

Review of Environmental Factors (REF)

Environmental Assessment for Council Projects

Yellow Rock Road Upgrade, Tullimbar

Contents

Section A – Project Details; Background Location and Context	3
Section B – Site Identification	12
Section C – Reasons for Activity and Options	13
Section D – Existing Environment and Assessment of Impacts.....	15
Vegetation on Site	15
Fauna and Fauna Habitat.....	16
Water	17
Fish Habitat.....	18
Coastal	19
Contamination	19
Heritage.....	20
Impact Assessment	22
Strategic Planning:.....	24
Section E Planning Controls and Approvals.....	25
Section F – Environmental Conditions	27
Section G – Conclusion and Summary of Impact Assessment	32
Section H	33
Section I – Environment Officer Sign Off.....	33
Section J – Project Approval	34
Section K – Acknowledgement of and Commitment to Comply with Conditions.....	35
Section L – Site Induction – Councils Environment Officer	36
Section M – Site Inspection – Environment Officer	37
Appendix A – General Arrangements Plan	38
Appendix B – Background Searches.....	39
Appendix C – MNES Checklist	40

Appendix D – Aboriginal Heritage Due Diligence Report	41
Appendix E – Arborist Report	42
Appendix F – Acid Sulfate Soil Unexpected Finds Protocol.....	43

Document Version Control			
Version	Date	Description of Revision	Revised By
0.1	09-05-2025	Draft REF	
0.2	18-09-2025	Second Draft REF (following update to project design)	
0.3	03-10-2025	Update of Second Draft REF (following Council comments)	
0.4	8-01-2026	Council's update following Executive Manager comments for determination	
0.5	19-01-2026	Replying to internal comments	

Shellharbour City Council acknowledges the Traditional Custodians of Dharawal Country and recognises their continued connection to the land. We pay our respects to Elders past, present and emerging and the contribution they make to the life of this city.

This Review of Environmental Factors (REF) has been developed to ensure compliance with exercising an appropriate level of environmental due diligence under the relevant Environmental Planning and Assessment Act 1979 and other relevant Acts, including Division 5.1 and the requirements of Section 171(2) of the Environment Planning & Assessment Regulation 2021. This REF has been prepared in accordance with the requirements of Part 8, Division 1, sections 168-171 of the Environment Planning & Assessment Regulation 2021 and the NSW Government Guidelines for Division 5.1 Assessment (June 2022) published on the NSW planning portal. Separate Environmental Planning Instruments made under the EP&A Act may also be relevant and are addressed below in section A and section E.

Section A – Project Details; Background Location and Context	
Name of Project	Yellow Rock Road Upgrade, kerbside road repairs and upgrade of a stormwater detention basin, Tullimbar.
Type of project	Road upgrade works and associated kerbside road repairs and stormwater detention basin upgrade along Yellow Rock Road, Tullimbar including widening and re-sealing the existing road and construction of a 2.5 metre wide shared path.
Description of Proposed Works / Activities	The activity Shellharbour City Council is proposing improvements to Yellow Rock Road, Tullimbar. The activity area begins at the intersection of Yellow Rock Road and Illawarra Highway and ends at the stormwater detention basin on Paul Circuit Reserve. Improvement works include widening and re-sealing the road, installing and realigning associated infrastructure, and upgrading a stormwater detention basin. General Arrangement plans and other details are contained in Appendix A. Proposed works consist of: • Widening/re-sealing of the road, including the removal of four planted street trees. • Installation and realignment of stormwater infrastructure including pipes. • Extension of certain residential driveways where necessary. • Removal of redundant pavement and reinstatement with soil and turf at the existing turning head just south of the intersection of Yellow Rock Road and Illawarra Highway. • Creation of a 2.5 m shared path along the length of the road. • Potential utility relocation and readjustment where required. • Land acquisition at certain locations. • Line marking and new street signage. • Realignment of footpath in Hereford Chase (SP2), including the removal of three trees. • Addition of slip lane (SP2.5) into Araluen Terrace, including the removal of two trees. • Upgrades to stormwater detention basin on Paul Circuit Reserve including the removal of existing stormwater infrastructure, installation of new stormwater infrastructure and regrade of the basin floor.

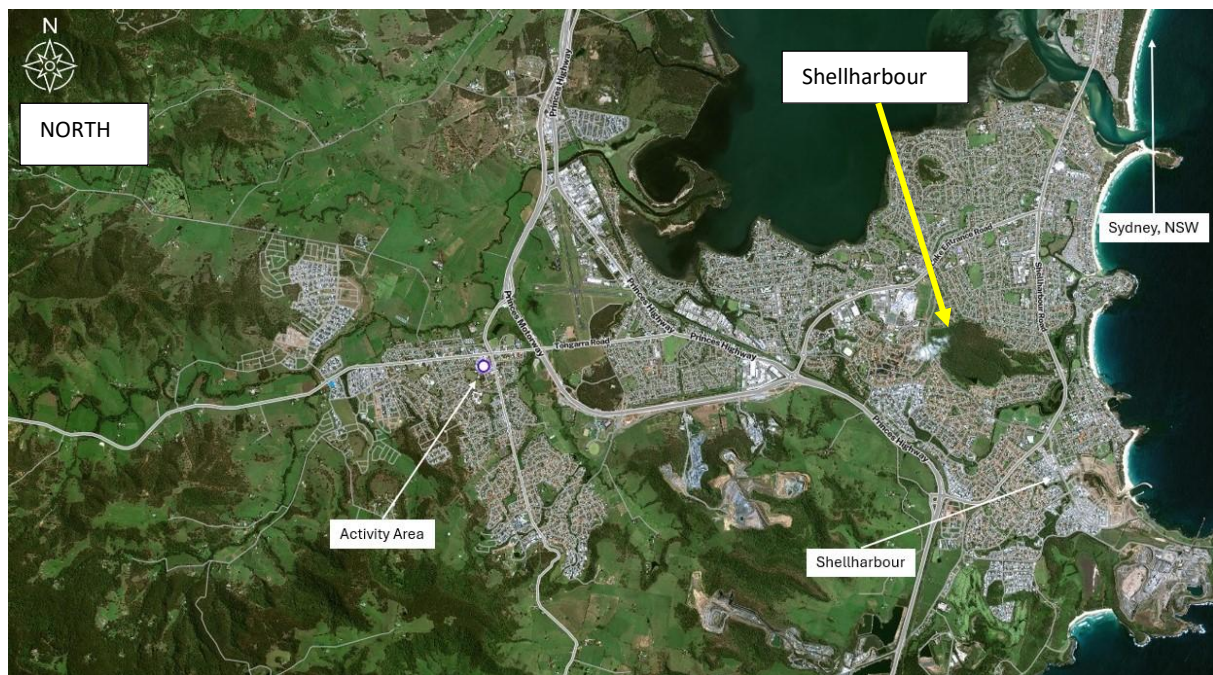
	Location and Context The activity area is approximately 840 m in length from Lot 1/DP1159680 to Lot 37/DP1216834. The area consists of formed road, road shoulder/embankment, man-made channel, stormwater detention basin and largely planted vegetation on both sides of the road at separate points. Two large Moreton Bay Fig trees are present on private land on the western side of the Yellow Rock Road / Wongawilli Street intersection. Two large Camphor Laurel trees and a mature Stone Pine are located on private land off Hereford Chase (this land is to be acquired). Two native trees are also located in the vicinity of the proposed slip lane. Site Context and Location of the activity area is shown in Figure 1 and Figure 2 respectively. The character of the activity is depicted in Photo 1 and Photo 2. Laydown and Compound Area The laydown / compound area that will be used to service construction activities will be located on disturbed land within the road reserve immediately north of Araluen Terrace. Access Access to the site will be via Illawarra Highway and Yellow Rock Road, and Yellow Rock Road will be required to operate under traffic control. Plant and Machinery Machinery to be used will include the following: • Excavator up to 12t. • Tipper Trucks. • Compactors. • Concrete trucks. • Dump truck. • Light vehicles. • Scrapers. • Asphalt pavers. • Backhoes. • Bulldozers.
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	Equipment and materials are expected to be stored within the laydown / compound area immediately north of Araluen Terrace. Materials Material to be used will include the following: • Erosion and sediment controls (e.g., coir logs, silt fencing, geofabric, sandbags). • Earthwork materials (e.g., topsoil, gravel, sand, clean fill material) and other various materials for road formation. • Bitumen and aggregates for pavement production. • Stabilising binders to treat the road formation and culvert bases. • Cement and aggregates for concrete (drainage construction, pavement construction, and kerb and guttering). • Precast concrete elements for drainage construction and miscellaneous work. • Concrete. • Mass Block Concrete Retaining Blocks. • Turf. • Stormwater pipes. • Gabion baskets. • Sandstone logs. Waste Management Disposal, tracking and destination facilities of wastes will be recorded and undertaken in accordance with NSW EPA Waste Classification Guidelines. Waste will generally consist of: • Construction waste (concrete, road materials and stormwater detention basin materials) • Stormwater infrastructure waste required to be removed as part of the stormwater detention basin upgrade. • Waste oils and liquids from machinery. • Domestic wastes generated by workers. • Cleared vegetation waste. Waste generation from the proposed works is estimated to include: • 80 m³ concrete waste.
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	• 1,300 m³ clay for disposal following sub-grade improvements. • 1,200 m³ road base (re-usable). Other The works will be carried out by a contractor on behalf of Shellharbour City Council. No ongoing works are expected during the 'operational' phase, post construction. The northern entrance to the activity area will be accessed via Illawarra Highway at the intersection of Escarpment Drive, Illawarra Highway and Yellow Rock Road intersection and the southern entrance via the intersection of Yellow Rock Road and Araluen Terrace.
Is excavation required?	☒ Yes ☐ No If yes, what is maximum depth? Excavation is expected to be to a maximum depth of 700 mm for stormwater and gutter improvement works. Excavation of the stormwater detention basin is required to remove existing infrastructure and to regrade the basin floor to batters of 1:2 and 1:4. No known contaminated sites have been recorded within the activity area (NSW EPA) (Appendix B).
Is vegetation removal required?	☒ Yes ☐ No The activity will require the removal of four planted street trees, two large Camphor Laurel trees and one Stone Pine tree (referred to as Trees 1-3 in the Arborist report), and two native <i>Acacia maidenii</i> trees in the vicinity of the slip lane (refer Photo 5). All vegetation removed will be replaced on a one for one basis. The activity will also require the trimming of two large Moreton Bay Fig trees (referred to as Trees 4 and 5 in the Arborist report). An Arborist report has been prepared for Trees 1-5 and is contained in Appendix E. Regional mapping maps vegetation in the activity area is classified as mostly cleared.
Outline of Concept/final/detailed design	A General Arrangement Plan is provided in Appendix A. The Description of Proposed Works / Activities has been provided at the introduction of this Section.

