Performance outcomes	Acceptable outcomes	Response
PO54 Regional ecosystems on the subject land and any adjacent land retain sufficient **vegetation** to: 1. maintain **ecological processes**; and 2. ensure the **regional ecosystem** remains in the landscape despite **threatening processes**.	**AO54.1 Clearing** occurs in accordance with reference table 3 of this code.	
PO55 Where: 1. **clearing** of **vegetation** in a **regional ecosystem** does not maintain **ecological processes;** and 2. the **regional ecosystem**; and 3. the **clearing** cannot be avoided; and 4. the **clearing** has been mitigated an **offset** is provided for any acceptable **significant residual impact**.	No acceptable outcome is prescribed.	NA
Soil erosion if the local government is not the assessment manager for the development application		
PO56 Clearing does not result in **accelerated soil erosion** within or outside the land the subject of the development application.	**AO56.1 Clearing** only occurs if an **erosion and sediment control plan** is developed and implemented to prevent **soil erosion and instability** resulting from the **clearing**.	NA
Salinity		
PO57 Clearing within 100 metres of a **salinity expression area** does not contribute to or accelerate **land degradation** through either of the following: 1. **waterlogging**; 2. the **salinisation** of **groundwater**, surface water or soil.	**AO57.1 Clearing** does not occur within 100 metres of a **salinity expression area**.	NA
Conserving endangered and of concern regional ecosystems		

Performance outcomes	Acceptable outcomes	Response
PO58 Clearing of **vegetation** maintains the composition, structure and function of **endangered regional ecosystems** and/or **of concern regional ecosystems**.	**AO58.1 Clearing** does not occur in an **endangered regional ecosystem** or an **of concern regional ecosystem**. OR **AO58.2** Total **clearing** of **endangered regional ecosystems** and **of concern regional ecosystems** combined does not exceed the widths prescribed in reference table 1 of this code. OR **AO58.3** Total **clearing** of **endangered regional ecosystems** and **of concern regional ecosystems** combined does not exceed areas prescribed in reference table 1 of this code.	NA
PO59 Where **clearing** of **vegetation** in an **endangered regional ecosystem** or an **of concern regional ecosystems** does not maintain the composition, structure and function of the **regional ecosystem**, and cannot be avoided and has been mitigated, the cleared area: 1. is **rehabilitated**; or 2. where the cleared area cannot be **rehabilitated**, an **offset** is provided for any acceptable **significant residual impact**.	No acceptable outcome is prescribed.	NA
Essential habitat excluding essential habitat for *Phascolarctos cinereus* (koalas) if development is assessable under Schedule 10, Part 10 of the Planning Regulation 2017		
PO60 Clearing of **vegetation** in a **regional ecosystem** that is an area of **essential habitat** maintains the composition, structure and function of the **regional ecosystem** for each **protected wildlife** species individually.	**AO60.1 Clearing** does not occur in **essential habitat**. OR **AO60.2 Clearing** in **essential habitat** does not exceed the widths prescribed in reference table 1 of this code. OR	NA

Performance outcomes	Acceptable outcomes	Response
	AO60.3 Clearing in **essential habitat** does not exceed the areas prescribed in reference table 1 of this code.	
PO61 Where **clearing** of **vegetation** in a **regional ecosystem** that is an area of **essential habitat** does not maintain the composition, structure and function of the **regional ecosystem**, and cannot be avoided and has been mitigated, an **offset** is provided for any acceptable **significant residual impact for** each **protected wildlife** species individually.	No acceptable outcome is prescribed.	NA
Acid sulfate soils if the local government is not the assessment manager for the development application		
PO62 Clearing does not result in, or accelerate, disturbance of acid sulfate soils or changes to the hydrology of the location that will result in either of the following: 1. aeration of horizons containing iron sulphides; 2. mobilisation of acid or metals.	**AO62.1 Clearing** does not occur in **land zone 1**, **land zone 2** or **land zone 3**. OR **AO62.2 Clearing** in **land zone 1**, **land zone 2** or **land zone 3** in areas below the five metre Australian Height Datum only occurs where: 1. **mechanical clearing** does not disturb the soil to a depth greater than 30 centimetres; and 2. acid sulfate soils are managed consistent with the soil management guidelines in the Queensland Acid Sulfate Soil Technical Manual.	NA
Staged clearing		
PO63 Clearing: 1. is staged in line with operational needs that restrict **clearing** to the current operational area; and 2. only occurs in the area from which material will be extracted, and any reasonably associated **built infrastructure**, within the term of the development approval; and 3. does not occur without required permits.	No acceptable outcome is prescribed.	NA

Table 16.7: Coordinated project (all other purposes)

Performance outcomes	Acceptable outcomes	Response
Clearing avoids and minimises impacts		
PO64 Clearing of **vegetation** and **adverse impacts of clearing vegetation** do not occur unless the application has demonstrated that the **clearing** and the **adverse impacts of clearing** have been: 1. reasonably avoided; or 2. reasonably minimised where it cannot be reasonably avoided.	No acceptable outcome is prescribed.	NA
Clearing associated with wetlands		
PO65 Clearing of **vegetation** within a natural **wetland** and/or within 100 metres of the **defining bank** of a natural **wetland** maintains the composition, structure and function of any **regional ecosystem** associated with any natural **wetland** to protect all of the following: 1. bank stability by protecting against bank erosion; 2. water quality by filtering sediments, nutrients and other pollutants; 3. aquatic habitat; 4. terrestrial habitat.	**AO65.1 Clearing** does not occur in a natural **wetland** or within 100 metres of the **defining bank** of any natural **wetland**. OR **AO65.2 Clearing** within 100 metres of the **defining bank** of any natural **wetland**: 1. does not occur within 10 metres of the **defining bank** of any natural **wetland**; and 2. does not exceed widths in table reference table 1 in this code.	NA
PO66 Where **clearing** of **vegetation** in a **regional ecosystem** associated with a natural **wetland** does not maintain the composition, structure and function of the **regional ecosystem**, and cannot be avoided and has been mitigated, an **offset** is provided for any acceptable **significant residual impact**.	No acceptable outcome is prescribed.	NA
Clearing associated with watercourses and drainage features		
PO67 Clearing of **vegetation** within a **watercourse** and/or **drainage feature** and/or within the relevant distance (listed in reference table 2) of a **watercourse** and/or **drainage feature,** maintains the composition, structure and function of the **regional ecosystem** associated with the **watercourse** and/or **drainage feature** to protect all of the following:	**AO67.1 Clearing** does not occur in any of the following areas: 1. inside the **defining bank** of a **watercourse** or **drainage feature**; and 2. within the relevant distance of the **defining bank** of any **watercourse** or **drainage feature** in reference table 2 of this code. OR	NA

Performance outcomes	Acceptable outcomes	Response
1. bank stability by protecting against bank erosion; 2. water quality by filtering sediments, nutrients and other pollutants; 3. aquatic habitat; 4. terrestrial habitat.	**AO67.2 Clearing** within any **watercourse** or **drainage feature**, or within the relevant distance of the **defining bank** of any **watercourse** or **drainage feature** in reference table 2 of this code: 1. does not exceed the widths in table reference table 1 of this code; and 2. does not occur within 10 metres of the **defining bank**, unless **clearing** is required into or across the **watercourse** or **drainage feature**.	
PO68 Where **clearing** of **vegetation** in a **regional ecosystem** associated with a **watercourse** and/or **drainage feature** does not maintain the composition, structure and function of the **regional ecosystem**, and cannot be avoided and has been mitigated, an **offset** is provided for any acceptable **significant residual impact**.	No acceptable outcome is prescribed.	NA
Connectivity		
PO69 Regional ecosystems on the subject land and any adjacent land retain sufficient **vegetation** to: 1. maintain **ecological processes**; and 2. ensure the **regional ecosystem** remains in the landscape despite **threatening processes**.	**AO69.1 Clearing** occurs in accordance with reference table 3 of this code.	NA
PO70 Where: 1. **clearing** of **vegetation** in a **regional ecosystem** does not maintain **ecological processes;** and 2. the **regional ecosystem**; and 3. the **clearing** cannot be avoided; and 4. the **clearing** has been mitigated an **offset** is provided for any acceptable **significant residual impact**.	No acceptable outcome is prescribed.	NA
Soil erosion if the local government is not the assessment manager for the development application		
PO71 Clearing does not result in **accelerated soil erosion** within or outside the land the subject of the development application.	**AO71.1 Clearing** only occurs if an **erosion and sediment control plan** is developed and implemented to prevent **soil erosion and instability** resulting from the **clearing**.	NA

Performance outcomes	Acceptable outcomes	Response
Salinity		
PO72 Clearing within 100 metres of a **salinity expression area** does not contribute to or accelerate **land degradation** through either of the following: 1. **waterlogging**; 2. the **salinisation** of **groundwater**, surface water or soil.	**AO72.1 Clearing** does not occur within 100 metres of a **salinity expression area**.	NA
Conserving least concern regional ecosystems - Minimising clearing of areas temporarily required to enable construction of the infrastructure		
PO73 Clearing of **vegetation** for temporary use areas to construct necessary infrastructure, such as temporary use roads or access tracks, maintains the composition, structure and function of **least concern regional ecosystems**.	**AO73.1 Clearing** for temporary use areas to construct necessary infrastructure does not occur in a **least concern regional ecosystem**. OR **AO73.2** Total **clearing** for temporary use areas to construct necessary infrastructure in any **regional ecosystem** combined does not exceed the widths prescribed in table reference table 1 of this code. OR **AO73.3** Total **clearing** for temporary use areas to construct necessary infrastructure in any **regional ecosystem** combined does not exceed areas prescribed in table reference table 1 of this code.	NA
PO74 Where **clearing** of **vegetation** in a **regional ecosystem** for temporary use areas to construct necessary infrastructure does not maintain the composition, structure and function of the **regional ecosystem**, and cannot be avoided and has been mitigated, the **cleared** area is **rehabilitated**.	No acceptable outcome is prescribed.	NA
Conserving endangered and of concern regional ecosystems		
PO75 Clearing of **vegetation** maintains the composition, structure and function of **endangered regional ecosystems** and/or **of concern regional ecosystems**.	**AO75.1 Clearing** does not occur in an **endangered regional ecosystem** or an **of concern regional ecosystem**. OR	NA

Performance outcomes	Acceptable outcomes	Response
	AO75.2 Total **clearing** of **endangered regional ecosystems** and **of concern regional ecosystems** combined does not exceed the widths prescribed in table reference table 1 of this code. OR **AO75.3** Total **clearing** of **endangered regional ecosystems** and **of concern regional ecosystems** combined does not exceed areas prescribed in reference table 1 of this code.	
PO76 Where **clearing** of **vegetation** in an **endangered regional ecosystem** or an **of concern regional ecosystems** does not maintain the composition, structure and function of the **regional ecosystem**, and cannot be avoided and has been mitigated, the cleared area: 1. is **rehabilitated**; or 2. where the cleared area cannot be **rehabilitated**, an **offset** is provided for any acceptable **significant residual impact**.	No acceptable outcome is prescribed.	NA
Essential habitat excluding essential habitat for *Phascolarctos cinereus* (koalas) if development is assessable under Schedule 10, Part 10 of the Planning Regulation 2017		
PO77 Clearing of **vegetation** in a **regional ecosystem** that is an area of **essential habitat** maintains the composition, structure and function of the **regional ecosystem** for each **protected wildlife** species individually.	**AO77.1 Clearing** does not occur in **essential habitat**. OR **AO77.2 Clearing** in **essential habitat** does not exceed the widths prescribed in reference table 1 of this code. OR **AO77.3 Clearing** in **essential habitat** does not exceed the areas prescribed in reference table 1 of this code.	NA

Performance outcomes	Acceptable outcomes	Response
PO78 Where **clearing** of **vegetation** in a **regional ecosystem** that is an area of **essential habitat** does not maintain the composition, structure and function of the **regional ecosystem**, and cannot be avoided and has been mitigated, an **offset** is provided for any acceptable **significant residual impact for** each **protected wildlife** species individually.	No acceptable outcome is prescribed.	NA
Acid sulfate soils if the local government is not the assessment manager for the development application		
PO79 Clearing does not result in, or accelerate, disturbance of acid sulfate soils or changes to the hydrology of the location that will result in either of the following: 1. aeration of horizons containing iron sulphides 2. mobilisation of acid or metals.	**AO79.1 Clearing** does not occur in **land zone 1**, **land zone 2** or **land zone 3**. OR **AO79.2 Clearing** in **land zone 1**, **land zone 2** or **land zone 3** in areas below the five metre Australian Height Datum only occurs where: 1. **mechanical clearing** does not disturb the soil to a depth greater than 30 centimetres; and 2. acid sulfate soils are managed consistent with the soil management guidelines in the Queensland Acid Sulfate Soil Technical Manual.	NA

Table 16.8: Material change of use and / or reconfiguring a lot for all other purposes

Performance outcomes	Acceptable outcomes	Response
Clearing avoids and minimises impacts		
PO80 Clearing of **vegetation** and **adverse impacts of clearing vegetation** do not occur unless the application has demonstrated that the **clearing** and the **adverse impacts of clearing** have been: 1. reasonably avoided; or 2. reasonably minimised where it cannot be reasonably avoided.	No acceptable outcome is prescribed.	**Complies with PO80** The proposed development footprint has been reduced to increase protection of the site's vegetation. The proposed reserve (approximately 3ha) is more than 100m width/depth and the total connected remnant vegetation is >10ha (including connected vegetation external to the site); and protects a minimum of 30% of the site area. The revised development reasonably avoids and minimises impacts on mapped vegetation, thereby complying with this PO.

Performance outcomes	Acceptable outcomes	Response
		The site contains 8.12ha of Category B Least concern Remnant Vegetation representing Least concern regional ecosystems (RE) 11.1.2 and 11.2.5. No regrowth is mapped over the site, however surveys found the mapped Category B vegetation to include a mix of remnant and regrowth condition. The proposed works will impact approximately 63% (51,234m^2 / 5.123ha) of the site's mapped regulated Category B (remnant) vegetation (refer Table 5.3 and Figure 5.1). Surveys ground truthed the regulated vegetation and found it represents three (3) distinct regional ecosystems - RE 11.2.5 (Vegetation Associations A, B and C), RE 11.1.4 and 11.1.2 (Vegetation Association D). Vegetation Associations A and D were found to represent remnant (Category B) vegetation while B and C were found to reflect regrowth condition based on structural criteria (height / cover of ecologically dominant layer not meeting the RE benchmark conditions). The proposed works will impact approximately 4.37ha (43,752m2) of the site's ground truthed Category B (remnant) vegetation representing Vegetation Associations A and D. No impacts are proposed on Vegetation Associations C (contains occasional marine plants – mangrove fern and salt couch) and D (mangroves and salt marsh communities). The proposed development protects all marine plants recorded on site which were predominantly within Vegetation Association D (mangroves and salt marsh communities), and occasional presence in Vegetation Association C (mangrove fern and salt couch). The Livingstone Planning Scheme 2018 – Biodiversity Overlay Code identifies estuarine wetland habitat in the south west of the site on

Performance outcomes	Acceptable outcomes	Response
		Mulambin Ck. This wetland will be protected by a 100m-200m minimum buffer to the proposed development footprint as shown in Figure 5.2. The proposed rehabilitation within this wetland setback will further enhance the buffer function. It is there considered the layout appropriately avoids and minimises clearing on the areas of vegetation on site considered to be functionally significant, ie containing marine plants and or providing a wetland buffer function.
Clearing associated with wetlands		
PO81 Clearing of **vegetation** within a natural **wetland** and/or within 100 metres of the **defining bank** of a natural **wetland** maintains the composition, structure and function of any **regional ecosystem** associated with any natural **wetland** to protect all of the following: 1. bank stability by protecting against bank erosion; 2. water quality by filtering sediments, nutrients and other pollutants; 3. aquatic habitat; 4. terrestrial habitat.	**AO81.1 Clearing** does not occur in a natural **wetland** or within 100 metres of the **defining bank** of any natural **wetland**. OR **AO81.2 Clearing** within 100 metres of the **defining bank** of any natural **wetland**: 1. does not occur within 10 metres of the **defining bank** of any natural **wetland**; and 2. does not exceed widths in reference table 1 in this code.	**Complies with PO81** The Livingstone Planning Scheme 2018 – Biodiversity Overlay Code identifies estuarine wetland habitat in the south west of the site on Mulambin Ck. This wetland will be protected by a 100m-200m minimum buffer to the proposed development footprint as shown in Figure 5.2. The proposed rehabilitation within this wetland setback will further enhance the buffer function.
PO82 Where **clearing** of **vegetation** in a **regional ecosystem** associated with a natural **wetland** does not maintain the composition, structure and function of the **regional ecosystem**, and cannot be avoided and has been mitigated, an **offset** is provided for any acceptable **significant residual impact**.	No acceptable outcome is prescribed.	**Complies with PO82** The Livingstone Planning Scheme 2018 – Biodiversity Overlay Code identifies estuarine wetland habitat in the south west of the site on Mulambin Ck. This wetland will be protected by a 100m buffer to the proposed development footprint as shown in Figure 5.2. The proposed rehabilitation within this wetland setback will further enhance the buffer function.
Clearing associated with watercourses and drainage features		
PO83 Clearing of **vegetation** within a **watercourse** and /or **drainage feature** and/or within the relevant distance (listed in reference table 2) of a	**AO83.1 Clearing** does not occur in any of the following areas:	**Complies with PO83** No clearing within a watercourse or drainage feature proposed.

Performance outcomes	Acceptable outcomes	Response
watercourse and/or **drainage feature,** maintains the composition, structure and function of the **regional ecosystem** associated with the **watercourse** and/or **drainage feature** to protect all of the following: 1. bank stability by protecting against bank erosion; 2. water quality by filtering sediments, nutrients and other pollutants; 3. aquatic habitat; 4. terrestrial habitat.	1. inside the **defining bank** of a **watercourse** or **drainage feature**; and 2. within the relevant distance of the **defining bank** of any **watercourse** or **drainage feature** in reference table 2 of this code. OR **AO83.2 Clearing** within any **watercourse** or **drainage feature**, or within the relevant distance of the **defining bank** of any **watercourse** or **drainage feature** in reference table 2 of this code: 1. does not exceed the widths in table reference table 1 of this code; and 2. does not occur within 10 metres of the **defining bank**, unless **clearing** is required into or across the **watercourse** or **drainage feature**.	
PO84 Where **clearing** of **vegetation** in a **regional ecosystem** associated with a **watercourse** and/or **drainage feature** does not maintain the composition, structure and function of the **regional ecosystem**, and cannot be avoided and has been mitigated, an **offset** is provided for any acceptable **significant residual impact**.	No acceptable outcome is prescribed.	**Complies with PO84** No clearing proposed in a regional ecosystem associated with a watercourse and/or drainage feature.
Connectivity		
PO85 Regional ecosystems on the subject land and any adjacent land, retain sufficient **vegetation** to maintain: 1. **ecological processes**; and 2. ensure the **regional ecosystem** remains in the landscape despite **threatening processes**.	**AO85.1 Clearing** occurs in accordance with reference table 3 in this code**.**	**Complies with PO85** All vegetation in the 100m wetland buffer area will be retained and protected to ensure ecological processes are maintained. This protected area includes the more highly connected areas of vegetation and all regional ecosystems present on site are represented in the proposed reserve.
Soil erosion if the local government is not the assessment manager for the development application		
PO86 Clearing does not result in **accelerated soil erosion** within or outside the land the subject of the development application.	**AO86.1 Clearing** only occurs if an **erosion and sediment control plan** is developed and implemented to prevent **soil erosion and instability** resulting from the **clearing**.	**NA – Council is Assessment Manager**

State Development Assessment Provisions v3.0

State code 16: Native vegetation clearing

Page **27** of **59**

Performance outcomes	Acceptable outcomes	Response
Salinity		
PO87 Clearing within 100 metres of a **salinity expression area** does not contribute to or accelerate **land degradation** through either of the following: 1. **waterlogging**; 2. the **salinisation** of **groundwater**, surface water or soil.	**AO87.1 Clearing** does not occur within 100 metres of a **salinity expression area**.	**Complies with PO87** The vegetation in land zone 1 (marine sediments) could be considered a salinity expression area. All vegetation in this area will be protected within the proposed reserve and buffered to avoid land degradation.
Conserving endangered and of concern regional ecosystems		
PO88 Clearing of **vegetation** maintains the composition, structure and function of **endangered regional ecosystems** and/or **of concern regional ecosystems**.	**AO88.1 Clearing** does not occur in an **endangered regional ecosystem** or an **of concern regional ecosystem**. OR **AO88.2** Total **clearing** of **endangered regional ecosystems** and **of concern regional ecosystems** combined does not exceed the widths prescribed in reference table 1 of this code. OR **AO88.3** Total **clearing** of **endangered regional ecosystems** and **of concern regional ecosystems** combined does not exceed areas prescribed in reference table 1 of this code.	**Complies with PO88** No Of Concern or Endangered Vegetation is mapped on the site.
PO89 Where **clearing** of **vegetation** in an **endangered regional ecosystem** or an **of concern regional ecosystems** does not maintain the composition, structure and function of the **regional ecosystem**, and cannot be avoided and has been mitigated, the cleared area: 1. is **rehabilitated**; or 2. where the cleared area cannot be **rehabilitated**, an **offset** is provided for any acceptable **significant residual impact**.	No acceptable outcome is prescribed.	**Complies with PO89** No Of Concern or Endangered Vegetation is mapped on the site.
Essential habitat excluding essential habitat for *Phascolarctos cinereus* (koalas) if development is assessable under Schedule 10, Part 10 of the Planning Regulation 2017		

Performance outcomes	Acceptable outcomes	Response
PO90 Clearing of **vegetation** in a **regional ecosystem** that is an area of **essential habitat** maintains the composition, structure and function of the **regional ecosystem** for each **protected wildlife** species individually.	**AO90.1 Clearing** does not occur in **essential habitat**. OR **AO90.2 Clearing** in **essential habitat** does not exceed the widths prescribed in reference table 1 of this code. OR **AO90.3 Clearing** in **essential habitat** does not exceed the areas prescribed in reference table 1 of this code.	**Complies with PO90** The Vegetation Management Supporting Map (refer Figure 4.2 and Appendix B) indicates the site's Category B vegetation is Essential Habitat for *Crocodylus porosus* (estuarine crocodile) – Vulnerable, *Numenius madagascariensis* (eastern curlew) – Endangered and *Limosa lapponica baueri* (Western Alaskan bar-tailed godwit) - Vulnerable. All potential habitat for these species is proposed to be protected in the reserve. As detailed in s5.2.1 vegetation within the balance of the site does not provide habitat values for these species.
PO91 Where **clearing** of **vegetation** in a **regional ecosystem** that is an area of **essential habitat** does not maintain the composition, structure and function of the **regional ecosystem**, and cannot be avoided and has been mitigated, an **offset** is provided for any acceptable **significant residual impact for** each **protected wildlife** species individually.	No acceptable outcome is prescribed.	**Complies with PO91** The Vegetation Management Supporting Map (refer Figure 4.2 and Appendix B) indicates the site's Category B vegetation is Essential Habitat for *Crocodylus porosus* (estuarine crocodile) – Vulnerable, *Numenius madagascariensis* (eastern curlew) – Endangered and *Limosa lapponica* baueri (Western Alaskan bar-tailed godwit) - Vulnerable. All potential habitat for these species is proposed to be protected in the reserve. As detailed in s5.2.1 vegetation within the balance of the site does not provide habitat values for these species.
Acid sulfate soils if the local government is not the assessment manager for the development application		
PO92 Clearing does not result in, or accelerate, disturbance of acid sulfate soils or changes to the hydrology of the location that will result in either of the following: 1. aeration of horizons containing iron sulphides; 2. mobilisation of acid or metals.	**AO92.1 Clearing** does not occur in **land zone 1**, **land zone 2** or **land zone 3**. OR **AO92.2 Clearing** in **land zone 1**, **land zone 2** or **land zone 3** in areas below the five metre Australian Height Datum only occurs where: 1. **mechanical clearing** does not disturb the soil to a depth greater than 30 centimetres; and	**NA – Council is Assessment Manager**

Performance outcomes	Acceptable outcomes	Response
	2. acid sulfate soils are managed consistent with the Queensland Acid Sulfate Soil Technical Manual.	

Table 16.9: Material change of use and / or reconfiguring a lot for which there will be no clearing as a result of the material change of use or reconfiguring a lot

Performance outcomes	Acceptable outcomes	Response
PO93 Clearing as a result of a material change of use or **clearing as a result of reconfiguring a lot** does not occur.	No acceptable outcome is prescribed.	NA

Table 16.10: Material change of use and / or reconfiguring a lot for which clearing is limited to clearing that could be done as exempt clearing work for the purpose of the development prior to the material change of use or reconfiguring a lot application being approved

Performance outcomes	Acceptable outcomes	Response
Clearing avoids and minimises impacts		
PO94 Clearing of **vegetation** and **adverse impacts of clearing vegetation** do not occur unless the application has demonstrated that the **clearing** and the **adverse impacts of clearing** have been: 1. reasonably avoided; or 2. reasonably minimised where it cannot be reasonably avoided.	No acceptable outcome is prescribed.	NA
Clearing that could already be done under an exemption		
PO95 Clearing of **vegetation** does not occur unless it is **clearing** that could be done as **exempt clearing work** for the purpose of the development prior to the material change of use or reconfiguring a lot application being approved.	No acceptable outcome is prescribed.	NA

Table 16.11: Necessary environmental clearing

Performance outcomes	Acceptable outcomes	Response
Clearing avoids and minimises impacts		

Performance outcomes	Acceptable outcomes	Response
PO96 Clearing of **vegetation** and **adverse impacts of clearing vegetation** do not occur unless the application has demonstrated that the **clearing** and the **adverse impacts of clearing** have been: 1. reasonably avoided; or 2. reasonably minimised where it cannot be reasonably avoided.	No acceptable outcome is prescribed.	NA
Clearing associated with wetlands (Land Restoration and Natural Disaster Preparation)		
PO97 Clearing of **vegetation** within a natural **wetland** and/or within 100 metres of the **defining bank** of a natural **wetland** maintains the composition, structure and function of any **regional ecosystem** associated with any natural **wetland** to protect all of the following: 1. bank stability by protecting against bank erosion; 2. water quality by filtering sediments, nutrients and other pollutants; 3. aquatic habitat; 4. terrestrial habitat.	**AO97.1 Clearing** does not occur in any of the following areas: 1. inside the **defining bank** of any natural **wetland**; and 2. within 100 metres of the **defining bank** of any natural **wetland**. OR **AO97.2 Clearing** within 100 metres of the **defining bank** of any natural **wetland** only occurs where: 1. **clearing** does not exceed 0.5 hectares; and 2. **clearing** retains all **mature trees** and **habitat trees**; and 3. **clearing** that is for **flood preparation** complies with all of the following: a. **clearing** is undertaken by **felling** only; and: b. **clearing** does not exceed 100 square metres; and c. **clearing** does not occur outside the **defining banks** of a natural **wetland**.. OR **AO97.3 Clearing** to provide necessary access to undertake **necessary environmental clearing** only occurs where **clearing**: 1. does not exceed 10 metres in width; and 2. retains all **mature trees** and **habitat trees**; and	NA

Performance outcomes	Acceptable outcomes	Response
	3. the access track: a. runs parallel to a natural **wetland** and **clearing** is not within 10 metres of the **defining bank** of a natural **wetland**; or b. is required to provide access across the **wetland**.	
PO98 Where **clearing** of **vegetation** in a **regional ecosystem** associated with a natural **wetland** does not maintain the composition, structure and function of the **regional ecosystem**, and cannot be avoided and has been mitigated, the cleared area is **rehabilitated**.	No acceptable outcome is prescribed.	NA
Clearing associated with wetlands (natural channel diversion and contaminants removal)		
PO99 Clearing of **vegetation** within a natural **wetland** and/or within 100 metres of the **defining bank** of a natural **wetland** maintains the composition, structure and function of any **regional ecosystem** associated with any natural **wetland** to protect all of the following: 1. bank stability by protecting against bank erosion; 2. water quality by filtering sediments, nutrients and other pollutants; 3. aquatic habitat; 4. terrestrial habitat.	**AO99.1 Clearing** does not occur in any of the following areas: 1. inside the **defining bank** of any natural **wetland**; and 2. within 100 metres of the **defining bank** of any natural **wetland**. OR **AO99.2 Clearing** within 100 metres of the **defining bank** of any natural **wetland** only occurs where: 1. **clearing** does not exceed 0.5 hectares; and 2. **clearing** retains all **mature trees** and **habitat trees**. OR **AO99.3 Clearing** to provide necessary access to undertake **necessary environmental clearing** only occurs where **clearing**: 1. does not exceed 10 metres in width; and 2. retains all **mature trees** and **habitat trees**; and 3. the access track:	NA

