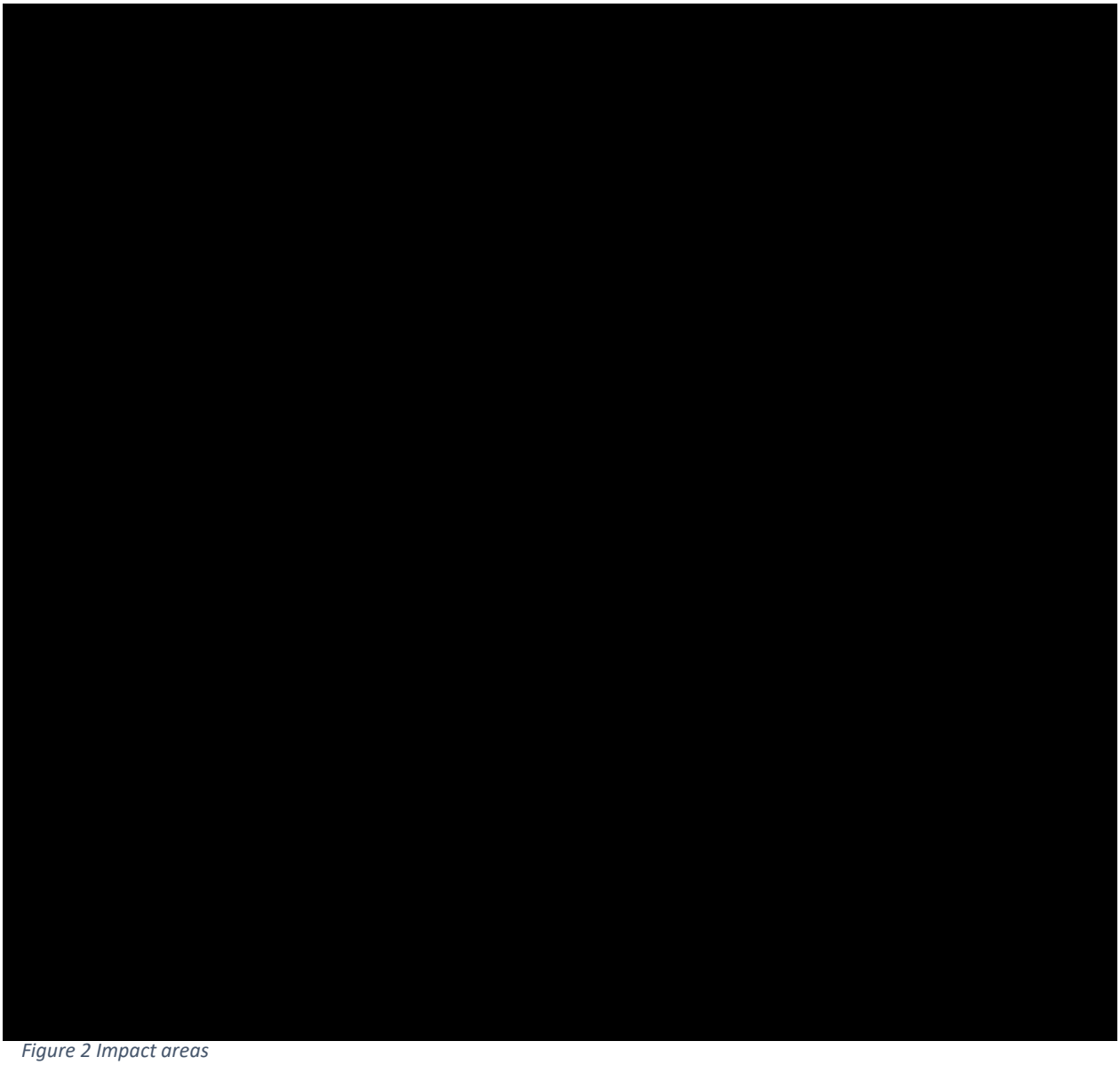

Figure 2 Impact areas

This information has been redacted to protect sensitive Aboriginal heritage information.

Legend

	Rouse Hill WRP Boundary		*Habitat Trees*
	Compliance Project Boundary		*Dural Land Sand Habitat Area*
	Proposed Scope / Boundary Extensions		*Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion (PCT 835) forming part of a component of the River Flat Eucalyptus Forest on Coastal Floodplains TEC.*
	Refined Aboriginal Heritage PAD		*Broad-leaved Ironbark - Grey Gum open forest of the edges of the Cumberland Plain, Sydney Basin Bioregion (PCT 1395) forming part of a component of the Shale Sandstone Transition Forest TEC.*

Existing Approved Plan

1. Description

Currently, compliance upgrades have been approved for the Rouse Hill Water Recycling Plant. Proposed upgrades include:

- inlet works, including:
  - screening and grit removal
  - 3x barometric loops1 (~12 m high) associated with 3x rising main tie ins for Sydney Water's Metro North West urban renewal wastewater corridor project (Sydney Water, 2021)
  - a fourth connection (<25 m) adjacent the proposed inlet works and connected to SP1139 will tie into the inlet works
  - temporary connection from the new inlet works to an existing flow splitter structure and to the recently upgraded (Phase 1) transfer pump station
- wet weather (WW) PST conversion
- reclaimed effluent (RE) system (existing) upgrade
- OCF with 15 m vent stack and connections to the new inlet works and wet weather PST (note - existing OCF will continue to operate)
- HV switch room, HV switch board and HV network reticulation via existing conduit
- inlet works LV switch room and LV switch board and transformer kiosks
- DN760 gravity pipeline
- first flush tank
- internal access road
- demolition of redundant education building and microfiltration (MF) building
- new mechanical primaries (potentially part of this scope, to be confirmed during detailed design)
- decommission mechanical equipment within existing inlet works

Description of proposed changes

Extra vegetation is required to be cleared to facilitate the construction of the core scope of the Rouse Hill Compliance and Growth Projects, access track to Withers Road and relocation of the electrical switch rooms of Rouse Hill WRP due to significant operational impacts to the plant.

Threatened species

Background searches identified 30 threatened flora species and 61 threatened fauna species recorded (EES 2021) or predicted to occur (Commonwealth of Australia 2021) within 5 kilometres of the study area. Those species considered most likely to have habitat within the study area based on the background research are as follows.

Flora

- *Downy Wattle Acacia pubescens* (Vulnerable, EPBC Act and BC Act).
- *Darwinia biflora* (Vulnerable, EPBC Act and BC Act).
- *Dillwynia tenuifolia* (Vulnerable, BC Act).
- *Epacris purpurascens var. purpurascens* (Vulnerable, BC Act).
- *Eucalyptus sp. Cattai* (Critically Endangered, EPBC Act and BC Act).
- *Hibbertia superans* (Endangered, BC Act).

- *Pultenaea parviflora* (Vulnerable, EPBC Act, Endangered, BC Act*).*
- *Tetratheca glandulosa* (Vulnerable, BC Act).