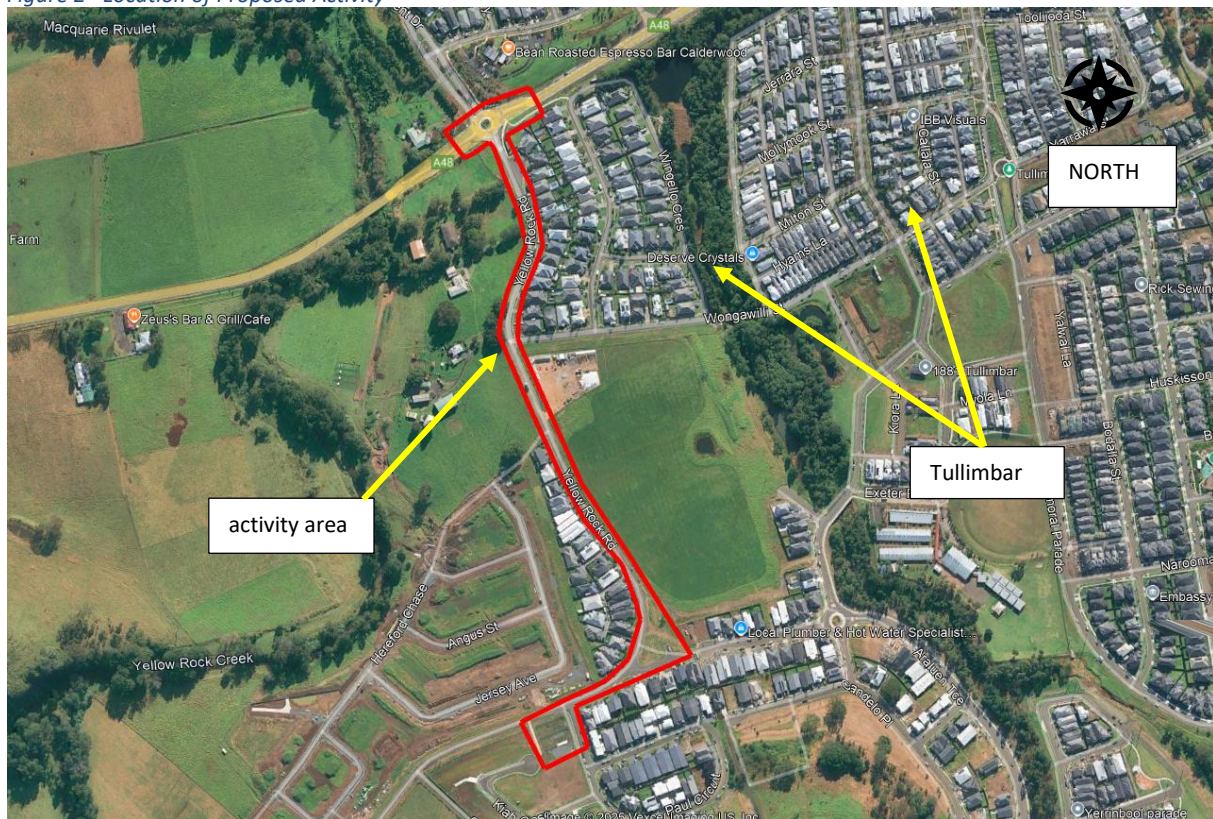
	The road works will also include: • Make smooth connection with existing shared path. • Make smooth connection with existing kerb and gutter. • Demolish footpath and reinstate footpath with turf. • Match existing service put lid to new shared path. • Existing kerb inlet put to be demolished, redundant pipe to be filled with cementitious grout. • Extend driveway to proposed kerb alignment. • Demolish and dispose of redundant pavement and reinstate with soil turf. • Construct concrete driveway layback. • Replace rural fencing where boundary is changed, new fencing to match existing. • Modify existing pit to suit new kerb location and levels. The stormwater detention basin works will also include: • Stormwater management upgrade to support the Yellow Rock Road upgrade activities. • Removal of existing infrastructure, including pipes, headwall, outlet pits, riprap, bioretention and associated subsoil drainage lines, and a concrete weir. • Installation of new infrastructure, including box culvert, concrete weirs, stormwater pipes, pipe headwall, gabion walls, sandstone log retaining walls and rip rap. • Regrade of the basin floor to batters of 1:2 and 1:4. • Spray seeding of 1:4 batters. • Planting of low maintenance ground covers on 1:2 batters.
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Figure 1 Site Context



(Source: Sixmaps)

Figure 2 Location of Proposed Activity



(Source: Google earth)

Photo 1 Activity area looking south near intersection with Illawarra Highway.