Performance outcomes	Acceptable outcomes	Response
	a. runs parallel to a natural **wetland** and **clearing** is not within 10 metres of the **defining bank** of a natural **wetland**; or b. is required to provide access across the **wetland**.	
PO100 Where **clearing** of **vegetation** in a **regional ecosystem** associated with a natural **wetland** does not maintain the composition, structure and function of the **regional ecosystem**, and cannot be avoided and has been mitigated, the cleared area: 1. is **rehabilitated**; or 2. where the **cleared** area cannot reasonably be **rehabilitated**, an **offset** is provided for any acceptable **significant residual impact**.	No acceptable outcome is prescribed.	NA Application is for ROL only.
Clearing associated with watercourses and drainage features (Land Restoration and Natural Disaster Preparation)		
PO101 Clearing of **vegetation** within a **watercourse** and/or **drainage feature** and/or within the relevant distance (listed in reference table 2) of a **watercourse** and/or **drainage feature** maintains the composition, structure and function of any **regional ecosystem** associated with any **watercourse** and/or **drainage feature** to protect all of the following: 1. bank stability by protecting against bank erosion; 2. water quality by filtering sediments, nutrients and other pollutants; 3. aquatic habitat; 4. terrestrial habitat.	**AO101.1 Clearing** does not occur in any of the following areas: 1. inside the **defining bank** of a **watercourse** or **drainage feature**; and 2. within the relevant distance of the **defining bank** of any **watercourse** or **drainage feature** in reference table 2 of this code. OR **AO101.2 Clearing** in any **watercourse** or **drainage feature**, or within the relevant distance of the **defining bank** of any **watercourse** or **drainage feature** in reference table 2 of this code only occurs where: 1. **clearing** does not exceed 0.5 hectares; and 2. **clearing** retains all **mature trees** and **habitat trees**; and 3. **clearing** that is for **flood preparation** complies with all of the following: a. **clearing** is undertaken by **felling** only; and b. **clearing** does not exceed 100 square metres; and	NA

Performance outcomes	Acceptable outcomes	Response
	c. **clearing** does not occur outside of the **defining bank** of any **watercourse** or **drainage feature**. OR **AO101.3 Clearing** to provide necessary access to undertake **necessary environmental clearing** only occurs where **clearing**: 1. does not exceed 10 metres in width; and 2. retains all **mature trees** and **habitat trees**; and 3. the access track: a. runs parallel to a **watercourse** or **drainage feature** and **clearing** is not within 10 metres of the **defining bank** of a **watercourse** or **drainage feature**; or b. is required to provide access across the **watercourse** or **drainage feature**.	
PO102 Where **clearing** of **vegetation** in a **regional ecosystem** associated with a **watercourse** and/or **drainage feature** does not maintain the composition, structure and function of the **regional ecosystem**, and cannot be avoided and has been mitigated, the **cleared** area is **rehabilitated**.	No acceptable outcome is prescribed.	NA
Clearing associated with watercourses and drainage features (natural channel diversion and contaminants removal)		
PO103 Clearing of **vegetation** within a **watercourse** and/or **drainage feature** and/or within the relevant distance (listed in reference table 2) of a **watercourse** and/or **drainage feature maintains** the composition, structure and function of any **regional ecosystem** associated with any **watercourse** or **drainage feature** to protect all of the following: 1. bank stability by protecting against bank erosion; 2. water quality by filtering sediments, nutrients and other pollutants; 3. aquatic habitat; 4. terrestrial habitat.	**AO103.1 Clearing** does not occur within any of the following areas: 1. inside the **defining bank** of a **watercourse** or **drainage feature**; and 2. within the relevant distance of the **defining bank** of any **watercourse** or **drainage feature** in reference table 2 of this code. OR **AO103.2 Clearing** in any **watercourse** or **drainage feature**, or within the relevant distance of the **defining bank** of any **watercourse** or	NA

Performance outcomes	Acceptable outcomes	Response
	drainage feature in reference table 2 of this code only occurs where: 1. **clearing** does not exceed 0.5 hectares; and 2. **clearing** retains all **mature trees** and **habitat trees**. OR **AO103.3 Clearing to provide necessary access to undertake necessary environmental clearing only occurs where:** 1. **clearing** does not exceed 10 metres in width; and 2. **clearing** retains all **mature trees** and **habitat trees**; and 3. the access track: a. runs parallel to a **watercourse** or **drainage feature** and **clearing** is not within 10 metres of the **defining bank** of a **watercourse** or **drainage feature**; or b. is required to provide access across the **watercourse** or **drainage feature**.	
PO104 Where **clearing** of **vegetation** in a **regional ecosystem** associated with a **watercourse** and/or **drainage feature** does not maintain the composition, structure and function of the **regional ecosystem**, and cannot be avoided and has been mitigated, the cleared area: 1. is **rehabilitated**; or 2. where the **cleared** area cannot reasonably be **rehabilitated**, an **offset** is provided for any acceptable **significant residual impact**.	No acceptable outcome is prescribed.	NA
Connectivity (land restoration and natural disaster preparation)		
PO105 Regional ecosystems on the subject land and any adjacent land retain sufficient **vegetation** to: 1. maintain **ecological processes**; and 2. ensure the **regional ecosystem** remains in the landscape despite **threatening processes**.	**AO105.1 Clearing** occurs in accordance with reference table 3 of this code.	NA

Performance outcomes	Acceptable outcomes	Response
PO106 Where: 1. **clearing** of **vegetation** in a **regional ecosystem** does not maintain **ecological processes;** and 2. the **regional ecosystem** does not remain in the landscape despite **threatening processes;** and 3. the **clearing** cannot be avoided; and 4. the **clearing** has been mitigated; the **cleared** area is **rehabilitated**.	No acceptable outcome is prescribed.	NA
Connectivity (natural channel diversion and contaminants removal)		
PO107 Regional ecosystems on the subject land and any adjacent land retain sufficient **vegetation** to: 1. maintain **ecological processes**; and 2. ensure the **regional ecosystem** remains in the landscape despite **threatening processes**.	**AO107.1 Clearing** occurs in accordance with reference table 3 of this code.	NA
PO108 Where: 1. **clearing** of **vegetation** in a **regional ecosystem** does not maintain **ecological processes**; and 2. the **regional ecosystem** does not remain in the landscape despite **threatening processes;** and 3. the **clearing** cannot be avoided; and 4. the **clearing** has been mitigated; the **cleared** area: a. is **rehabilitated**; or b. where the **cleared** area cannot reasonably be **rehabilitated**, an **offset** is provided for any acceptable **significant residual impact**.	No acceptable outcome is prescribed.	NA
Soil erosion if the local government is not the assessment manager for the development application		
PO109 Clearing does not result in **accelerated soil erosion** within or outside the land the subject of the development application.	**AO109.1 Clearing** only occurs if an **erosion and sediment control plan** is developed and implemented to prevent **soil erosion and instability** resulting from the **clearing**.	NA
Salinity		
PO110 Clearing within 100 metres of a **salinity expression area** does not contribute to or	**AO110.1 Clearing** does not occur within 100 metres of a **salinity expression area**.	NA

Performance outcomes	Acceptable outcomes	Response
accelerate **land degradation** through either of the following: 1. **waterlogging**; 2. the **salinisation** of **groundwater**, surface water or soil.		
Essential habitat (land restoration and natural disaster preparation) excluding essential habitat for *Phascolarctos cinereus* (koalas) if development is assessable under Schedule 10, Part 10 of the Planning Regulation 2017		
PO111 Clearing of **vegetation** in a **regional ecosystem** that is an area of **essential habitat** maintains the composition, structure and function of the **regional ecosystem** for each **protected wildlife** species individually.	**AO111.1 Clearing** does not occur in **essential habitat**. OR **AO111.2 Clearing** in **essential habitat** does not exceed the widths prescribed in reference table 1 of this code. OR **AO111.3 Clearing** in **essential habitat** does not exceed the areas prescribed in reference table 1 of this code.	NA
PO112 Where **clearing** of **vegetation** in a **regional ecosystem** that is an area of **essential habitat** does not maintain the composition, structure and function of the **regional ecosystem** for each **protected wildlife** species individually, and cannot be avoided and has been mitigated, the **cleared** area is **rehabilitated**.	No acceptable outcome is prescribed.	NA
Essential habitat (natural channel diversion and contaminants removal) excluding essential habitat for *Phascolarctos cinereus* (koalas) if development is assessable under Schedule 10, Part 10 of the Planning Regulation 2017		
PO113 Clearing of **vegetation** in a **regional ecosystem** that is an area of **essential habitat** maintains the composition, structure and function of the **regional ecosystem** for each **protected wildlife** species individually.	**AO113.1 Clearing** does not occur in **essential habitat**. OR **AO113.2 Clearing** in **essential habitat** does not exceed the widths prescribed in reference table 1 of this code.	NA

Performance outcomes	Acceptable outcomes	Response
	OR **AO113.3 Clearing** in **essential habitat** does not exceed the areas prescribed in reference table 1 of this code.	
PO114 Where **clearing** of **vegetation** in a **regional ecosystem** that is an area of **essential habitat** does not maintain the composition, structure and function of the **regional ecosystem** for each **protected wildlife** species individually, and cannot be avoided and has been mitigated, the cleared area: 1. is **rehabilitated**; or 2. where the **cleared** area cannot reasonably be **rehabilitated**, an **offset** is provided for any acceptable **significant residual impact** for each **protected wildlife** species individually.	No acceptable outcome is prescribed.	NA
Acid sulfate soils if the local government is not the assessment manager for the development application		
PO115 Clearing does not result in, or accelerate, disturbance of acid sulfate soils or changes to the hydrology of the location that will result in either of the following: 1. aeration of horizons containing iron sulphides; 2. mobilisation of acid or metals.	**AO115.1 Clearing** does not occur in **land zone 1**, **land zone 2** or **land zone 3**. OR **AO115.2 Clearing** in **land zone 1**, **land zone 2** or **land zone 3** in areas below the five metre Australian Height Datum only occurs where: 1. **mechanical clearing** does not disturb the soil to a depth greater than 30 centimetres; and 2. acid sulfate soils are managed consistent with the soil management guidelines in the Queensland Acid Sulfate Soil Technical Manual.	NA
Maintaining the composition, structure and function of the regional ecosystem (land restoration and natural disaster preparation)		
PO116 Clearing of **vegetation** maintains the composition, structure and function of the **regional ecosystem**.	**AO116.1 Clearing** retains all of the following: 1. **habitat trees**; 2. **mature trees**; and 3. the natural floristic composition and **range of sizes** across the **application area**.	NA

Performance outcomes	Acceptable outcomes	Response
	OR **AO116.2 Clearing** is for the purpose of **natural disaster preparation** and does not exceed the widths prescribed in reference table 1 of this code. OR **AO116.3 Clearing** is for the purpose of **natural disaster preparation** and does not exceed the areas prescribed in reference table 1 of this code.	
PO117 Where **clearing** of **vegetation** in a **regional ecosystem** does not maintain the composition, structure and function of the **regional ecosystem**, and cannot be avoided and has been mitigated, the cleared area is **rehabilitated**.	No acceptable outcome is prescribed.	NA
Maintaining the composition, structure and function of the regional ecosystem (natural channel diversion and contaminants removal)		
PO118 Clearing of **vegetation** maintains the composition, structure and function of the **regional ecosystem**.	**AO118.1 Clearing** retains all of the following: 1. **habitat trees**; 2. **mature trees**; and 3. the natural floristic composition and **range of sizes** across the **application area**.	NA
PO119 Where **clearing** of **vegetation** in a **regional ecosystem** does not maintain the composition, structure and function of the **regional ecosystem**, and cannot be avoided and has been mitigated, the cleared area: 1. is **rehabilitated**; or 2. where the **cleared** area cannot reasonably be **rehabilitated**, an **offset** is provided for any acceptable **significant residual impact**.	No acceptable outcome is prescribed.	NA
Duration of clearing, preventing land degradation, and maintaining biodiversity, ecological processes and regional ecosystems (Land Restoration, Natural Disaster Preparation and Contaminates Removal)		
PO120 Clearing occurs only during a period that: 1. will not contribute to **land degradation**; and 2. ensures the ongoing maintenance of **ecological processes** and **biodiversity**; and 3. maintains the **regional ecosystem**.	No acceptable outcome is prescribed.	NA

Table 16.12: Control non-native plants or declared pests

Performance outcomes	Acceptable outcomes	Response
Clearing avoids and minimises impacts		
PO121 Clearing of **vegetation** and **adverse impacts of clearing vegetation** do not occur unless the application has demonstrated that the **clearing** and the **adverse impacts of clearing** have been: 1. reasonably avoided; or 2. reasonably minimised where it cannot be reasonably avoided.	No acceptable outcome is prescribed.	NA
Clearing associated with wetlands		
PO122 Clearing of **vegetation** within a natural **wetland** and/or within 100 metres of the **defining bank** of a natural **wetland** maintains the composition, structure and function of any **regional ecosystem** associated with a natural **wetland** to protect all of the following: 1. bank stability by protecting against bank erosion; 2. water quality by filtering sediments, nutrients and other pollutants; 3. aquatic habitat; 4. terrestrial habitat.	**AO122.1 Mechanical clearing** does not occur in any of the following areas, unless it is required to provide necessary access to control non-native plants or **declared pests**: 1. inside the **defining bank** of any natural **wetland**; and 2. within 20 metres of the **defining bank** of any natural **wetland**. AND **AO122.2 Clearing** to provide necessary access to control non-native plants or **declared pests** only occurs where: 1. **clearing** does not exceed five metres in width; and 2. **clearing** retains all **mature trees** and **habitat trees**; and 3. the access track: a. runs parallel to a natural **wetland** and **clearing** is not within 10 metres of the **defining bank** of a natural **wetland**; or b. is required to provide access across the **wetland**. AND	NA

State Development Assessment Provisions v3.0

State code 16: Native vegetation clearing

Page **40** of **59**

Performance outcomes	Acceptable outcomes	Response
	AO122.3 Chemical **clearing** retains: 1. all **mature trees**; and 2. all **habitat trees**; and 3. at least 50 per cent of **immature trees** in each 50 metre by 50 metre area. AND **AO122.4** Root absorbed broad spectrum herbicides are not applied within whichever is the greater distance from the **defining bank** of a natural **wetland**: 1. 100 metres; or 2. the distance specified on the approved product label; or 3. the distance specified in the safety and use conditions issued by the Australian Pesticides and Veterinary Medicines Authority. AND **AO122.5 Aerial application** of a **foliar herbicide** does not occur within whichever is the greater distance from the **defining bank** of a natural **wetland**; 1. 50 metres; or 2. the distance specified for **wetlands** on the approved product label; or 3. the distance specified in the safety and use conditions issued by the Australian Pesticides and Veterinary Medicines Authority.	
Clearing associated with watercourses or drainage features		
PO123 Clearing of **vegetation** within a **watercourse** and/or **drainage feature** and/or within the relevant distance (listed in reference table 2) of a **watercourse** and/or **drainage feature** maintains the composition, structure and function of any **regional ecosystem** associated with any **watercourse**	**AO123.1 Mechanical clearing** does not occur in any of the following areas, unless it is required to provide necessary access to control non-native plants or **declared pests**: 1. inside the **defining bank** of any **watercourse** or **drainage feature**; and	NA

Performance outcomes	Acceptable outcomes	Response
and/or **drainage feature** to protect all of the following: 1. bank stability by protecting against bank erosion; 2. water quality by filtering sediments, nutrients and other pollutants; 3. aquatic habitat; 4. terrestrial habitat.	2. within 10 metres of the **defining bank** of a **watercourse** or **drainage feature** that is a **stream order** 1 or 2 **watercourse** or **drainage feature**; and 3. within 15 metres of the **defining bank** of a **watercourse** or **drainage feature** that is a **stream order** 3 or 4 **watercourse** or **drainage feature**; and 4. within 20 metres of the **defining bank** of a **watercourse** or **drainage feature** that is a **stream order** 5 or more **watercourse** or **drainage feature**. AND **AO123.2 Clearing** to provide necessary access to control non-native plants or **declared pests** only occurs where: 1. **clearing** does not exceed five metres in width; and 2. **clearing** retains all **habitat trees** and **mature trees**; and 3. the access track: a. runs parallel to the **watercourse** or **drainage feature** and is not within 10 metres of the **defining bank** of the **watercourse** or **drainage feature**; or b. is required to provide access across the **watercourse** or **drainage feature**. AND **AO123.3** Chemical **clearing** retains all of the following: 1. **mature trees;** and 2. **habitat trees**; and 3. at least 50 per cent of **immature trees** in any 50 metre by 50 metre area.	

Performance outcomes	Acceptable outcomes	Response
	AND **AO123.4 Root absorbed broad spectrum herbicides** are not applied within whichever is the greater distance from the **defining bank** of a **watercourse or drainage feature**: 1. 100 metres; or 2. any distance specified on the approved product label; or 3. the distance specified in the safety and use conditions issued by the Australian Pesticides and Veterinary Medicines Authority. AND **AO123.5 Aerial application** of a **foliar herbicide** does not occur within whichever is the greater distance from the **defining bank** of a **watercourse or drainage feature**: 1. 50 metres; or 2. any distance specified on the approved product label; or 3. the distance specified in the safety and use conditions issued by the Australian Pesticides and Veterinary Medicines Authority.	
Soil erosion		
PO124 Clearing of **vegetation** does not result in **accelerated soil erosion** within or outside the land subject of the development application.	**AO124.1 Clearing** only occurs where **recognised best practice methods** are employed to: 1. prevent **soil erosion and instability** resulting from the **clearing**; and 2. stabilise **soil erosion and instability** which would result from **clearing**; and 3. prevent increased sediment run-off entering a **wetland**, **watercourse** or **drainage feature** as a result of the **clearing**. AND **AO124.2 Mechanical clearing:**	NA

Performance outcomes	Acceptable outcomes	Response
	1. does not occur on a **slope** greater than 15 percent; and 2. in each 50 by 50 metre area (0.25 hectares), retains 50 per cent of the **ground cover** and does not disturb more than 50 per cent of the **ground cover**. AND **AO124.3** New access tracks required to provide necessary access to control a non-native plant or **declared pests** do not exceed five metres in width or de-stabilise the banks of any **watercourse** or **drainage feature** as a result of crossing, construction or use.	
Acid sulfate soils if the local government is not the assessment manager for the development application		
PO125 Clearing does not result in, or accelerate, disturbance of acid sulfate soils or changes to the hydrology of the location that will result in either of the following: 1. aeration of horizons containing iron sulphides; 2. mobilisation of acid or metals.	**AO125.1 Clearing** does not occur in **land zone 1**, **land zone 2** or **land zone 3**. OR **AO125.2 Clearing** in **land zone 1**, **land zone 2** or **land zone 3** in areas below the five metre Australian Height Datum only occurs where: 1. **mechanical clearing** does not disturb the soil to a depth greater than 30 centimetres; and 2. acid sulfate soils are managed consistent with the soil management guidelines in the Queensland Acid Sulfate Soil Technical Manual.	NA
Conserving remnant vegetation that is a regional ecosystem		
PO126 Clearing activities: 1. maintain the natural floristic composition and **range of sizes** of each species of the **regional ecosystem** evenly spaced across the **application area**; and 2. retain all **habitat trees** and **mature trees**.	**AO126.1 Mechanical clearing**: 1. only occurs within 1.5 metres from the edge of the canopy of individual non-native plants, unless the **clearing** is required to provide necessary access to control a non-native plant or **declared pest**; and 2. does not occur using two machines linked by chain or cable; and	NA

Performance outcomes	Acceptable outcomes	Response
	3. retains all **habitat trees** and **mature trees**. AND **AO126.2 Clearing** to provide necessary access to control non-native plants or **declared pests** does not exceed five metres in width. AND **AO126.3** Any **regional ecosystem burn** is undertaken in accordance with the fire guideline for the **regional ecosystem**, as outlined in the Regional Ecosystem Description Database (REDD). AND **AO126.4** Chemical **clearing** retains all of the following: 1. **mature trees**; and 2. **habitat trees**; and 3. at least 50 per cent of **immature trees** in each 50 metre by 50 metre area. AND **AO126.5 Aerial application** of a **root-absorbed broad spectrum herbicides** does not occur. AND **AO126.6 Root-absorbed broad spectrum herbicides** are not applied within whichever distance is the greater from a **mature tree** or a **habitat tree**; 1. 30 metres; or 2. the distance specified on the approved product label; or	

Performance outcomes	Acceptable outcomes	Response
	3. the distance specified in the safety and use conditions issued by the Australian Pesticides and Veterinary Medicines Authority.	
Duration of clearing, preventing land degradation, and maintaining biodiversity, ecological processes and regional ecosystems		
PO127 Clearing occurs only during a period that: 1. will not contribute to **land degradation**; and 2. ensures the ongoing maintenance **of ecological processes** and **biodiversity**; and 3. maintains the **regional ecosystem**.	No acceptable outcome is prescribed.	NA

Table 16.13: Encroachment

Performance outcomes	Acceptable outcomes	Response
Clearing associated with wetlands		
PO128 Clearing of **vegetation** within a natural **wetland** and/or within 100 metres of the **defining bank** of a natural **wetland** maintains the composition, structure and function of any **regional ecosystem** associated with a natural **wetland** to protect all of the following: 1. bank stability by protecting against bank erosion; 2. water quality by filtering sediments, nutrients and other pollutants; 3. aquatic habitat; 4. terrestrial habitat.	**AO128.1 Mechanical clearing** does not occur in any of the following areas: 1. inside the **defining bank** of any natural **wetland**; and 2. within 20 metres of the **defining bank** of any natural **wetland**. AND **AO128.2 Root absorbed broad spectrum herbicides** are not applied within whichever is the greater distance from the **defining bank** of a natural **wetland**: 1. 100 metres; or 2. the distance specified on the approved product label; or 3. the distance specified in the safety and use conditions issued by the Australian Pesticides and Veterinary Medicines Authority.	NA
Clearing associated with watercourses or drainage features		
PO129 Clearing of **encroachment** maintains: 1. bank stability by protecting against bank erosion; and 2. water quality by filtering sediments, nutrients and other pollutants; and	**AO129.1 Mechanical clearing** does not occur in any of the following areas: 1. inside the **defining bank** of any **watercourse** or **drainage feature**; and	NA

Performance outcomes	Acceptable outcomes	Response
3. aquatic habitat; and 4. terrestrial habitat.	2. within 10 metres of the **defining bank** of a **watercourse** or **drainage feature** that is a **stream order** 1 or 2 **watercourse** or **drainage feature**; and 3. within 15 metres of the **defining bank** of a **watercourse** or **drainage feature** that is a **stream order** 3 or 4 **watercourse** or **drainage feature**; and 4. within 20 metres of the **defining bank** of a **watercourse** or **drainage feature** that is a **stream order** 5 or more **watercourse** or **drainage feature**. AND **AO129.2 Root-absorbed broad spectrum herbicides** are not applied within whichever is the greater distance from the **defining bank** of a **watercourse** or **drainage feature**: 1. 100 metres; or 2. any distance specified on the approved product label; or 3. the distance specified in the safety and use conditions issued by the Australian Pesticides and Veterinary Medicines Authority.	
Soil erosion		
PO130 Clearing does not result in **accelerated soil erosion** within or outside the land subject of the development application.	**AO130.1 Clearing** only occurs where **recognised best practice methods** are employed to: 1. prevent **soil erosion and instability** resulting from the **clearing**; and 2. stabilise **soil erosion and instability** which would result from **clearing**; and 3. prevent increased sediment run-off entering a **wetland**, **watercourse** or **drainage feature** as a result of the **clearing**. AND	NA

Performance outcomes	Acceptable outcomes	Response
	AO130.2 Mechanical clearing does not occur in any of the following areas: 1. within 50 metres of an area of **soil erosion and instability**; and 2. **slopes** greater than five per cent.	
Salinity		
PO131 Clearing within 100 metres of a **salinity expression area** does not contribute to or accelerate **land degradation** through either of the following: 1. **waterlogging**; 2. the **salinisation** of **groundwater**, surface water or soil.	**AO131.1 Clearing** does not occur within 100 metres of a **salinity expression area**.	NA
Acid sulfate soils if the local government is not the assessment manager for the development application		
PO132 Clearing does not result in, or accelerate, disturbance of acid sulfate soils or changes to the hydrology of the location that will result in either of the following: 1. aeration of horizons containing iron sulphides; or 2. mobilisation of acid or metals.	**AO132.1 Clearing** does not occur in **land zone 1**, **land zone 2** or **land zone 3**. OR **AO132.2 Clearing** in **land zone 1**, **land zone 2** or **land zone 3** in areas below the five metre Australian Height Datum only occurs where: 1. **mechanical clearing** does not disturb the soil to a depth greater than 30 centimetres; and 2. acid sulfate soils are managed consistent with the soil management guidelines in the Queensland Acid Sulfate Soil Technical Manual.	NA
Clearing limited to specific regional ecosystems		
PO133 Clearing of **encroachment** does not occur, other than in the **regional ecosystems** listed in reference table 5 of this code.	No acceptable outcome is prescribed.	NA
Conserving vegetation		
PO134 Clearing activities: 1. result in the restoration of the **regional ecosystem**; and 2. retain all **habitat trees**; and 3. retain all **groves**; and	**AO134.1 Clearing** retains all of the following: 1. all **mature trees**; and 2. all **habitat trees**; and 3. all woody **vegetation** within a **grove,** unless it is undertaken by a **regional ecosystem burn**.	NA

Performance outcomes	Acceptable outcomes	Response
4. retain species which make up the natural floristic composition of the **regional ecosystem**, distributed in a natural pattern.	AND **AO134.2** Any **regional ecosystem burn** is undertaken in accordance with the fire guideline for the **regional ecosystem**, as outlined in the Regional Ecosystem Description Database (REDD). AND **AO134.3 Clearing** does not result in debris being stacked or pushed against a **mature tree** or a **habitat tree**. AND **AO134.4 Mechanical clearing** does not occur within 10 metres of a **mature tree** or a **habitat tree**. AND **AO134.5 Aerial application** of a herbicide does not occur. AND **AO134.6** Chemical **clearing** does not occur within five metres of a **mature tree** or a **habitat tree**. AND **AO134.7 Root-absorbed broad spectrum herbicides** are not applied in any of the following areas: 1. **regional ecosystems** 11.4.11 and 11.8.11; and 2. within whichever is the greater distance from a **mature tree** or a **habitat tree**:	

Performance outcomes	Acceptable outcomes	Response
	a. 10 metres; or b. the distance specified by the approved product label; or c. the distance specified in the safety and use conditions prescribed by the Australian Pesticides and Veterinary Medicines Authority; and 3. within whichever is the greater distance from a **grove**: a. 30 metres; or b. the distance specified by the approved product label; or c. the distance specified in the safety and use conditions issued by the Australian Pesticides and Veterinary Medicines Authority.	
Duration of clearing, preventing land degradation, and maintaining biodiversity, ecological processes and regional ecosystems		
PO135 Clearing occurs only during a period that: 1. will not contribute to **land degradation**; and 2. ensures the ongoing maintenance of **ecological processes** and **biodiversity**; and 3. maintains the **regional ecosystem**.	No acceptable outcome is prescribed.	NA

Table 16.14: Fodder harvesting

Performance outcomes	Acceptable outcomes	Response
Clearing associated with wetlands		
PO136 Clearing of **vegetation** within a natural **wetland** and/or within 100 metres of the **defining bank** of a natural **wetland** maintains the composition, structure and function of any **regional ecosystem** associated with a natural **wetland** to protect all of the following: 1. bank stability by protecting against bank erosion; 2. water quality by filtering sediments, nutrients and other pollutants; 3. aquatic habitat;	**AO136.1 Mechanical clearing** does not occur in any of the following areas: 1. inside the **defining bank** of any natural **wetland**; and 2. within 20 metres of the **defining bank** of any natural **wetland**. AND **AO136.2 Mechanical clearing** that is strip	NA

Performance outcomes	Acceptable outcomes	Response
4. terrestrial habitat.	harvesting or block harvesting does not occur in any of the following areas: 1. inside the **defining bank** of any natural **wetland**; and 2. within 100 metres of the **defining bank** of any natural **wetland**.	
Clearing associated with watercourses or drainage features		
PO137 Clearing of **vegetation** within a **watercourse** and/or **drainage feature** and/or within the relevant distance (listed in reference table 2) of a **watercourse** and/or **drainage feature** maintains the composition, structure and function of any **regional ecosystem** associated with any **watercourse** and/or **drainage feature** to protect all of the following: 1. bank stability by protecting against bank erosion; 2. water quality by filtering sediments, nutrients and other pollutants; 3. aquatic habitat; 4. terrestrial habitat.	**AO137.1 Mechanical clearing** does not occur in any of the following areas: 1. inside the **defining bank** of any **watercourse** or **drainage feature**; and 2. within 20 metres of the **defining bank** of any **watercourse** or **drainage feature**. AND **AO137.2 Mechanical clearing** that is **strip harvesting** or **block harvesting** does not occur in any of the following areas: 1. inside the **defining bank** of any **watercourse** or **drainage feature**; and 2. within 100 metres of the **defining bank** of any **watercourse** or **drainage feature**.	NA Application is for ROL only.
Soil erosion		
PO138 Clearing does not result in **accelerated soil erosion** within or outside the land subject of the development application.	**AO138.1 Clearing** only occurs where **recognised best practice methods** are employed to: 1. prevent **soil erosion and instability** resulting from the **clearing**; and 2. stabilise **soil erosion and instability** which would result from **clearing**; and 3. prevent increased sediment run-off entering a **wetland**, **watercourse** or **drainage feature** as a result of the **clearing**. AND **AO138.2 Mechanical clearing** does not occur on a **slope** greater than five percent.	NA Application is for ROL only.