Fauna

- Dusky Woodswallow *Artamus cyanopterus cyanopterus* (Vulnerable, BC Act).
- Glossy Black-cockatoo *Calyptorhynchus lathami* (Vulnerable, BC Act).
- Varied Sittella *Daphoenositta chrysoptera* (Vulnerable, BC Act).
- Eastern False Pipistrelle *Falsistrellus tasmaniensis* (Vulnerable, BC Act)
- Little Lorikeet *Glossopsitta pusilla* (Vulnerable, BC Act).
- Swift Parrot *Lathamus discolor* (Critically Endangered, EPBC Act, Endangered, BC Act).
- Eastern Coastal Free-tailed Bat *Micronomus norfolkensis* (Vulnerable, BC Act).
- Little Bent-winged Bat *Miniopterus australis* (Vulnerable, BC Act).
- Large Bent-winged Bat *Miniopterus orianae oceanensis* (Vulnerable, BC Act).
- Southern Myotis *Myotis macropus* (Vulnerable, BC Act).
- Powerful Owl *Ninox strenua* (Vulnerable, BC Act).
- Flame Robin *Petroica phoenicea* (Vulnerable, BC Act).
- Greater Broad-nosed Bat *Scoteanax rueppellii* (Vulnerable, BC Act).
- Dural Land Snail *Pommerhelix duralensis* (Endangered, EPBC Act and BC Act).

No threatened flora species were recorded within the study area during field investigations, or considered to occur due to the urban nature and disturbance evident within the study area. Based on the size of the study area and due to historic disturbances, the survey effort is considered comprehensive to assess the presence of the flora species within the study area. Taking all of these factors into consideration, there is a low likelihood of occurrence of the above listed threatened flora.

An assessment of the habitat values of the study area is provided in **Table 1** below for threatened fauna species.

Table 1: Assessment of habitat for threatened fauna species

Habitat feature	Threatened fauna association	Likelihood of occurrence or impact
Feed trees	Angophoras, Eucalypts and other flowering perennial species recorded in the study area may provide nectar resources suitable for nectivorous bird species, such as Little Lorikeet and Swift Parrot, whilst in flower.	Based on the transient nature of these species and surrounding resources and connectivity within the landscape there is not likely to be an impact to Little Lorikeet, Swift Parrot or Glossy Black-cockatoo species. There is no breeding habitat within the study area that is suitable for Glossy

	The Swamp Oak trees within the study area provide foraging resources for the Glossy Black-cockatoo and other cockatoo species.	Black-cockatoo, as the study area contains only small to medium (5-15 cm) hollows. The study area is not located within the Swift Parrot Important Areas map (DPIE 2021a).
Vegetated areas	Large trees may provide habitat for a range of woodland bird species such as Dusky Woodswallow, Varied Sittella, and Flame Robin. The grassy understory, woody debris, and fallen timber recorded in the study area may provide habitat for Dural Land Snail.	Based on the presence of habitat features for these species, there is a moderate likelihood of presence and therefore impacts to this species are considered herein. Dural Land Snail was detected during a previous field investigation within the Rouse Hill study area and good quality habitat was located within the study area (Appendix 1; Figure 1.1 and Figure 1.2) (ENsure 2018). Impacts to this species are considered herein.
Hollow-bearing trees	Three potential hollow-bearing trees were recorded in the Rouse Hill study area and two at Castle Hill study area (Appendix 1; Figure 1.1 and Figure 1.2) containing small to medium sized hollows with dimensions of approximately 15 cm. These tree hollows may provide potential roosting and/or nesting habitat for microbats including the threatened Southern Myotis and Greater Broad-nosed Bat but is unlikely to provide roosting habitat for Powerful Owl due to the small dimensions of the hollows.	It is recommended that if possible, the hollow-bearing trees be retained as an important habitat feature in the landscape that may be used by threatened microbats, as well as providing feeding and perching habitat for other avifauna.
Rocky outcrops	There are no rocky outcrops within the study area.	No impact to threatened fauna.
Waterways (creek, river or dam)	Cattai Creek is present to the west, with Castle Hill Creek tributary running to the south of the Castle Hill study area. Second Ponds Creek is present to the north of the Rouse Hill study area. There are no waterways within the study area.	No direct or indirect impacts to threatened fauna.

Caves and shelters	There are no caves or shelters within the study area or within proximity to the study area.	No impact to threatened fauna.

Based on the size of the study area, the survey effort is considered comprehensive to assess habitat presence for the species outlined in Table 1. Taking all of these factors into consideration, there is a low likelihood of impact for the above listed nomadic species.

Site description of proposed areas to be cleared

Areas of Clearing are numbered on the map in figure 2.

Area 1

Area 1 has a mown groundlayer consisting of mostly exotic groundlayer species and some common native species. There are no trees or shrubs to be removed. This area is not mapped as an EEC and is consistent with the current REF.

Area 2

Area 2 has a mown groundlayer with several tall Eucalyptus. The Trees were inspected but there were no habitat features identified within the trees. Adjacent to the site is natural bushland in relatively good condition, but this area will not be impacted by the construction work.

The site has been identified as River Flat Eucalyptus Forest on Coastal Floodplains according to maps within the REF. When ground-truthing the site, only 4 canopy trees were identified in the proposal area and the River Flat Eucalyptus Forest on Coastal Floodplains community is considered to be in poor condition.

Area 3

Area 3 consists of the land surrounding concrete tanks adjacent to the compound perimeter fence. The groundlayer and shrubs layer consists of exotic vegetation, including several priority weeds such as Green Cestrum and African Olive.

Several Eucalypts also need to be removed. These were inspected and no habitat features could be found.

The area has been mapped as River Flat Eucalyptus Forest on Coastal Floodplains. Tests of significance under the BC Act and the EPBC Act indicated that a significant impact was not likely to result from this proposal. Tests of significance can be found in **Appendix A.** Significant Impact Criteria assessment can be found in **Appendix B.**

Area 4

Area 4 is also referred to as the Withers Rd Access Track. This area consists of exotic groundlayer and shrub species. No canopy trees are within this area.

The area is mapped in the REF as passing through River Flat Eucalyptus Forest on Coastal Floodplains, however, when provided with the when ground-truthing the site, no native vegetation was found within the site to be cleared and the area is not considered to be part of the River Flat Eucalyptus Forest on Coastal Floodplains community. This is confirmed with the provided Flora and Fauna Assessment in Appendix B of the *Decision Report North West Treatment Hub Castle Hill and Rouse Hill Water Recycling Plants Compliance Upgrade January 2022.*

Area 5

Area 5 includes an area south of the proposed inlet works and recycled water storage area. The bushland is in moderate-good condition, consisting of a diverse mix of Eucalypts and native shrub species and a mix of exotic and native groundlayer species. A proportion of this area is mapped as Shale Sandstone Transition Forest. Tests of significance under the BC Act and the EPBC Act indicated that a significant impact was not likely to result from this proposal. Tests of significance can be found in **Appendix A.** Significant Impact Criteria assessment can be found in **Appendix B.**

The threatened species, Dural Land Snail (*Pommerhelix duralensis*), was not identified during the field investigation at the Rouse Hill WRP, however it was previously recorded at Rouse Hill WRP during field investigations for the Phase 1 upgrade. The Dural Land Snail is listed as endangered under the EPBC Act and BC Act. It is expected that removal of the proposed patch of Shale Sandstone Transition Forest would have minimal impact to a very limited number of individual Dural Land Snails. The proposal is unlikely to substantially interfere with the recovery of this species. Tests of significance under the BC Act and the EPBC Act indicated that a significant impact to the Dural Land Snail was not likely to result from this proposal and a Species Impact Statement (SIS) is not required. Tests of significance can be found in **Appendix A.** Significant Impact Criteria assessment can be found in **Appendix B.**

This does not rule out the area as being potential habitat for the Snails as they can be very hard to find and additional safeguards outlined below should be employed to ensure safe relocation of any unidentified Dural Land Snails.