Photo 2 Activity area looking south towards Wongawilli Intersection – Moreton Bay Fig tree on RHS



Photo 3 Looking south with Hereford Chase on the right



Photo 4 Looking north at the southern end of the activity area

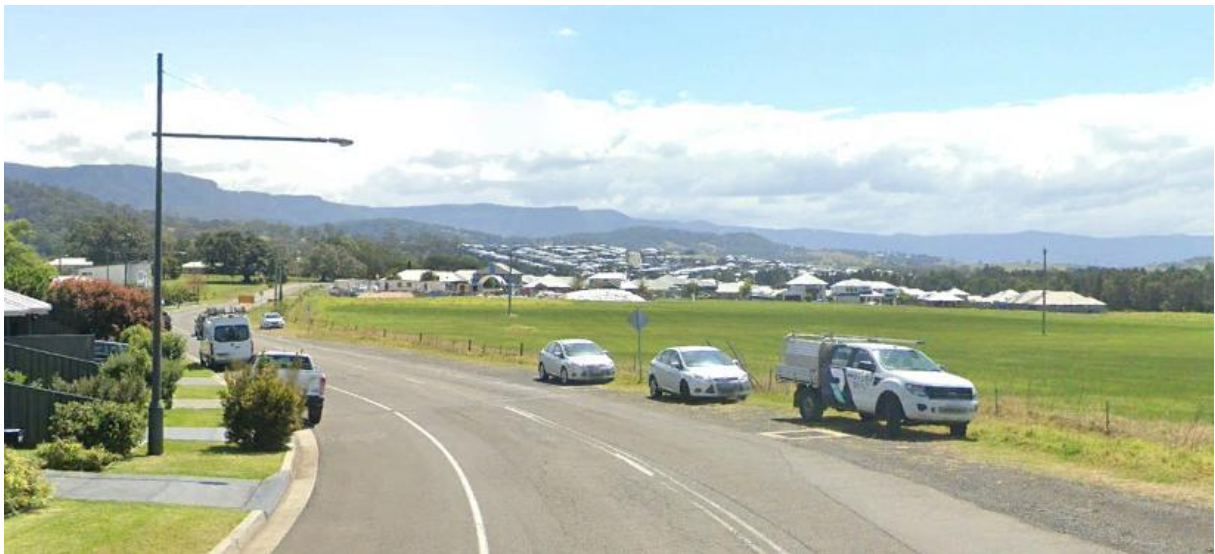


Photo 5 Looking east at the two Acacia maidenii trees located at the proposed slip lane from Yellow Rock Road into Araleuen Terrace.



Section B – Site Identification	
Address	Yellow Rock Road and Paul Circuit Reserve, Tullimbar. (Road Reserve and reserve) Stretch of activity area from Lot 37/DP1216834 (south) to Lot 1/DP1159680 (north).
Lot and DP	Not applicable for road reserve – see above. Paul Circuit Reserve is located at Lot 37 DP1216834.
Land Status (Ownership)	Yellow Rock Road and Paul Circuit Reserve, Tullimbar is Council owned land.
Statutory and Planning Context	The road upgrade component of the activity can be characterised as <i>roads or road infrastructure facilities</i> and can be carried out without consent by or on behalf of a public authority (Shellharbour City Council) in accordance with Section 2.109 of the <i>State Environmental Planning Policy (Transport and Infrastructure) 2021</i> (Transport and Infrastructure SEPP). The stormwater detention basin upgrade component of the activity can be characterised as <i>stormwater management systems</i> and can be carried out without consent by or on behalf of a public authority (Shellharbour City Council) in accordance with Section 2.137 of the Transport and Infrastructure SEPP.
Shellharbour Local Environment Plan 2013 (Shellharbour LEP)	The activity area is zoned DM (Deferred Matter), SP2 Classified Road, and R2 Low Density Residential under the Shellharbour LEP. This REF has been prepared under the provisions of Part 5 of the EP&A Act and consequently the provisions of the Shellharbour LEP do not apply. The activity is considered to be consistent with the objectives of the underlying and surrounding R2 Residential zone by meeting the day to day needs of the travelling public. The activity is permitted without consent under Section 2.109 and Section 2.137 of the Transport and Infrastructure SEPP.
Current use of the site	Yellow Rock Road is currently functioning as a residential road. The Paul Circuit Reserve is currently functioning as a stormwater detention basin.
Adjoining land uses	The stretch of Yellow Rock Road subject to the proposed works runs slightly northwest to southeast. This stretch of Yellow Rock Road has cleared land to

	the northwest and residential housing on the northeast and residential housing on the southwest and cleared land southwest. Residential housing currently surrounds or is designated to surround the Paul Circuit Reserve.
Natural landforms/features	Yellow Rock Road is at a slight incline on the southern end of the road at the intersection with Araluen Terrace and Paul Circuit Reserve.
Soil type/stability/potential for erosion	The soil type at the proposed activity area is dermosols and kurosols. Dermosols is a non-texture contrast soil with a moderately deep structured subsoil. Dermosols are relatively well drained (particularly the Red and Brown Dermosols). Kurosols is an acidic soil with a texture contrast between the A and B horizons. Kurosols often have a poorly structured, hardsetting surface, making them prone to poor drainage and low water-holding capacity.
Section C – Reasons for Activity and Options	
Are there alternative options?	☐ Yes ☒ No <i>If yes, what are they?</i> The only other option would be the “do nothing” option, which would be sub optimal.
Reasons for adopting the preferred option	☒ Practicality and functionality ☐ Cost efficiency ☒ Environmental sustainability ☒ To minimise environmental impact Practicality and functionality: The works are required to enable the safe and ongoing use of the existing road infrastructure. Environmental sustainability: The activity involves as minimal vegetation loss as possible. It is also anticipated that rainfall runoff into receiving environments will be improved with the new upgrade to the embankment and upgrade to the stormwater retention basin. Environmental impact: This REF has been completed to address impacts with appropriate safeguards and mitigation measures to lessen any

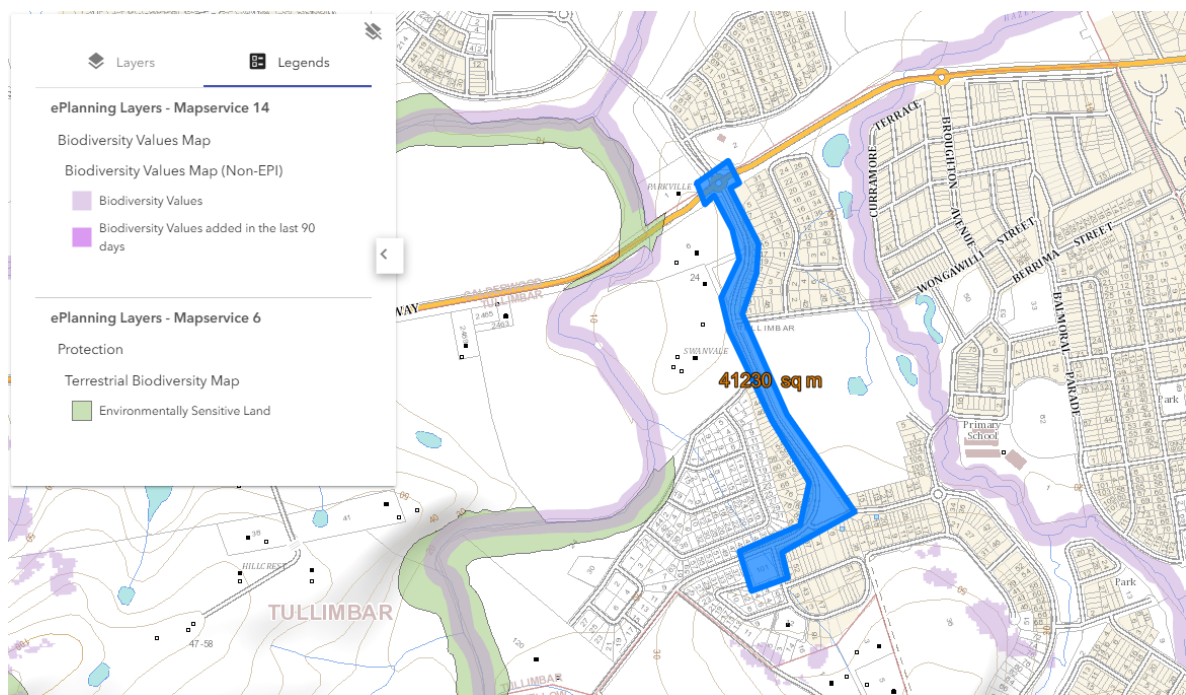
	environmental and social impacts associated with the activity, as far as practicable.
Have the principles of Ecologically Sustainable Development been considered in your design and execution plans?	☒ Yes ☐ No <i>If yes, how? If no, why not?</i> The approach taken in the REF acknowledges and accepts the financial costs associated with all the measures required for the activity to avoid, minimize, mitigate, and manage potential environmental and social impacts for the proposed activity.