Performance outcomes	Acceptable outcomes	Response
	OR **AO138.3 Mechanical clearing** does not occur within 50 metres of an area of **soil erosion and instability**.	
Salinity		
PO139 Clearing within 100 metres of a **salinity expression area** does not contribute to or accelerate **land degradation** through either of the following: 1. **waterlogging**; 2. the **salinisation** of **groundwater**, surface water or soil.	**AO139.1 Clearing** does not occur within 100 metres of a **salinity expression area**.	NA Application is for ROL only.
Essential habitat excluding essential habitat for *Phascolarctos cinereus* (koalas) if development is assessable under Schedule 10, Part 10 of the Planning Regulation 2017		
PO140 Clearing of **vegetation** in a **regional ecosystem** that is an area of **essential habitat** maintains the composition, structure and function of the **regional ecosystem** for each **protected wildlife** species individually.	**AO140.1 Clearing** does not occur in **essential habitat**. OR **AO140.2 Clearing** in **essential habitat** does not exceed the widths prescribed in reference table 1 of this code. OR **AO140.3 Clearing** in **essential habitat** does not exceed the areas prescribed in reference table 1 of this code.	NA Application is for ROL only.
PO141 Where **clearing** of **vegetation** in a **regional ecosystem** that is an area of **essential habitat** does not maintain the composition, structure and function of the **regional ecosystem**, and cannot be avoided and has been mitigated, an **offset** is provided for any acceptable **significant residual impact for** each **protected wildlife** species individually.	No acceptable outcome is prescribed.	NA Application is for ROL only.
Limits to clearing for fodder harvesting		
PO142 Clearing is limited to:	No acceptable outcome is prescribed.	NA

Performance outcomes	Acceptable outcomes	Response
1. the extent necessary to provide fodder for stock; and 2. areas where the stock is located, and the stock have sufficient water.		Application is for ROL only.
PO143 Clearing must only occur: 1. in **regional ecosystems** listed in reference table 6 or reference table 7 of this code; and 2. in accordance with the harvesting method limitations for the **regional ecosystem** listed in reference table 6 or reference table 7 of this code.	No acceptable outcome is prescribed.	NA Application is for ROL only.
PO144 Clearing consists predominantly of **fodder species**.	No acceptable outcome is prescribed.	NA Application is for ROL only.
Conserving vegetation		
PO145 Clearing is carried out in a way that conserves: 1. **remnant vegetation** in perpetuity; and 2. the **regional ecosystem** in which the **vegetation** is situated.	**AO145.1 Clearing** does not result in the removal of non-**fodder species** with a height of four metres or more. AND **AO145.2 Selective harvesting**: 1. retains all non-**fodder species** except where the damage is an unavoidable consequence of **clearing** the selected fodder tree; and 2. when using a chainsaw in **regional ecosystems** listed in reference table 6 of this code, retains at least one fodder tree for every fodder tree **cleared**; and 3. in **least concern regional ecosystems** listed in reference table 7 of this code, retains at least one fodder tree for each fodder tree **cleared**; and 4. in **of concern regional ecosystems** listed in reference table 7 of this code, retains at least two fodder trees for each fodder tree **cleared**. AND **AO145.3 Strip harvesting** and **block harvesting**:	NA Application is for ROL only.

Performance outcomes	Acceptable outcomes	Response
	1. where **fodder harvesting** has previously occurred in an area of a lot, only occurs if all of the following apply: a. the **vegetation** has not been cleared in the last 10 years; and b. the average height of the fodder trees is at least 70 per cent of the height of the tallest stands of **fodder species** in the **regional ecosystem**; and c. the fodder trees that were previously harvested have now attained an average height of at least 4 metres; and 2. aligns **clearing** along the contour where practical; and 3. does not occur in patches of **regional ecosystems** that are less than 10 hectares in area or less than 500 metres wide. AND **AO145.4 Strip harvesting**: 1. does not result in any **strip harvesting area** exceeding 50 metres in width; and 2. results in all **strip retention areas**: a. being preserved along the length of **strip harvest areas** to a width of at least 1.5 times that of the adjacent **strip harvest area**; and b. containing **fodder species** with an average height of at least four metres; and 3. does not result in **clearing** for machinery access between **strip harvest areas** exceeding 15 metres in width. AND **AO145.5 Block harvesting**: 1. does not result in any **block harvest area** exceeding one hectare; and	

Performance outcomes	Acceptable outcomes	Response
	2. results in **block retention areas**: a. being preserved between **block harvest areas** in accordance with the widths specified in reference table 8 of this code; and b. containing **fodder species** with an average height of at least four metres; and 3. does not result in **clearing** for machinery access between **block harvest areas** exceeding 10 metres in width.	
Cleared vegetation		
PO146 Fodder harvesting is carried out in a way that results in the woody biomass of the **cleared vegetation** remaining where it is **cleared**.	No acceptable outcome is prescribed.	NA Application is for ROL only.
Conserving the fodder resource		
PO147 Fodder harvesting is carried out in a way that will conserve the fodder resource.	**AO147.1 Clearing** does not occur: 1. in an area that has been **cleared** in the previous 10-year period; and 2. more than once in the same area of a lot; and 3. in more than 50 per cent of the area of the **regional ecosystem** listed in reference table 6 and reference table 7 of this code on the lot; and 4. in areas required to be retained under this code, a development approval or any **accepted development vegetation clearing code**.	NA Application is for ROL only.
Duration of clearing, preventing land degradation, and maintaining biodiversity, ecological processes and regional ecosystems		
PO148 Clearing occurs only during a period that: 1. will not contribute to **land degradation**; and 2. ensures the ongoing maintenance of **ecological processes** and **biodiversity**; and 3. maintains the **regional ecosystem**.	No acceptable outcome is prescribed.	NA Application is for ROL only.

Table 16.15: Managing thickened vegetation

Performance outcomes	Acceptable outcomes	Response
Clearing associated with wetlands		

Performance outcomes	Acceptable outcomes	Response
PO149 Clearing of **vegetation** within a natural **wetland** and/or within 100 metres of the **defining bank** of a natural **wetland** maintains the composition, structure and function of any **regional ecosystem** associated with a natural **wetland** to protect all of the following: 1. bank stability by protecting against bank erosion; 2. water quality by filtering sediments, nutrients and other pollutants; 3. aquatic habitat; 4. terrestrial habitat.	**AO149.1 Mechanical clearing** does not occur in any of the following areas: 1. inside the **defining bank** of a natural **wetland**; and 2. within 20 metres of the **defining bank** of a natural **wetland**.	NA Application is for ROL only.
Clearing associated with watercourses or drainage features		
PO150 Clearing of **vegetation** within a **watercourse** and/or **drainage feature** and/or within the relevant distance (listed in reference table 2) of a **watercourse** and/or **drainage feature** maintains the composition, structure and function of any **regional ecosystem** associated with any **watercourse** and/or **drainage feature** to protect all of the following: 1. bank stability by protecting against bank erosion; 2. water quality by filtering sediments, nutrients and other pollutants; 3. aquatic habitat; 4. terrestrial habitat.	**AO150.1 Mechanical clearing** does not occur in any of the following areas: 1. inside the **defining bank** of any **watercourse drainage feature**; 2. within 10 metres of the **defining bank** of a **watercourse** or **drainage** feature that is a **stream order** 1 or 2 **watercourse** or **drainage feature**; 3. within 15 metres of the **defining bank** of a **watercourse** or **drainage feature** that is a **stream order** 3 or 4 **watercourse** or **drainage feature**; 4. within 20 metres of the **defining bank** of a **watercourse** or **drainage feature** that is a **stream order** 5 or more **watercourse** or **drainage feature**.	NA Application is for ROL only.
Soil erosion		
PO151 Clearing does not result in **accelerated soil erosion** within or outside the land subject of the development application.	**AO151.1 Clearing** only occurs where **recognised best practice methods** are employed to: 1. prevent **soil erosion and instability** resulting from the **clearing**; and 2. stabilise **soil erosion and instability** which would result from **clearing**; and 3. prevent increased sediment run-off entering a **wetland**, **watercourse** or **drainage feature** as a result of the **clearing**.	NA Application is for ROL only.

Performance outcomes	Acceptable outcomes	Response
	AND **AO151.2 Mechanical clearing** does not: 1. occur in a **regional ecosystem** in reference table 4 of this code that states '**mechanical clearing** not permitted'; 2. disturb more than 50 per cent of the ground surface or result in any hectare having less than 50 per cent **ground cover**; 3. occur on a **slope** greater than five per cent; and 4. occur within 50 metres of an area of **soil erosion and instability**.	
Acid sulfate soils if the local government is not the assessment manager for the development application		
PO152 Clearing does not result in, or accelerate, disturbance of acid sulfate soils or changes to the hydrology of the location that will result in either of the following: 1. aeration of horizons containing iron sulphides; 2. mobilisation of acid or metals.	**AO152.1 Clearing** does not occur in **land zone 1**, **land zone 2** or **land zone 3**. OR **AO152.2 Clearing** in **land zone 1**, **land zone 2** or **land zone 3** in areas below the five metre Australian Height Datum only occurs where: 1. **mechanical clearing** does not disturb the soil to a depth greater than 30 centimetres; and 2. acid sulfate soils are managed consistent with the soil management guidelines in the Queensland Acid Sulfate Soil Technical Manual.	NA Application is for ROL only.
Restoring the regional ecosystem		
PO153 Clearing activities: 1. restore the natural floristic composition and **range of sizes** of each species of the **regional ecosystem** evenly spaced across the **application area**; and 2. retain **mature trees**, **habitat trees** and **tall immature trees** and **thickets**.	**AO153.1 Clearing** does not occur in **thickets**. AND **AO153.2 Clearing** retains: 1. all **mature trees** and **habitat trees**; 2. a full **range of sizes** and species typical of the **regional ecosystem** in the area; and	NA Application is for ROL only.

Performance outcomes	Acceptable outcomes	Response
	3. where the number of **mature trees** plus **habitat trees** is less than 20 per hectare, **tall immature trees** to total 20 **mature trees**, **habitat trees** and **tall immature trees** per hectare. AND **AO153.3 Clearing** does not result in debris stacked or pushed against a **mature tree**, **habitat tree** or **tall immature tree**. AND **AO153.4** If **clearing immature trees**, retain **immature trees** in each 50 metre by 50 metre area to at least the density specified reference table 4 of this code. AND **AO153.5** If **clearing low shrubs**: 1. in **regional ecosystems** where **clearing** is restricted to **low shrubs** as specified in reference table 4 of this code – **clearing** retains all **immature trees**; 2. in **regional ecosystems** where **clearing** is not restricted to **low shrubs** as specified in reference table 4 of this code – **clearing** retains at least the number of **immature trees** specified in reference table 4 of this code; and 3. **clearing** retains at least 10 per cent of the predominate species that have thickened. AND **AO153.6 Mechanical clearing** does not occur within 5 metres of the trunk of a **mature tree**, **habitat tree** or **tall immature tree**.	

Performance outcomes	Acceptable outcomes	Response
	AND **AO153.7 Clearing** is not undertaken by: 1. **aerial application** of any herbicide; and/or 2. application of a **root-absorbed broad spectrum herbicide**. AND **AO153.8** Chemical **clearing** does not occur within five metres of the trunk of a **mature tree**, **habitat tree** or **tall immature tree**. AND **AO153.9** Any **regional ecosystem burn** is undertaken in accordance with the fire guideline for the **regional ecosystem**, as outlined in the Regional Ecosystem Description Database (REDD).	
Clearing limited to specific regional ecosystems and specific clearing methods		
PO154 Clearing must be for the purpose of restoring the remnant **regional ecosystem** and only occur if all of the following apply: 1. **clearing** is in **regional ecosystems** prescribed in reference table 4 of this code; and 2. **clearing** is in accordance with the **clearing** restrictions for the **regional ecosystem** prescribed in reference table 4 of this code.	No acceptable outcome is prescribed.	NA Application is for ROL only.
PO155 Clearing occurs only during a period that: 1. will not contribute to **land degradation**; and 2. ensures the ongoing maintenance of **ecological processes** and **biodiversity**; and 3. maintains the **regional ecosystem**.	No acceptable outcome is prescribed.	NA Application is for ROL only.

Appendix F – Livingstone Shire Planning Scheme 2018 Biodiversity Overlay Code Response

8.2.3 Biodiversity overlay code

8.2.3.1 Application

This code applies to the assessment of development if it is identified as an applicable code for development, as specified in the assessment benchmarks column in the tables of assessment located in Part 5 of the planning scheme.

When using this code, reference should be made to section 5.3.2 and where applicable, section 5.3.3 located in Part 5.

All subject matter in this code is applicable to the development assessment, unless the following circumstance arises:

(1) The heading of a specific benchmarks for assessment table specifies otherwise; or

(2) A heading within a specific benchmark for assessment table specifies that the outcomes apply to a specific type of development or to development at a specific location; or

(3) A performance outcome or acceptable outcome specifies that the outcomes apply to a specific type of development or to development at a specific location.

In the circumstance where point (2) or point (3) above arises the following applies:

(1) the development assessment outcomes apply only to the type of development specified or only to development at the location specified; and

(2) the development must still be assessed against all other general subject matter of the code.

For the purpose of this code, any reference to matters of environmental significance is an all-encompassing reference to matters of national environmental significance (MNES), matters of state environmental significance (MSES), and matters of local environmental significance (MLES).

Areas that are known to contain matters of environmental significance or which may contain matters of environmental significance are identified by the series of biodiversity overlays. The table below provides an outline of the biodiversity overlays and the matters of environmental significance. The table may assist when using this code.

Overlays	Description
Matters of National Environmental Significance (MNES)	
Matters of national environmental significance are protected under the *Environment Protection and Biodiversity Conservation Act 1999*. Matters of national environmental significance and matters of State environmental significance are generally not located in isolation to each other or other ecological values. There may therefore be MNES located in areas identified on planning scheme overlay maps as MSES. Editor's note: Commonwealth Government internet search tools are available to assist in determining whether MNES are present and whether actions require approval from the relevant federal minister.	
Matters of State Environmental Significance (MSES)	

Overlays	Description
Declared fish habitat	The overlay identifies State fish habitat areas that are management (A) areas or management (B) areas declared under the Fisheries Act 1994. These areas protect all fish habitats within from adverse impacts which may result from physical disturbance from coastal development. These areas still allow for legal fishing activities.
High ecological significance wetlands	The overlay identifies wetlands in a wetland protection area or wetlands of high ecological significance shown on a map of referable wetlands under the Environmental Protection Regulation 2008.
High ecological value waters (watercourses)	The overlay identifies watercourses in high ecological value waters as defined in the Environmental Protection (Water) Policy 2009.
High ecological value waters (wetlands)	The overlay identifies wetlands in high ecological value waters as defined in the *Environmental Protection (Water) Policy 2009*.
Marine Park	The overlay identifies State marine parks and zones declared under the *Marine Parks Act 2004*. The marine park may consist of marine national park, marine conservation park, scientific research zone, preservation zones or buffer zones.
Protected Areas	The overlay identifies State protected area estates (including all classes of protected area except coordinated conservation areas) declared under the *Nature Conservation Act 1992*.
Regulated Vegetation	The overlay identifies regulated vegetation under the *Vegetation Management Act 1999*, that is: • Category B areas on the regulated vegetation management map that are 'endangered' or 'of concern' regional ecosystems; • Category C areas on the regulated vegetation management map that are 'endangered' or 'of-concern' regional ecosystems; • Category R areas on the regulated vegetation management map; • Regional ecosystems that intersect with wetlands identified on the vegetation management wetlands map.
Wildlife Habitat	The overlay identifies threatened wildlife and areas of essential habitat for wildlife prescribed as endangered or vulnerable under the Nature Conservation Act 1992.
Matters of Local Environmental Significance (MLES)	
Habitat and Vegetation	The overlay identifies local environmentally significant habitat and vegetation. These areas may include tracts of native remnant vegetation, vegetation growing on serpentine geology, and other locally identified important vegetation.

Overlays	Description
Local Biodiversity Corridors	The overlay identifies local and sub-regional corridors of wildlife habitat in areas of the planning scheme area that are facing urban development pressure. These corridors provide connections which enable the migration of flora and fauna.
Waterways	The overlay identifies local environmentally significant waterways. Values associated with waterways include provision of flora and fauna habitat, and contribution to natural hydrological cycles and surrounding ecosystems.
Wetlands	The overlay identifies local environmentally significant wetlands. Values associated with wetlands include provision of flora and fauna habitat, and contribution to natural hydrological cycles and surrounding ecosystems.

8.2.3.2 Purpose

The purpose of the biodiversity overlay code is to identify, protect, enhance and rehabilitate areas containing matters of environmental significance and the ecological processes and biodiversity values of terrestrial and aquatic ecosystems.

8.2.3.3 Overall Outcomes

The purpose of the code will be achieved through the following overall outcomes:

(1) matters of environmental significance and corridors which link them are identified, protected, enhanced and rehabilitated to maintain ecological processes and biodiversity;

(2) nature corridors or links are maintained and where appropriate, rehabilitated and expanded to support:

   a. the natural movement and proliferation of native species;

   b. ecological responses to climate change;

   c. the maintenance of large scale migratory lifecycle processes; and

   d. connectivity between significant habitat areas and areas of remnant vegetation;

(3) development does not cause significant adverse impacts on areas containing matters of environmental significance, by appropriately addressing impacts on issues including but not limited to the following:

   a. species or habitat loss or disturbance, including terrestrial and aquatic wildlife corridors;

   b. soil degradation, pollution, erosion, contamination, acidification or salinization;

   c. modification to natural processes; and

   d. reduction in water quality, ecological values and the natural hydrological regimes of surface and ground waters;

(4) development maintains or increases the resilience of ecosystems and wildlife habitats to threatening processes, including the impacts of climate change;

(5) development facilitates land tenure and other management arrangements for the long-term conservation of environmentally significant areas, ecological processes and biodiversity values;

(6) corridors and associated buffers have dimensions which suitably provide for:

   a. movement of native fauna;

   b. viable habitat areas;

   c. minimisation of edge effects;

   d. maintenance of the hydrological functions of waterways or wetlands;

   e. appropriate access for sustainable recreation; and

   f. any additional maintenance and bushfire setback functions to be located outside the areas required for ecological purposes; and

(7) fragmentation of existing habitat areas is minimised, particularly where it impacts on the future health of populations of native fauna and flora species.

8.2.3.4 Specific benchmarks for assessment

Table 8.2.5.4.1 Performance outcomes and acceptable outcomes for assessable development

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets either the performance outcome or overall outcome	Internal use
LAND USE			
PO1 In areas identified as having matters of environmental significance, all uses are located, designed and operated to: (a) retain and protect significant environmental values; and (b) maintain the underlying ecological functions and biophysical processes of the site and surrounds.	No acceptable outcome is nominated. Editor's note: Schedule SC7.5 identifies the primary attributes included in areas containing matters of State environmental significance. Site-specific investigation will be required to confirm the extent and nature of values indicated on the overlay map.	**Complies** The revised design reduced the development footprint, facilitating increased protection for mapped and ground truthed significant values including: • Protection of all regional ecosystem types mapped over the site including Regional Ecosystems 11.1.2 and 11.2.5; • Increased buffering to MLES wetlands along Mulambin Ck (minimum 100-200m); and • Increased protection of habitat that contributes to a north-south sub-regional corridor.	
NATIVE VEGETATION AND HABITAT			
PO2 Development retains and regenerates native vegetation in such a way as to: (a) retain vegetation that is in patches of greatest size and smallest possible edge-to area ratio; (b) maximise the linkages between vegetation located on the subject site; (c) maximise linkages between vegetation located on	No acceptable outcome is nominated.	**Complies** The reserve area (3ha) provides for protection and restoration of: • All regional ecosystem types mapped over the site including Regional Ecosystems 11.1.2 and 11.2.5; • Riparian vegetation along Mulambin Ck; • Buffers to estuarine wetlands along Mulambin Ck (minimum 100-200m); and • Habitat that is connected to adjoining estuarine communities and contributes to a north-south sub-regional corridor.	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets either the performance outcome or overall outcome	Internal use
adjacent properties within the biodiversity network; (d) allow the dispersal or movement through biodiversity corridors; and (e) protect riparian vegetation in and adjacent to watercourses. Editor's note: Council may adopt an offsets planning scheme policy for matters of local environmental significance at a future date. Editor's note: Development applications proposed in areas identified as having matters of environmental significance that prepare all relevant material in accordance with Schedule SC7.5 Environmental Management Planning Scheme Policy, will assist in demonstrating achievement of these performance outcomes			

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets either the performance outcome or overall outcome	Internal use
PO3 Development retains, protects and enhances areas of habitat that support a critical life stage in ecological process such as feeding, breeding or roosting for the identified species. Editor's note: Council may adopt an offsets planning scheme policy for matters of local environmental significance at a future date. Editor's note: Development applications lodged with Council must identify all species listed that are present within or adjacent to the premises and habitats that may be affected by the proposal. In particular applications are to identify and describe how the development protects or enhances wildlife habitat at any critical life stage ecological processes within or adjacent to the development area. This should be reflected in an ecological assessment report prepared in accordance with the Schedule SC7.5.	No acceptable outcome is nominated.	**Complies** The proposed 3ha reserve protects estuarine and wetland vegetation that provides habitat for significant species including the Vulnerable estuarine crocodile (*Crocodylus porosus*), the Endangered eastern curlew (*Numenius madagascariensis*) and the Vulnerable Western Alaskan bar-tailed godwit (*Limosa lapponica baueri*). The estuarine wetland vegetation is protected by a minimum 100m buffer to the development. Additionally the proposed reserve will be restored to enhance the buffering and corridor functions of this area.	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets either the performance outcome or overall outcome	Internal use
PO4 Development protects existing biodiversity corridors and assists in the establishment of new corridors which have adequate dimensions and characteristics to support: (a) unimpeded movement of terrestrial and aquatic fauna that are associated with or are likely to use the biodiversity corridor as part of their normal life cycle evolutionary and genetic processes; (b) the natural change in distributions of species and connectivity between populations of species over long periods of time; (c) ecological responses to climate change; (d) maintenance of large scale seasonal/ migratory species processes and movement of fauna; (e) connectivity between large tracts and patches of native remnant vegetation and habitat areas; and (f) effective and continuous movement of terrestrial and aquatic fauna.	**AO4.1** Development involving roads, pipelines, pedestrian access and in-stream structures: (a) does not create barriers to the movement of fauna (including fish passage) along or within biodiversity corridors; or (b) provides effective wildlife movement infrastructure in accordance with best practice which: (i) enables fauna to safely negotiate a development area; and (ii) separates fauna from potential hazards through the use of appropriate fencing. **AO4.2** Development ensures that biodiversity corridors have a sufficient width to protect habitat, minimise impacts from adjoining land use, and to enhance connectivity in accordance with the following: (a) regional corridors retain a width of at least five-hundred (500) metres; and (b) local corridors retain a width of at least fifty (50) metres	**Complies** The proposed 3ha reserve protects habitat that is connected to adjoining estuarine communities and contributes to a north-south sub-regional corridor. The estuarine wetland vegetation is protected by a minimum 100m buffer to the development. Additionally, the proposed reserve will be restored to enhance the buffering and corridor functions of this area. The dimensions of the proposed reserve (approximately 200m wide) maximises the protection of existing biodiversity and habitat values including all three (3) regional ecosystems mapped on the site.	
WETLANDS AND WATERWAYS			
PO5	**AO5.1**	**Complies**	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets either the performance outcome or overall outcome	Internal use
Development retains waterways and wetlands and avoids impacts on: (a) native riparian vegetation; (b) habitat; (c) ecological functions; (d) water quality; and (e) nature conservation values.	A buffer surrounding a waterway or wetland is established and maintained free of development, the width of which is supported by an evaluation of the environmental values and functions and threats to matters of State or local environmental significance. Editor's note: The Queensland wetland buffer guideline, Department of Environment and Heritage, 2011 should be referred to when planning detailed buffer design to position development, determine any alternative buffer widths, and establish operating measures that avoid adverse impacts on a wetland.	The proposed 3ha reserve protects estuarine and wetland vegetation along Mulambin Ck. The estuarine wetland vegetation is protected by a minimum 100m buffer to the development. Additionally the proposed reserve will be restored to enhance the buffering and corridor functions of this area.	
PO6 Development does not cause land degradation near a waterway or wetland, including: (a) mass movement, gully erosion, rill erosion, sheet erosion, tunnel erosion, stream bank erosion, wind erosion, or scalding; and (b) loss or modification of chemical, physical or biological properties or functions of soil.	**AO6.1** Native vegetation is retained or where retention is unavoidable, it is reinstated within riparian areas and buffer areas. **AO6.2** Foreshore areas are fenced to prevent stock access. **AO6.3** Riparian areas are fenced to limit stock access to a limited number of watering holes.	**Complies** The proposed 3ha reserve protects estuarine and wetland vegetation along Mulambin Ck. The estuarine wetland vegetation is protected by a minimum 100m buffer to the development. Additionally the proposed reserve will be restored to enhance the buffering and corridor functions of this area.	
ALL MATTERS OF ENVIRONMENTAL SIGNIFICANCE			
PO7 All matters of environmental significance are identified and protected from significant adverse	No acceptable outcome is nominated.	**Complies** The revised design reduced the development footprint, facilitating increased protection for matters of environmental significance mapped over the site including:	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets either the performance outcome or overall outcome	Internal use
impacts associated with development. Editor's note – Council may adopt an offsets planning scheme policy for matters of local environmental significance at a future date.		• All regional ecosystem types mapped over the site including Regional Ecosystems 11.1.2 and 11.2.5 and their surrogate fauna habitat values; • Buffers to MLES wetlands along Mulambin Ck (minimum 100-200m); and • habitat that contributes to a north-south sub-regional corridor.	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets either the performance outcome or overall outcome	Internal use
PO8 Development enhances or maintains the existing surface water hydrological regime of all areas containing matters of environmental significance.	No acceptable outcome is nominated.	**Complies** Matters of Environmental Significance include the biodiversity corridor and estuarine wetland along Mulambin Creek. The proposed reserve protects these values by providing a restored minimum 100m buffer to the development. The proposed restored reserve will maintain the existing surface water hydrological regime of the estuarine wetlands and support the existing biodiversity corridor function.	
PO9 Development: (a) enhances or maintains the existing groundwater hydrological regime of all areas containing matters of environmental significance; (b) ensures that the water table and hydrostatic pressure in the area of environmental significance is returning to its natural state; and (c) does not result in ingress of saline water into freshwater aquifers.	No acceptable outcome is nominated.	**Complies** The proposed 3ha reserve protects estuarine and wetland vegetation along Mulambin Ck. The estuarine wetland vegetation is protected by a minimum 100m buffer to the development. Additionally the proposed reserve will be restored to enhance the buffering and corridor functions of this area.	
ONGOING MANAGEMENT, CONSTRUCTION AND OPERATION			

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets either the performance outcome or overall outcome	Internal use
PO10 During the construction and operation of development, ongoing management, monitoring and maintenance is undertaken to ensure impacts on environmentally significant areas, biodiversity values and ecological processes, including water quality and hydrology, are avoided or minimised.	No acceptable outcome is nominated.	**Complies** The proposed development will be managed in accordance with approved management plans that will ensure potential impacts are appropriately avoided, minimised, mitigated and managed.	
PO11 Development transfers into public ownership, or incorporates within a voluntary statutory covenant registered under the Land Title Act 1994, any land required for public access or for some other public purpose consistent with its ecological functions, including: (a) access for maintenance; (b) linking core and remnant habitat areas; and (c) land protecting water quality and ecological processes.	No acceptable outcome is nominated.	**Complies** The proposed 3ha reserve will be restored and dedicated to Council as public open space.	
REHABILITATION			

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets either the performance outcome or overall outcome	Internal use
PO12 Areas degraded as a result of development are rehabilitated by the proponent as near as is practicable to the naturally occurring local native plant species and ecological communities. Editor's note: A rehabilitation plan supported by expert ecological advice prepared in accordance with Schedule SC7.5 will assist in demonstrating achievement of this performance outcome.	No acceptable outcome is nominated.	**Complies** The proposed 3ha reserve will be restored in accordance with an approved Rehabilitation Management Plan and dedicated to Council as public open space.	
VEGETATION CLEARING			
PO13 Development avoids indiscriminate and unnecessary clearing of vegetation in order to protect: (a) the visual integrity of the natural landscape; (b) ecological features and processes that underpin biodiversity.	**AO13.1** Vegetation clearing: (a) does not occur; or (b) where it cannot be avoided, is carried out in accordance with the development works code	**Complies** The revised design reduced the development footprint, facilitating increased protection for mapped and ground truthed significant values including: • Protection of all regional ecosystem types mapped over the site including Regional Ecosystems 11.1.2 and 11.2.5; • Increased buffering to MLES wetlands along Mulambin Ck (minimum 100-200m); and Increased protection of habitat that contributes to a north-south sub-regional corridor.	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets either the performance outcome or overall outcome	Internal use
PO14 Development retains and protects locally significant species, including but not limited to the following: (a) *Cycas ophiolitica;* (b) *Byfield Fern;* (c) *Stackhousia tryonii; and* (d) *Koala.*	No acceptable outcome is nominated.	**Complies** An ecological assessment was undertaken and none of the listed species were detected or considered likely to occur within the site based on the mapped vegetation associations and habitat values.	
IF RECONFIGURING A LOT			
PO15 The ecological function and biodiversity values of existing vegetation and habitat are maintained by ensuring that reconfiguring a lot in areas containing matters of environmental significance does not result in significant adverse impacts on the values present. Editor's note – Council may adopt an offsets planning scheme policy for matters of local environmental significance at a future date. Editor's note: Development applications proposed in areas identified as having matters of environmental significance that prepare all relevant material in accordance with Schedule SC7.5 Environmental Management Planning Scheme Policy, will assist in demonstrating achievement of these performance outcomes.	**PO15.1** Reconfiguring a lot does not result in the following: (a) the creation of additional lots within areas mapped as containing matters of environmental significance; or (b) the creation of new lots adjoining areas mapped as containing matters of environmental significance of less than ten (10) hectares.	**Complies** The revised design reduced the development footprint, facilitating increased protection for mapped and ground truthed significant values including: • Protection of all regional ecosystem types mapped over the site including Regional Ecosystems 11.1.2 and 11.2.5; • Increased buffering to MLES wetlands along Mulambin Ck (minimum 100-200m); and • Increased protection of habitat that contributes to a north-south sub-regional corridor.	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets either the performance outcome or overall outcome	Internal use
PO16 Reconfiguring a lot incorporates a buffer to areas containing matters of environmental significance in accordance with minimum best practice standards and the buffer area has characteristics to minimise development impacts on the values present. Editor's note: The Queensland wetland buffer guideline, Department of Environment and Heritage, 2011 should be referred to when planning detailed buffer design to position development, determine any alternative buffer widths, and establish operating measures that avoid adverse impacts on a wetland.	No acceptable outcome is nominated.	**Complies** The revised design reduced the development footprint, facilitating increased protection for mapped and ground truthed significant values including: • Protection of all regional ecosystem types mapped over the site including Regional Ecosystems 11.1.2 and 11.2.5; • Increased buffering to MLES wetlands along Mulambin Ck (minimum 100-200m); and • Increased protection of habitat that contributes to a north-south sub-regional corridor.	