Several of the Eucalypts appeared to have hollows, dead limbs and rough loose bark which are habitat features. These trees were marked with a large H on their trunk.

Control Measures and Safeguards

As a safeguard when clearing all potential habitat trees, either a

- Trained wildlife carer or ecologist should be onsite or,
- An approved tree feller with an inspection camera experienced in rescuing and relocating wildlife should be used for felling any habitat trees.
- Any leaf litter and associated topsoil close to where the Land Snails were found should be carefully relocated to a nearby area underneath mature eucalypts.

Consistency with the Approved Project.

Impacts	Original Vegetation Clearing area	Total Vegetation Clearing area
Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion forming part of a component of the River Flat Eucalyptus Forest on Coastal Floodplains TEC.		
Size of clearing	900m^2	1,347m^2
Vegetation	Vegetation is described in the REF as being in 'good' condition	The additional areas of clearing have a healthy, diverse canopy layer but the shrub layer is missing and groundlayer is mostly exotic. Native groundlayer species are common throughout the area. Therefore, the condition can be described a 'poor to moderate'
Habitat features	Several habitat trees were identified in the REF.	No obvious habitat features.
Broad-leaved Ironbark - Grey Gum open forest of the edges of the Cumberland Plain, Sydney Basin Bioregion forming part of a component of the Shale Sandstone Transition Forest TEC		
Size of clearing	4700m^2	7,347m^2
Vegetation	The vegetation is described within the REF as being 'Moderate'	This area contained a number of habitat trees, naturally regenerating native species such as Eucalypts, acacias and other species typically found in Shale Sandstone Transition Forest. Exotic Shrub and Groundlayer species were also found within the area, so the condition can be described as 'moderate'.
Habitat features	Several habitat trees were identified in the REF. Snail shells were found within this area but could not be positively identified as Dural Land Snail shells.	Several habitat trees were found and marked with a large H on their trunk.

Conclusion

This consistency assessment finds that the new area of vegetation clearing at Rouse Hill WRP has resulted in

- A larger area of vegetation to be cleared, please see table above.
- Tests of significance under the BC Act and the EPBC Act indicated that a significant impact was not likely to result from this proposal for the threatened species the Dural Land Snail, the ECC River Flat Eucalyptus Forest on Coastal Floodplains or the CEEC Shale Sandstone Transition Forest (Cumberland Plain Woodland).
- Provided the implementation of recommended mitigation measures and controls in this REF, construction of the proposal is considered to have a minimal impact on the surrounding environment.

- All matters affecting or likely to affect the environment as a result of the proposal, have been considered as required by section 5.5 of the EP&A Act. Provided that the mitigation measures outlined in this document are implemented, the proposal is unlikely to have a significant adverse impact on the environment. Standard environmental management practices, inclusive of the mitigation measures outlined in this document, would be documented within the CEMP to be utilised by all contractors involved with the proposal.

Kirsty Reynolds (Ba Env Sc.)

Ecologist for **Blue Tongue Ecosystems Pty Ltd**

Appendix A- Test of Significance (Biodiversity Conservation Act)

1. Threatened ecological communities.

River-Flat Eucalypt Forest

River-Flat Eucalypt Forest (REF) is listed as a critically endangered ecological community (CEEC) under the Biodiversity Conservation Act (BC Act). The area adjacent to Seconds Pond Creek has been mapped as REF.

The vegetation within the Study Area does not conform to the Threatened Ecological Community, however some canopy trees which did not have any habitat features, are present.

***a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse impact on the lifecycle of the species such that a viable local population of the species is likely to be placed at risk of extinction ***
Not applicable. REF is a threatened community.

b) In the case of an endangered ecological community of critically endangered ecological community, whether the proposed development or activity:
i. Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or
ii. Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction
The small area of River-flat Eucalypt Forest forms part of a localised patch along the riparian corridors along Second Pond's Creek. The vegetation is located on the southern extent of the linear patch with large amounts of the TEC extending east and west from the impact area. Although, the proposed works will reduce the overall extent of the TEC the impact will be localised and unlikely to place the local occurrence at risk of extinction. The patch directly impacted by the proposal is also considered unlikely to substantially modify the composition of the TEC in the locality, due to the degraded and edge effect nature of the vegetation within the proposed works footprint.

c) In relation to the habitat of a threatened species or ecological community:
> ***i. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and***
> ***ii. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and***
> ***iii. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality***

Approximately 1,347m^2 of River-flat Eucalypt Forest may be permanently removed as a result of the proposed works this is a small portion of the habitat available to the local occurrence of the community along the Second Ponds Creek riparian corridor.
The patch of the TEC directly impacted by the proposed works has the potential to result in minor increases to fragmentation of the locally occurring TEC along the riparian corridors. The removal of a small amount of the TEC within a larger patch is unlikely to fragment or isolate the patch such that the local occurrence is at risk of extinction.
The area of habitat directly impacted by the proposed works is not considered important to the long term survival of the community in the locality.

d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)

No area of outstanding biodiversity value has been declared for REF

e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process

The proposed works have the potential to result in the following key threatening processes which are listed under the Schedule 4 of the BC Act and which are considered relevant to River-flat Eucalypt Forest:

- Clearing of native vegetation.

The proposed works requires clearing of land where this community occurs. A total of 1,347m^2 of this community will be directly removed by the proposed works.

Conclusion

The proposed works are unlikely to significantly impact River-flat Eucalypt Forest for the following reasons:

- The proposed works are localised, the study area has already been exposed to a number of disturbances which are unlikely to be further exacerbated by the proposed works.
- The proposed works is unlikely to significantly alter floristic or structural diversity of the retained portions of the EEC.
- The localised nature of the proposed works will not significantly trigger or exacerbate any key threatening processes.

Therefore, no further assessment is required and a SIS or BDAR is not required.

Shale Sandstone Transition Forest in the Sydney Basin Bioregion

Shale Sandstone Transition Forest in the Sydney Basin Bioregion (SSTF) is listed as a CEEC under the BC Act.

The vegetation within the Study Area conforms to the TEC, however a proportion the area has been historically disturbed and is either planted vegetation or regrowth.

The vegetation is part of a larger bushland remnant which has been mapped as SSTF to the South, which will not be impacted by the upgrades to the facility. The size of the remaining remnant which remain intact is approximately 1.5Ha.

a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse impact on the lifecycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

Not applicable. SSTF is a threatened community.

b) In the case of an endangered ecological community of critically endangered ecological community, whether the proposed development or activity:

> ***i. Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or***
> ***ii. Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction***

The local occurrence of Shale Sandstone Transition is considered to be vegetation that forms part of the same vegetation community that is contiguous and continuous with the vegetation within the study area. This patch totals approximately 6.54 hectares in size and up to 7,347 m^2 of vegetation is to be removed for the proposed works. The overall patch presents in generally good condition with relatively low weed ingress and higher native diversity in all stratum. The vegetation to be removed by the proposed works is located within the operations footprint of the Rouse Hill WRP, occurs on the north most extent of the patch and has been subjected to edge effects and disturbance. The vegetation to be directly removed does not comprise any ecological components critical to the survival of the TEC in the locality.

Although, the removal of 7,347 m^2 is likely to reduce the availability of habitat for the TEC within the locality it is unlikely, due to the low condition and native species diversity that removal of this vegetation will result in an adverse effect that the local occurrence would be placed at risk of extinction.