Section D – Existing Environment and Assessment of Impacts

Existing Environment and Potential Impacts – refer to **Appendix B** for Background Searches

The activity area is located along Yellow Rock Road, Tullimbar for approximately 840 m stretch of the road beginning at the intersection of Yellow Rock Road and Illawarra Highway and ending at the stormwater retention basin on Paul Circuit. The land has been highly disturbed by the existing road infrastructure, stormwater infrastructure, and residential housing which lines the north-east and south-west sides of Yellow Rock Road. The works are required to upgrade the existing road infrastructure and associated services including a shared path and stormwater infrastructure.

The following figure illustrates the location of the proposed works (highlighted in blue) and the relation to waterways and areas of environmentally sensitive land and biodiversity values. This figure was generated from the NSW Planning Portal Spatial Viewer.



Sensitive receivers (e.g. residents) are anticipated to experience temporary and short-term noise impacts associated with the proposed works, which will take place during the NSW EPA recommended standard hours for construction noise (Monday to Friday 7am to 6pm, and Saturday 8am to 1 pm).

Following the implementation of mitigation measures outlined in this REF, noise impacts to sensitive receptors will be minimised and the overall impact has been assessed as negligible. It is unlikely that the proposed works will result in vibration being experienced by any surrounding sensitive receivers.

Vegetation on Site

Will any vegetation on site be pruned or removed?

☒ Yes ☐ No

The activity will require the removal of 5 trees. Two large Camphor Laurel trees, a mature Stone Pine tree (referred to as Trees 1-3 in the Arborist report) and two native *Acacia maidenii* trees in the vicinity of the slip lane. Native trees to be removed will be replaced on a 3:1 ratio and non-native will be 1:1. As the project will require the removal of 2 native

trees and 3 non-native trees, 7 trees will need to be offset with the goal for these trees to be replanted along Yellow Rock Road.

The activity will also require the trimming of two large Moreton Bay Fig trees (referred to as Trees 4 and 5 in the Arborist report). An Arborist report has been prepared for Trees 1-5 and is contained in **Appendix E**.

Will footprint of works occur within the Structural Root Zone or Dripline of any trees?

☒ Yes ☐ No

If yes to either of the above questions, a report from a suitably qualified Arborist may be required; contact Environment team for advice.

With regards to trees that will be retained, the activity will likely encroach on the dripline of Trees 4 and 5 (Moreton Bay Fig trees) as incursion to the relevant Tree Protection Zone (TPZ) will occur and trimming will be required. An Arborist report has been prepared for these trees (**Appendix E**).

The Arborist report noted that the greatest impediments on Trees 4 and 5 from the activity will be impacts to the canopy. The Australian Standard *Protection of trees on development sites* (AS 4970) recommends no more than 10% encroachment of the TPZ unless the TPZ can be compensated elsewhere and is contiguous with the TPZ. Care should be taken during pruning as over-pruning could result in extremely asymmetrical and off balanced tree. The activity is likely to have some impact on the root systems of Trees 4 and 5, however it is likely to be reasonably minimal.

Suitable mitigation measures for the management of these two large Moreton Bay Fig trees has been provided in **Section F**.

Fauna and Fauna Habitat

There are no threatened species located within the vicinity of the proposed works.

The biodiversity values mapping tool does not identify any biodiversity mapping considerations within the vicinity of the activity area.

A MNES search was conducted on 6 May 2025 to determine if there are any Matters of National Environmental Significance within a 10 km radius of the activity area. The search identified 10 threatened ecological communities, 111 threatened species and 59 migratory species within the 10 km radius of the activity area.

Part of the activity includes the realignment of a section of footpath from Hereford Chase (SP2) which required the removal of two Camphor Laurel (*Cinnamomum camphora*) trees and a Stone Pine (*Pinus pinea*) tree (Trees 1-3).

The species *Cinnamomum camphora* is considered a weed species in most local government areas. It is noted that *Cinnamomum camphora* is listed as an exempt tree species within Chapter 21 of the SCC DCP. Hence the removal of Trees 2 and 3 is not considered significant in terms of a loss to existing biodiversity values. The Stone Pine tree (Tree 1) is considered to be entering late senescence or declining state, with evidence of cracking and splitting occurring in the basal area.

The activity will also require the trimming of two large Moreton Bay Fig trees (Trees 4 and 5) near the intersection of Yellow Rock Road and Wongawilli Street.

Further discussion on Tree 1-5 impacted by the activity is provided in the Arborist report (Appendix E).

The Arborist report did not identify any of these trees to have a high wildlife habitat value. However, due to their size and canopy cover, there is potential for these trees provide fauna habitat in the form of nests or hollows. No nests and one hollow were identified during the site inspection. This hollow was occupied by a wasp's nest. A pre-clearance survey will be required within one week prior to the commencement of construction or any vegetation removal to confirm that there is no fauna present.

The activity will require the removal of four small planted street trees to accommodate for the road widening works.

Following finalisation of the designs, Council have identified the need to remove two native *Acacia maidenii* trees to include the additional of a slip lane (SP2.5). The two *Acacia maidenii* occur as isolated trees over an exotic understorey. A review of historical aerial imagery indicates that the area was previously cleared and therefore these trees have been identified as native regrowth vegetation. While *Acacia maidenii* is characteristic of locally occurring threatened ecological communities (TECs), the species has a very wide distribution and is not restricted to the TECs. Given the degraded nature of the site, and the presence of only two regrowth *Acacia maidenii*, with an exotic and partly managed (mown) understorey, the vegetation within the site is not considered to conform to a TEC under the NSW *Biodiversity Conservation Act 2016* (BC Act) or Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Furthermore, the species is commonly known to regenerate after disturbance in disturbed areas, although given the degraded nature of the site, it is very unlikely that there would be any further natural regeneration within the site.

In summary, the vegetation within the site is considered to comprise native regrowth vegetation in poor condition and is not considered to align with a TEC. As such, a Test of Significance in accordance with the BC Act is not required. Further assessment under the EPBC Act is also not required.

It is concluded that there is likely to be no significant threat or impact on any local species, population or ecological community or its habitat listed under the BC Act (i.e. no loss of habitat for a threatened species or ecological community).

No nationally listed Threatened Ecological Communities were considered to be present within the activity area and the activity is unlikely to have a significant impact.

Provided mitigation measures are implemented to prevent potential direct and in-direct impacts on vegetation it is concluded that the activity is unlikely to have an adverse effect during the construction phase.

Water

How far is the activity from a water body (including a drain, creek, river, lake or the ocean) and is the existing environment within or near a water body?

A search on NSW SEED Mapping database determined that the nearest body of water is a 'Natural Water Course' which is located approximately 92 m northeast of the activity area along Wingello Crescent. There are various other man-made water bodies within the vicinity of the activity area however due to the nature of the works and the distance of these water bodies from the activity, they are not deemed to be at risk of being impacted by the proposed works.

NSW Hydrology Map shows a natural water line intersecting the project site and surrounding area. This water line has since been destroyed due to the development that has occurred at Tullimbar and has been replaced by a stormwater pipeline system. These pipelines still feed into Yellow Rock Creek as the existing water course did.

Will works or project impact waterways with increased runoff or contamination?

☐ Yes ☒ No

Water and Hydrology

What kind of water source is this location?

The water source in this location is stormwater runoff from Yellow Rock Road and surrounding residential streets.