13.6 - DEVELOPMENT PERMIT FOR A RECONFIGURING A LOT FOR A RECONFIGURING A LOT FOR ONE (1) INTO 77 RESIDENTIAL LOTS AND ONE ENVIRONMENT AND DRAINAGE LOT (STAGES 1-4), ON LOT 2 ON RP617670, AND LOCATED AT 1-41 NEVILLE STREET, MULAMBIN QLD 4703

2nd Environmental Report

Meeting Date: 19 August 2025

Attachment No: 8


NGH
Prepared for Livingstone Regional Council
1-41 Neville Street, Mulabin
Development Application Review
March 2025
Project Number: 25005

1-41 Neville Street, Mulabin

Development Application Review

Document verification

Project Title:	Development Application Review
Project Number:	25005
Project File Name:	250005_NQ Env Planner DA Submissions

Revision	Date	Prepared by	Approved by
Draft	4/03/2025	Julie Giguere	
Final V1.0	05/03/2025	Julie Giguere	Adam Folkers

NGH Pty Ltd is committed to environmentally sustainable practices, including fostering a digital culture and minimising printing. Where printing is unavoidable, NGH prints on 100% recycled paper.

We acknowledge the Traditional Owners of this land and pay our respect to Elders past, present and emerging. We recognise that the First Nations peoples of Australia have traditionally managed the resources of this land in a sustainable way, and that they are the original custodians of the Australian environment.

Table of contents

Appendices

1. Background

1.1. Proposal

In July 2024, Livingstone Regional Council (LRC) received a Development Application (DA) for the Reconfiguration of a Lot (ROL) – 1 into 85 lots, including a drainage reserve and boundary realignment, at 1-41 Neville Street, Mulambin (DA reference: D235-2024). The proposed development site is formally described as Lot 2 on RP617670 (the Site) and is located within the Rural Zone.

The development is planned to be constructed in four stages, comprising 85 residential lots and one drainage reserve lot.

NGH Pty Ltd (NGH) has been engaged by LRC to conduct a peer review and assessment of the DA against environmental related overlays and planning scheme policies within the Livingstone Planning Scheme 2018 (Livingstone Planning Scheme).

1.2. Site and surrounds

The site is located in the Livingstone Shire suburb of Mulambin, a coastal town south of Yeppoon. on Lot 2 on RP617670. The site covers 10 hectares and is predominantly vegetated, with cleared tracks in the central and western areas.

Under the Livingstone Planning Scheme 2018, the site is zoned Rural, with surrounding areas to the northeast and south designated as Low Density Residential, while areas to the northwest remain Rural.

1.3. Previous approvals

The site was previously granted Development Permit D-74-2015 in 2015 (Council reference D-74-2015) for the reconfiguration of one lot into 62 lots and a Material Change of Use for a dwelling house on each lot. This Development Permit (D-74-2015) lapsed in February 2020.

2. Scope of works

NGH has been engaged by LRC to conduct a peer review and assessment of DA D235-2024. The scope of this assessment report includes:

- Reviewing the adequacy of the Ecological Site Assessment (Burchills Science and Engineering, 2024)
- Assessing DA D235-2024, including supporting Environmental technical reports, against the Livingstone Planning Scheme codes and policies
- Providing recommendations for conditions of approval and/or reasons for refusal.

The objective of the assessment is to:

- Determine whether the information provided is sufficient to complete an assessment of the DA
- Determine the degree to which the requirements of the Livingstone Planning Scheme have been achieved

- Suggest conditions for approval where applicable

2.1. Legislative context

2.1.1. Planning Act 2016

The Queensland *Planning Act 2016* (Planning Act) provides for an efficient, effective, transparent, integrated, coordinated and accountable system of land use planning and development assessment to facilitate the achievement of ecological sustainability. The Queensland *Planning Regulation 2017* (Planning Regulation) provides for the development of local planning schemes that guide and regulate the planning, design, delivery, and management of development in their region in accordance with the Planning Act (e.g. the Livingstone Planning Scheme).

2.1.2. Livingstone Planning Scheme

The Livingstone Planning Scheme 2018 provides a framework for managing development in alignment with state and regional policies. Originally prepared under the Sustainable Planning Act 2009, it was later amended on 6 June 2017 to align with the Planning Act 2016. The Livingstone Planning Scheme outlines Livingstone Shire Council's vision for development over a 10-year period, incorporating local planning responses while considering state planning policies and the Central Queensland Regional Plan. It applies to all land, roads, and waterways within the Livingstone Shire Council area and connects with surrounding local government areas.

2.2. Material Assessed for the Application

The following DA materials were reviewed to assess the DA against the relevant Livingstone Planning Scheme overlay codes and Planning Scheme Policies (see Section 2.3):

- Bulk Earthworks Drawings
- Bushfire hazard overlay code
- Bushfire Hazard Assessment & Bushfire Management Plan Proposed 91 lot Residential Subdivision on Lot 2RP617670 1-41 Neville St, Mulambin Qld 4703
- RESPONSE TO COUNCIL INFORMATION REQUEST – ENGINEERING ITEMS
- Response to SARA Request for Information (Ref: 2408-41758 SRA) – Coastal Hazards
- Ecological Site Assessment
- Ecology and Coastal Hazard Responses
- Engineering Plans
- Engineering Report
- Flood hazard Overlay Assessment
- FURTHER ADVICE - DEVELOPMENT APPLICATION D-235-2024
- Information Request Response
- Email - Reserve to be dedicated to Council
- Stormwater Management Plan
- Updated Coastal Hazards Assessment
- Updated Ecological Assessment

- Updated proposal Plans
- Updated Stormwater Management Plans

2.3. Assessment against the Planning Scheme

This assessment considers the following Livingstone Planning Scheme overlay codes:

- Acid Sulfate overlay code
- Biodiversity overlay code
- Bushfire hazard overlay code
- Coastal hazard overlay
- Flood hazard overlay code

The below relevant Livingstone Planning Scheme Policies will also be considered:

- SC7.2 Bushfire hazard
- SC7.4 Coastal hazard
- SC7.5 Environmental Management
- SC7.6 Flood hazard
- SC7.13 Stormwater management
- SC7.16 Landscaping

3. Assessments

3.1. Compliance with Planning Scheme Overlay Codes and Policies

3.1.1. Biodiversity Overlay Code and Planning Scheme Policy

A response to the Biodiversity Overlay Code is provided in Appendix B. Overall, the proposal complies with the code. As the proposal was referred to the State Assessment Referral Agency (SARA), Matters of State Environmental Significance (MSES) were assessed by the State, resulting in appropriate conditions, including the dedication of a reserve and the offsetting of 4.09 ha of residual impacts on Wildlife Habitat for Tachyglossus aculeatus (short-beaked echidna). A Vegetation Management Plan was also endorsed.

This effectively leaves the MLES to be reviewed by Council against the Biodiversity Overlay and Environmental Management Planning Scheme policy. Generally, it was found that the proposal is compliant with the Code and the Policy. However, some issues remain outstanding,but are believed to be resolvable through conditioning.

Of relevance to this proposal, the Planning Scheme Policy provides guidance on requirements for ecological assessment reports. It also provides guidance on how to minimise adverse impacts and maximise beneficial impacts of the development.

The Ecological Site Assessment generally complies with the requirements of the policy in that:

- The study is prepared by a suitably qualified person
- The report addresses the relevant legislation
- The report is adequately structured

- Describes the existing environment
- Describes the ecological status and significance

Limitations of the report include:

- Landscape character and visual amenity
- Insufficient information about the hydrological impacts on the wetland and the receiving environment
- Results of desktop review searches including EPBC Act Protected Matter Report for Matters of National Environmental Significance, QLD WildNet species list and Vegetation management report were not included as Appendices
- Outline of flora survey methods used did not specify the type of survey sites used such as secondary or quaternary sites
- Survey methods were not included on the Flora Survey Results map including the location of Regional Ecosystem assessments/ transects, timed meander track log for Protected Plants Survey and locations of significant weeds
- A map of fauna survey results was not included with locations of identified habitat features
- Fauna Habitat quality assessments were not included

Development conditions to appropriately address the above are provided in Section 3.2 of this report.

3.1.2. Bushfire hazard overlay code and Bushfire hazard planning scheme policy

A response to the Biodiversity Overlay Code is provided in Appendix B. The site is within the low, medium and high bushfire hazard overlay. As such, the provisions of the Bushfire hazard policy apply. The applicant has submitted a Bushfire Hazard Assessment & Bushfire Management Plan along with a response to the overlay code.

There is no indication that consultation was undertaken with either Queensland Fire and Emergency Services (QFES) or Council as recommended by the Policy. This is particularly important given the proposal will create a bushfire track on a proposed reserve to be dedicated to Council. Maintenance arrangements would also need to be determined.

The report submitted by the applicant complies with the policy in that:

- The report was completed by a qualified person
- The overall sitting of the development is appropriate as it is located below a source of bushfire hazard
- Previous history of the site was considered
- The site context was considered appropriately in that vegetation, aspect, slope overall hazard and environmentally significant areas were considered
- The expected likely bushfire behaviour was considered
- The development is not on a ridge top

The subject site is located between RL 3 m – 6 m. Within the 100 m distance, lots to the south are standard suburban lots at RL 4m - 6m and would be exempted under the AS 3959. To the east, there are suburban lots between RL 6-8 m and the foreshore further away which would be exempted under AS 3959.

The report has the following limitations:

- The policy requires consideration of the macro context, including nearby bushland within a 10-kilometre (km) radius
- The fire trail proposed on the future reserve lacks details in terms of width and access. There is also one entrance but no provision for a turning point or for an exit point.

In regards to the methodology used to determine the asset protection zone, the planning scheme policy is to comply with the following:

For reconfiguring a lot, address the need for perimeter roads, open space, and other such arrangements to:

(a) ensure the distance between newly created lots and the hazard source(s) is sufficient to satisfy the requirements of the planning scheme Bushfire Hazard Overlay Code and the State Planning Policy; and

(b) achieve sufficient separation between the hazard source and newly created lots to ensure that the expected radiant heat exposure is no greater than 29 kW/m2 - Bushfire Attack Level 29 (BAL 29) as per the Australian Standard 3959 Construction of Buildings in Bushfire Prone Areas. (SC7.2.5 for bushfire management plan (3))

The Planning Scheme Policy on Bushfire Hazard does not prescribe a particular methodology to assess the width of the asset protection zone. However, it does require that it satisfies the requirements of the State Planning Policy. The applicant has used the Bushfire Attack Level (BAL) assessment for the report which is generally more restrictive than the calculator associated with the Planning Scheme Policy. A reliability assessment between the State Mapping and Council mapping is generally conducted to satisfy the State Planning Policy. However, as the Planning Scheme policy is not specific, there is some leeway, and the BAL assessment is considered to be acceptable.

One issue found with the calculation is the generic use of the FDI 40, which is the blanket value used for Queensland as per the Australian Standard. However, Note 1 of Table 2.1 of AS 3959-2018 – state the following: "*The FDI values may be able to be refined within a jurisdiction or region where sufficient climatological data is available and in consultation with the relevant authority*. "

In this case, the Bushfire Resilient Communities MapViewer provides more specific data (refer to Figure 1-1), which can be accessed at:
https://experience.arcgis.com/experience/61bf89d8f50e4ce3b8f52c8afb4cbeb4/#data_s=id%3AdataSource_1-18ed08b5d92-layer-80-190b4c6ea35-layer-46-0%3A2061

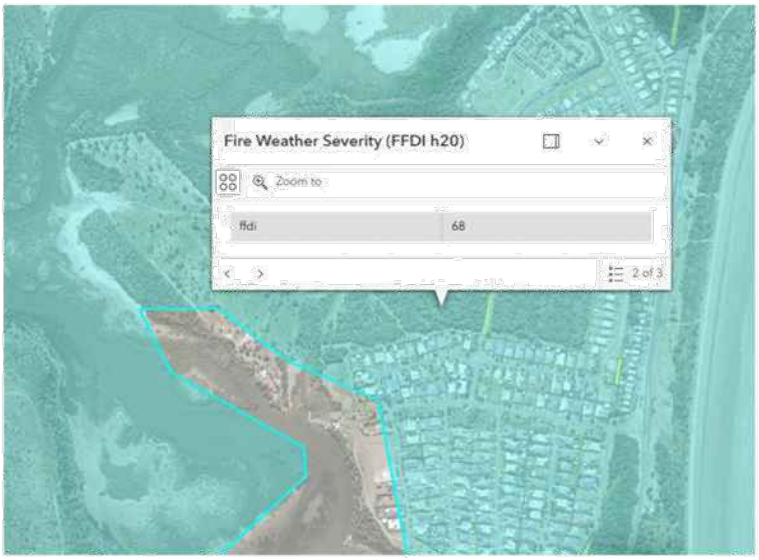

Figure 1-1 : FDI value

Although the Livingstone Planning Scheme does not specify a required methodology, it references the State Planning Policy, which in turn refers to the *Bushfire Resilient Communities: Technical Reference Guide for the State Planning Policy State Interest – Natural Hazards, Risks and Resilience – Bushfire* (October 2019). This guide calls for a Reliability Assessment, which has not been provided.

Given that the Livingstone Planning Scheme does not explicitly mandate a specific methodology, arguing for an alternative approach would be challenging. Therefore, the chosen methodology is considered appropriate.

A fire trail is proposed within the proposed reserve. However, there is insufficient information to confirm compliance with Council requirements, and therefore, conditioning is necessary

Development conditions to address the above are provided in Section 3.2 of this report.

3.1.3. Acid Sulfate Overlay

The proposal is able to be conditioned for acid sulfate soils.

Development conditions to address the above are provided in Section 3.2 of this report.

3.1.4. Coastal Hazard Planning Scheme Policy Overlay and Coastal Hazard Planning Scheme policy

No issues were identified with the Coastal Hazard Planning Scheme Policy Overlay or the Coastal Hazard Planning Scheme Policy. The proposal was submitted to SARA for assessment and subsequently approved.

3.1.5. Flood Hazard Overlay and Planning Scheme Policy (Drainage and water quality comments)

The proposal was assessed from an environmental perspective only and the following comments are provided:

- Amendment to 2415 C110C111 Rev B - Earthworks sections sheet 1 to include a flat bottom swale drain designed in accordance with best practice (e.g. International Erosion Control Association [IECA] or Water by Design guidelines)
- Storage for the 1% AEP should be considered in the form of a bio-basin. While the 2.5% increase in peak flow is negligible and acceptable from an infrastructure engineering perspective, it may still impact groundwater recharge rates, scouring, and pollutant runoff during the first flush into the nearby wetland. It would be beneficial to address this potential impact in the Ecological Site Assessment
- A boundary re-alignment will be necessary to allow for future Stormwater Quality Improvement Devices to the north. Although there is still a possibility that an alternate solution could be provided, the present solution does not fit the property footprint. Either an alternate solution is found or it would be recommended that the application be amended to include the boundary re-alignment.

Development conditions to address the above are provided in Section 3.2 of this report.

3.1.6. Landscaping Planning Scheme Policy

No landscaping plan has been provided at this this stage. A landscaping plan should be included prior to an operational works application.

Development conditions to address the above are provided in Section 3.2 of this report.

4. Draft conditions

The following conditions are recommended:

Vegetation removal

X. All vegetative waste cleared as part of the development of the site is to be either:

a) stored neatly on site, and shredded within sixty (60) days of clearing; or

b) removed off the site to an approved disposal location.

X. Any pruning works must be in accordance with AS 4373-2007 – Pruning of Amenity Tree.

X. Tree removal is to be conducted in stages and minimised for as much as practicable

X A pre-clearance survey is to be undertaken by a qualified fauna spotter catcher to minimise disruption to native fauna

Ecological management

X. Prior to any operational works being submitted, an amended Ecological report is to be submitted to the satisfaction of the responsible authority. The amended report is to include:

1. Include the results of the desktop review searches for all environmental matters of significance;
2. Outline of flora survey methods used (for example, secondary and quaternary sites);
3. Include location of Regional Ecosystem assessments/ transects, timed meander track log for Protected Plants Survey and locations of significant weeds;
4. Demonstrate that the survey efforts were sufficient;

5. Include details about fauna survey results that include habitat features and fauna habitat quality
6. Discuss the hydrological post-development impacts on the nearby wetland. In particular, a 2.5 % increase in the peak flow at 1% AEP increase predicted.

X. Prior to any operational works being submitted, a rehabilitation plan for the proposed reserve and any other areas as deemed relevant by the amended ecological report. The rehabilitation plan is to be compliant with SC7.5 Environmental Management and consider the following:

1. Identify any plants of local significance that can be salvaged and provide a re-planting scheme
2. any bushfire requirement as discussed in the endorsed bushfire hazard assessment and management plan;
3. Include a species management plan for dispersal (eg. staged clearing, pre-clearing assessment by a spotter catcher). The management plan is to include but not exclusively the short beaked echidna (*Tachyglossus aculeatus)* – Least of Concern Species;
4. Consider barriers to movement through the road network, particularly to Neville Street.

X. Prior to any operational works application being submitted, an amended site plan is to be submitted to the satisfaction of the responsible authority incorporating any consequential changes in the layout resulting from Conditions X and Y must be included.

Advice Note: The site is included within the Protected Plant trigger under the Nature Conservation Act 1992. Any vegetation clearing will need to take into account the requirements under the Nature Conservation Act 1992.

Bushfire

X. The applicant shall submit, prior to any Operational Works Application, an amended Bushfire Hazard Assessment and Management Plan that includes the following:

1. Amended calculations for the asset protection zone that includes a FDI that follows best practices;
2. The Bushfire Management Plan and subdivision layout is to be amended consequently;
3. Recommendations for interim bushfire protection for each stage that include bushfire trails, etc.

X. The applicant shall submit, prior to any Operational Works Application, an amended site plan to incorporate:

1. Any changes resulting from the amended calculations for the asset protection zone;
2. The bushfire trail on the proposed Reserve lot is to:
    i. provide for a minimum width of 6 m;
    ii. suitable for two-wheel drive vehicles during the dry season;
    iii. The vehicles are able to enter and exit in a forward gear or a turnaround is to be provided with an inner turning radius of 6 m and an outer turning radius of 12 m;
3. A staging plan indicating interim solutions for the integration of bushfire breaks or other temporary solutions for each stage.

X. Prior to the endorsement of Survey plans, a bushfire break is to be established as per the endorsed Bushfire Management Plan.

X. All operational works must be carried out in accordance with the approved bushfire management plan.

X. All residential lots are provided with water supply and pressure in accordance with Australian Standard AS2419 Fire Hydrant Installations.

Acid Sulfate

X. The applicant shall submit, prior to any operational works application, an acid sulfate soils assessment report and management plan prepared by a suitably qualified person that includes the results of on-site testing is to be submitted to the satisfaction of Council.

Stormwater management plan

X. Prior to any operational works being submitted, a Stormwater management plan is to be submitted to the satisfaction of the responsible authority. The amended report is to include:

1. Inclusion of water sensitive urban design best practices. This includes, but not exclusively flat bottom swale drains instead of "V" shape drains as indicated on 2415 C110C111 Rev B - Earthworks sections sheet 1 – Sections;
2. An amended design that is able to be fully contained within the development site.

Landscaping

X. Prior to any operational works application, a landscaping plan is to be submitted that is compliant with Planning Scheme Policy SC7.16.4. Determining the site for suitable landscape treatments. The landscaping plan is to include any salvaged plant species.

5. Recommendations and Conclusion

This peer review and assessment of DA D235-2024 demonstrates that the proposal can comply with the environmentally relevant Planning Scheme codes and policies through the implementation of reasonable and relevant conditions. From an environmental compliance perspective, there are no sufficient grounds for refusal. However, this does not preclude the possibility of refusal on other grounds, such as scenic amenity or traffic impacts, which have not been considered in this report.

The environmental conditions are based on the following:

- From a desktop perspective, the ecological report demonstrates compliance with the Biodiversity Overlay Code and associated policy. In particular:
  - Establishment of a dedicated reserve with buffers to protect high environmental values, such as wetlands and marine plants.
  - Consideration of biodiversity corridors.The proposal is generally able to comply with the bushfire requirements including the Bushfire Hazard Overlay Code and associated policy.
- Asset Protection Zones provide a tolerable level of risk.
- Coastal hazards including storm tide and erosion have been adequately considered.

However, several issues have been identified that can be addressed through conditions, including:

- Insufficient information provided within the ecological report including:

  - The ecological report lacks sufficient detail to confirm that adequate ground-truthing was conducted.
  - Limited details regarding fauna survey results.
  - No rehabilitation plan.
- Insufficient information provided within the bushfire hazard assessment and management plan including:
  - A BAL utilising an FDI that follows best practices.
  - Limited information regarding interim bushfire protection for each stage including bushfire trails, etc.
  - Detail regarding the bushfire trail within the proposed reserve.
- Limited information is provided within the Stormwater Management Plan, including:
  - The need for amendments to incorporate best practices.
  - Ensuring the proposed stormwater management solution is contained within the subject site.

Development conditions to address the above are provided in Section 3.2 of this report.

Appendix A - Proposed Plans

APPLICATION FOR RECONFIGURATION OF A LOT (1 INTO 85) AT 1-41 NEVILLE STREET, MULAMBIN, QLD 4703 LOT 2 ON RP617670 FOR RED EMPEROR PTY LTD JOB No. 2415

LOCALITY PLAN
SCALE 1:2500
IMAGE SOURCE: NEARMAP

SCHEDULE OF DRAWINGS

DWG	DESCRIPTION
2415 - P01	LOCALITY PLAN AND SCHEDULE OF DRAWINGS
2415 - P02	OVERALL LAYOUT AND KEY PLAN
2415 - P03	PLAN OF DEVELOPMENT SHEET 1
2415 - P04	PLAN OF DEVELOPMENT SHEET 2
2415 - P05	PLAN OF DEVELOPMENT (AERIAL IMAGE) SHEET 1
2415 - P06	PLAN OF DEVELOPMENT (AERIAL IMAGE) SHEET 2
2415 - P07	ROAD HIERARCHY PLAN
2415 - P08	PROPOSED TYPICAL ROAD CROSS SECTIONS
2415 - P09	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 1
2415 - P10	ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 2
2415 - P12	PRELIMINARY SERVICES PLAN SHEET 1
2415 - P13	PRELIMINARY SERVICES PLAN SHEET 2

PROPERTY DESCRIPTION

LOT 2 ON RP617670
1-41 NEVILLE STREET, MULAMBIN, QLD 4703
SITE AREA = 10.03 Ha
DEVELOPMENT AREA = 6.92 Ha

THESE PLANS HAVE BEEN PREPARED FOR A **MATERIAL CHANGE OF USE** APPLICATION ONLY AND ARE NOT SUITABLE FOR SUBMISSION WITH ANY OTHER COUNCIL APPLICATION.

CIVIL DESIGN BASED ON:
FIELD SURVEY BY **CAPRICORN SURVEY GROUP CQ**
DWG No. 025210 DATED 22/04/2024
GDA2020 MGA 56

NOTE:
THESE DESIGN DRAWINGS HAVE BEEN PREPARED FROM THIRD PARTY INFORMATION RECEIVED FROM THE FOLLOWING CONSULTANTS. ALL SET OUT, LEVELS AND LOCATIONS MUST BE CROSS CHECKED BY A LICENSED SURVEYOR BEFORE COMMENCING CONSTRUCTION TO ENSURE COMPLIANCE WITH CURRENT MAPPING GRIDS, HEIGHT DATUMS AND BUILDING SETBACKS.
SURVEYOR CAPRICORN SURVEY GROUP CQ PH: 07 4927 5199
ENVIRONMENTAL ASSESSMENT BIRCHILLS ENGINEERING SOLUTIONS PH: 07 5509 8400

REV	DATE	DESCRIPTION	BY	CHKD
A	25.06.24	FOR APPROVAL	EC	CS
B	03.07.24	FOR APPROVAL	EC	CS
C	19.09.24	COUNCIL / SARA RFI RESPONSE	TW	TB
D	28.10.24	RFI RESPONSE	EC	CS

DETAILS	
DATUM	AHD
DESIGN	CS
DRAWN	EC
DESIGN CHECK	TB
DATE	25-06-24

SCALE: 1:2500 50 0 50 100 A1; 1:3000 A3

APPROVED
Director: TONY SHELLEY (RPEQ 7736)
DRAWING STATUS
FOR APPROVAL

Barlow Shelley CONSULTING ENGINEERS
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e office@barlowshelley.com.au W www.barlowshelley.com.au
a PO Box 899 Maroochydore 4558 ABN 89 215 591 077

PROJECT:
PROPOSED RESIDENTIAL DEVELOPMENT AT 1-41 NEVILLE STREET, MULAMBIN, QLD 4703 FOR RED EMPEROR PTY LTD

JOB NUMBER: 2415

DRAWING TITLE:
LOCALITY PLAN AND SCHEDULE OF DRAWINGS

DRAWING NUMBER: P01 REV: D

p:\2415-neville st mulambin\design\civil\acad\2415 - p01 - locality plan and schedule of drawings.dwg

LEGEND

- SITE BOUNDARY
- PROPOSED STAGE BOUNDARY
- PROPOSED LOT BOUNDARY
- EASEMENT BOUNDARY
- 15m OFFSET TO MARINE PLANT AREA
- MAPPED MARINE PLANT AREA
- EASEMENT
- ASSET PROTECTION ZONE (APZ)
- BUSHFIRE ACCESS GRAVEL TRACK
- PROPOSED AREA TO BE TRANSFERRED TO COUNCIL
- PROPOSED AREA TO BE RECEIVED FROM COUNCIL

DETAIL 1 - PROPOSED BOUNDARY REALIGNMENT (BALANCE AREA SWAP)
SCALE 1:500

PROPOSED LOTS

LEGEND	SIZE (m²)	STAGE 1	STAGE 2	STAGE 3	STAGE 4	TOTAL
	450	0	1	0	1	2
	450-600	19	15	11	13	58
	>600	4	11	6	4	25
	TOTAL	23	27	17	18	85

SITE INFORMATION

1-41 NEVILLE ST, MULAMBIN QLD 4703
LIVINGSTONE SHIRE COUNCIL
ZONING: L1 - Rural
LOT PLAN: 2RP617670
TOTAL AREA: 100,059m²

REV	DATE	DESCRIPTION	BY	CHKD
A	25.06.24	FOR APPROVAL	EC	CS
B	03.07.24	FOR APPROVAL	EC	CS
C	19.09.24	COUNCIL / SARA RFI RESPONSE	TW	TB
D	28.10.24	RFI RESPONSE	EC	CS

DETAILS	
DATUM	AHD
DESIGN	CS
DRAWN	EC
DESIGN CHECK	TB
DATE	25-06-24

SCALE
1:1500 30 20 10 0 30 60 A1
1:3000 A3
1:1000 10 0 10 20 30 40 50 A1
1:2000 A3
This drawing is not to be copied or amended without written permission from Barlow Shelley Consulting Engineers

APPROVED
Director: TONY SHELLEY (RPEQ 7736)
DRAWING STATUS
FOR APPROVAL

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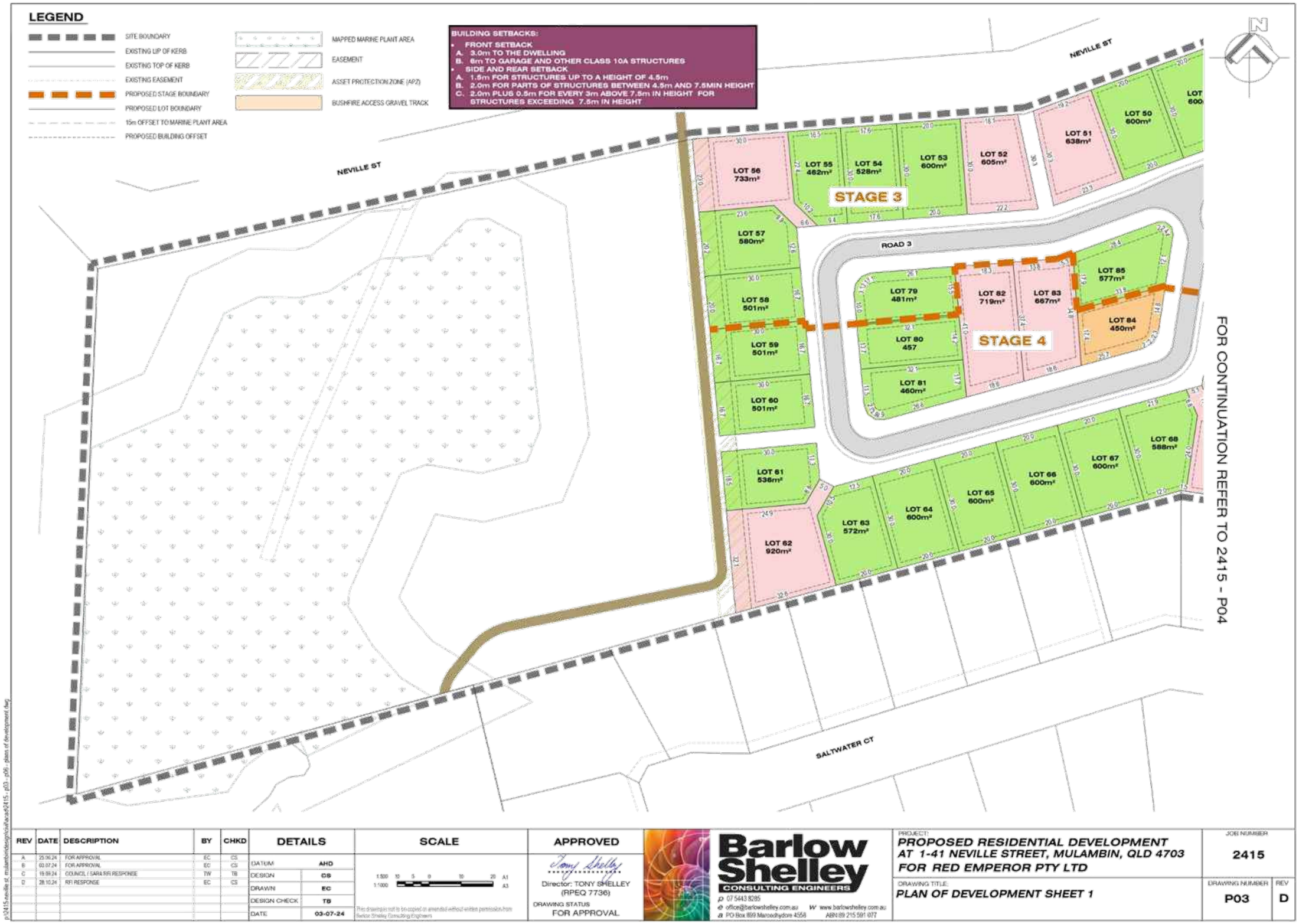
PROJECT:
PROPOSED RESIDENTIAL DEVELOPMENT AT 1-41 NEVILLE STREET, MULAMBIN, QLD 4703 FOR RED EMPEROR PTY LTD