The removal of 7,347m^2 of TEC from the local occurrence will result in removal of native vegetation species. The species to be removed are proportionally represented within the retained areas of vegetation and are not considered at a risk of being made absent from the local occurrence of the TEC. Therefore, it is unlikely the works will substantially and adversely modify the composition such that the local occurrence would be placed at risk of extinction.

c) In relation to the habitat of a threatened species or ecological community:

> ***i. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and***
> ***ii. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and***

iii. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality

The Proposal is likely to result in removal of approximately 7,347 m^2 of SSTF

The Proposal would not result in fragmentation or isolation of the remaining patch of vegetation, as it would remove an edge of vegetation on the existing larger remnant.

The long-term survival of SSTF occurring in adjoining land and in the locality is unlikely to be impacted by the Proposal if no further clearing or impacts occur. However, increased edge effect resulting from the removal of the existing vegetation is likely to occur. This may result in an increase of weed growth and reduced resilience in the existing SSTF
The area to be removed has several hollow bearing trees which may provide habitat to native species.
The area of habitat to be directly and indirectly impacted by the proposed works is not considered important to the long term survival of the community in the locality.

d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)

No area of outstanding biodiversity value has been declared for SSTF

e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process

The following impacts are listed as Key Threatening Processes (KTPs) under the Act that are referred to in the Final Determination for SSTF

Clearing of native vegetation

The proposed action will include clearing of 7,347 m^2 of native vegetation,

High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition

The area is fenced from public access adjacent to a Water Recycling Plant, therefore high frequency fires are unlikely.

Removal of dead wood and dead trees

Several large dead trees and dead wood on the ground will be removed.
Any dead wood or dead trees that are required to be removed for the proposed action can be moved to regenerating areas in the retained, conserved SSTF during clearing operations if appropriate.

Invasion of native plant communities by exotic perennial grasses

The edge of the SSTF adjoining the Study Area is currently subject to invasion by, and high cover of, perennial exotic grasses, particularly Eragrostis curvula, Chloris gayana, Paspalum dilatatum and Pennisetum clandestinum. It is likely that the proposed activity would result in an increased cover of exotic perennial grasses to areas of retained vegetation adjacent to the Study Area. Management of existing exotic grasses in the remnant will reduce the spread further into the core of the healthy bushland area.

Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants

The proposal is unlikely to increase the extent garden escapes including aquatic plants.

Invasion and establishment of exotic vines and scramblers

There are exotic vines and scrambler such as *Araujia sericifera* in the woodland. The proposal is unlikely to increase the extent of these species.

Conclusion

The proposed works are unlikely to significantly impact Shale Sandstone Transition Forest for the following reasons:

- The proposed works are localised, the study area has already been exposed to a number of disturbances which are unlikely to be further exacerbated by the proposed works.
- The proposed works is unlikely to significantly alter floristic or structural diversity of the retained portions of the EEC.
- The localised nature of the proposed works will not significantly trigger or exacerbate any key threatening processes.

Therefore, no further assessment is required and a SIS or BDAR is not required.

2. Fauna Species

The Dural Land Snail (*Pommerhelix duralensis*)

The Dural Land Snail is a medium sized terrestrial snail which lives in shale-influenced-habitats, which occurs in low densities along the western and northwest fringes of the Cumberland IBRA subregion on shale-sandstone transitional landscapes. The species is listed as Endangered under the BC Act.

Targeted surveys were undertaken at the base of Eucalypts within the Study Area, and 4 shells were found.

No live snails were found, however they are notoriously hard to find, often hiding under logs, rocks and in curled up leaves. Also, the species is active from approximately one hour after dusk until dawn and no confirmed diurnal activity has been reported (*Pers. Comm.* Peter Ridgeway 2023).

a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse impact on the lifecycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

Little is known about the lifecycle of the Dural Land Snail. It is known to be hermaphroditic, laying relatively few (about 32) eggs per season. The mortality of offspring is 90% in the first year and overall mortality is 99.8% within four-five years (McLauchlan, 1951)

The species' dispersal is extremely slow, with the maximum nightly straight-line-dispersal recorded as 0.96 m in a survey totalling 16 survey-animal-nights. Unlike Cumberland Land Snails, The Dural Land Snails do not climb or burrow. Therefore, likelihood that individuals of the species will disperse into suitable habitat nearby is low.

The development would remove an area of potential suitable habitat for the species; therefore it is likely that the removal of the area of vegetation within the Study Area could impact on the lifecycle of the species. Dural Land Snails have been recorded in other bushland remnants nearby, however, based on the available information for maximum snail densities, the area of impact is capable of supporting <2 snail, based upon three snails per hectare and an impact area of 7,347 m2 (Ridgeway et al. 2014). Given the connection to the rest of the approximately 6.54 hectares patch of shale-influenced vegetation will not be significantly reduced, it is unlikely that the works will have an adverse impact on the lifecycle of the species, such that a viable local population of the species is likely to be placed at risk of extinction.

b) In the case of an endangered ecological community of critically endangered ecological community, whether the proposed development or activity:

> ***i. Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or***
>
> ***ii. Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction***

Not applicable. Dural Land Snail is a threatened species.

c) In relation to the habitat of a threatened species or ecological community:

> ***i. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and***

ii. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

iii. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality

The Proposal is likely to result in removal of approximately 7,347 m^2 of Shale Sandstone Transition Forest in the Sydney Basin Bioregion.

Dural Land Snails are not known to migrate and have very little interactions with adjoining bushland. Therefore, it is unlikely that the project will affect other populations in surrounding areas of habitat.

It is proposed that the leaf litter be removed via a flat excavator mud bucket to a depth of 0.15m and carefully placed in the remaining adjacent bushland in the unlikely event that a Dural Land Snail in present in the soils.

d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)

No area of outstanding biodiversity value has been declared within the project area.

e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process

The Proposal may remove of dead wood and dead trees, which are listed as a Key Threatening Process under the BC Act.

Conclusion

Four snail shells were identified during pre-clearing surveys of the area, but could not be positively identified as Dural Land Snail shells. The identified shells have been conservatively assumed to be a remnant living population. Due to the sedentary lifestyle of the species and the fact that live animals are typically difficult to find, it is presumed that a living population inhabits the area. The above outlined mitigation measures of relocated topsoil provides survivability in the unlikely event that live animals are present in the area. Application of the BOS or preparation of a SIS is therefore not required.

Based on the available information in the scientific literature and the minimal impacts to potential habitat within the study area, it is concluded that the proposed project impacts are unlikely to lead to a significant impact on Dural Land Snail.

Populations in surrounding areas will not be impacted by the proposal.

Appendix B- Significant Impact Criteria assessment

The following section provides for Significant Impact Criteria assessments as outlined in the Matters of National Environmental Significance: Significant impact guidelines 1.1 (CoA 2013) for all entities listed under the EPBC Act that have likelihood of impact or occurrence rated as medium or greater.

Shale Sandstone Transition Forest in the Sydney Basin Bioregion

Shale Sandstone Transition forest occurs as a forest or woodland community dominated by Eucalyptus species with a native species composition which is determined by the transitional geology between Wianamatta and Hawkesbury Sandstone (NSW Scientific Committee 2019).

Shale Sandstone Transition Forest in the Sydney Basin Bioregion is listed as Critically Endangered under the EPBC Act. As such an assessment against the Significant Impact Criteria has been undertaken below.