Will the works potential impact water quality?

☐ Yes ☒ No

Construction works has the potential to impact water quality via an increase in erosion through the exposure of soils. A suite of sediment and nutrient controls, prepared in accordance with the Landcom Managing Urban Stormwater - Soils and Construction (the Blue Book) will ensure the impacts to water quality are minimised. Once constructed the works will not increase impacts on water quality.

Will the works change the hydrology of the area or adjacent area?

☐ Yes ☒ No

The project is only modifying the basin to keep its behaviour consistent with existing hydrological conditions. The flood report provided by Maker (February, 2025) states that “... *modifying the basin to reduce flows [from the road upgrade] and appears to be feasible from a hydraulic perspective.*”

Fish Habitat

Is the site designated Fish Habitat or adjacent to Fish Habitat?

☐ Yes ☒ No

If yes, will the project include any activities requiring a permit?

☐ Yes ☒ No

The proposed activity is not located near or adjacent to any key fish habitat and due to the nature of the works and distance from any body of water, the activity is not predicated to impact any fish habitat.

The DPI outlines activities requiring a permit in designated Fish Habitat including:

- Dredging and reclamation
- Harming marine vegetation (saltmarsh, mangroves etc)
- Use of explosives and other substances

The proposed works do not involve any of the above activities and will not be taking place within a designated Fish Habitat.

Coastal
Coastal Management and Coastal Processes Is the proposal within any Coastal management areas, Potential Blue Carbon areas? such as Coastal Environment Area, Coastal Use Area, Coastal Wetlands, Coastal Rainforests, or Proximity Areas? ☐ Yes ☒ No Will the proposed works impact any of these areas? Based on type of works, materials used, impact, risk to the location as result of the works. ☐ Yes ☒ No
Contamination
Is the site listed as contaminated? ☐ Yes ☒ No The activity area is not registered as a contaminated site under the NSW EPA, see Appendix B. The closest contamination site is Tallawarra Power Station which is approximately 7.75 km northeast of the proposed activity area. An Unexpected Finds Protocol is to be followed in the unlikely event contamination is uncovered during the proposed works. A search was conducted on the EPA Contamination Register on 6 May 2025. There are no known contaminated areas that will likely impact the site, these results are included in Appendix B. <i>If yes provide detail:</i> ☐ Landfill ☐ Petrol Station ☐ Extractive industry ☐ Other, please specify: <i>If no, a Contamination Unexpected Finds Protocol must be included within the conditions. See standard conditions.</i> <i>Is it identified as a potential site for asbestos? Has a geotechnical report found any asbestos?</i> ☐ Yes ☒ No
Acid Sulphate Soils Are Acid Sulphate Soils mapped as being likely to occur? ☐ Yes ☒ No No Acid Sulphate Soils are present on site.

If yes, what class?

Are excavation works proposed to the depth of mapped Acid Sulphate Soil?

☐ Yes ☒ No

In the unlikely event that contamination is uncovered during the proposed works an Unexpected Finds Protocol would be followed. Refer to **Appendix F – Acid Sulfate Soil Unexpected Finds Protocol**.

Heritage

Non-Aboriginal Heritage

The site is highly disturbed including paved hard surface/bulk earthworks/previous landfill site/ other, and therefore has no potential for cultural heritage values. A preliminary assessment is not required.

Does the proposed works require a Preliminary Cultural Heritage Assessment?

☐ Yes ☒ No

Is the site listed as a heritage item listed in the LEP?

☐ Yes ☒ No

If yes, provide details; advice must be sought from Council's Heritage Officer.

Is there potential for the site to have cultural heritage values?

☐ Yes ☒ No

Will the proposed works potentially impact cultural heritage values?

☐ Yes ☒ No

Aboriginal Heritage

Does the proposed works require a Preliminary Aboriginal Cultural Heritage Assessment?

☒ Yes ☐ No

A preliminary assessment is required due to the sites potential to have cultural heritage values.

1. Is there potential for the site to have cultural heritage values?

☒ Yes ☐ No

A search on the Aboriginal Heritage Information Management System (AHIMS) has been conducted and has identified recorded sites within the area. Therefore, further assessment was required for the proposed works.

2. Will the proposed works potentially impact cultural heritage values?

☒ Yes ☐ No

The Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (The Code) has been applied to assess any potential cultural heritage impacts that may arise as a result of this project, with the following result:

The site has potential for cultural heritage values and the proposed works have potential to impact cultural heritage values. A preliminary assessment has been conducted. Report attached below.

An Aboriginal Heritage Due Diligence Assessment Report (AHDDR) was undertaken by OzArk Environment & Heritage (January 2025) for the upgrades to Yellow Rock Road, refer to **Appendix D**. An excerpt from the AHDDR states “No Aboriginal objects or areas of subsurface archaeological potential were recorded within the study area during the visual inspection. The lack of Aboriginal objects is likely due to the levels of existing disturbance combined with the narrow extent of the study area.”

The assessment concluded that an Aboriginal Heritage Impact Permit (AHIP) application is not necessary or required for the proposed works.

It is noted that the AHDDR did not include the stormwater retention basin at Paul Circuit Reserve. However, this basin has already been extensively impacted by the construction of the existing stormwater infrastructure and it is unlikely that the proposed works will impact any Aboriginal objects.

To ensure the greatest possible protection to the area’s Aboriginal cultural heritage values, recommendations were made in the AHDDR that have been incorporated into this REFs environmental conditions. The AHDDR stated that the proposed work may proceed within the study area without further archaeological investigation if these recommendations are adhered prior to and during construction.

Impact Assessment Section 171(2) of the Environmental Planning & Assessment Regulation 2021	
When considering the likely impact of an activity on the environment, the proponent and determining authority must take into account the factors set out in Table below, in accordance with clause 171(2) of the <i>Environmental Planning & Assessment Regulation 2021</i>. Will the below factors likely be impacted by the works? outline details. Refer to guide: NSW Gov, Guidelines for Division 5.1 assessments (amazonaws.com)	
(a) the environmental impact on the community,	Y ☐ N ☒ The project would negatively transform the locality in the short-term due to construction works and the presence of construction materials, machinery and signage. Once operational the proposal would provide an improved
(b) the transformation of the locality,	Y ☐ N ☒ There will be minor short term adverse impacts on the locality during the construction phase of the project. After construction, it is considered that the project will provide an overall benefit and there will not be significant impacts on the locality.
(c) the environmental impact on the ecosystems of the locality,	Y ☐ N ☒ The proposed scope of work is unlikely to impact on biological diversity or ecological integrity.
(d) reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality,	Y ☐ N ☒ There would be no substantive impacts to the recreational, scientific or other environmental quality or value as a result of the proposed activity, and following construction, there would be minimal impact on aesthetic or environmental quality of the area.
(e) the effects on any locality, place or building that has—	Y ☐ N ☒ The proposed works are unlikely to have an adverse impact on the below two factors.
(i) aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance, or	Y ☐ N ☒ It is unlikely that there will be an impact as discussed in the Aboriginal and non-Aboriginal Heritage sections above.
(ii) other special value for present or future generations,	Y ☐ N ☒ The proposed work will have a positive impact for present and future generations.
(f) the impact on the habitat of protected animals, within the meaning of the Biodiversity Conservation Act 2016 ,	Y ☐ N ☒ No significant habitat features such as rock outcrop, stick nests, hollow bearing trees or burrows will be directly impacted. Indirect impacts are negligible /minor and will be managed under conditions outlined in Section F.