JOB NUMBER: 2415

DRAWING TITLE:
OVERALL LAYOUT AND KEY PLAN

DRAWING NUMBER: P02 REV: D

p:\2415-neville st_mulambin\designs\civil\acad\2415 - p02 - overall layout and key plan.dwg



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C	19.09.24	COUNCIL / SARA RFI RESPONSE	TW	TB
D	28.10.24	RFI RESPONSE	EC	CS

DETAILS	
DATUM	AHD
DESIGN	CS
DRAWN	EC
DESIGN CHECK	TB
DATE	03-07-24

SCALE
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PROJECT:
PROPOSED RESIDENTIAL DEVELOPMENT AT 1-41 NEVILLE STREET, MULAMBIN, QLD 4703 FOR RED EMPEROR PTY LTD

JOB NUMBER: 2415

DRAWING TITLE:
PLAN OF DEVELOPMENT SHEET 1

DRAWING NUMBER: P03 REV: D

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B	03.07.24	FOR APPROVAL	EC	CS
C	19.09.24	COUNCIL / SARA RFI RESPONSE	TW	TB
D	28.10.24	RFI RESPONSE	EC	CS

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DATUM	AHD
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DESIGN CHECK	TB
DATE	03-07-24

SCALE
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JOB NUMBER: 2415

DRAWING TITLE:
PLAN OF DEVELOPMENT SHEET 2

DRAWING NUMBER: P04 REV: D

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D	28.10.24	RFI RESPONSE	EC	CS

DETAILS	
DATUM	AHD
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DESIGN CHECK	TB
DATE	03-07-24

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JOB NUMBER: 2415

DRAWING TITLE:
PLAN OF DEVELOPMENT (AERIAL IMAGE) SHEET 1

DRAWING NUMBER: P05

REV: D

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JOB NUMBER: 2415

DRAWING TITLE:
PLAN OF DEVELOPMENT (AERIAL IMAGE) SHEET 2

DRAWING NUMBER: P06

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C	28.10.24	RFI RESPONSE	EC	CS

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DESIGN CHECK	TB
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JOB NUMBER: 2415

DRAWING TITLE:
ROAD HIERARCHY PLAN

DRAWING NUMBER: P07

REV: C

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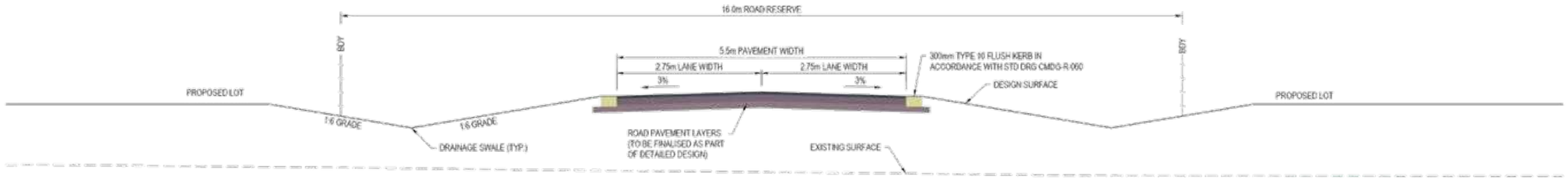
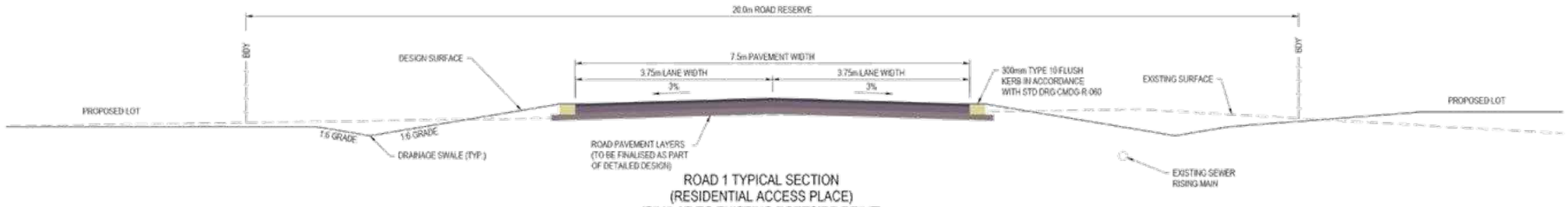


ROAD 2 AND 3 TYPICAL SECTION
(RESIDENTIAL ACCESS PLACE)



ROAD 1 TYPICAL SECTION
(RESIDENTIAL ACCESS PLACE)
(SIMILAR TO EXISTING PORTSIDE DRIVE)

p:\2415-neville st, mulambin\design\civil\acad\2415 - p08 - proposed typical road cross sections.dwg

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B	19.09.31	COUNCIL / SARA RFI RESPONSE	TW	TB
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DESIGN CHECK	TB
DATE	25-06-24

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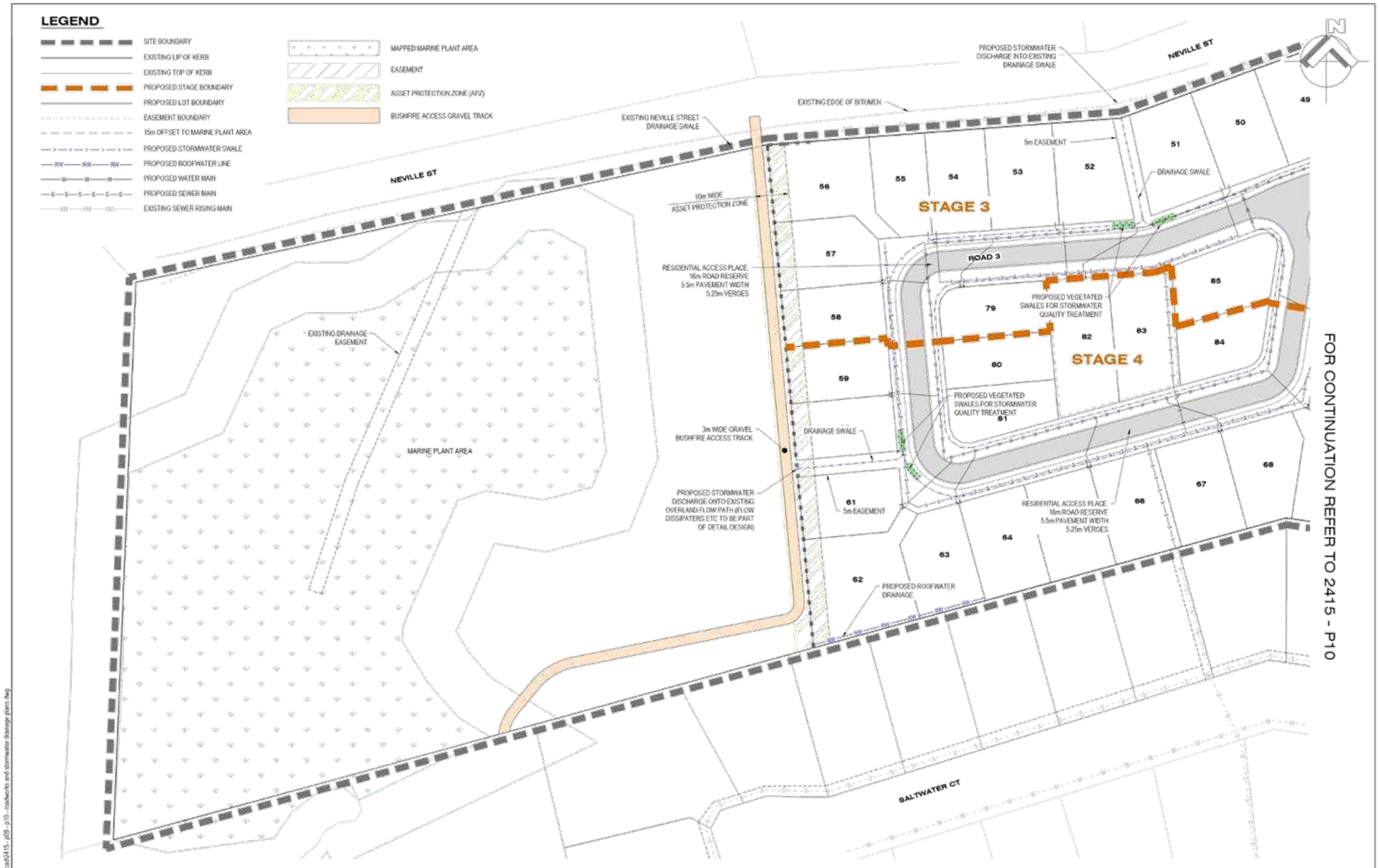
JOB NUMBER: 2415

DRAWING TITLE:
PROPOSED TYPICAL ROAD CROSS SECTIONS

DRAWING NUMBER: P08

REV: C



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DESIGN CHECK	TB
DATE	25-06-24

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PROJECT:
PROPOSED RESIDENTIAL DEVELOPMENT AT 1-41 NEVILLE STREET, MULAMBIN, QLD 4703 FOR RED EMPEROR PTY LTD

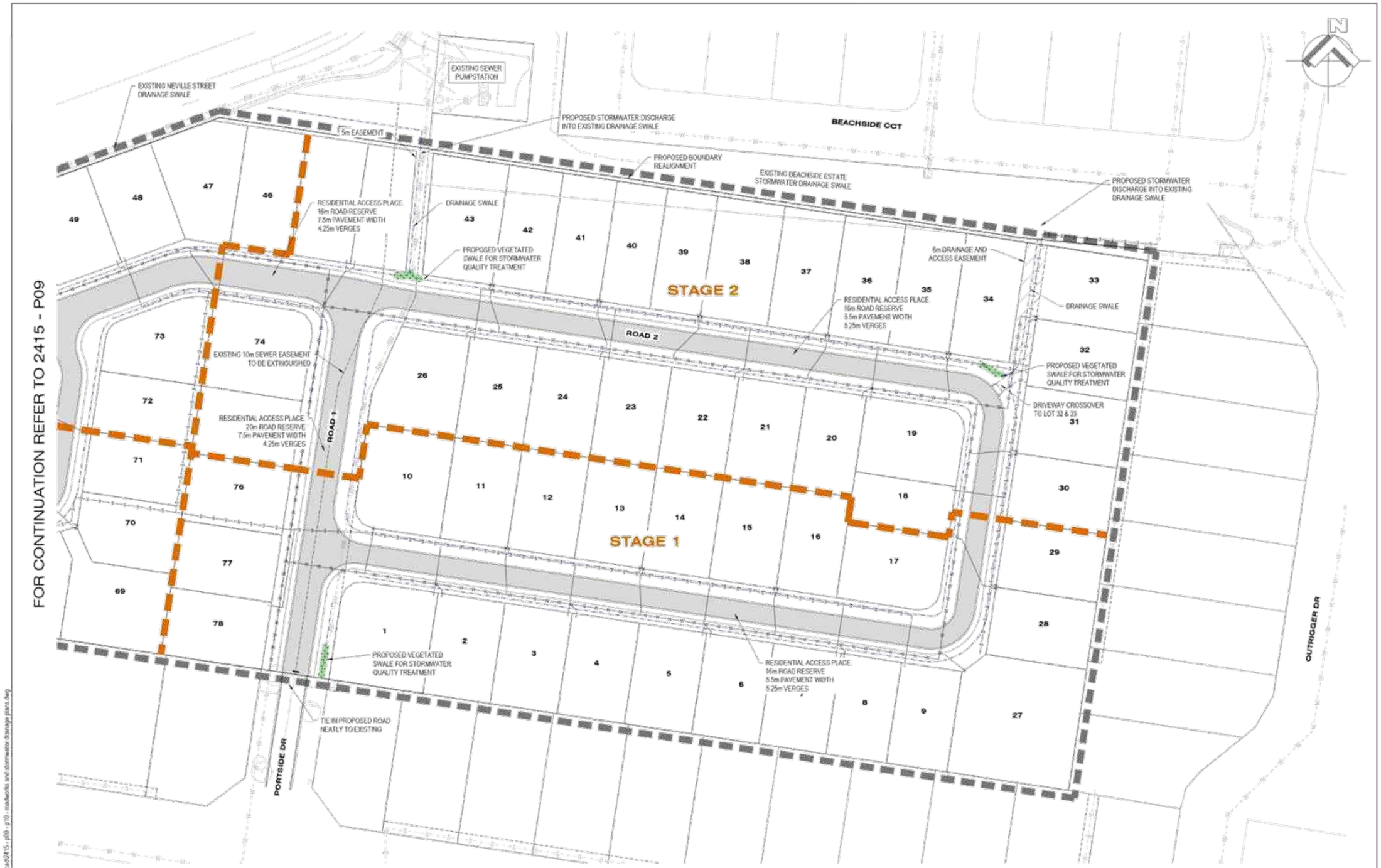
JOB NUMBER
2415

DRAWING TITLE:
ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 1

DRAWING NUMBER
P09

REV
C

p:\2415-neville st mulambin\design\civil\acad\2415 - p09 - p10 - roadworks and stormwater drainage plans.dwg



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DESIGN CHECK	TB
DATE	25-06-24

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PROPOSED RESIDENTIAL DEVELOPMENT
AT 1-41 NEVILLE STREET, MULAMBIN, QLD 4703
FOR RED EMPEROR PTY LTD

JOB NUMBER: 2415

DRAWING TITLE:
ROADWORKS AND STORMWATER DRAINAGE PLAN SHEET 2

DRAWING NUMBER: P10

REV: C

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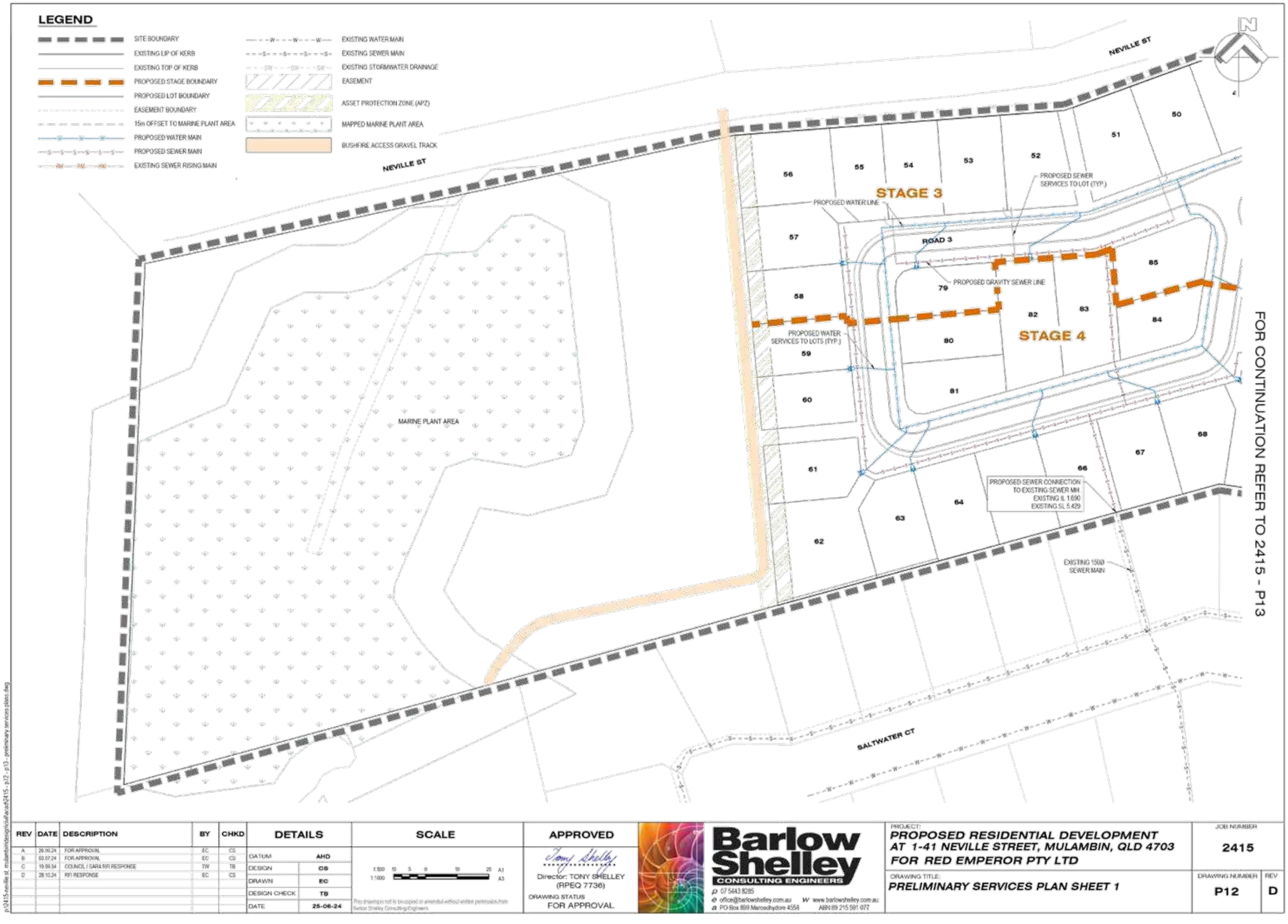

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D	28.10.24	RFI RESPONSE	EC	CS

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DATUM	AHD
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DRAWN	EC
DESIGN CHECK	TB
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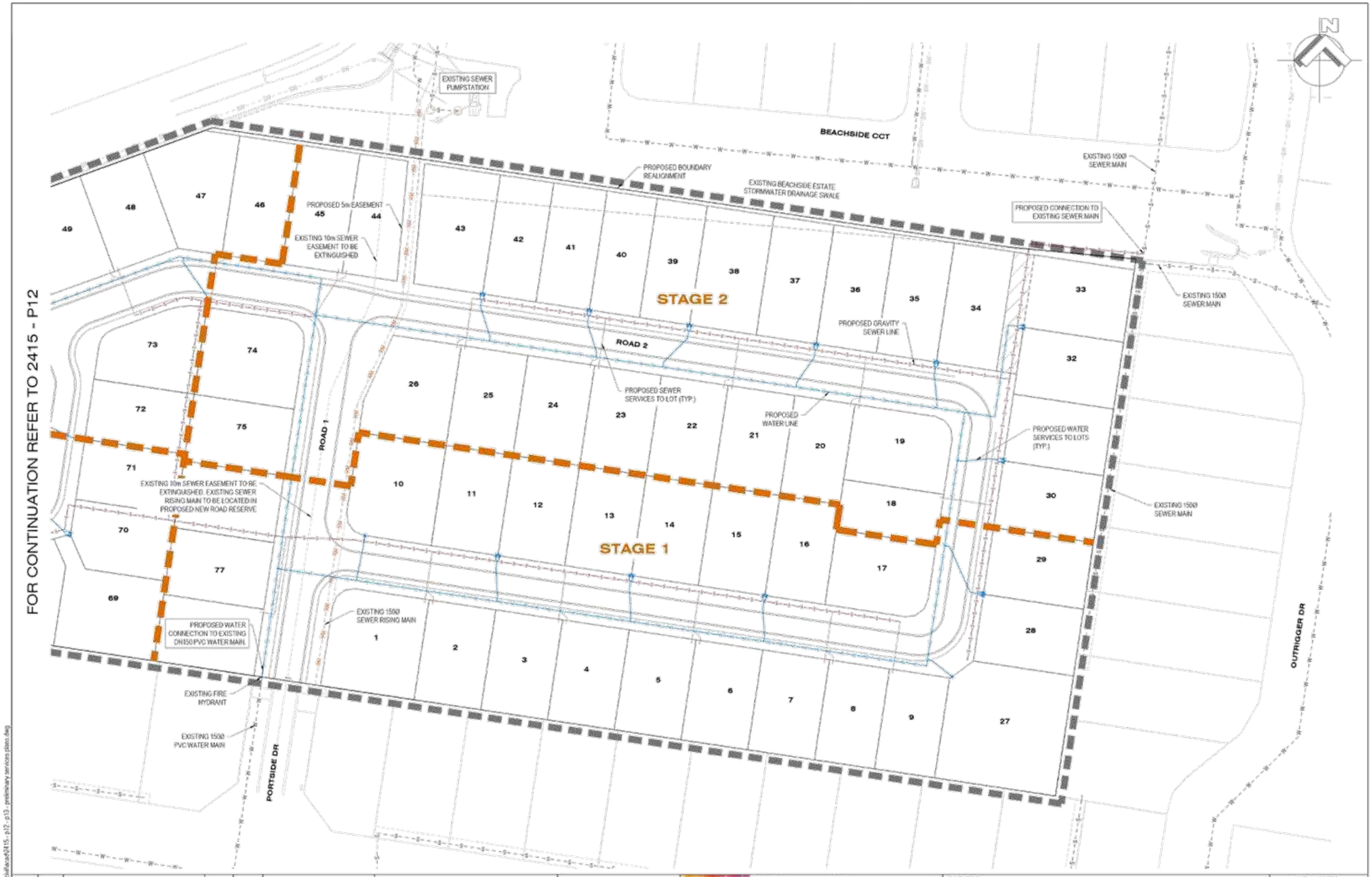
PROPOSED RESIDENTIAL DEVELOPMENT AT 1-41 NEVILLE STREET, MULAMBIN, QLD 4703 FOR RED EMPEROR PTY LTD

JOB NUMBER: **2415**

DRAWING TITLE:
PRELIMINARY SERVICES PLAN SHEET 1

DRAWING NUMBER: **P12** REV: **D**



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D	28.10.24	RFI RESPONSE	EC	CS

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DATE	25-06-24

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PROJECT:
PROPOSED RESIDENTIAL DEVELOPMENT
AT 1-41 NEVILLE STREET, MULAMBIN, QLD 4703
FOR RED EMPEROR PTY LTD

JOB NUMBER: 2415

DRAWING TITLE:
PRELIMINARY SERVICES PLAN SHEET 2

DRAWING NUMBER: P13

REV: D

p:\2415 neville st, mulambin\design\civil\acad\2415 - p12 - p13 - preliminary services plans.dwg

Appendix B Overlay Assessment

8.2.3. Biodiversity overlay code

8.2.3.1. Application

This code applies to the assessment of development if it is identified as an applicable code for development, as specified in the assessment benchmarks column in the tables of assessment located in Part 5 of the planning scheme.

When using this code, reference should be made to section 5.3.2 and where applicable, section 5.3.3 located in Part 5. All subject matter in this code is applicable to the development assessment, unless the following circumstance arises:

(1) The heading of a specific benchmarks for assessment table specifies otherwise; or
(2) A heading within a specific benchmark for assessment table specifies that the outcomes apply to a specific type of development or to development at a specific location; or
(3) A performance outcome or acceptable outcome specifies that the outcomes apply to a specific type of development or to development at a specific location.

In the circumstance where point (2) or point (3) above arises the following applies:

(1) the development assessment outcomes apply only to the type of development specified or only to development at the location specified; and

(2) the development must still be assessed against all other general subject matter of the code.

For the purpose of this code, any reference to matters of environmental significance is an all encompassing reference to matters of national environmental significance (MNES), matters of state environmental significance (MSES), and matters of local environmental significance (MLES).

Areas that are known to contain matters of environmental significance or which may contain matters of environmental significance are identified by the series of biodiversity overlays.

The table below provides an outline of the biodiversity overlays and the matters of environmental significance. The table may assist when using this code.

Overlays	Description
Matters of National Environmental Significance (MNES)	
Matters of national environmental significance are protected under the *Environment Protection and Biodiversity Conservation Act 1999*. Matters of national environmental significance and matters of State environmental significance are generally not located in isolation to each other or other ecological values. There may therefore be MNES located in areas identified on planning scheme overlay maps as MSES. Editor's note: Commonwealth Government internet search tools are available to assist in determining whether MNES are present and whether actions require approval from the relevant federal minister.	
Matter of State Environmental Significance (MSES)	
Declared fish habitat	The overlay identifies State fish habitat areas that are management (A) areas or management (B) areas declared under the *Fisheries Act 1994*. These areas protect all fish habitats within from adverse impacts which may result from physical disturbance from coastal development. These areas still allow for legal fishing activities.
High ecological significance wetlands	The overlay identifies wetlands in a wetland protection area or wetlands of high ecological significance shown on a map of referable wetlands under the Environmental Protection Regulation 2008.
High ecological value waters (watercourses)	The overlay identifies watercourses in high ecological value waters as defined in the Environmental Protection (Water) Policy 2009.
High ecological value waters (wetlands)	The overlay identifies wetlands in high ecological value waters as defined in the Environmental Protection (Water) Policy 2009.
Marine Park	The overlay identifies State marine parks and zones declared under

	the *Marine Parks Act 2004*. The marine park may consist of marine national park, marine conservation park, scientific research zone, preservation zones or buffer zones.
Protected Area	The overlay identifies State protected area estates (including all classes of protected area except coordinated conservation areas) declared under the *Nature Conservation Act 1992*.
Regulated vegetation	The overlay identifies regulated vegetation under the *Vegetation Management Act 1999*, that is: • Category B areas on the regulated vegetation management map that are 'endangered' or 'of concern' regional ecosystems; • Category C areas on the regulated vegetation management map that are 'endangered' or 'of-concern' regional ecosystems; • Category R areas on the regulated vegetation management map; • Regional ecosystems that intersect with wetlands identified on the vegetation management wetlands map.
Wildlife habitat	The overlay identifies threatened wildlife and areas of essential habitat for wildlife prescribed as endangered or vulnerable under the *Nature Conservation Act 1992*.
Matters of Local Environmental Significance (MLES)	
Habitat and vegetation	The overlay identifies local environmentally significant habitat and vegetation. These areas may include tracts of native remnant vegetation, vegetation growing on serpentine geology, and other locally identified important vegetation.
Local biodiversity corridors	The overlay identifies local and sub-regional corridors of wildlife habitat in areas of the planning scheme area that are facing urban development pressure. These corridors provide connections which enable the migration of flora and fauna.
Waterways	The overlay identifies local environmentally significant waterways. Values associated with waterways include provision of flora and fauna habitat, and contribution to natural hydrological cycles and surrounding ecosystems.
Wetlands	The overlay identifies local environmentally significant wetlands. Values associated with wetlands include provision of flora and fauna habitat, and contribution to natural hydrological cycles and surrounding ecosystems.

8.2.3.2. Purpose

The purpose of the biodiversity overlay code is to identify, protect, enhance and rehabilitate areas containing matters of environmental significance and the ecological processes and biodiversity values of terrestrial and aquatic ecosystems.

8.2.3.3. Overall outcomes

The purpose of the code will be achieved through the following overall outcomes:

(1) matters of environmental significance and corridors which link them are identified, protected, enhanced and rehabilitated to maintain ecological processes and biodiversity;

(2) nature corridors or links are maintained and where appropriate, rehabilitated and expanded to support:

(a) the natural movement and proliferation of native species;

(b) ecological responses to climate change;

(c) the maintenance of large scale migratory lifecycle processes; and

(d) between significant habitat areas and areas of remnant vegetation;

(3) development does not cause significant adverse impacts on areas containing matters of environmental significance, by appropriately addressing impacts on issues including but not limited to the following:

(a) species or habitat loss or disturbance, including terrestrial and aquatic wildlife corridors;

(b) soil degradation, pollution, erosion, contamination, acidification or salinization;

(c) modification to natural processes;

(d) and reduction in water quality, ecological values and the natural hydrological regimes of surface and ground waters;

(4) development maintains or increases the resilience of ecosystems and wildlife habitats to threatening processes, including the impacts of climate change;

(5) development facilitates land tenure and other management arrangements for the long-term conservation of environmentally significant areas, ecological processes and biodiversity values; corridors and associated buffers have dimensions which suitably provide for:

(a) movement of native fauna;

(b) viable habitat areas;

(c) Minimisation of edge effects;

(d) maintenance of the hydrological functions of waterways or wetlands;

(e) appropriate access for sustainable recreation; and

(f) any additional maintenance and bushfire setback functions to be located outside the areas required for ecological purposes; and

(7) fragmentation of existing habitat areas is minimised, particularly where it impacts on the future health of populations of native fauna and flora species.