Reduce the extent of an ecological community

Shale Sandstone Transition Forest occurs on the edge of the Cumberland Plain where underlying sandstone soils influence the community which ranges from Kurrajong to Cattai in the north, Strathfield down to Campbelltown in the east, Bargo in the south, and Oakdale to Emu Plains on the west, comprising an area of approximately 2,200 km^2. The community can also occur on sandstone dominated Hornsby, Woronora and Lower Blue Mountains plateaux that adjoin the Cumberland Plain.

The examples in the study area and within the locality of the study area have undergone extensive clearing and modification for development. The removal of up to 7,347 m^2 of Shale Sandstone Transition which has been previously heavily disturbed from construction and operation of the Rouse Hill WRP is unlikely to significantly reduce the southern extent of this community.

Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines

Importantly, the proposal will not result in the fragmentation of large patches of high-quality Shale Sandstone Transition Forest TEC. There is unlikely to be declines in population density or species richness within vegetation patches because of the proposal. There is also unlikely to be a significant alteration to community composition, species interactions or ecosystem functioning in the locality due to the proposal.

Under the EPBC Act, a patch is defined as a discrete and continuous area of the TEC. However, a patch may include small-scale disturbances, such as tracks or breaks or small-scale variations in vegetation that do not significantly alter its overall functionality (for instance the movement of wildlife or dispersal of plant propagules). The proposal will result in some minor fragmentation of the community, however it is unlikely to be considered significant such that it would impact the functionality of the community.

Adversely affect habitat critical to the survival of an ecological community

The Matters of National Environmental Significance Significant impact guideline (Commonwealth of Australia 2013) state the 'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:

- For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators),

- To maintain genetic diversity and long term evolutionary development, or
- For the reintroduction of populations or recovery of the species or ecological community.

Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns

The project is not expected to result in substantial alteration to surface water patterns. Although an overall increase in hardstand area is likely to result from the proposed works. The current levels of hardstand associated with the Rouse Hill WRP mean it is unlikely to present a significant change to current patterns.

Alterations to hydrological patterns may also occur, but the area of the TEC impacted in this is not expected to be substantial due overall distance from waterways.
As such, the project is not expected to result in impacts that modify or destroy abiotic factors necessary for the survival of the TEC.

Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting

The project will not result in specific impacts to characteristic and functionally important species, as neither the construction or operational impacts will result in alterations to fire or flood regimes that maintain (or would potentially impact upon) the diversity of the TEC in the impact area, or broader landscape. The project will not alter management regimes of any retained vegetation, such as increased under-scrubbing or grazing, and there is no likelihood of the project resulting in an increase in harvesting of flora species.

The composition of Shale Sandstone Transition Forest in the Sydney Basin Bioregion may be modified because of the proposal through weed invasion and vegetation removal. However, the local occurrence of this ecological community is currently suffering from altered composition caused by a reduction in ecological function, as indicated by:

- Altered species composition.
- Altered structure.
- Disruption of ecological processes (i.e. altered drainage).
- Invasion and establishment of exotic species.

Adjoining retained vegetation may be indirectly impacted by increased weed species however, a strip of retained vegetation already impacted by significant weed species will be retained which will provide a buffer between disturbed areas a retained vegetation. The proposed works will also employ weed management to prevent further pressures from weed species on retained vegetation.

While modification of the ecological community will occur in and adjacent to the direct area of disturbance, the proposal is not considered likely to further modify the composition of the threatened ecological community such that its local occurrence is placed at risk of extinction. No flow on effects to other areas of the local occurrence will occur. The composition of the Shale Sandstone Transitional in the Sydney Basin Bioregion within the study area is predicted to remain intact after the implementation of the proposal.

Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:

- ***Assisting invasive species, that are harmful to the listed ecological community, to become established***
- ***Causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community***

Weed introduction and spread and the infection of native plants by Phytophthora cinnamomi has been identified as being spread by construction machinery. Phytophthora infects the roots of plants and has the potential to cause dieback. Machinery associated with vegetation clearance and subsequent construction for the proposal has the potential to introduce and transmit weed propagules and Phytophthora to remaining native vegetation remnants of the species. This is a potential indirect impact to Shale Sandstone Transitional in the Sydney Basin Bioregion through the spread and transmission of weeds and pathogens into retained habitat.

This impact can be mitigated through the development and implementation of suitable control measures for vehicle and plant hygiene and is unlikely to have a significant impact. It is the intention to use current best practice hygiene protocols as detailed in RMS (2011) to prevent the introduction or spread of weeds and pathogens. The proposal mitigation strategy and environmental management procedures would include guidance for preventing the introduction and/or spread of weeds and disease-causing agents such as bacteria and fungi.

No regular mobilisation of fertilisers, herbicides or other chemicals will occur because of the project.

Interfere with the recovery of an ecological community

The Shale Sandstone Transition Forest of the Sydney Basin Bioregion ecological community is covered by the Cumberland Plain Recovery Plan (DECCW 2011), a multi-entity recovery plan that has been prepared for 20 threatened species, populations and ecological communities that occur within the 'Cumberland Plain' region in western Sydney. The recovery plan has the following objectives:

- To build a protected area network, comprising public and private lands, focused on the priority conservation lands.
- To deliver best practice management for threatened biodiversity across the Cumberland Plain, with a specific focus on the priority conservation lands and public lands where the primary management objectives are compatible with biodiversity conservation.
- To develop an understanding and enhanced awareness in the community of the Cumberland Plain's threatened biodiversity, the best practice standards for its management, and the recovery program.
- To increase knowledge of the threats to the survival of the Cumberland Plain's threatened biodiversity, and thereby improve capacity to manage these in a strategic and effective manner.

The project will directly impact upon 7,347 m^2 of the TEC.

Whilst the project will impact upon Shale Sandstone Transition Forest, impacts to the community are limited to a small area of vegetation within the operations boundary of the Rouse Hill WRP where canopy has been previously thinned for construction and operation of the plant. This level of residual impact will not reduce the ongoing capacity of the intact TEC retained within adjacent properties.

The project will not result in impacts likely to be adverse to any of the other objectives of the Cumberland Plain Conservation Plan, nor will it impact upon areas of high quality habitat which could support the TEC into the future, and as such it is not expected that the project will interfere with the recovery of an ecological community.

Conclusion

The proposal is predicted to result in the removal of approximately 7,347 m^2 of the Shale Sandstone Transition Forest of the Sydney Basin Bioregion TEC. When the proportional impact is considered, the impact is small as the patch of the TEC is large and the vegetation proposed to be removed is currently highly altered and subject to regular pressures from within the operations of the Rouse Hill WRP. This impact is not considered important in terms of its intensity, magnitude and geographic extent.

The proposal will result in some small-scale disturbances but no large-scale alteration to overall functionality of vegetation will occur. Therefore, habitat fragmentation is considered a minor impact of the proposal regarding its context and intensity. Alteration of abiotic factors is not considered a major impact. The proposal is not considered likely to further modify the composition of the threatened ecological community such that its local occurrence is placed at risk of extinction. Weed introduction and spread and the infection of native plants by pathogens can be mitigated through the development and implementation of suitable control measures for vehicle and plant hygiene.

All patches of EPBC Act listed Shale Sandstone Transition Forest of the Sydney Basin Bioregion ecological community area considered critical to the survival of this community and as the proposal includes vegetation removal it is interfering with the recovery of this ecological community.

The Department of the Environment indicates that a 'significant impact' is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts. While an area of the Shale Sandstone Transition Forest of the Sydney Basin Bioregion TEC will be impacted, the intensity, magnitude and geographic extent of the impacts are not likely to result in a significant impact.