(g) the endangering of a species of animal, plant or other form of life, whether living on land, in water or in the air,	Y ☐ N ☒ The proposed activity will not impact threatened species listed under the BC Act or EPBC Act.
(h) long-term effects on the environment,	Y ☐ N ☒ The proposed activity would have no adverse long-term effect on the environment.
(i) degradation of the quality of the environment,	Y ☐ N ☒ The proposed activity is mostly located in an area already disturbed and will not further degrade the quality of the environment.
(j) risk to the safety of the environment,	Y ☐ N ☒ The project would pose a minimal risk to the safety of the environment; however, the potential impacts would be minimised with the implementation of the safeguards outlined in Section F.
(k) reduction in the range of beneficial uses of the environment,	Y ☐ N ☒ The project may have an impact to travel for the community. However, this is considered short-term and minor impact as the proposed activity will benefit the community with an upgraded asset.
(l) pollution of the environment,	Y ☐ N ☒ Pollution risks are minor temporary (during construction) and will be managed under mitigation measures outlined in Section F
(m) environmental problems associated with the disposal of waste,	Y ☐ N ☒ There are no expected problems associated with the disposal of waste. Environmental conditions in Section F have been provided to manage waste disposal.
(n) increased demands on natural or other resources that are, or are likely to become, in short supply,	Y ☐ N ☒ Resources required are readily available, and are unlikely to become in short supply.
(o) the cumulative environmental effect with other existing or likely future activities,	Y ☐ N ☒ It is not anticipated that the project would have a significant cumulative impact on the environment due to the temporary nature and location of the works.
(p) the impact on coastal processes and coastal hazards, including those under projected climate change conditions,	Y ☐ N ☒ The project is not located within mapped coastal hazard areas under the Resilience and Hazards SEPP (Coastal Use Area).
(q) applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1,	Y ☒ N ☒ See the table below for applicable strategic planning.
(r) other relevant environmental factors.	Y ☐ N ☒

Strategic Planning:

Community Strategic Plan

1.2 We Are a Liveable Community

1.2.3 Construct and upgrade buildings and infrastructure that meet current and future community needs.

2.1 We Are Sustainable

2.1.4 Our waste is managed as a valuable resource, and the environmental impacts are minimized.

2.2 We Are a Beautiful & Connected City

2.2.3 Facilitate sustainable development that considers current and future needs of our community and environment.

4.2 We Have Strong Leadership

4.2.1 Our Council is transparent and trusted to make decisions that reflect the values of the community collectively.

4.2.2 The Council lives responsibly within its means and strengthens its financial sustainability.

4.2.3 The workforce is capable, resilient, and diverse.

4.2.4 Undertake visionary, integrated, long-term planning and decision-making, reflective of community needs and aspirations.

The project aligns with;

- Active Transport Strategy
- Zero Emissions Shellharbour Strategy 2022-2025

Section E Planning Controls and Approvals
<i>Biodiversity and Conservation Act 2016</i>
Will the proposed works potentially impact any Threatened Species, Endangered Ecological Communities or Populations listed under the <i>NSW Biodiversity Conservation Act 2016</i>? ☐ Yes ☒ No <i>If yes assess in accordance with NSW GOV Threatened Species Test of Significance (ToS) Guidelines.</i> <i>Has a BC Act Test of Significance been completed and attached?</i> ☒ Not required ☐ Yes
<i>Environmental Protection Biodiversity Conservation Act (EPBC)1999</i>
Will the proposed works potentially impact any Threatened Species, Endangered Ecological Communities or other matters listed under the Commonwealth <i>Environment Protection Biodiversity Conservation Act 1999</i>? ☐ Yes ☒ No <i>If yes assess and if required conduct an EPBC Significant Impact Criteria Assessment.</i> <i>Has an EPBC Act Assessment been completed and attached?</i> ☒ Not required ☐ Yes
<i>Protection of Environment Operations (POEO) 1997</i>
☐ Yes ☒ No <i>If yes, please specify and attach any approvals/permits/licences as an appendix to this document</i>
<i>Local Land Services Act (LLS) 2013</i>
☐ Yes ☒ No <i>Please specify and attach any approvals/permits/licences as an appendix to this document</i>
<i>Environmental Planning and Assessment Act 1979 (EP&A)</i>
☒ Yes ☐ No The REF has been prepared in accordance with section 5.5 and 5.10(a) of the EP&A Act and Section 171(2) of the <i>Environmental Planning and Assessment Regulation 2021</i>.
<i>National Parks and Wildlife Act 1974 (NPWS)</i>
☐ Yes ☒ No <i>Please specify and attach any approvals/permits/licences as an appendix to this document</i> NA

<i>Heritage Act 1977</i>
☐ Yes ☒ No <i>Please specify and attach any approvals/permits/licences as an appendix to this document.</i> NA
<i>Water Management Act 2000</i>
☐ Yes ☒ No The WM Act regulates controlled activities that occur within 40 m of 'waterfront land', where 'waterfront land' means the bed of any river, lake or estuary, and the land within 40 m of the riverbanks, lake shore or estuary mean high water mark. Under Schedule 4 of the <i>Water Management (General) Regulation 2018</i> , public authorities do not need to obtain a controlled activity approval under the WM Act as long as the activity does not cause any change in the course of a river, and the activity has been assessed under the EP&A Act and found to not be likely to significantly affect the environment. There are no open bodies of water in the vicinity of the proposed works which would be impacted as a result of the activities. The activity would not cause any change to any water flow nearby the site. As documented in the REF the activity is not likely to significantly affect the environment.
<i>Fisheries Management Act 1994</i>
Are any other approvals, permits or licences required for this project? ☐ Yes ☒ No
<i>Crown Land Management Act 2016 (CLM)</i>
☐ Yes ☒ No <i>please specify and attach any approvals/permits/licences as an appendix to this document</i>

Section F – Environmental Conditions

General

- A CEMP shall be prepared prior to commencement of construction to ensure that all safeguards and management measures detailed in this REF are implemented, and that construction impacts on the locality are managed. The CEMP shall include the following plans and protocols:
 - Unexpected finds protocol for Aboriginal objects.
 - Unexpected finds protocol for heritage objects.
 - Unexpected contamination finds protocol.
 - Unexpected Acid Sulphate Soil finds protocol (**Appendix F**).
 - Erosion and Sediment Control Plans

Protection of native vegetation

- All machinery used on site is to be clean - i.e., tracks, tyres buckets and attachments are to be visibly free of soil or plant material to minimise the risk of introduction and spread of weed propagules.
- Remove any waste containing weeds and seed material from the site such that the spread of weeds is minimised.
- Dispose of all rubbish and surplus material within 24 hours of completion.
- An offset ratio for native trees that are to be removed will be 3 to 1. Meaning, for every native tree that is approved to be removed, 3 trees of an appropriate species within an appropriate location will be offset.
- An offset ratio for non-native trees that are to be removed will be 1 to 1.
- Where planted street trees will be retained and not impacted by the activity, protective fencing will be installed at the TPZ, consisting of 1.8 m high chain wire mesh supported by robust posts, at a minimum radius of 3 m from the trunk of each tree. This fencing will be installed prior to commencement of the activity and remain in place until all works are completed.
- Signage shall be erected on the fence with the message 'Tree Protection Zone, Do Not Enter'.
- The TPZ within the protective fencing shall be mulched with a maximum depth of 75 mm of suitable organic mulch (wood chips or compost leaf chip mulch) and kept regularly watered for the duration of the activity.
- Trees 1-3 (associated with the realignment of the footpath in Hereford Chase) should be replaced with more appropriate species.
- Trees 4 and 5 (associated with the intersection upgrade at Wongawilli Street) will require minor canopy reduction pruning which will need to be clearly detailed to ensure the trees are not permanently disfigured. These trees will tolerate a degree of root pruning for the road widening, however the canopies at maturity will still need to be taken into consideration.
- Excavations within TPZ of Trees 4 and 5 can occur provided the following methodology is implemented. A flat bucket attachment on the excavator can be used within the TPZ areas to locate roots within the excavation areas. Provided levels are reduced by small increments so as not to damage any roots found. Should any roots >50 mm be located, hydro excavation shall commence in order to fully expose roots along the line of excavation. This is to ensure that no roots within the TPZ are to be cut or damaged that are >50 mm in diameter. A spotter must be present due to the tight working area to ensure overhanging limbs are not damaged. The Project Arborist shall supervise the excavations within the TPZ areas of Trees 4 and 5.