8.2.3.4. Specific benchmarks for assessment

Table 8.2.3.4.1 — Outcomes for assessable development

Performance outcomes	Acceptable outcomes	Proponent response	NGH Comments
Land use			

PO1 . In areas identified as having matters of environmental significance, all uses are located, designed and operated to: **(a) retain and protect significant environmental values; and** **(b) maintain the underlying ecological functions and biophysical processes of the site and surrounds.**	No acceptable outcome is nominated. Editor's note: Schedule SC7.5 identifies the primary attributes included in areas containing matters of State environmental significance. Site-specific investigation will be required to confirm the extent and nature of values indicated on the overlay map.	**Complies** The revised design reduced the development footprint, facilitating increased protection for mapped and ground truthed significant values including: • Protection of all regional ecosystem types mapped over the site including Regional Ecosystems 11.1.2 and 11.2.5; • Increased buffering to MLES wetlands along Mulambin Ck (minimum 100-200m); and • Increased protection of habitat that contributes to an increased protection for mapped and ground truthed	The report identifies environmental values on-site. The proposal retains 30 30,101m^2 of Protected area which contains MSES and MLES. As the application has been referred to the State for MSES, a referral response was obtained allowing clearing of MSES vegetation to be ofsetted but also ensuring that a reserve is created to ensure marine plants are protected and to ensure that sufficient buffer are maintained. One Special Least Concern species the short beaked echidna (*Tachyglossus aculeatus)* was observed on site for which environmental offsets were required by the State. As a decision was made by the State regarding the MSES, this leaves the MLES to be assessed by Council. The MLES identified on the site are: • Habitat and Vegetation - Native remnant vegetation (Regional Ecosystems 11.1.2 and 11.2.5) • Local Biodiversity Corridors – north/south sub-regional corridor (western part of site)

			• Wetlands and waterways – wetland (estuarine – Mulambin Ck foreshore). In terms of retaining significant value, the proposed reserve will act as a biodiversity corridor and will ensure that there is sufficient buffer and ensure wildlife passage. The underlying functions of the site, particularly the hydrological functions has not been discussed within the ecological report but has been discussed as part of the Coastal Hazard Study. Consideration of those should be included in the ecological report. Considering that the reserve will act as a biodiversity corridor, ensuring that sufficient buffer to the wetland is provided and preserves some of the corridors, the proposal is considered compliant with the PO.
Native vegetation and habitat			
PO2 . Development retains and regenerates native vegetation in such a way as to: (a) retain vegetation that is in patches of greatest size and smallest possible edge-to area	No acceptable outcome is nominated	**Complies** The reserve area (3ha) provides for protection and restoration of: • All regional ecosystem types mapped over the site including Regional Ecosystems 11.1.2 and 11.2.5; • Riparian vegetation along Mulambin Ck;	The proposed reserve is appropriately located in that it retains the most significant vegetation on the site and that it provides a biodiversity corridor and retains a large patch of greatest size with minimal fragmentation with respect to the greater

ratio; (b) maximise the linkages between vegetation located on the subject site; **(c) maximise linkages between vegetation** **Editor's note: Council may adopt an offsets planning scheme policy for matters of local environmental significance at a future date. Editor's note: Development applications proposed in areas identified as having matters of environmental significance that prepare all relevant material in accordance with Schedule SC7.5 Environmental Management Planning Scheme Policy, will assist in demonstrating achievement of these performance outcomes.**		• Buffers to estuarine wetlands along Mulambin Ck (minimum 100-200m); and • Habitat that is connected to adjoining estuarine communities and contributes to a north-south sub-regional corridor	biodiversity corridor running from north to south. The proposal complies with PO2
PO3 Development retains, protects and enhances areas of habitat that support a critical life stage in ecological process such as feeding, breeding or roosting for the identified species.		**Complies** The proposed 3ha reserve protects estuarine and wetland vegetation that provides habitat for significant species including the Vulnerable estuarine crocodile (*Crocodylus porosus*), the Endangered eastern curlew (*Numenius madagascariensis*) and the Vulnerable Western Alaskan bar-tailed godwit (*Limosa lapponica baueri*). The estuarine	The proposal complies in that the reserve will support critical life stages of protected species. One Special Least Concern species the short beaked echidna (*Tachyglossus aculeatus)* was observed on site. As it will be affected by the clearing a species

Editor's note: Council may adopt an offsets planning scheme policy for matters of local environmental significance at a future date. **Editor's note: Development applications lodged with Council must identify all species listed that are present within or adjacent to the premises and habitats that may be affected by the proposal. In particular applications are to identify and describe how the development protects or enhances wildlife habitat at any critical life stage ecological processes within or adjacent to the development area. This should be reflected in an ecological assessment report prepared in accordance with the Schedule SC7.5.**		wetland vegetation is protected by a minimum 100m buffer to the development. Additionally, the proposed reserve will be restored to enhance the buffering and corridor functions of this area.	management was proposed in the ecological report a
PO4 Development protects existing biodiversity corridors and assists in the establishment of new corridors which have adequate dimensions and characteristics to	AO4.1 Development involving roads, pipelines, pedestrian access and in-stream structures: (a) does not create barriers to the movement of fauna (including fish	**Complies** The proposed 3ha reserve protects habitat that is connected to adjoining estuarine communities and contributes to a north-south sub-regional	NGH Agrees with this statement. However, there will be barrier to movement through the road network Crossings may be necessary. This should be part of the

support: (a) unimpeded movement of terrestrial and aquatic fauna that are associated with or are likely to use the biodiversity corridor as part of their normal life cycle evolutionary and genetic processes; (b) the natural change in distributions of species and connectivity between populations of species over long periods of time; (c) ecological responses to climate change; (d) maintenance of large scale seasonal/ migratory species processes and movement of fauna; (e) connectivity between large tracts and patches of native remnant vegetation and habitat areas; and (f) effective and continuous movement of terrestrial and aquatic fauna.	passage) along or within biodiversity corridors; or (b) provides effective wildlife movement infrastructure in accordance with best practice which: (i) enables fauna to safely negotiate a development area; and (ii) separates fauna from potential hazards through the use of appropriate fencing. AO4.2 Development ensures that biodiversity corridors have a sufficient width to protect habitat, minimise impacts from adjoining land use, and to enhance connectivity in accordance with the following: (a) regional corridors retain a width of at least five-hundred (500) metres; and (b) local corridors retain a width of at least fifty (50) metres.	corridor. The estuarine wetland vegetation is protected by a minimum 100m buffer to the development. Additionally, the proposed reserve will be restored to enhance the buffering and corridor functions of this area. The dimensions of the proposed reserve (approximately 200m wide) maximises the protection of existing biodiversity and habitat values including all three (3) regional ecosystems mapped on the site.	species management plan to be conditioned.
Wetlands and waterways			
PO5 Development retains waterways and wetlands and avoids impacts on: (a) native riparian vegetation; (b) habitat; (c) ecological functions; (d) water	PO5.1 A buffer surrounding a waterway or wetland is established and maintained free of development, the width of which is supported by an	The proposed 3ha reserve protects estuarine and wetland vegetation along Mulambin Ck. The estuarine wetland vegetation is protected by	NGH considers that sufficient buffer from the wetland was considered.

quality; and (e) nature conservation values.	evaluation of the environmental values and functions and threats to matters of State or local environmental significance. Editor's note: The Queensland wetland buffer guideline, Department of Environment and Heritage, 2011 should be referred to when planning detailed buffer design to position development, determine any alternative buffer widths, and establish operating measures that avoid adverse impacts on a wetland.	a minimum 100m buffer to the development. Additionally the proposed reserve will be restored to enhance the buffering and corridor functions of this area.	
PO6 Development does not cause land degradation near a waterway or wetland, including: (a) mass movement, gully erosion, rill erosion, sheet erosion, tunnel erosion, stream bank erosion, wind erosion, or scalding; and (b) loss or modification of chemical, physical or biological properties or functions of soil.	AO6.1 Native vegetation is retained or where retention is unavoidable, it is reinstated within riparian areas and buffer areas. AO6.2 Foreshore areas are fenced to prevent stock access. AO6.3 Riparian areas are fenced to limit stock access to a limited number of watering holes.	**Complies** The proposed 3ha reserve protects estuarine and wetland vegetation along Mulambin Ck. The estuarine wetland vegetation is protected by a minimum 100m buffer to the development. Additionally the proposed reserve will be restored to enhance the buffering	The 3 ha reserve will be restored. It is recommended that a restoration/rehabilitation plan be included in the condition package and that the hydrology be considered. An Erosion and Sediment Control Plan (ESP) will be required at the operational works stage to prevent land degradation and erosion near a waterway/wetland.

		and corridor functions of this area.	
All matters of environmental significance			
PO7 All matters of environmental significance are identified and protected from significant adverse impacts associated with development. **Editor's note – Council may adopt an offsets planning scheme policy for matters of local environmental significance at a future date.**	No acceptable outcome is nominated.	• All regional ecosystem types mapped over the site including Regional Ecosystems 11.1.2 and 11.2.5 and their surrogate fauna habitat values; • Buffers to MLES wetlands along Mulambin Ck (minimum 100-200m); and habitat that contributes to a north-south sub-regional corridor.	Consideration of all matters of environmental significance identified have been adequately included.
Hydrology			
PO8 Development enhances or maintains the existing surface water hydrological regime of all areas containing matters of environmental significance.	No acceptable outcome is nominated.	**Complies** Matters of Environmental Significance include the biodiversity corridor and estuarine wetland along Mulambin Creek. The proposed reserve protects these values by providing a restored minimum 100m buffer to the development. The proposed restored reserve will maintain the existing surface water hydrological regime of the estuarine wetlands and support the existing	The reserve will ensure that hydrological matters will be protected.

		biodiversity corridor function.	
PO9 Development: (a) enhances or maintains the existing groundwater hydrological regime of all areas containing matters of environmental significance; (b) ensures that the water table and hydrostatic pressure in the area of environmental significance is returning to its natural state; and (c) does not result in ingress of saline water into freshwater aquifers.	No acceptable outcome is nominated	**Complies** The proposed 3ha reserve protects estuarine and wetland vegetation along Mulambin Ck. The estuarine wetland vegetation is protected by a minimum 100m buffer to the development. Additionally the proposed reserve will be restored to enhance the buffering and corridor functions of this area.	There is sufficient buffer from the wetland. However, insufficient information about the hydrology has been provided. Additional information should be submitted,
Ongoing management, construction and operation			
PO10 During the construction and operation of development, ongoing management, monitoring and maintenance is undertaken to ensure impacts on environmentally significant areas, biodiversity values and ecological processes, including water quality and hydrology, are avoided or minimised.	No acceptable outcome is nominated.	**Complies** The proposed 3ha reserve protects estuarine and wetland vegetation along Mulambin Ck. The estuarine wetland vegetation is protected by a minimum 100m buffer to the development. Additionally, the proposed reserve will be restored to enhance the buffering and corridor functions of this area.	This should be conditioned at the Operational Works stage.

PO11 Development transfers into public ownership, or incorporates within a voluntary statutory covenant registered under the Land Title Act 1994, any land required for public access or for some other public purpose consistent with its ecological functions, including: (a) access for maintenance; (b) linking core and remnant habitat areas; and (c) land protecting water quality and ecological processes.	No acceptable outcome is nominated.	Complies The proposed 3ha reserve will be restored and dedicated to Council as public open space.	This complies with the requirement.
Rehabilitation			
PO12 Areas degraded as a result of development are rehabilitated by the proponent as near as is practicable to the naturally occurring local native plant species and ecological communities. **Editor's note: A rehabilitation plan supported by expert ecological advice prepared in accordance with Schedule SC7.5 will assist in demonstrating**	No acceptable outcome is nominated.	**Complies** The proposed 3ha reserve will be restored in accordance with an approved Rehabilitation Management Plan and dedicated to Council as public open space.	A 3ha reserve is proposed to be rehabilitated. A rehabilitation plan supported by expert ecological advice prepared in accordance with Schedule SC7.5 is required.

achievement of this performance outcome.			
Vegetation clearing			
Vegetation clearing PO13 Development avoids indiscriminate and unnecessary clearing of vegetation in order to protect: (a) the visual integrity of the natural landscape; (b) ecological features and processes that underpin biodiversity.	AO13.1 Vegetation clearing: (a) does not occur; or (b) where it cannot be avoided, is carried out in accordance with the Development Works Code.	**Complies** The revised design reduced the development footprint, facilitating increased protection for mapped and ground truthed significant values including: • Protection of all regional ecosystem types mapped over the site including Regional Ecosystems 11.1.2 and 11.2.5; • Increased buffering to MLES wetlands along Mulambin Ck (minimum 100- 200m); and • Increased protection of habitat that contributes to a north-south sub-regional corridor.	The reserve will protect the main point of interest in the landscape being the wetland and coastal area. The most significant ecological features and processes will be preserved that underpin biodiversity whilst maintaining the visual integrity of the natural landscape.
PO14 Development retains and protects locally significant species, including but not limited to the following: (a) Cycas ophiolitica; (b) Byfield Fern; (c) Stackhousia tryonii; and (d) Koala.	No acceptable outcome is nominated.	**Complies** An ecological assessment was undertaken and none of the listed species were detected or considered likely to occur within the site based on the mapped vegetation	As none of those species are considered to occur on the site, the proposal is considered acceptable.

		associations and habitat values.	
If reconfiguring a lot			
PO15 If reconfiguring a lot The ecological function and biodiversity values of existing vegetation and habitat are maintained by ensuring that reconfiguring a lot in areas containing matters of environmental significance does not result in significant adverse impacts on the values present. **Editor's note – Council may adopt an offsets planning scheme policy for matters of local environmental significance at a future date.** **Editor's note: Development applications proposed in areas identified as having matters of environmental significance that prepare all relevant material in accordance with Schedule SC7.5 Environmental Management Planning Scheme Policy, will assist in demonstrating achievement of these**	AO15.1 Reconfiguring a lot does not result in the following: (a) the creation of additional lots within areas mapped as containing matters of environmental significance; or (b) the creation of new lots adjoining areas mapped as containing matters of environmental significance of less than ten (10) hectares.	**Complies** The revised design reduced the development footprint, facilitating increased protection for mapped and ground truthed significant values including: • Protection of all regional ecosystem types mapped over the site including Regional Ecosystems 11.1.2 and 11.2.5; • Increased buffering to MLES wetlands along Mulambin Ck (minimum 100- 200m); and • Increased protection of habitat that contributes to a north-south subregional corridor.	The proposal is unable to comply with AO15.1. However, the reserve will ensure that the significant values of MES are retained.

performance outcomes.			
PO16 Reconfiguring a lot incorporates a buffer to areas containing matters of environmental significance in accordance with minimum best practice standards and the buffer area has characteristics to minimise development impacts on the values present. **Editor's note: The Queensland wetland buffer guideline, Department of Environment and Heritage, 2011 should be referred to when planning detailed buffer design to position development, determine any alternative buffer widths, and establish operating measures that avoid adverse impacts on a wetland.**	No acceptable outcome is nominated.	**Complies** The revised design reduced the development footprint, facilitating increased protection for mapped and ground truthed significant values including: • Protection of all regional ecosystem types mapped over the site including Regional Ecosystems 11.1.2 and 11.2.5; • Increased buffering to MLES wetlands along Mulambin Ck (minimum 100- 200m); and • Increased protection of habitat that contributes to a north-south subregional corridor.	NGH agrees with the comments of the applicant.

8.2.4. Bushfire hazard overlay code

8.2.4.1. Application

This code applies to the assessment of development if it is identified as an applicable code for development, as specified in the assessment benchmarks column in the tables of assessment located in Part 5 of the planning scheme.

When using this code, reference should be made to section 5.3.2 and where applicable, section 5.3.3 located in Part 5.

All subject matter in this code is applicable to the development assessment, unless the following circumstance arises:

(1) The heading of a specific benchmarks for assessment table specifies otherwise; or
(2) A heading within a specific benchmark for assessment table specifies that the outcomes apply to a specific type of development or to development at a specific location; or
(3) A performance outcome or acceptable outcome specifies that the outcomes apply to a specific type of development or to development at a specific location.

In the circumstance where point (2) or point (3) above arises the following applies:

(1) the development assessment outcomes apply only to the type of development specified or only to development at the location specified; and

(2) the development must still be assessed against all other general subject matter of the code.

Editor's note—The bushfire hazard area is a natural hazard area for the purpose of State Planning Policy. Within this area, susceptibility to bushfire has been identified. The area identified in the bushfire hazard overlay maps may not reflect the full extent of the area that may be affected by bushfire.

8.2.4.2. Purpose

The purpose of the bushfire hazard overlay code is to ensure that development in bushfire prone areas does not increase risk to life, property, community, economic activity and the environment during bushfire events.

8.2.4.3. Overall outcomes

The purpose of the code will be achieved through the following overall outcomes:

(1) development is located where bushfire hazard risk to personal safety and property is avoided or minimised and mitigated to acceptable levels;
(2) highly vulnerable and community uses are not located in bushfire hazard areas;
(3) vegetation which is identified as matters of State or local environmental significance is not cleared to achieve bushfire hazard minimisation;
(4) natural processes and the protective function of landforms and vegetation are maintained in bushfire hazard areas;
(5) access is provided for safe entry and exit requirements for residents during bushfire events;
(6) development provides for the efficient operational requirements of fire fighters during bushfire events;
(7) development is provided with adequate water supply and fittings for fire-fighting vehicles, and access arrangements for fire fighters;

(8) emergency services facilities are located and designed to function effectively during and after a bushfire;
(9) development does not create an unacceptable burden on disaster management response or recovery capacity and capabilities; and
(10) development avoids the storage of hazardous materials in a bushfire hazard area.

Editor's note—For building assessment provisions, the bushfire hazard (bushfire prone) areas defined by the planning scheme overlays are designated to be the bushfire prone area for the purposes of the National Construction Code.

8.2.4.4. Specific benchmarks for assessment Table

8.2.4.4.1 — Outcomes for assessable development

Performance outcomes	Acceptable outcomes	Proponent response	NGH Comments
Development other than reconfiguring a lot where located in bushfire hazard areas identified as potential impact buffer, or medium potential bushfire intensity, or high potential bushfire intensity, or very high potential bushfire intensity		N/A	N/A
Bushfire planning			
PO1 Development does not expose people and property to unacceptable risk from bushfire hazard taking into account: (a) vegetation type; (b) slope; (c) aspect; (d) bushfire history; (e) ongoing maintenance; and (f) on-site and off-site fire hazard implications. Editor's note: Off-site impacts may include potential hazard from land up to ten (10) kilometres away from the site. For example, it may be relevant to consider how large tracts of forest	AO1.1 Development is located within a building protection zone approved as part of a Development Permit for reconfiguration of a lot, and the building protection zone was determined in accordance with SC7.2 Bushfire hazard planning scheme policy. AO1.2 If the development is not located within an approved building protection zone for the site in accordance with AO1.1, then the development occurs only if it is located in	N/A	N/A

away from the site may impact on the bushland that surrounds the site. Editor's note: Schedule 6, Part 2 of the Planning Regulation, 2017, makes specific development within a bushfire hazard overlay located on a lot smaller than 2,000m2 which is zoned residential accepted development.	accordance with a bushfire management plan which has been prepared in accordance with SC7.2 Bushfire hazard planning scheme policy, and the bushfire management plan demonstrates that: (a) the development is not in a medium, high or very high bushfire hazard area; or (b) the outermost walls or living spaces of buildings on the site are separated from the edge of the bushfire hazard source, the greater of the following: (i) sufficient distance to achieve a bushfire attack level no greater than 29kW/m2; or (ii) a distance of twenty (20) metres; or (iii) no less than 1.5 times the mature tree canopy height in the hazard hazardous vegetation. Editor's note: The Bushfire Attack Level is calculated in accordance with the methodology described in the Australian Standard AS 3959 – Construction of buildings in bushfire prone areas. Editor's note: Council may accept a bushfire management plan that was prepared for a previous development approval over the land,		

	prior to the SC7.2 Bushfire hazard planning scheme policy coming into effect, subject to further assessment to ensure compliance with current standards. AO1.3 Buildings and structures are located within a building protection zone which achieves the following: (a) the inner zone and outer zone of the building protection zone have slopes under thirty-three (33) per cent; and (b) the inner zone has the following characteristics: (i) it has a minimum distance of ten (10) metres, or a distance sufficient to achieve a bushfire attack level no greater than 29kW/m2; and (ii) tree canopy cover in the zone is less than ten (10) per cent; and (iii) tree canopy is located greater than two (2) metres from any part of the roofline of a building; and (c) the outer zone has the following characteristics: (i) it has a minimum distance of ten (10) metres plus one (1) metre for every degree of downslope vegetation; and (ii) tree canopy cover in the zone is less than thirty (30) per cent. Note: The following		

	figures illustrate the desired outcome. Editor's note: The term 'building protection zone' is explanatory in nature. In documents other than this Code, it may also be referred to as an asset protection zone, building radiation zone, or defendable space. Regardless of the name, the above figures illustrate the key features of the zone.		
Land use			
PO2 In areas determined to be at an unacceptable risk from bushfire hazards, development does not occur if it is for a use which: (a) results in a significant concentration of people at any one time; or (b) results in a significant increase in people living or working in the area; or (c) involves institutional uses where evacuating people may be difficult; or (d) involves a significant number of vulnerable people; or (e) involves essential public infrastructure; or (f) involves manufacture or storage of hazardous materials.	No acceptable outcome is nominated.	N/A	N/A

PO3 In areas determined to have bushfire hazard risk within tolerable levels, development occurs only **f: (a) it adequately mitigates potential adverse impacts from bushfire hazard through siting, design, and other mitigation measures; (b) it supports safe and efficient evacuation and emergency services access to the site in the event of a bushfire; and (c) essential public infrastructure is not put at significant risk from destruction or failure during and immediately after bushfire events.**			
Internal access			
PO5 Development ensures that the location, siting, and design of development and associated internal access ways: (a) avoid potential for entrapment during a bushfire; and (b) enable safe evacuation of the site during a bushfire for site occupants.	AO5.1 Internal access ways have: (a) a minimum cleared width of six (6) metres; (b) a minimum cleared height of 4.8 metres; (c) a minimum formed width of four (4) metres; (d) a maximum gradient of twenty-five (25) per cent if sealed, or eighteen (18) per cent if unsealed; (e) where the length of the access way is greater than thirty (30) metres, an average gradient no greater than 14.4 per cent; (f) a cross fall no	N/A	N/A

	greater than eighteen (18) per cent if sealed, or 12.5 per cent if unsealed; (g) where there are dips or peaks, entry and exit angles no greater than 12.5 per cent; (h) adequate drainage to prevent soil erosion; (i) where the site: (i) is located within a reticulated municipal water supply area, a maximum length of seventy (70) metres from the development to an all-weather public road designed with culverts and bridges constructed with a minimum load bearing of fifteen (15) tonnes; or (ii) is not located within a reticulated municipal water supply area, a maximum length of 200 metres from the development to an all-weather public road designed with culverts and bridges constructed with a minimum load bearing of eight (8) tonnes.		
Emergency access			
PO6 Development has adequate access to external road networks which can be utilised by emergency vehicles, and	AO6.1 Where located on a property greater than two thousand (2000) square metres in area, the development has direct access to a	N/A	N/A

provides safe evacuation in the event of a bushfire.	constructed all-weather public road which is capable of carrying emergency service vehicles.		
Water supply for firefighting purposes			
PO7 Development provides adequate water supply for firefighting purposes and the water supply is safely located and freely accessible for firefighting.	AO7.1 Development involving existing or new buildings having a gross floor area greater than fifty (50) square metres comply with the following: (a) the development site has access to a reliable municipal reticulated water supply with sufficient flow and pressure characteristics for fire-fighting purposes at all times (the minimum pressure and flow is 10 litres per second at 200 kPa; or (b) all buildings are located within ten (10) metres of a water tank, which: (i) is constructed with fire-proof materials or is located underground with above-ground access points; (ii) meets the minimum water supply requirements outlined in Table 8.2.4.4.3; (iii) is located more than nine (9) metres from any potential fire hazards (such as venting gas bottles and combustible structures);	N/A	N/A

	(iv) is located within six (6) metres of a hardstand area allowing access for a heavy rigid fire appliance; (v) is fitted with fire brigade tank fittings consisting of: (A) for above ground tanks, a fifty (50) millimetre ball valve and male camlock coupling and metal pipe fittings; or (B) for underground tanks, an access hole having a minimum diameter of 200 millimetres to allow access for suction lines; and (vi) is identified by directional signage clearly provided at the street access point. Editor's note: Water supply for fire-fighting is in addition to water supply for household use. Where a non-reticulated supply of water is required, swimming pools, creeks and dams should not be used as a substitute for a dedicated static supply as these sources of water are not reliable during drought conditions.		
Activities involving hazardous material			
PO8 The manufacture or storage of hazardous materials does not increase the risk of fire hazard.	AO8.1 Development does not involve the manufacture or storage of hazardous materials beyond that which is	N/A	N/A

	commonly associated with domestic use.		
Landscaping and fencing			
PO9 Landscaping does not create an unacceptable risk to people or property and provides for ongoing management of risk to the development and people from a bushfire.	AO9.1 Development complies with a landscaping plan which: (a) is prepared in compliance with an approved bushfire management plan; (b) preserves the requirements of any building protection zone; and (c) does not increase the exposure of a habitable building not located in a building protection zone to a bushfire hazard.	N/A	N/A
PO10 Development utilises fencing that: (a) does not contribute to the spread of bushfire; (b) provides access for fire-fighting purposes; (c) facilitates the safe movement of fauna in rural areas.	AO10.1 Fences are constructed: (a) using non-combustible or fire retardant materials within twenty (20) metres of any building used for accommodation; (b) with gates that can be freely accessed for firefighting purposes (if applicable); and (c) to not impede the safe movement of fauna (where applicable).	N/A	N/A
Reconfiguring a lot where located in bushfire hazard areas identified as potential impact buffer, or medium potential bushfire intensity, or high potential bushfire intensity, or very high potential bushfire intensity Note: The following performance outcomes and acceptable outcomes apply only to the following categories of			The site is located within a low, medium, and high bushfire area and a rural zone.

development: Reconfiguring a lot in the Rural zone and in the Emerging Community zone; Reconfiguring a lot in any other zone where more than 6 additional lots are created and a new road is created.			
Bushfire planning			
PO11 The lot layout is designed as a consequence of, and in accordance with the recommendations of a bushfire hazard assessment and management plan. Editor's note: A bushfire hazard assessment and management plan should precede the reconfiguring design and inform the lot layout, not vice versa. Editor's note: The recommendations of a bushfire hazard assessment and management plan (if considered suitable) may be attached to the conditions of any development approval (if given).	No acceptable outcome is nominated.	Please refer to the Bushfire Hazard Assessment and Management Plan submitted with the development application. All recommendation of the management plan have been adopted in the revised layout (**Attachment 1**) or will continue to apply to the proposed development. An updated Bushfire Report isn't considered necessary.	A Bushfire Hazard Assessment and Management Plan was provided with the application.
PO12 A bushfire hazard assessment and management plan demonstrates that all future buildings are able to be separated from the bushfire hazard by a distance which is the greater of the following: (a) a sufficient distance	No acceptable outcome is nominated.	Please refer to the Bushfire Hazard Assessment and Management Plan submitted with the development application. Section 1.3.3 of the report	the Bushfire Hazard Assessment and Management Plan demonstrate that the future dwellings will be able to achieve a BAL level of 29kw/m2

to achieve a bushfire attack level no greater than 29kW/m2; or (b) no less than 1.5 times the mature tree canopy height in the hazard hazardous vegetation; or (c) for forest or woodland vegetation, a sufficient area to create a building protection zone which achieves the following: (i) the inner zone and outer zone of the building protection zone have slopes under thirty-three (33) per cent; and (ii) the inner zone has the following characteristics: (A) it has a minimum distance of ten (10) metres, or a distance sufficient to achieve a bushfire attack level no greater than 29kW/m2; and (B) tree canopy cover in the zone is less than ten (10) per cent; and (C) three canopy is located greater than two (2) metres from any part of the roofline of a building; and (iii) the outer zone has the following characteristics: (A) it has a minimum distance of ten (10) metres plus one (1) metre for every degree of downslope vegetation; and (B) tree canopy cover in the zone is less than thirty (30) per cent. Editor's note: The		demonstrates future dwellings will achieve a BAL no greater than 29kW/m2.	

separation area between buildings and the bushfire hazard may include: a cleared road reserve of adequate width; or open space acceptable to Council as a reserve contributed as part of the open space requirements of a development; or maintainable land retained in private ownership in lots which are large enough to contain the required separation distance; or maintainable open space or fire trail in a Community Management Scheme owned and maintained by the body corporate.			
PO13 Lot design minimises the number of lots which have a direct interface with the bushfire hazard	AO13.1 No more than twenty (20) per cent of the total number of lots in the development interface directly with the fire hazard.	Only ~8% of the lots (Lots 56 to 62) interface directly with the fire hazard.	
Access			
PO14 The reconfiguring design ensures that the road network, future driveways and access routes: (a) avoid potential for entrapment during a bushfire; (b) provide safe and efficient movement of residents, workers and visitors out	AO14.1 Where creating lots having an area less than two (2) hectares: (a) all lots are separated from hazardous vegetation by a constructed all-weather, public road; (b) the road layout provides for at least one	The escape route from vegetation hazards located to the West and North is the internal proposed roads which connect to the existing Saltwater	Residential lots will have an area of less than 2 hectare except for the reserve. Not all lots will be separated from hazardous vegetation by an all-weather public

of the subdivision and away from an approaching bushfire; (c) provides alternative access and egress considering the most likely bushfire scenarios; (d) ensures that the location, siting, and design of development and associated driveways and access routes enables safe and efficient access for emergency services vehicles during and after a bushfire. Editor's note: A bushfire hazard assessment and management plan can assist in demonstrating compliance with this performance outcome.	alternative access route connecting all lots in the development to a public road that meets the requirements in Table 8.2.4.4.2 and which is connects to a collector road; and (c) cul-de-sacs are avoided except where: (i) a perimeter road with a cleared width of twenty (20) metres separates the lots at the head of the cul-de-sac from hazardous vegetation; and (ii) the cul-de-sac is no longer than seventy (70) metres from the intersection with another road to the furthest future building. Editor's note: Where staged development occurs or development is in accordance with an approved master plan, a temporary perimeter road may be considered, subject to availability of reticulated water supply. AO14.2 Where creating lots having an area greater than two (2) hectares: (a) all lots have a driveway or private road access which connects directly to a constructed allweather public road; (b) dead-end roads are a maximum length of 200 metres and an alternative emergency evacuation route is provided away from the	Crescent to the south of the subject lot. **AO14.2 n/a** **AO14.3 N/A** ill not result in driveways longer than 70m.	road. Lots 56 to 62 back on to the future reserve. There is only one entry/exit point to the prosed development which is onto Saltwater Cresent. The development is staged into 4 different stages. However, no perimeter road is proposed for the interim stage. Depending on when the clearing is done, a bushfire break/perimeter road should be established. All driveways lengths will be able to comply

	most likely source of bushfire risk. AO14.3 For all lots, private roads and access driveways comply with the requirements specified in Table 8.2.4.4.2. AO14.4 Where the lots: (a) are required to be supplied with reticulated municipal water supply, private roads and access driveways have a maximum length of seventy (70) metres from an all-weather public road designed with culverts and bridges constructed with a minimum load bearing of fifteen (15) tonnes; or (b) are not required to be supplied with reticulated municipal water supply, private roads and access driveways have a maximum length of 200 metres from an all-weather public road designed with culverts and bridges constructed with a minimum load bearing of eight (8) tonnes.		
Water for fire fighting purposes			
PO15 **Development involving new premises provides adequate infrastructure to support firefighting.**	AO15.1 Where the development is connected to a reticulated water supply, lots are provided with water supply and	Complies This can be conditioned in the Decision Notice where reasonable and relevant.	A condition is recommended.

pressure in accordance with Australian Standard AS2419 Fire Hydrant Installations.		