After consideration of the factors above, an overall conclusion has been made that the proposal is unlikely to result in a significant impact to the Shale Sandstone Transition Forest TEC as the impact is not considered to be of significance having regard to its context and intensity.

River-flat Eucalypt Forest on Coastal Floodplains of Southern New South Wales and Eastern Victoria

River-flat Eucalypt forest occurs as a tall forest to woodland structured vegetation unit overlying alluvial soils associated with coastal river floodplains and other site where transient water accumulates (DAWE 2020). The community has been subjected to a significant reduction in extent and is continually threatened by ongoing process including vegetation clearing, weed invasion, livestock grazing and climate change (DAWE 2020, pp. 202)

River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria is listed as Critically Endangered under the EPBC Act. As such an assessment against the Significant Impact Criteria has been undertaken below.

Reduce the extent of an ecological community

The community extends from Sale in Victoria to Raymond Terrace in NSW (DAWE 2020). The extent of the community has been reduced by over 70 % within this area and is at further threats due to location over productive areas of land (DAWE 2020).

The project will result in an overall reduction of less than 0.001 % of River-flat Eucalypt Forest that is likely to be directly and indirectly impacted by the current proposal, and a relatively localised impact of the TECs extent of occurrence. This has been assessed as unlikely to be a significant reduction of the extent of River-flat Eucalypt Forest.

Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines

The proposed works will require the removal of 1,347m^2 of River-flat Eucalypt Forest.

This direct impact is likely to lead to minor increases in localised fragmentation impacts, particularly to the patches of retained vegetation immediately adjacent to the impact area. These impacts are not considered substantial and will not result is further decreases in connectivity of canopy vegetation. The increased fragmentation will not substantially reduce connectivity as the impacts occur within / adjacent to already fragmented patches of the TEC. Edge effects may increase as a result of the project, but these are again not expected to be substantial.

As the fragmentation impacts expected to occur as a result of the proposed works are localised and relatively minor in nature, they are not expected to increase impacts to Rive-flat Eucalypt Forest such that a significant impact to the TEC is likely to occur.

Adversely affect habitat critical to the survival of an ecological community

The Matters of National Environmental Significance Significant impact guideline (Commonwealth of Australia 2013) state the 'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:

- For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators),
- To maintain genetic diversity and long term evolutionary development, or
- For the reintroduction of populations or recovery of the species or ecological community.

No such habitat has been identified in a recovery plan for River-flat Eucalypt Forest, nor is it listed on the Register of Critical Habitat maintained by the minister under the EPBC Act.

Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns.

The project is not expected to result in substantial alteration to surface water patterns. Alterations to hydrological patterns may also occur, but the area of the TEC impacted in this is not expected to be substantial due to its occurrence further back from the riverbank and on higher parts of the floodplain.

Mitigation measures would ensure that downstream indirect impacts (such as sediment and nutrient transportation) would be controlled and would not impact remaining areas of River-flat Eucalypt Forest

As such, the project is not expected to result in impacts that modify or destroy abiotic factors necessary for the survival of the TEC.

Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting

The project will not result in specific impacts to characteristic and functionally important species, as neither the construction or operational impacts will result in alterations to fire or flood regimes that maintain (or would potentially impact upon) the diversity of the TEC in the impact area, or broader landscape. The project will not alter management regimes of any retained vegetation, such as increased under-scrubbing or grazing, and there is no likelihood of the project rustling in an increase in harvesting of flora species.

The composition of River-flat Eucalypt may be modified because of the proposal through weed invasion and vegetation removal. However, the local occurrence of this ecological community is currently suffering from altered composition caused by a reduction in ecological function, as indicated by:

- Altered species composition.
- Altered structure.
- Disruption of ecological processes (i.e. altered drainage).
- Invasion and establishment of exotic species.

As the proposed works will removed 1,347m^{2}of vegetation within a large (greater than 20 hectare) patch, it is unlikely that this impact will further exacerbate these pressures.

While modification of the ecological community will occur in and adjacent to the direct area of disturbance, the proposal is not considered likely to further modify the composition of the threatened ecological community such that its local occurrence is placed at risk of extinction. No flow on effects to other areas of the local occurrence will occur. The composition of the River-flat Eucalypt Forest within the study area is predicted to remain intact after the implementation of the proposal.

Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:

- Assisting invasive species, that are harmful to the listed ecological community, to become established
- Causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community

Weed introduction and spread and the Infection of native plants by Phytophthora cinnamomi has been identified as being spread by construction machinery. Phytophthora infects the roots of plants and has the potential to cause dieback. Machinery associated with vegetation clearance and subsequent construction for the proposal has the potential to introduce and transmit weed propagules and Phytophthora to remaining native vegetation remnants of the species. This is a potential indirect impact to River-flat Eucalypt Forest through the spread and transmission of weeds and pathogens into retained habitat.

This impact can be mitigated through the development and implementation of suitable control measures for vehicle and plant hygiene and is unlikely to have a significant impact. It is the intention to use current best practice hygiene protocols as detailed in RMS (2011) to prevent the introduction or spread of weeds and pathogens. The proposal mitigation strategy and environmental management procedures would include guidance for preventing the introduction and/or spread of weeds and disease-causing agents such as bacteria and fungi.

No regular mobilisation of fertilisers, herbicides or other chemicals will occur because of the project.

Interfere with the recovery of an ecological community

There is no Commonwealth adopted Recovery Plan for River-flat Eucalypt Forest. However, the TEC is included in the Cumberland Plain Recovery Plan (DECCW 2011), a multi-entity recovery plan that has been prepared for 20 threatened species, populations and ecological communities that occur within the 'Cumberland Plain' region in western Sydney. The recovery plan has the following objectives:

- To build a protected area network, comprising public and private lands, focused on the priority conservation lands.
- To deliver best practice management for threatened biodiversity across the Cumberland Plain, with a specific focus on the priority conservation lands and public lands where the primary management objectives are compatible with biodiversity conservation.
- To develop an understanding and enhanced awareness in the community of the Cumberland Plain's threatened biodiversity, the best practice standards for its management, and the recovery program.
- To increase knowledge of the threats to the survival of the Cumberland Plain's threatened biodiversity, and thereby improve capacity to manage these in a strategic and effective manner
- The project will directly impact upon 1,347m^2 of the TEC.

Whilst the project will impact upon River-flat Eucalypt Forest in low condition, impacts to the community are limited to a small area of vegetation within the operations boundary of the Rouse Hill WRP where canopy has been previously thinned for construction and operation of the plant. This level of residual impact will not reduce the ongoing capacity of the intact TEC retained within adjacent properties.

The project will not result in impacts likely to be adverse to any of the other objectives of the Cumberland Plain Conservation Plan, nor will it impact upon areas of high quality habitat which could support the TEC into the future, and as such it is not expected that the project will interfere with the recovery of an ecological community.

Conclusion

The proposal is predicted to result in the removal of approximately 1,347m^2 of the River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria. When the proportional impact is considered, the small impact occurs within a larger patch of the TEC is large and a minimal amount of vegetation will be removed. This impact is not considered important in terms of its intensity, magnitude and geographic extent.

The proposal will result in some small-scale disturbances but no large-scale alteration to overall functionality of vegetation will occur. Therefore, habitat fragmentation is considered a minor impact of the proposal regarding its context and intensity. Alteration of abiotic factors is not considered a major impact. The proposal is not considered likely to further modify the composition of the threatened ecological community such that its local occurrence is placed at risk of extinction. Weed introduction and spread and the infection of native plants by pathogens can be mitigated through the development and implementation of suitable control measures for vehicle and plant hygiene.