- Generally, any roots found during any excavation shall not be pruned unless under forty (40) mm in diameter. If roots are found and are over forty (40) mm in diameter, the Project Arborist shall be contacted immediately. Any tree roots over forty (40) mm in diameter that are damaged due to excavation, or any other construction work shall be pruned cleanly with a saw, following approval by the Project Arborist.

Protection of native animals

- A pre-clearance survey of the vegetation to be removed is required within one week prior to removal for any roosting or nesting fauna present.
- If hollows are present within any trees (hollow bearing trees), an ecologist needs to be present for the removal of those trees.
- Site inspection prior to any works commencing for any fauna within the work zone, and sufficient time is allowed for them to move on and not impact them.
- In the event of any injury to native fauna, contact a local vet or Wildlife Rescue South Coast on 0418 427 214 immediately.

Cultural Heritage

- All land and ground disturbance activities must be confined to within the proposed activity area, as this will eliminate the risk of harm to potential Aboriginal objects that may be in adjacent landforms. Should the parameters of the project extend beyond the assessed areas, then further archaeological assessment may be required.
- Stop work if any potential Aboriginal heritage objects are found/uncovered during demolition, secure the site and inform Heritage NSW and Shellharbour City Council's Environmental Officer immediately.
- Inductions for work crews should include a cultural heritage awareness procedure to ensure they recognise Aboriginal artefacts and are aware of the legislative protection of Aboriginal objects under the NPW Act and the contents of the Unanticipated Finds Protocol.
- If an object or Aboriginal Heritage Item is uncovered the following steps will be taken as per Councils Aboriginal Due Diligence Framework:
 - Inform Aboriginal Sub-Committee and invite comments within 14-day period.
 - Consider Comments from Aboriginal Advisory Sub-Committee and make final recommendations to council.
 - Communicate outcome to Aboriginal Advisory Sub-Committee for Information.

Erosion and sediment control

- Minimise soil disturbance wherever possible.
- Sediment and nutrient controls, prepared in accordance with the Landcom Managing Urban Stormwater - Soils and Construction (the Blue Book), as indicated in the *Attachment 4 –Plan 7B020 Erosion & Sediment Control Measures*, shall be implemented to reduce the impacts of stormwater, erosion, and sedimentation on water quality. Specific erosion and sediment controls are to be contained within a site Erosion and Sediment Control Plan.
- All erosion and sediment control measures will be established before physical activity begins. Control measures are to remain in place until all surfaces have been fully restored and stabilised.

- Temporary stockpiles will have appropriate erosion control devices installed to control runoff and prevent sedimentation.
 - Sediment and erosion control devices will be inspected regularly, maintained to ensure effectiveness over the entire duration of the project, and cleaned out before 30% capacity is reached.
 - All sediment and erosion control measures are to be installed prior to the commencement of any works and maintained for the duration of the project.
-
- Any fuel, chemicals and potentially hazardous materials stored on site are to be stored in a roofed, fire-protected and impervious bunded area at least 50 m from waterways, drainage lines, stormwater basins, flood-affected areas or slopes above 10% building design, and would comply with relevant Australian Standards and would be in accordance with relevant guidelines.
 - Refilling of plant and equipment would occur as far away as practical from drainage lines or unsealed surfaces.
 - Any plant and machinery operating within or near drainage lines will give full consideration of weather and environmental conditions i.e., would operate in periods of low to no rainfall and when no surface water is present, as to avoid sediment loss off site and impacts to water quality.
 - Construction works are not to be scheduled during times of rainfall or when there is surface water flow present across the activity area. Construction should give full consideration of weather conditions and forecasts.

Contamination

- No chemicals, fuels and/or wastes are to be stored within 5 metres of gutters or stormwater drains. All such substances must be contained/stored in a designated containment area within the activity area such as a work vehicle or site shed/compound.
- Emergency spill kits are to be carried by all work crews and kept on site during operational hours.
- Any imported fill to be used on site must be from a known source, free of any contaminants and generally compatible with the existing soil characteristics of the site. If any potential contamination or suspect material such as asbestos is encountered cease works immediately and contact a council environment officer.

Contamination - Unexpected Finds Protocol

- In the instance that any suspected contamination is identified such as asbestos or other unknown material during excavation, site works must cease until a Council Environment Officer can advise on treatment required.

Waste

- Any excess excavated spoil (where re-use is not possible), vegetation or general waste will be loaded into trucks and disposed of at Dunmore Recycling and Waste Disposal Depot.
- Any excavated soil to be disposed of offsite must be assessed by a suitably qualified consultant in accordance with the Waste Classification Guidelines, Part 1: Classifying Waste (EPA 2014) to inform appropriate disposal.

- Wherever possible, waste generated during site preparation and construction will be reused. Waste that cannot be avoided, re-used, or recycled will be managed in accordance with the principles of the *Waste Avoidance and Resource Recovery Act 2001* and classified in accordance with the Waste Classification Guidelines and disposed of at appropriately licenced facilities.
- Treatment, handling, and disposal methods for contaminated soils, if encountered, will be done in accordance with NSW EPA Guidelines. Contaminated soils will be disposed of at an EPA licensed waste depot.
- Before spoil from the stormwater detention basin is disposed of off site, details will be collected regarding the origin of the spoil, who is disposing of the spoil, where the spoil will be taken, the amount of spoil disposed of, description of the type of spoil to be disposed of, detail of how records will be kept, and the timeframe to complete works.

Dust Management

- Areas to be disturbed will be stripped progressively and only where necessary.
- Soil stabilising methods such as matting, grassing or mulching will be employed.
- Disturbed areas will be dampened with a light water spray or via water cart when there is excessive dust.
- All stockpiles will be covered and placed in locations protected during windy conditions.
- Vehicle movements will be restricted as much as possible.
- Any loads of excavated material and loads transported from the site will be kept covered at all times during transportation and will remain covered until they are reused or disposed of at an EPA licensed waste disposal facility.
- Wind breaks, such as wind fences, will be constructed where reasonable.
- A water cart or sufficient water sprays will be made available at all times.
- Water will be applied to suppress dust from open earthworks and unprotected stockpiles.
- In adverse conditions when dust cannot be adequately controlled, works will cease until conditions improve.
- All works will stop if dust continues to leave the site when all of the above methods have been undertaken.

Noise and disruption

- Construction noise will be limited to operational hours recommended by NSW EPA recommended standard hours for construction noise are Monday to Friday 7am to 6pm, and Saturday 8am to 1 pm.
- No machinery is to operate or be stored outside of the designated work areas including stockpiling or any other activity.
- Plant and equipment which is used intermittently will either be shut down in the intervening periods between works or throttled down to a minimum.

Site Management / Miscellaneous

- Emergency spill kits are to be carried by all work crews and kept on site during operational hours.
- During construction works the site shall be kept in a clean and orderly manner to reduce the visual impact to site users.

- Work areas shall be bounded by fencing or barriers and appropriate signage to prevent pedestrian access during construction.

Site Rehabilitation

- Any damage to grassed areas must be restored at the completion of the works.
- Stockpiles and materials must be removed to a suitable waste disposal facility such as Dunmore Recycling and Waste Disposal Depot.
- Areas of compacted earthworks will be progressively rehabilitated with exotic grass / turf and fenced off as soon as practicable to prevent erosion.

Bushfire

- Daily monitoring of local NSW Rural Fire Service Fire Danger Ratings and Meteorological conditions.
- No hot works during High or above Fire Danger Rating.
- Fire extinguishers to be on all major plant and equipment.
- Fire extinguishers available for use in emergencies.
- Fire risk management and Emergency Plan to be included in site inductions and toolbox talks.