Table 8.2.4.4.2 — Emergency services vehicles road and access design requirements

Emergency service vehicle road and access design standards
Public roads (other than within the buffer area) are constructed to the following minimum standards: (a) Two-wheel drive, all weather roads, accommodating two way traffic; (b) Perimeter roads are connected to internal road networks at regular intervals; (c) A minimum formed width of 7.5 metres; (d) A minimum six (6) metres clear of standing flammable vegetation (excluding street trees); (e) A minimum cleared height of 4.8 metres; (f) Curves have a minimum inner radius of six (6) metres and they are not excessive in number to allow for rapid access and egress; (g) The minimum distance between inner and outer curves is six (6) metres; (h) Maximum grades for sealed roads do not exceed twenty-five (25) per cent and an average grade of not more than eighteen (18) per cent, or other gradient specified by road design standards, whichever is the greater; (i) Capacity to carry a fully loaded firefighting vehicle (approximately fifteen (15) tonnes for areas with municipal reticulated water supply, or eight (8) tonnes in other areas), with load limits clearly marked on any bridges.
Private roads and fire trails are constructed to the following minimum standards: (a) A minimum formed width of four (4) metres including any gates; (b) A minimum six (6) metres clear of standing flammable vegetation; (c) A minimum cleared height of 4.8 metres; (d) Where less than six (6) metres formed width and greater than 200 metres in length, passing bays twenty (20) metres long by three (3) metres wide, or turning facilities every 200 metres; (e) Adequate drainage and erosion control devices; (f) A gradient no greater than 12.5 per cent and a cross fall of no greater than eighteen (18) per cent; (g) Access at each end of the private road or the fire trail from a public road; (h) Access point signed and direction of travel identified; and (i) Suitable arrangements in place to ensure maintenance in perpetuity. For private roads, capacity to carry a fully loaded firefighting vehicles (approximately fifteen (15) tonnes for areas with municipal reticulated water supply, or eight (8) tonnes in other areas), with load limits clearly marked on any bridges.

Table 8.2.4.4.3 — Water storage requirements

Lot size / use type	Minimum water requirement (per dwelling, combined or independent living quarters, combined or independent living unit, cabin, habitable building,

	non-habitable building having an area greater than 50 square metres, or similar) located on each lot
Lots less than 1,000 square metres	5,000 litres
Lots between 1,000 square metres and less than one (1) hectare	10,000 litres
Lots greater than one (1) hectare	25,000 litres
Other development requirements	
Where the development does not involve a circumstance identified above, the minimum water requirement must be in accordance with water supply recommendations determined as part of a bushfire hazard assessment report and bushfire management plan which has been prepared by a suitably qualified person in accordance with Planning Scheme Policy SC7.2.	

8.2.5. Coastal hazard overlay code

8.2.5.1. Application

This code applies to the assessment of development if it is identified as an applicable code for development, as specified in the assessment benchmarks column in the tables of assessment located in Part 5 of the planning scheme.

When using this code, reference should be made to section 5.3.2 and where applicable, section 5.3.3 located in Part 5.

All subject matter in this code is applicable to the development assessment, unless the following circumstance arises:

(1) The heading of a specific benchmarks for assessment table specifies otherwise; or
(2) A heading within a specific benchmark for assessment table specifies that the outcomes apply to a specific type of development or to development at a specific location; or
(3) A performance outcome or acceptable outcome specifies that the outcomes apply to a specific type of development or to development at a specific location.

In the circumstance where point (2) or point (3) above arises the following applies:

(1) the development assessment outcomes apply only to the type of development specified or only to development at the location specified; and

(2) the development must still be assessed against all other general subject matter of the code. The coastal hazard overlays include the following:

(1) storm tide hazard inundation areas; and

(2) erosion prone areas.

Storm tide inundation areas:

(1)The storm tide hazard inundation areas mapping includes:

(a) areas where detailed storm tide hazard modelling has been undertaken*; and

(b) areas where detailed storm tide hazard modelling has not been undertaken. *Capricorn Coast Storm Tide Study Upgrade, Aurecon 2015 In areas where detailed storm tide hazard modelling has been undertaken, Council has adopted the following planning assumptions for the minimum floor levels of habitable rooms: (a) (b) the 1% annual exceedance probability (AEP) modelling; an assumed 0.8m sea level rise to account for climate change to 2100;

(3) In areas where detailed storm tide modelling has not been undertaken, the defined storm tide hazard level is identified as two (2) metres above highest astronomical tide, which includes a sea level rise factor of 0.8 metres to account for climate change projections to 2100.

Schedule 9 of the planning scheme provides further detailed information relating to storm tide modelling and adopted hazard resiliency levels.

Erosion prone areas:

(1) The erosion prone areas shown on the coastal erosion prone overlay map are declared by the Department of Environment and Heritage Protection (EHP) under section 70 of the Coastal Protection and Management Act 1995, commencing 8 July 2015.

(2) The erosion prone areas mapping includes a 0.8 metre sea level rise to account for climate change projections.

Editor's notes: Applicants must be aware that in storm tide hazard areas, flood hazard may also affect land.

For development located in both the storm tide inundation and coastal erosion prone areas, all performance outcomes below are applicable.

8.2.5.2. Purpose

The purpose of the coastal hazard overlay code is to ensure that development in the coastal zone is planned, designed, constructed and operated to:

(1) avoid, or minimise and mitigate risk to people and property from coastal hazards including storm tide inundation and coastal erosion, taking into account predicted effects of climate change;
(2) and protect coastal resources and allow for natural fluctuations in coastal processes as far as possible.

8.2.5.3. Overall outcomes

The purpose of the code will be achieved through the following overall outcomes:

(1) foreshore ecosystems and biological diversity are protected and managed to maintain their natural protective functions and allow for natural fluctuations to continue as far as possible;
(2) risk from coastal hazards (including predicted effects of climate change) is avoided or mitigated and managed to acceptable levels;

(3) matters of State or local environmental significance are not adversely impacted on in order to achieve hazard minimisation or mitigation;
(4) coastal dependent land use and infrastructure is undertaken in a manner which minimises impacts on coastal resources and mitigates risks to people and property
(5) emergency services facilities and vulnerable community uses are located and designed to function effectively during and after coastal hazard events;
(6) development does not create an unacceptable burden on disaster management response or recovery capacity and capabilities; recovery capacity and capabilities;
(7) development avoids the storage of hazardous materials in a coastal hazard area
(8) public access to the foreshore is maintained and enhanced; and
(9) development does not include canals and artificial waterways that connect to tidal waterways.

8.2.5. Coastal hazard overlay code

Table 8.2.5.4.1 — Outcomes for development that is accepted subject to requirements and assessable development

Performance outcomes	Acceptable outcomes		
Storm tide hazard areas			
PO1 Development of an existing lot is designed and constructed to avoid adverse impacts on people and property from storm tide inundation.	AO1.1 Where an existing lot, development (including additions and alterations) achieves the following: (a) the floor level of habitable rooms is located at or above the defined minimum habitable floor height for the site (refer Schedule 9, Table SC9.1.1); (b) the floor level of non-habitable rooms is located above the adopted inundation levels for the site and intended use (refer Schedule 9, Table SC9.1.2, Table SC9.1.3, and Table SC9.1.6 as relevant to the development); (c) other than AO1.1(d) below, parts	N/A	The development is the reconfiguration of a Lot.

	of a building below the floor level of habitable rooms are completely unenclosed to allow for flowthrough water movement; (d) a lower level enclosure of no more than five (5) square metres may accommodate a laundry or workshop use and is constructed from flood resilient materials; and (e) water tanks located below the minimum floor level of habitable rooms are constructed of reinforced concrete with sufficient footings or supports to resist wave forces. Note: Not all locations within the planning scheme area have detailed modelling. Where detailed modelling has not been undertaken, the defined storm tide hazard level is identified as two (2) metres above the highest astronomical tide, which includes a sea level rise factor of 0.8 metres to account for climate change projections to 2100. An additional freeboard allowance may be required for habitable room floor levels. Editor's note: To assist with determining the suitability of the development, Council may require that a coastal hazard risk assessment is undertaken as part of a development application in	

	accordance with SC7.4 Coastal hazard planning scheme policy.		
PO2 Development involving essential electrical services is located and designed to ensure public safety and minimise consequences of damage due to storm tides. Editor's note: Essential electrical services include any area or room used for fire control panel, telephone PABX, sensitive substation equipment including transformers, low voltage switch gear, high voltage switch gear, battery chargers, protection control and communication equipment, low voltage cables, high voltage cables, and lift or pump controls.	AO2.1 Essential electrical services are located: (a) at or above the defined minimum habitable floor height for the site (refer to Schedule 9); or (b) within an existing basement only where: (i) the basement is a waterproof structure with walls and floors impermeable to the passage of water; and (ii) all entry points are located at or above the defined minimum habitable floor level for the property.	N/A	Electrical services will be able to be located above the defined minimum habitable floor height following the bulk earthworks plan submitted.
PO3 A basement (excluding basement storage used only for bike storage, or change room, or building maintenance storage) is suitably located and designed to ensure public safety.	AO3.1 If development involves a basement (excluding basement storage used only for bike storage, or change room, or building maintenance storage), the basement is located and designed to achieve the following: (a) the basement is a waterproof structure with walls and floors impermeable to the passage of water; and (b)	N/A	N/A. No basement storage is proposed.

	all entry points are located at or above the defined minimum habitable floor level for the property.		
PO4 The development does not change storm tide characteristics, which may cause adverse impacts external to the site.	AO4.1 The development does not involve the following: (a) new buildings or structures or additions to existing buildings or structures (including any impermeable parts thereof) located below the defined storm tide hazard level if: (i) having an enclosed space having a volume exceeding fifty (50) cubic metres; or (ii) resulting in a net increase in building materials resulting in a volume exceeding fifty (50) cubic metres; or (b) a net increase in filling on the site greater than Acceptable outcomes fifty (50) cubic metres; or (c) filling material with a height greater than onehundred (100) millimetres; or (d) block or solid walls or fences; or (e) garden beds or other structures with a height more than one-hundred (100) millimetres.	**Alternate Solution Provided** The proposed development will result in the establishment of residential land parcels which encroach into the mapped erosion prone area. The layout of the proposed infill development is consistent with the built form of the adjoining residential development to the south of the site, which has been filled to deliver low density residential lots, a similar methodology proposed by the current application. In practical terms, the development site is situated in a sheltered backwater of the Mulambin Creek estuary which is not subjected	The proposal does not comply with the AO but will not cause adverse impacts external to the site due to storm tide. It is noted that storm tide was assessed as part of State referral and that approval was granted.

		to erosive processes during a storm tide events (neither scour from wave impact or from the conveyance of flood / tidal waters). As demonstrated by modelling undertaken as part of the Coastal Hazard Assessment, the civil works proposed as part of the development will have negligible impact upon the characteristics of storm tide events external to the site and will not result in actionable damage to properties upstream / downstream or adjacent to the development site. For further details, please refer to afflux mapping included in Appendix D of the Coastal Hazard Assessment prepared by Burchills submitted as part of the RFI response package.	

PO5 Development is located, designed and constructed to avoid adverse impacts on people and property from storm tide inundation.	AO5.1 Development: (a) does not result in: (i) an increase in the number of dwellings at the site; or (ii) an increase in the number of people permanently employed at the site; and (b) is located, designed, constructed and operated to ensure structures can withstand wave action, inundation and recession of flood waters from a defined storm tide event.	**Complies with PO5** The proposed development will result in the subdivision of the existing land parcel to create 85 residential allotments and balance lot. The finished surface level of all lots created as part of the proposed subdivision will be established above the design storm tide level prescribed by the Livingstone Shire Council.	The proposal does not comply with the Ao. However, impacts on people and property will avoid storm tide inundation. Compliance with the PO is able to be achieved.
PO6 Land, buildings and structures used for the manufacture, transport or storage of hazardous materials in bulk, are located and designed to prevent hazardous materials, whether loose or in containers, from entering any water body, waterway or storm tide inundation area.	AO6.1 Land, buildings and structures used for the manufacture, transport or storage of hazardous materials in bulk, are located outside a storm tide inundation area.	N/A	N/A
PO7 Emergency services facilities or vulnerable community uses are located and designed to function effectively during and after coastal hazard.	AO7.1 Development of emergency services or vulnerable community uses are: (a) located above the storm tide event resiliency level for the	N/A	N/A

Editor's note: Emergency services and vulnerable community uses include: emergency services facilities, emergency shelters, hospitals and associated facilities, major switch yards and substations, fire and police facilities, power stations, sewage treatment plants, communication network facilities, retirement village, homes for the aged, hospice, child care centres, educational facilities, stores of valuable records or items of historical or cultural significance (for example galleries and libraries), water treatment plants and works of any electricity entity not listed in this table.	specific use as specified in Schedule 9,Table SC9.1.6; or (b) designed to ensure any components of the infrastructure that are likely to fail or may result in contamination when inundated by storm tide inundation, are located above the storm tide event level for that activity in specified in Schedule 9, Table SC9.1.6.		
PO8 Development is located, designed and operated to maintain or enhance existing levels of public access to and along the foreshore.	AO8.1 Existing public access ways or roads which provide public access to the foreshore: (a) are retained in place; or (b) are re-located subject to Council approval.	N/A	No changes in public access is expected.
PO9 Minor public marine development minimises disturbance of the natural environment within waterways.	AO9.1 New minor public marine development: (a) relies on a natural channel of a depth adequate for the intended vessels; and (b) is designed and located such that maintenance dredging following initial	N/A	N/A

	construction is not required.		
Erosion prone areas			
PO10 Development is located, designed and constructed to avoid adverse impacts on people and property from coastal erosion.	AO10.1 Development is: (a) essential community infrastructure which cannot be located elsewhere; or (b) coastal-dependent development; or (c) temporary, readily relocatable or able to be abandoned. AO10.2 Where involving an additional building or extensions or alterations to an existing building, the development does not extend any further seaward than existing buildings or structures.	**Complies with PO10** The proposed development will result in the subdivision of the existing land parcel to create 85 residential allotments. The finished surface level of all lots created as part of the proposed subdivision will be established well above the design storm tide level prescribed by the Livingstone Shire Council. As demonstrated by modelling undertaken as part of the Coastal Hazard Assessment, the civil works proposed as part of the development will have negligible impact upon the characteristics of storm tide events external to the site and will	The proposal complies with he PO.

		not result in actionable damage to properties upstream / downstream or adjacent to the development site. For further details, please refer to afflux mapping included in Appendix D of the Coastal Hazard Assessment prepared by Burchills submitted as part of the RFI response package.	

Table 8.2.5.4.2 — Additional outcomes for assessable development

Performance outcomes	Acceptable outcomes		
Storm tide hazard areas			
PO11 New lots and development associated with reconfiguring a lot does not create an unacceptable risk of adverse impact to people, property, and infrastructure due to storm tide hazard and inundation	No acceptable outcome is nominated.	**Complies with PO11** The finished surface level of all lots created as part of the proposed subdivision will be established well above the design storm tide level prescribed by the Livingstone Shire Council.	Complies with PO 11

		For further details, please refer to the civil design drawings prepared by Barlow Shelley.	
PO12 The development does not directly, indirectly or cumulatively increase the severity of the coastal hazard and the potential damage of other properties.	No acceptable outcome is nominated.	**Complies with PO12** The development application will result in the creation of 85 residential allotments and a balance lot. Lots within the western extents of the property (within the mapped erosion prone area) will be formed via bulk earthworks. As demonstrated by modelling undertaken as part of the Coastal Hazard Assessment, the civil works proposed as part of the development will have negligible impact upon the characteristics of storm tide events external to the site and will not increase the severity of coastal hazards within the surrounding local area and are unlikely to result in actionable damage to properties upstream / downstream or adjacent to	Complies with PO12

		the development site. For further details, please refer to the Coastal Hazard Assessment prepared by Burchills Engineering Solutions.	
PO13 Development does not include man-made canals or artificial waterways that connect to tidal waterways.	No acceptable outcome is nominated.	**Complies with PO13**	no artificial waterways are proposed. N/A
PO14 Development maintains existing natural environmental features such as mangroves and wetlands to mitigate impacts from storm-tide inundation and permanent inundation due to sea-level rise.	No acceptable outcome is nominated.	**Complies with PO14** The majority of vegetation within the mapped erosion prone area will be protected, with a large balance lot created as part of the development to be retained for conservation purposes. The preservation of the vegetation within this portion of the site will ensure that the physical integrity of the site is protected, mitigating any forces exerted by storm tides during severe weather events. For further details, please refer to the plan of development prepared by Barlow Shelley submitted as part of the application package.	The reserve created on the western side will maintain the existing natural environmental features. The proposal complies with PO14

Erosion prone areas			
PO15 Development avoids or mitigates any increase in risk to people and property from adverse coastal erosion impacts by: (a) minimising the area of the development footprint within the erosion prone area; (b) locating development as far landward as possible; (c) maximising the ability for buildings or structures to be abandoned, or disassembled for relocation either on the site or to another site; (d) installing and maintaining on-site coastal protection works.	disassembled for relocation either on the site or to another site; (d) installing and maintaining on-site coastal protection works.	**Alternate Solution Provided** The proposed development will result in the establishment of residential land parcels which encroach into the mapped erosion prone area. The layout of the proposed infill development is consistent with the built form of the adjoining residential development to the south of the site, which has been filled to deliver low density residential lots, a similar methodology proposed by the current application. In practical terms, the development site is situated in a sheltered backwater of the Mulambin Creek estuary which is not subjected to erosive processes during storm tide events (scour from wave impact or from the conveyance of flood / tidal waters).	The retaining wall will protect and people and property against erosion. The proposal complies with PO15 d)

		All new lots established as part of the proposed development will have a finished surface level above that of the design storm tide level prescribed by the Livingstone Shire Council. As demonstrated by modelling undertaken as part of the Coastal Hazard Assessment, the civil works (filling) proposed as part of the development will have negligible impact upon the characteristics of storm tide events external to the site and will not result in actionable damage to properties upstream / downstream or adjacent to the development site. For further details, please refer to afflux mapping included in Appendix D of the Coastal Hazard Assessment prepared by Burchills submitted as part of the RFI response package.	
PO16 New lots and development associated	No acceptable outcome is nominated.	**COMPLIES WITH PO16**	No unacceptable risk will be created.

with reconfiguring a lot does not create an unacceptable risk of adverse impact to people, property and infrastructure due to erosion resulting from storm tide hazards.		The development application will result in the creation of 85 residential allotments and a balance lot. Lots within the western extents of the property (within the mapped erosion prone area) will be formed via bulk earthworks. All new lots established as part of the proposed development will have a finished surface level above that of the design storm tide level prescribed by the Livingstone Shire Council. As demonstrated by modelling undertaken part of the Coastal Hazard Assessment, the civil works proposed as part of the development will have negligible impact upon the characteristics of storm tide events external to the site and will not result in actionable damage to properties upstream / downstream or adjacent to the development site.

		For further details, please refer to afflux mapping included in Appendix D of the Coastal Hazard Assessment prepared by Burchills submitted as part of the RFI response package.	
PO17 Where used, coastal protection works are: (a) consistent with a shoreline erosion management plan that has been prepared for the area; or (b) undertaken in response to a demonstrated need to protect existing permanent structures from an imminent threat of coastal erosion, where abandonment or relocation of the structures is not feasible, and a relevant shoreline erosion management plan has not been prepared.	No acceptable outcome is nominated.	**NOT APPLICABLE**	N/A
PO18 Development in an erosion prone area: (a) maintains, protects or enhances vegetation on coastal landforms; (b) maintains sediment volumes of dunes and near-shore coastal landforms; or (c) mitigates any increased risks from erosion through the location,	No acceptable outcome is nominated.	**COMPLIES WITH PO18** The majority of vegetation within the mapped erosion prone area will be protected, with a large lot created as part of the development to be retained for conservation purposes.	The proposed reserve will protect vegetation and coastal landform

design, construction and operating standards of development; (d) maintains physical coastal processes beyond the development including longshore transport of sediment along the coast; and (e) prevents increasing the risk of shoreline erosion for areas adjacent to the development, unless the development is an erosion control structure. Editor's note: Applications are to be supported by a report certified by a registered professional engineer that demonstrates this performance outcome will be achieved		The preservation of the vegetation within this portion of the site will ensure that the physical integrity of the site is protected, mitigating any forces exerted by storm tides during severe weather events. It should also be noted that modelling undertaken as part of the Coastal Hazard Assessment identified that there will be negligible afflux experienced offsite during the design storm tide event. For further details, please refer to the plan of development prepared by Barlow Shelley submitted as part of the application package.

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13.6 - DEVELOPMENT PERMIT FOR A RECONFIGURING A LOT FOR A RECONFIGURING A LOT FOR ONE (1) INTO 77 RESIDENTIAL LOTS AND ONE ENVIRONMENT AND DRAINAGE LOT (STAGES 1-4), ON LOT 2 ON RP617670, AND LOCATED AT 1-41 NEVILLE STREET, MULAMBIN QLD 4703

Coastal Hazard Assessment

Meeting Date: 19 August 2025

Attachment No: 9

BURCHILLS
ENGINEERING SOLUTIONS

1-41 Neville Street, Mulambin

Coastal Hazard Assessment

Client: Red Emperor Pty Ltd atf Red Emperor Trust
Project No: BE240146
Document No: BE240146-RP-CHA-02

October 2024

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Document Control Record

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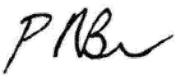
Signed:	
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01	Initial Issue	10.07.2024	NM	PB
02	RFI Response	31.10.2024	NM	PB

Recipients are responsible for eliminating all superseded documents in their possession

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Executive Summary

Burchills Engineering Solutions were engaged by Red Emperor Pty Ltd atf Red Emperor Trust to prepare a Coastal Hazard Assessment for the proposed residential subdivision at 1-41 Neville Street, Mulambin which is properly described as Lot 2 on RP617670 which is situated in the Livingstone Shire Council local government area.

The Coastal Hazard Assessment has been prepared as part of a Development Application package which proposes a residential subdivision which will deliver 91 residential lots, and a balance parkland lot.

A review of relevant State and Local Government map products has been undertaken as part of this assessment including:

- Livingstone Planning Scheme (Version 3);
- State Planning Policy Interactive Mapping System; and
- Development Assessment Mapping System.

Investigations identified that while the subject site was mapped as being impacted by the Livingstone Planning Scheme's *Coastal Hazard Overlay*, the site was mapped by the SPP interactive mapping system as being located within the 'Coastal Area' within a 'Coastal Management District' (CMD). The SPP mapping also identifies that the development site is mapped as being situated within a *Erosion Prone Area* and is subject to *Medium & High Storm Tide Inundation*.

This report has identified that development site is situated in a sheltered backwater of the Mulambin Creek estuary which is not subjected to erosive processes during a storm tide events (neither scour from wave impact or from the conveyance of flood / tidal waters).

The proposed infill development is consistent with the built form of the adjoining residential development to the south of the site, which has been filled to deliver low density residential lots, a similar methodology proposed by the current application. The establishment of the proposed development will require filling to a depth of up to 800mm deep as described on the attached earthworks concept plan, this with result in a loss of approximately 4,480m^3 of flood storage.

This version of the report has been prepared to address the Council's information request dated 16th August 2024, specifically, item 8.1 requesting 2-dimential hydraulic modelling of the potential effects on adjacent sites of the proposed filling in respect to the 1% AEP flood and storm tide event. The details of the modelling performed are contained in section 4 of this report.

The flood storage loss is a tiny fraction of flood storage available within the estuary, and hydraulic modelling has indicated that there will be no hydraulic impacts on upstream, downstream or adjacent properties or an increase in the coastal process risk profile resulting from the proposed civil works filling. Further the modelling indicated that the peak flood/storm tide level for the 1% AEP event as mapped in the Council Constraints mapping is RL3.78mAHD providing a 0.8m sea level rise, 300mm wave set-up, 300mm freeboard to the designated floor level of 5.2mAHD.

The proposed filling and edge rock/structural retaining will provide adequate mitigation of future coastal processes potentially impacting the proposed development.

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Table of Contents

Tables

Figures

Appendices

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1. Introduction

Burchills Engineering Solutions were engaged by Red Emperor Pty Ltd atf Red Emperor Trust to prepare a Coastal Hazard Assessment for the proposed residential subdivision at 1-41 Neville Street, Mulambin which is properly described as Lot 2 on RP617670 which is situated in the Livingstone Shire Council local government area.

The Coastal Hazard Assessment has been prepared as part of a Development Application package which proposes a 1 into 81 lot subdivision which will deliver 79 residential lots, a drainage / park lot and balance / parkland lot.

A review of relevant State and Local Government map products has been undertaken as part of this assessment including:

- Livingstone Shire Planning Scheme 2018;
- State Planning Policy Interactive Mapping System; and
- Development Assessment Mapping System.

The assessment has determined that parts of the proposed residential subdivision development will need to consider:

- Exposure to erosive processes driven by the fluctuation of the tidal prism;
- Hydrostatic and hydrodynamic forces exerted upon infrastructure during storm tide events;

1.1 Information Request Response

Table 1.1 provides responses to Livingstone Shire Council Information Response (D-235-2024) dated 16 August 2024

Table 1.1 Information Request Response

Item	Information Requested	Response
3	Provide a full assessment against the following assessment codes of the Livingstone Planning Scheme 2018, Version 3.0: 3.3 Flood Hazard Overlay Code	The proposed development on the subject site is outside of the Flood Hazard extent. Further details are provided in Section 2.2.
8	Coastal Hazard Assessment / Site Base Stormwater Management Plan related to proposed lots within Coastal Hazard Overlay	Refer to Section 4 for details on the 2d hydraulic modelling.
8.1	Provide an updated Coastal Hazard Assessment Report and the Site-Based Stormwater Management Plan which includes	
8.1.1	A 2-dimensional hydraulic model for new lots within the Coastal Hazard Area Overlay including lost flood storage due to proposed earthworks.	

Item	Information Requested	Response
8.1.2	Demonstrate that all proposed lots achieve a minimum finished floor level as per the inland coastal requirement of 5.2 metres Australian Height Datum (AHD) at Mulambin under the Livingstone Planning Scheme 2018, or achieve a minimum finished level being proved not being inundated under 1% AEP event as per the 2-dimensional hydraulic model as requested above.	Refer to Section 4.7 for mapping showing the proposed development remains above the 1% AEP event levels.
8.1.3	Demonstrate that the proposed works would not cause storm tide hazard impact and flood impact to other properties.	Refer to Section 4 for information in relation to storm tide. The 2d hydraulic modelling showed that there is no increase in hazard to surrounding properties. The proposed development on the subject site is outside of the Flood Hazard extent and will therefore not increase flood impact to other properties. Further details are provided in Section 2.2.

1.2 Site Description and Characteristics

The subject site is located at 1-41 Neville Street, Mulambin and is properly described as Lot 2 on RP617670. The site has a total area of 100,000m^2 and is identified by the Livingstone Shire Plan as being situated within a Rural zone.

The site in its current state the site remains undeveloped, with no built form onsite. The site is traversed by a number of unformed access tracks, which run in a north / south alignment and provide access to the property from Neville Street to the north and Portside Drive to the south. To the south and west of the site, the property is bound by low density residential development which is dominated by detached dwellings. To the north, the site is bound by further low density residential development and Neville Street, which forms the properties major site access. To the west the property is bound by rural land and Mulambin Creek.

A large proportion of the site covered by established vegetation, with only the site boundaries and tracks maintained as a grass cover. A small tidal inlet of Mulambin Creek is situated in the south-western extents of the property. A swale which is situated on the southern side of the Neville Street road reserve discharges stormwater to this inlet.