The Department of the Environment (2013) indicates that a 'significant impact' is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts (Department of the Environment, 2013). While an area of the River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria will be impacted, the intensity, magnitude and geographic extent of the impacts are insignificant.

After consideration of the factors above, an overall conclusion has been made that the proposal is unlikely to result in a significant impact to the River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria as the impact is not considered to be of significance having regard to its context and intensity.

Appendix E – Dural Land Snail Pre-Clearance

Dural Land Snail and Pre-Clearance Inspection

Rouse Hill WRP 2023

FEBRUARY 14

Blue Tongue Ecosystems

Authored by: Kirsty Reynolds

DOCUMENT CONTROL

Issued	Project Name	Version	Prepared by
14/02/2023	Dural Land Snail and Pre-Clearance Inspection- Rouse Hill WRP 2023	1	Kirsty Reynolds

Report Certification

I, Kirsty Reynolds (BA Env Sc) Managing Director of Blue Tongue Ecosystems Pty Ltd hereby state that this report, which comprises a Dural Land Snail Assessment at Rouse Hill WRP in north-western Sydney has been prepared in accordance with the requirements of the project brief provided by Fulton Hogan for Sydney Water (February 2023).

Disclaimer

This document has been prepared in accordance with information provided by Sydney Water and Fulton Hogan ('the client'). This investigation has relied upon information collected during the course of a field investigation, and as available in current known literature and data sources. All findings, conclusions or recommendations contained within this document are based upon the abovementioned circumstances.

Given the dynamic nature of the relevant pieces of environmental legislation considered in this report, the authors consider that this report only has a 'shelf life' of six months. If a development application, Review of Environmental Factors or Statement of Environmental Effect is not submitted to a determining authority for consideration within this time frame, it is recommended that this report be reviewed and revised where required in light of any relevant legislative listings or changes.

Contents

1 Introduction

At the request of Sydney Water, a Biodiversity survey with a focus on Dural and Cumberland Land Snails and Pre clearance inspection has been conducted in relation to the proposed upgrade for the plant.

Rouse Hill Water Recycling Plant is in The Hills Shire local government area and provide wastewater services to Sydney's North West. Phased upgrades of the treatment plants are required in order to service Sydney's North West into the future and ensure continued compliance with environmental regulatory frameworks as the region develops. As per the Safeguards outlined in the Review of Environmental Factors, North West Treatment Hub Castle Hill and Rouse Hill Water Recycling Plants Compliance Upgrade (August, 2021) an ecological assessment and pre-clearance has been conducted in relation to the proposed upgrade for the plant.

The proposal involves the clearing of bushland and open grassland to make way for the site compound area, inlet works and haul roads.

Areas to be cleared for construction within the Rouse Hill WRP have been identified within the Biodiversity Assessment Report (BAR) 2018 as containing 2 threatened communities and a threatened fauna species.

The threatened Communities have been identified within the study area as

- PCT (plant community type) 835 Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion (MZ3), which is associated with the Biodiversity Conservation Act 2016 (BC Act) listed Endangered Ecological Community River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (RFEF);
- PCT 1395 Narrow-leaved Ironbark - Broad-leaved Ironbark - Grey Gum open forest of the edges of the Cumberland Plain, Sydney Basin Bioregion (MZ4), which is associated with the BC Act listed Critically Endangered Ecological Community Shale Sandstone Transition Forest in the Sydney Basin Bioregion (SSTF).

Several Endangered (BC Act & EPBC Act) Dural Woodland Snail (Pommerhelix duralensis) OR Endangered (BC Act) Cumberland Plain Land Snail (Meridolum corneovirens) shells were found in within the area to be cleared during a fauna search for the BAR. Identification was difficult as the shells were of juvenile snails, and the two species are morphologically similar when not fully developed (pers. Comm. Peter Ridgeway).

The Dural Land Snail Assessment and Clearance Inspection has been prepared by Blue Tongue Ecosystems Pty Ltd in accordance with the Review of Environmental Factors Castle Hill and Rouse Hill WRP Compliance Upgrade, August, 2021

Figure 1 Map of site

2 Legislation

Table 1 Table of relevant legislation

Level	Lesislation	Relevance to Study Area
Commonwealth	Environment Protection and Biodiversity Conservation Act 1999	Under this Act an action will require approval from the Minister if the action has, will have, or is likely to have, a significant impact on a Matters of National Environmental Significance (MNES). MNES include listed threatened species and ecological communities, migratory species and wetlands of international importance protected under international agreements. Where applicable, the assessment criteria relevant to this Act must be drawn upon to determine whether there would be a significant effect on these species and hence whether referral to the Federal Environment Minister is required. Both Cumberland Land Snails and Dural Land Snails have been recorded at the site
State	NSW Environmental Planning and Assessment Act 1979	Part 5 of this Act requires that a determination be made as to whether a proposed action is likely to significantly affect threatened species or ecological communities, or their habitats listed on Schedules 1 and 2 of the BC Act. Where found, the assessment criteria under Part 7 Section 7.3 of the BC Act (the 'Assessment of Significance') will be drawn upon to determine whether there is likely to significantly affect threatened species or ecological communities, or their habitats, and hence whether a SIS is required.
	NSW Biodiversity Conservation Act 2016	The Act aims to: • to conserve biodiversity at bioregional and State scales, and promote ecologically sustainable development • to maintain the diversity and quality of ecosystems and enhance their capacity to adapt to change and provide for the needs of future generations, and • to support biodiversity conservation in the context of a changing climate, and • to support collating and sharing data, and monitoring and reporting on the status of biodiversity and the effectiveness of conservation actions, and • to assess the extinction risk of species and ecological communities, and identify key threatening processes, through an independent and rigorous scientific process.
	NSW Biosecurity Act 2015	This Act repeals several acts, one being the Noxious Weeds Act 1993. The general Biosecurity duty is to prevent, eliminate and minimise risks. The Act states that any land managers and users of land have a responsibility for managing weed biosecurity risks that they know about or could reasonably be expected to know about. There are a number of weeds listed in the Priority Weed list as WONs or on the Hawkesbury River County Council Priority Weed List.

3 Site Location and Assessment

Subject site within the Rouse Hill Water Recycling Plant is situated on Mile End Rd, Rouse Hill, in the North West of Sydney

The area designated for clearing is approximately 2Ha in an area of bushland to the south west portion of the plant.

The study site is located on a small area of overlap between the Cumberland Land Snail range and Dural Land Snail range (OEH 2023).

The majority of the area to be surveyed had been highly disturbed in the past. The groundlayer consists mainly of exotic grasses with minimal leaf litter, minimal shrub layer and mostly planted canopy species.

An area that appears to have remined undisturbed near the car park has deep leaf litter, a more diverse shrub and groundlayer, and remnant canopy species. Within the deeper leaf litter, hyphae and fruiting bodies of fungi could be found. These habitat characteristics are favoured by Land Snails.