Traffic and Transport

- A traffic control/management plan shall be prepared by a suitably qualified person as part of the CEMP. The CEMP shall detail construction vehicle movements and controls and the location of compound / laydown area/s. Details within the CEMP are to ensure that compliance with AS 1742.3 Traffic Control at Worksites, WHS 2011 & *Roads Act 1993* occurs.
- Work areas shall be bounded by fencing or barriers and appropriate signage to prevent pedestrian access during construction. Safe and alternative access should be provided for pedestrians where required.
- Where works would result in delays to traffic, where possible, they would be scheduled to occur outside of morning and afternoon peak traffic periods and the public would be notified in advanced.
- Parking for construction workers would be accommodated within the compound footprint and within the nearby road reserve.
- Traffic would be managed by traffic controllers throughout construction, where required; and
- Where possible, all loading and unloading operations will be conducted within the internal construction zone.

Amenity and Pedestrian Access

- Safe, alternative access should be provided for pedestrians where required.
- Lighting must be installed in line with design and in accordance with AS/NZS1158 and AS2560.2.2021 – with attention given to lighting angles and obtrusiveness.

Section G – Conclusion and Summary of Impact Assessment

Environmentally preferred option:

There is no environmental preferred option for the works. Works will be largely confined to the road reserve which is highly disturbed.

Summary of potential impacts:

☐ Removal of native vegetation	☐ Downstream contamination from fuels or chemicals	☐ Impact to creek or creek banks, lake or coast foreshore
☒ Impact to retained trees /vegetation	☐ Erosion	☐ Impacts to European or Aboriginal Cultural Heritage
☐ Impact to native fauna / fauna habitat	☒ Sediment	☒ Dust
☒ Impacts to adjacent areas	☐ Acid sulphate soils	☒ Construction Noise

Other impacts:

Various minor environmental impacts of the activity have been identified in this REF.

The activity would result in minimal vegetation loss and is not predicted to have an impact on threatened species, ecological community or its habitat listed under the BC Act (i.e., No loss of habitat for a threatened species or ecological community).

The activity will involve ground disturbance that has potential to create sediment laden water during rainfall. Controls will be installed prior to disturbance and maintained throughout construction activities in accordance with Landcom Managing Urban Stormwater - Soils and Construction (the Blue Book).

Noise will be experienced on a temporary and short-term bases by sensitive receptors and, provided the mitigation measures are implemented as per this REF, the overall noise impact from the proposed works will be negligible. It is unlikely that the proposed works will result in vibration being experienced by any surrounding sensitive receivers.

Based upon the information in this REF there are no long-term adverse effects created by carrying out the activity. Construction impacts will be minor and minimised through appropriate mitigation and management.

The REF examined and considered all relevant Commonwealth, NSW and local legislation and policies, along all matters affecting or likely to affect the environment by reason of the proposed activity. The proposed activity as described in the REF best meets the project objectives.

This REF was prepared in accordance with Section 5.5 and 5.10(a) of the EP&A Act. It is concluded that the proposed activity is unlikely to significantly affect the environment and hence an EIS is not required to be prepared under section 5.7 of the EP&A Act. The proposed activity is also unlikely to affect Commonwealth land or have an impact on any MNES. The proposed activity is unlikely to present a significant risk of harm to the environment and approval would be in the public interest.

Section H – Conditions and Environmental Mitigation Measures

Has a site visit been conducted?

☒ Yes ☐ No

Site visit was undertaken by representatives of Maker Engineering.

Environmental Determination

The environmental impacts are considered to be minor. The activity can take place in accordance with **Appendix A** (General Arrangements Plan) and the safeguards outlined in Section F of this REF.

Is a site environment orientation by a suitably qualified consultant required to prior to commencement of works?

☐ Yes ☒ No

If yes fill out details in Section L below

Is a site environment inspection required during works or after completion of works?

☒ Yes ☐ No

If yes fill out details in Section M below

Plus:

☒ The proposed activity complies with and/or is consistent with relevant specific requirements in the following planning instruments or approvals/licenses required:

*List any licences/permits/approvals identified as being required from **Section D**.*

Section I – Environment Officer Sign Off

This REF has been developed and provides detailed information whether there is a likely significant impact on the environment and has addressed to the fullest extent possible matters affecting or potentially to affect the environment as a result of the proposed works detailed in 'proposed works details section A and section B' of this REF. This REF has been completed to the best of my knowledge in accordance with EP&A act, EP&A Regulation and Guidelines approved under section 171 of EP&A Regulation 2021, the information contains neither false nor misleading.

Name and position of Environment Officer reviewing assessment

[Redacted] Project Assessment Officer

Email and Contact Phone Number

Date

8/01/2026

Action to be taken

☐ Return for alterations

☒ Elevate for determination

Environment Officer Peer Reviewer	
Name and position of Environment Officer reviewing assessment	██████████ Team Leader Biodiversity and Environmental Planning
Email and Contact Phone Number	██
Date	19/01/2026
Signature	██
Section J – Project Approval	
To be signed by the Director or Executive Manager authorising the works (or other delegated authority)	
I have reviewed the document in full and consider the project will not have significant impact on the environment, I endorse the recommendation – this provides project approval, and the project can proceed.	
Name	██████████
Position	Acting Executive Manager Infrastructure and Projects
Signature	██
Date	20/1/2026
Does this REF need to be published in accordance with EP&A Reg 2021 Section 171(4)? e.g. public exhibition	☒ Yes ☐ No <i>Environmental Planning and Assessment Regulation 2021</i> <i>171 Review of environmental factors—the Act, s 5.10(a)</i> <i>(4) The review of environmental factors must be published on the determining authority's website or the NSW planning portal if—</i> <i>(a) the activity has an estimated development cost of more than \$5 million</i>

Section K – Acknowledgement of and Commitment to Comply with Conditions

To be signed by the Manager/Supervisor authorising the works
(will be responsible for ensuring compliance with the conditions)

☐ I accept and endorse the determination - the project can proceed. I am aware that it is my responsibility to convey any conditions placed on this activity to the site supervisor for enforcement. Failure to do so may result in me being found negligent in this regard.

☐ All necessary parties will be informed of any conditions placed on this activity.

Name	
Position	
Signature	
Date	

Section L – Site Induction – Councils Environment Officer – Upload to ECM after completing and relate to REF document

To be conducted by the Environment Officer on site prior to commencement of works for staff or contractors undertaking the works, if required

Name of Environment Officer	
Signature	
Date	
Names and positions of staff inducted	Signatures of staff inducted
Discussion Points: e.g. key risks, site constraints, access, no go zone locations etc.	

Section M – Site Inspection – Environment Officer – upload to ECM relate to REF and update inspection register

To be conducted by the Environment Officer on site during works or after completion of works as relevant, if required

Name of Environment Officer conducting inspection	
Are works compliant with relevant conditions?	☐ Yes ☐ No
Notes/Details:	
Signature	
Date	

Appendix A – General Arrangements Plan

Appendix B – Background Searches

Appendix C – MNES Checklist

Appendix D – Aboriginal Heritage Due Diligence Report

Appendix E – Arborist Report

Appendix F – Acid Sulfate Soil Unexpected Finds Protocol

Acid Sulfate Soil Unexpected Finds Protocol

Where service trenches can be refilled within 24 hours, excavated Acid Sulfate Soil (ASS) material should be separated from overlying topsoil and temporarily stockpiled. Once trenching and laying of services is completed, ASS material should be returned to the trench first, followed by the topsoil (i.e. returned to original soil layers). Where ASS burial cannot be completed within 24 hours, or if there is surplus of ASS material, a liming procedure should be adopted.

Liming and Treatment Procedure for ASS

1. Lime the base of the stockpile pad 5 mm thick layer of fine grade 1 agricultural lime;
2. Spread excavated ASS onto the pad in layers 10 – 30 cm thick;
3. Apply lime at a standard rate of 25 kg of lime (1 bag) per cubic metre of soil. Windy conditions should be avoided for safety and efficiency;
4. Cultivate lime into the ASS layer well, preferably using a rotary hoe. Ensure an even homogenous mix of soil and lime is created before spreading the next soil layer;
5. Repeat steps 2 – 4 as required.

ASS treated in this way can be used as fill.