Figure 1.1 below provides a locality plan depicting the location of the development site while Figure 1.2 provides an aerial photograph of the site in its current state.

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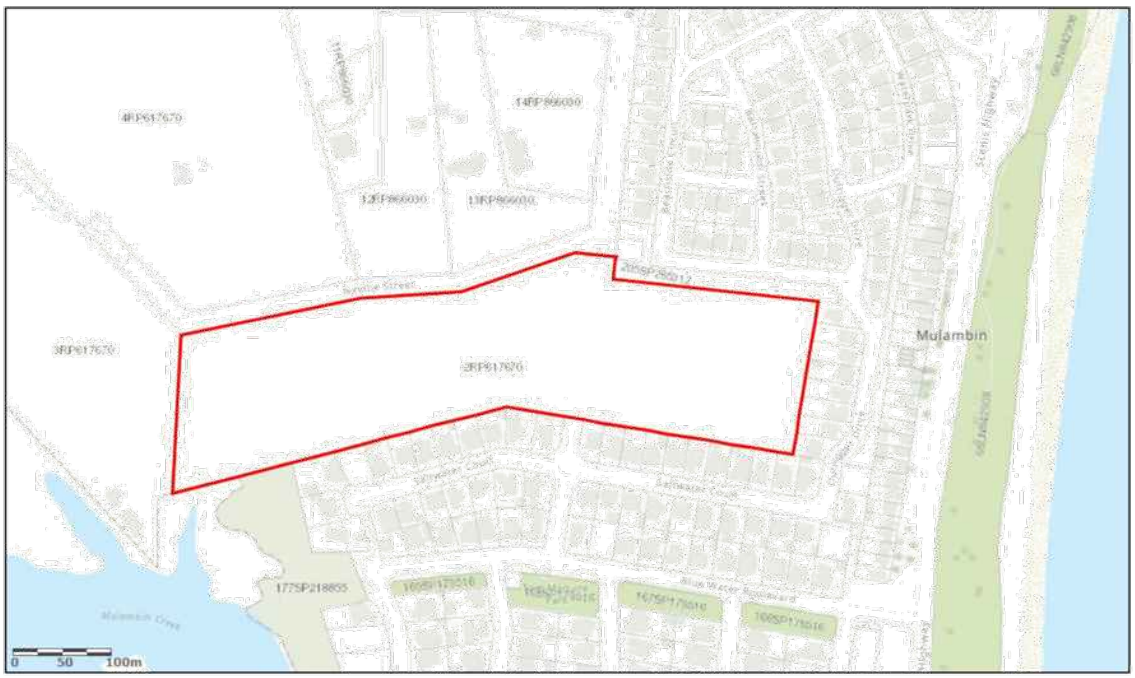

Figure 1.1 Locality Plan (Courtesy: DAMS)

Figure 1.2 Aerial Photograph of the Subject Site (Courtesy: DAMS)

1.3 Development History

A development permit for the subdivision of the subject site has been issued by the Livingstone Shire Council in the past. The development permit issued on 9 February 2016 (Council Reference: D/74-2015) granted permission for the subdivision of the existing land parcel to create 62 residential lots and open space. An extract of the approved plan of development is provided below in Figure 1.3.

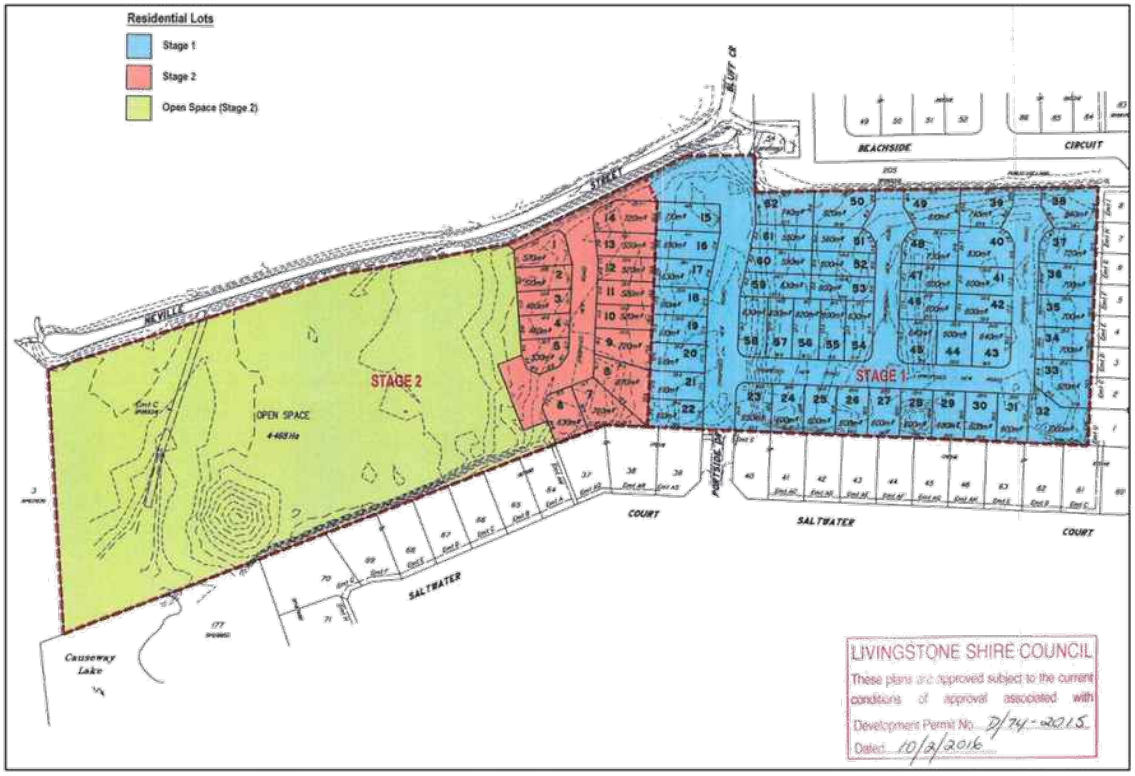

Figure 1.3 Previously Approved Plan of Development

1.4 Proposed Development

The development proposal will see the existing rural land parcel subdivided to deliver 91 low density residential lots, internal road network, a park / drainage lot and balance parkland lot. The residential lots delivered as part of the subdivision will vary in size from 450m^2 – 1,284m^2 and will have finished surface levels generally ranging from 5.0m – 5.7m.

Figure 1.4 below provides an extract of the plan of development prepared by Barlow Shelley Consulting Engineers. For further details, please refer to the full plan of subdivision contained in Appendix A of this report. Preliminary Bulk Earthworks Plans prepared by Barlow Shelley Consulting Engineers detailing civil works associated with the establishment of the proposed development are included in Appendix B.

Figure 1.4 Proposed Plan of Subdivision (Courtesy: Barlow Shelley Consulting Engineers)

2. Initial Desktop Review

2.1 Livingstone Planning Scheme 2018 – Coastal Hazard Overlay Code

An interrogation of the Livingstone Planning Scheme 2018 (Version 3) interactive mapping system has identified that the subject site is situated within the *Coastal Hazard* overlay and is within a:

- Coastal Hazard - Erosion Prone Area; and
- Coastal Hazard - Storm Tide Hazard Area.

The location of the subject site within a mapped coastal hazard area triggers assessment against the provisions of the Livingstone Planning Scheme's Coastal Hazard Overlay Code.

Figures 2.2 below provides an extract of the Coastal Hazard Overlay which depicts the extent of the erosion prone area over the site while Figure 2.3 depicts the extents of the site impacted by storm tide inundation. With respect to the figures below it is clear that the subject site in in a sheltered backwater and on the fringe of the impact zone for the mapped coastal hazards.

Figure 2.1 Erosion Prone Area Overlay Extract (Courtesy: Livingstone Shire Council)

Figure 2.2 Storm Tide Inundation Area Overlay Extract (Courtesy: Livingstone Shire Council)

2.2 Livingstone Planning Scheme 2018 – Flood Hazard Overlay Code

An interrogation of the Livingstone Planning Scheme 2018 (Version 3) interactive mapping system has identified that the subject site is situated within the *Flood Hazard Area.* However, as shown in Figure 2.3, the proposed development is outside of the Flood Hazard Area. Therefore, no further assessment is required.

Figure 2.3 Flood Hazard Overlay (Courtesy: Livingstone Shire Council)

The experience you deserve

2.3 Development Assessment Mapping System

An interrogation of the Development Assessment Mapping System has identified that the subject site is located within the Coastal Zone and is identified as being located within an erosion prone area and is partially located within the High to Medium Storm Tide inundation area. It is also important to note that the site is situated within the Coastal Management District (CMD), triggering assessment against the provisions of the State Development Assessment Provisions (SDAP) State Code 8: Coastal Development and Tidal Works.

Figures 2.3, 2.4 and 2.5 below provide extracts of DAMS Mapping depicting the extents of the mapped natural hazards overlays. For further details regarding the DAMS coastal hazard mapping, please refer to Appendix C.

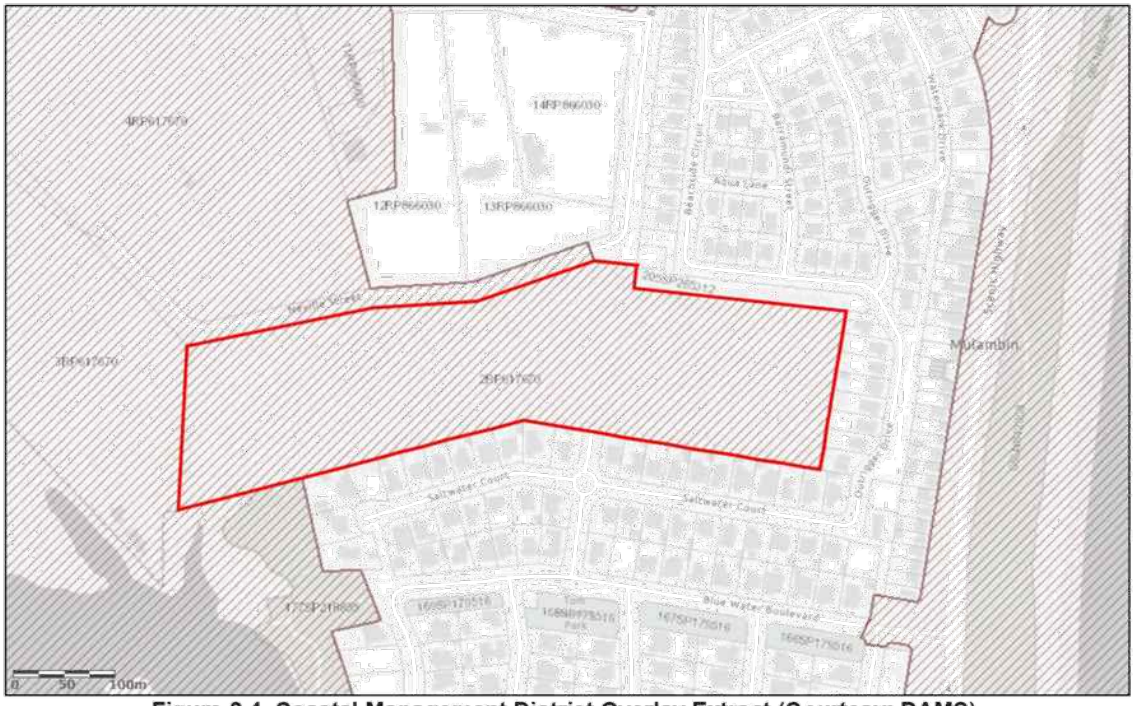

Figure 2.4 Coastal Management District Overlay Extract (Courtesy: DAMS)

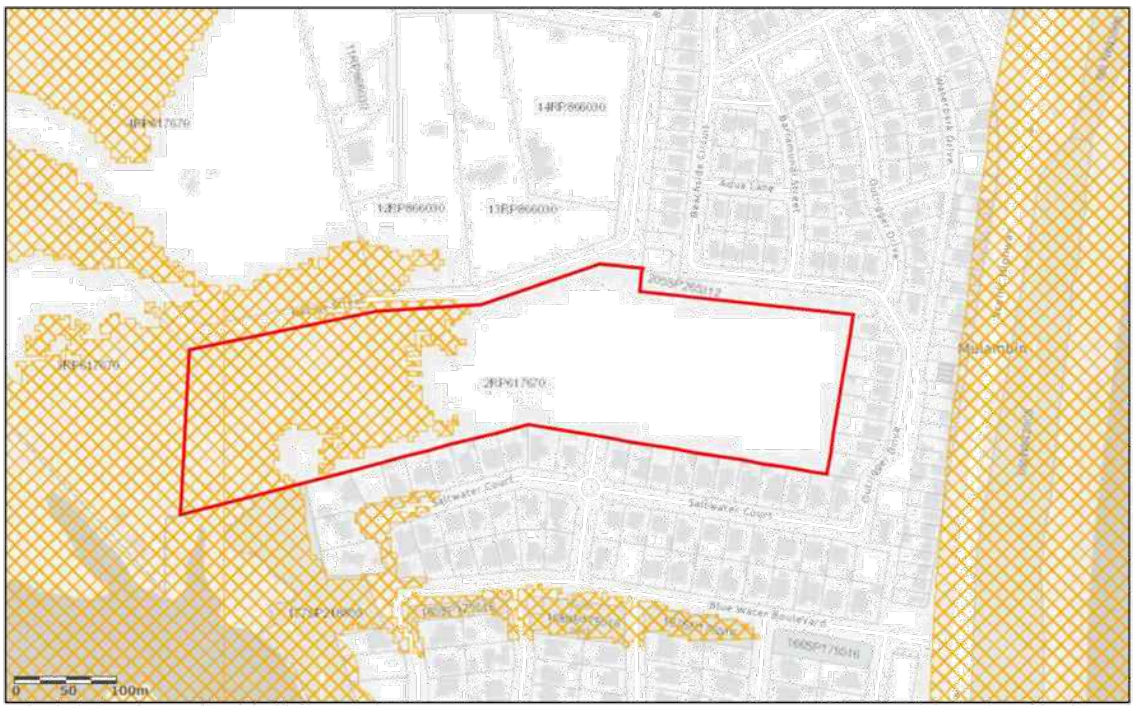

Figure 2.5 Erosion Prone Area Overlay Extract (Courtesy: DAMS)

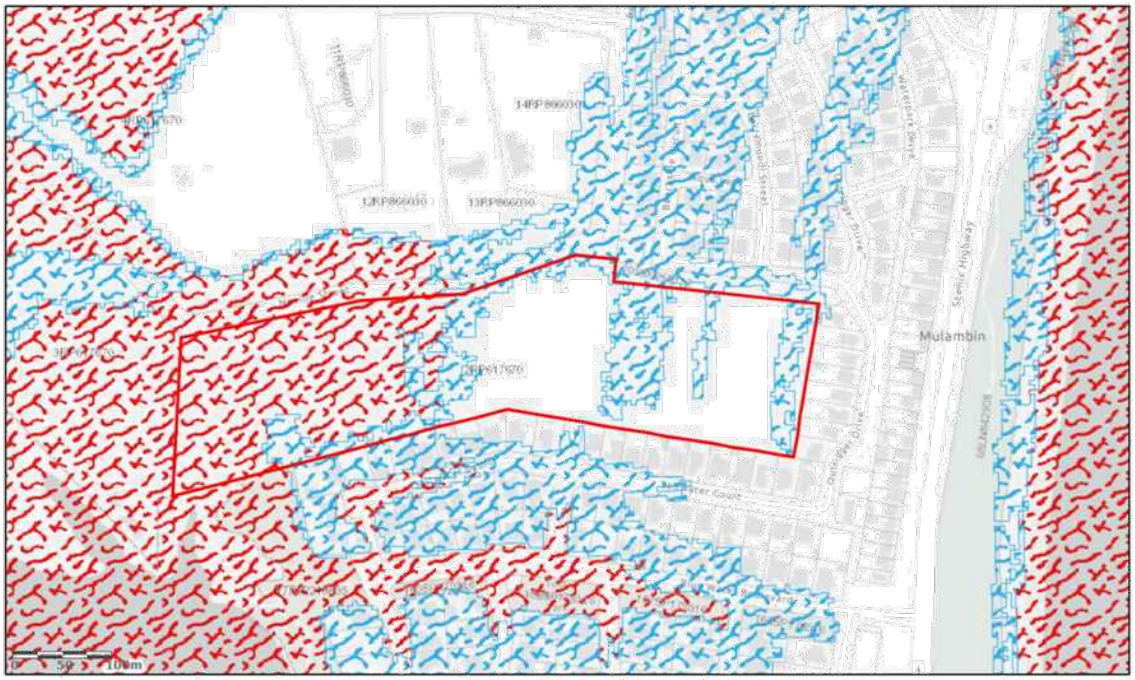

Figure 2.6 High & Medium Storm Tide Inundation Area Overlay Extract (Courtesy: DAMS)

3. Site Conditions

3.1 Environmental Conditions

The proposed subdivision is located adjacent to the lower reaches of Mulambin Creek. This area of the catchment is a dynamic environment which is shaped by coastal processes including fluctuations in the tide and storm surge. Given the location in the backwater of the estuary, there is limited direct effect of flooding and storm tide events on the subject site in the vicinity of the proposed development. Further the robust vegetation growth in the intertidal zone provides resilience against any erosive forces.

The following sections of this report discuss the environmental conditions experienced at the investigation area, focusing upon the following:

- Astronomical Tides; and
- Storm Tides.

3.2 Astronomical Tides

Property adjoining the Coral Sea is subject to semi-diurnal tides which have a tidal range of 5.21m. Tidal planes for Rosslyn Bay have been based on levels prescribed within the 2024 Semidiurnal Tidal Planes chart produced by Maritime Safety Queensland and have been reproduced below in Table 3.1.

Table 3.1 Semi Diurnal Tides Range for Rosslyn Bay 2024 PSM 47748

Tidal Planes	Level (m above LAT)	Level (m AHD)
Highest Astronomical	5.21	2.73
Mean High Water Spring	4.28	1.80
Mean Hight Water Neap	3.3	0.82
Mean Low Water Spring	0.67	-1.81
Mean Low Water Neap	1.66	-0.82
Mean Sea Level	2.48	0.00
Australian Height Datum	1.74 ref 6.64	0.00
Lowest Astronomical Tide	0.00	-2.48
Minimum Site Level	4.12	2.38
Maximum Site Level	6.56	4.82

3.3 Storm Tides

Storm tide inundation coupled with extreme wave conditions are the coastal hazards with the greatest potential for loss or harm to the community and environment. Storm tide inundation becomes a natural disaster when severe disruption occurs to a community (EPA, 2006). Storm tide is a combination of the normal astronomical tide and storm surge which in North-East Queensland are caused by severe weather events such as Tropical Lows (Cyclones).

A storm tide is the combined or total water level which comprises of the following components:

- Astronomical Tide; and

- Storm surge, the combined effect of the shore-ward, wind-induced currents generated by severe weather events.
- Wave set-up, the increase above the still-water level resulting from the presence of breaking waves in the surf zone.

The Capricorn Coast Storm Tide Study Upgrade prepared by Aurecon for the Livingstone Shire Council assessed the storm tide risks along the LGA's coastal fringe. As part of the report, storm tide modelling was undertaken to determine design water levels for specific scenarios and to establish minimum habitable floor levels for new developments in storm tide affected areas. Storm tide levels for the current day, years 2050 and 2100 1% AEP storm tide events for the Mulambin locality are detailed in Table 3.2 below.

Table 3.2 Summary of Predicted Storm Tide Levels for Mulambin Locality

Storm Tide Event	Scenario		
	Current Day	2050 Climate Change	2100 Climate Change
1% AEP	3.78m AHD	4.4m AHD*	4.9m AHD**

- **Accounts for a 0.3m sea level rise and 0.3m wave set-up*
- *** Accounts for a 0.8m sea level rise and 0.3m wave set-up*

3.4 Wave Action

While the subject site is situated in a coastal environment, the impacts of wave action upon the development will be negligible, as the site is setback from the open coast and is not exposed to wave energy.

3.5 Fluvial Flooding

The development site is situated within the Mulambin Creek estuary and is subject to periodic inundation during the design flood event (year 2100 climate change scenario 1% Annual Exceedance Period (AEP) flood event). The modelled climate change scenario event (as per the methodology prescribed by the State Planning Policy) accounts for a 0.8m of sea level rise and a 10% increase in rainfall intensity.

Due to the location of the proposed development at the bottom of the catchment, and located on a cul de sac tributary, the influence of fluvial flooding over the site will be minor only, with inundation largely driven by storm tides and backwater. Fluvial flooding will be low velocity and the risk of erosion is very low.

3.6 Design Considerations

3.6.1 Impacts of Coastal Hazards

The development site's south-western extents interface with Mulambin Creek. During storm tide events, flood waters can be expected to enter the site via an inlet of Mulambin Creek. Conditions during a storm tide event in this locality will be characterised by increased water levels within the Mulambin Creek catchment.

Increased water levels within the catchment will result in the temporary inundation of the site above the normal tidal range and can be expected to inundate the site for as long as an extended tidal cycle

(6-8hrs). The location of the site (inland from the open coast) means that the site will not be exposed to the impacts of wave actions. Additionally, the site is not located on a major conveyance path and is unlikely to be exposed to flows with any velocity which may result in bank erosion.

It is concluded therefore, that the impacts to the site from storm tide will be limited to:

- The fluctuation of tidal waters; and
- Forces exerted by water upon structures inundated by flood waters (hydrostatic uplift).

3.6.2 Coastal Protections

To ensure that the proposed residential subdivision is protected from the impacts of potential future coastal processes, it is proposed that a fill verge protected by a rock retaining wall situated on the western extents of the proposed residential lots adjacent be provided to protect the development from any future storm tide and resulting coastal hazards.

For further details, please refer to the civil design drawings prepared by Barlow Shelley Consulting Engineers submitted as part of the development application package.

3.6.3 Minimum Habitable Floor Levels

As detailed within *Schedule 9: Standards for Storm Tide Resilience* of the Livingstone Planning Scheme requires that all new development occurring in areas impacted by mapped coastal hazards (storm tide inundation / coastal erosion) be constructed to satisfy minimum habitable floor level requirements. Table 9.1.5 of Schedule 9 prescribes the minimum habitable floor levels for inland localities. The table identifies that new development occurring within the Mulambin locality (where inland from the coast) be constructed with a minimum finished floor level of **5.2m AHD**.

This makes allowance for the year 2100 climate change scenario which includes a stormtide level of 3.78m AHD, 0.8m sea level rise, 0.3m wave set-up and 0.3m of freeboard.

3.6.4 Flood Storage

As detailed in the civil design drawings prepared by Barlow Shelley Consulting Engineers, the proposed development will encroach into an area which is mapped as being subject to inundation during the design flood / storm tide event, resulting in an overall loss of approximately 4,480m^3 of flood storage. While the loss of 4,480m^3 of flood storage is considerable, flooding in this portion of the catchment (approximately 1.3km from the mouth of Mulambin Creek) is heavily influenced by storm tide and backwater, rather than fluvial conveyance flooding, so that any flood afflux resulting from the proposed filling will be negligible.

The site is also situated in a protected backwater of the Mulambin Creek estuary where velocities experienced during design flood events are low and impacts from wave action are minimal (refer Section 3.4).

Given the location of the proposed development and the conditions experienced onsite during the design event, it is expected that there will be no hydraulic impacts on adjacent properties upstream / downstream or adjacent during flood stormtide events as a result of the proposed earthworks.

4. Hydraulic Modelling

4.1 Overview

Burchills have created a TUFLOW model of the region, to replicate the results from the Capricorn Coast Storm Tide Study Upgrade (Aurecon, 2015), as Council's model was not able to be supplied. The model represents the Causeway Lake Coastal catchment, including Mulambin Creek. The model covers an area of 35km^2 and uses a nested grid, with a 10m grid cell size over the wider floodplain, 5m along the northern branch of Mulambin Creek and 2.5m around the Site, as shown in Figure 4.2.

This model will be used to test if the proposed development results in any increase in storm tide hazard for the surrounding properties.

The information below provides a summary of the TUFLOW modelling.

4.2 Model Scenarios and Events

Two (2) distinct model scenarios were simulated for the HIA:

- Pre-development scenario – represents the existing conditions of the subject site and surrounding area in the TUFLOW model.
- Post-development scenario - represents the post-development conditions of the subject site, including the fill pads, retaining wall and swale.

The 1% AEP storm tide scenario was assessed.

4.3 Model Boundary Conditions

The storm tide boundary has been applied upstream of the Scenic Highway causeway. Details of the structure were not available at the time of modelling.

The storm tide boundary was created using the Spring Tide, which has then been adjusted to take into account the storm surge. This boundary condition compared favourably with that shown in the Aurecon (2015) report to ensure consistency.

The development site location was compared to Council's mapped fluvial flood line. The site is located landward of the extremity of the fluvial flood line so accordingly fluvial flooding does not impact the site.

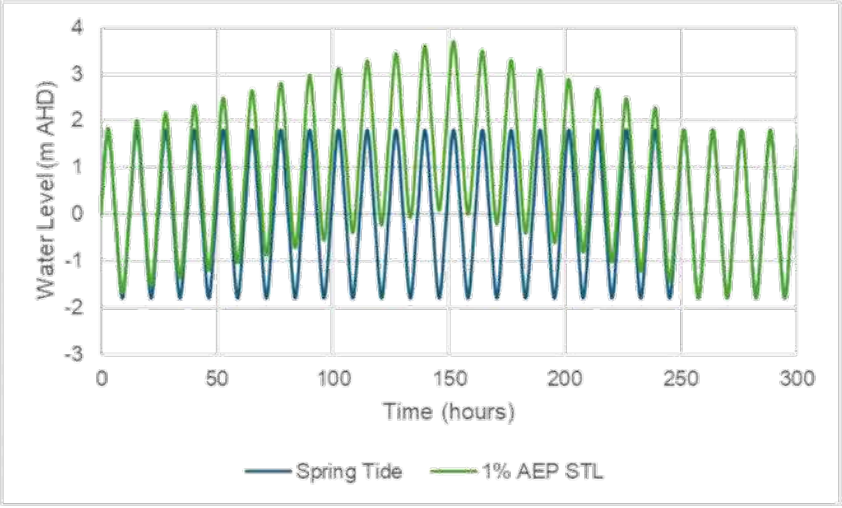

Figure 4.1 1% AEP Storm Tide Level Boundary Condition

4.4 Model Topography

LiDAR of the area was obtained from ELVIS, which was flown in September 2015.

The post-development topography was based upon the bulk earthworks plan, as shown in Figure 4.2.

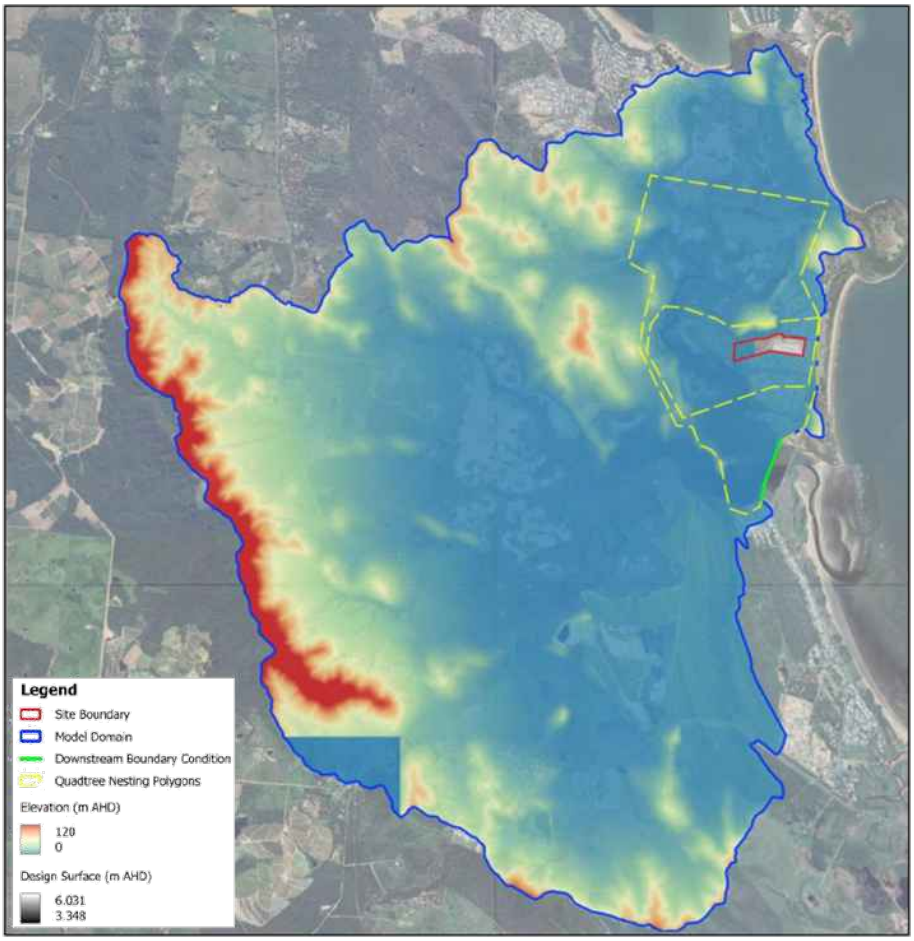

Figure 4.2 Post-Development Model Topography

4.5 Model Roughness

Table 4.1 provides the Manning's n values assigned to each type of land use within the modelled extent. This is consistent with the values used in the Aurecon (2015) study. Figure 4.3 shows the pre-development model roughness.

Table 4.1 Model land use and roughness

Land use types	Manning's n
Dense vegetation	0.09
Medium vegetation	0.07
Grassland/swamp	0.04
Urban areas	0.1
Waterbodies	0.05