4 Literature Review

Prior to carrying out any fieldwork, previous studies conducted in the surrounding region and known databases were consulted to identify the diversity of ecological communities, flora and fauna species known for, or potentially occurring in, the subject site. Documents reviewed included the

- Property Environmental Management Plan (PEMP) Rouse Hill Water Recycling Plant
- Biodiversity Assessment Report (BAR) Rouse Hill Water Recycling Plant
- Review of Environmental Factors. North West Treatment Hub Castle Hill and Rouse Hill Water Recycling Plants Compliance Upgrade (August, 2021)
- Conservation Advice Pommerhelix duralensis DURAL LAND SNAIL (OEH 2015)
- Australian Land Snails Volume 1: A Field Guide to Eastern Australian Species.
- A review of the land snail genus Meridolum (Gastropoda: Camaenidae) from central New South Wales, Australia (Clark 2009)
- Indications of diverse behavioural ecologies in the morphologically conservative Australian land snails Pommerhelix and Meridolum (Ridgeway et al. 2014)

A review of the Atlas of Living Australia databases (Atlas of Living Australia 2023) identified a large number of either Cumberland Land Snails and/or Dural Land Snails found in close proximity to the study area. See Figure 2

Personal Communication were conducted with Peter Ridgeway and Stephanie Clark on the identification of the juvenile snail shells.

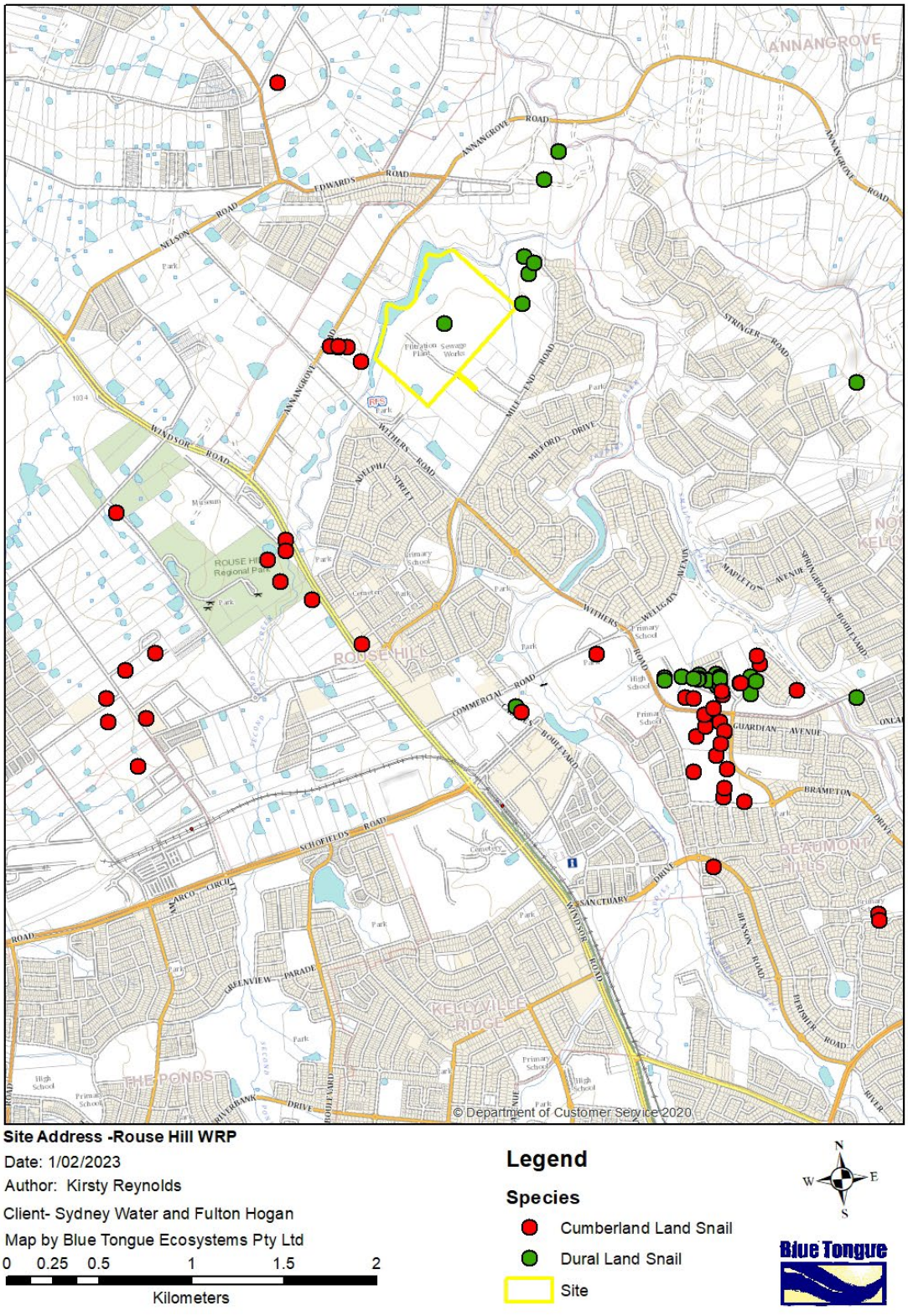

Figure 2 Map showing Land Snail found close to the subject site. This map is from the Atlas of Living Australia Website (2023)

5 Field survey methods

Investigations of the subject site were carried out by Kirsty Reynolds (B.Env.Sc.) [Senior ecologist], on 3rd February September 2023. The weather conditions experienced during the site investigation were warm temperatures (32 °C), clear skies (50%) and still conditions. There had been very little rainfall in the previous week.

Snail Survey

The BAR recommended that surveys for threatened snails be undertaken immediately prior to works, preferably during cool weather, after rain and close to sunset or sunrise.
As a snail has already been identified as present within the study area, a thorough search was undertaken. This included a visual and hand search, carefully turning over rocks, logs and large debris (replacing these on site after inspection) and searching through leaf litter and vegetation. Concentrating on litter at the base of trees, grass tussocks, logs and other debris, randomly sampled as encountered.

It was recommended that any live snails be translocated to a suitable location nearby and the position georeferenced within the report, however none were found during the search.

6 Snails recorded during the field investigation.

By the completion of the field investigations conducted within, adjacent to and in the vicinity of the proposal area, four juvenile Dural (or Cumberland) Land Snail shells were found in leaf litter. All shells were empty and had the potential of being in the leaf litter for up several years (Peter Ridgeway, pers comm. 2023). As all the shells were juveniles, a positive identification was sought by both Peter Ridgeway and Dr Stephanie Clark, both experts in identifying Land Snails.

No live snails were found, this is likely due to;

- Warm weather (>30C),
- no rainfall in the week prior to the inspection and
- Dural or Cumberland Land Snails are generally active from approximately one hour after dusk until dawn and no confirmed diurnal activity has been reported.

All other areas of leaf litter around trees were extensively searched in the area designated for clearing. Although there were areas of deep leaf litter and native fungi, no snails or old shells were found.

Figure 3 Dural Land Snail shells found in leaf litter

Figure 4 Photo of area where Snail shells found

7 Recommendations

The area where the snails were found had previously been identified as Dural or Cumberland Snail habitat. Dural land snails have been recorded as having a very limited migration and dispersal rate, therefore this area has possibly been the home range for the snails for several years (Peter Ridgeway, pers comm. 2023).

The areas surrounding this small location have previously been disturbed and do not possess characteristic of Dural (or Cumberland) Land Snail habitat.

It is therefore recommended that the location of known Dural (or Cumberland) Land Snail habitat is left undisturbed, and construction takes place in the areas that where historically cleared.

If this is not possible, the area should thoroughly checked just prior to clearing and snails translocated to adjacent known locations of the snails. Timing of the search should include.

- from approximately one hour after dusk until dawn
- after or during rain

8 References

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