Transport for NSW

Memo

To	David Pattison, Senior Manager Project Services North
From	Ross Gersekowski, Project Contract Manager
Priority	URGENT
Date	31/10/2022
Subject	Addendum assessment and decision for proposed modification to S5440 - 5450 Little Creek – Tabulam Rivulet MWREF

Proposed modification

Modification to the seg. 5440 5450 Little Creek – Tabulam Rivulet MWREF.

Background

Modification to the seg. 5440 5450 Little Creek – Tabulam Rivulet MWREF is required to accommodate additional ancillary areas and trees identified for removal arising from a pre-delivery inspection and handover meeting, involving TfNSW Delivery and Environmental staff. It is proposed to include additional ancillary areas and remove further trees because they are now assessed as being located within the required construction footprint, when originally assessed as otherwise.

Purpose

The purpose of this memo is to:

1. Describe the proposed modification
2. Document and assess the likely impacts of the proposed modification on the environment
3. Detail protective measures to be implemented
4. Document the recommendation of the Transport Manager Environment & Sustainability and the decision by the Transport delegated manager whether or not to determine the modification to the project.

This memo is an addendum to and is to be read in conjunction with the approved Minor Works REF Little Creek - Tabulam Rivulet recommended by Greg Collins, Transport for NSW Environmental Manager, and approved by David Pattison, Senior Manager Project Services South,on 25 August 2022.

Description of proposed modification

The proposed modification is two-fold:

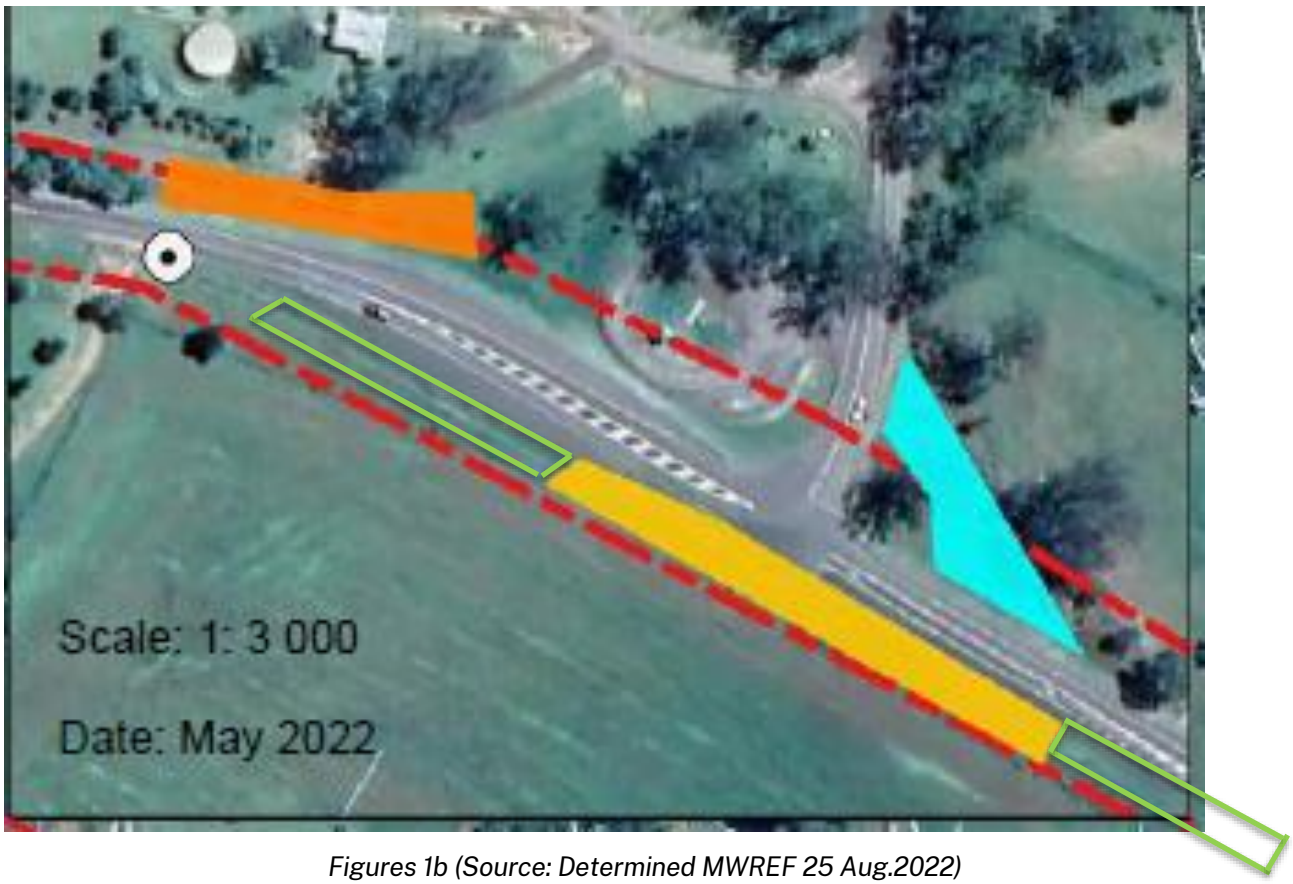
1. Summarise additional ancillary sites identified as required for the duration of the project eg stockpile sites, spoil disposal areas, vehicle parking areas and site compound locations.
2. Removal of additional trees within the project footprint, deemed to be impacted as a result of the need to find sites required for the disposal of excess spoil generated by the proposal via the provision of wider/flatter batters adjacent to the designed formation.

Additional Ancillary sites to determined MWREF (source Google Maps):

Ancillary Area A (Figure 1a) – existing stockpile area approximately 2.3km west of Tabulam Rivulet bridge in Maintenance segment 5470 (northern side of the road corridor). This area is proposed to be utilised as a temporary material stockpile area for gravels and cover aggregates and has been regularly used by Kyogle Council in maintaining the highway. The area has also been assessed in the Draft MWREF document for the Tara to Captains Creek project S5470 5480 which continues from the completion of this project. There are no known issues included in the draft document.

Figure 1a (Source: Google Maps Nov.2022)

Ancillary Areas B (figure 1b) (Source determined MWREF 25 Aug.2022) – additional parking and possible site compound area as depicted by the green bounded areas (note area includes open areas of the road corridor free from native vegetation)



Figures 1b (Source: Determined MWREF 25 Aug.2022)

Ancillary Area C (figure 1c) (Source D.Quinn via Google Maps 29/11/2022) – additional parking and possible site compound area as depicted by the red bounded areas (note area includes open areas of private property free from native vegetation and as discussed with property owner).

Figure 1c (Source: D.Quinn 29 Nov.2022)

Ancillary Area D (figure 1d) – vehicle parking and turn around area east of Tabulam Rivulet

Additional excess spoil and tree removal areas to determined MWREF:

Site 1 - (depicted by the red bounded, green cross-hatched area in Figure 2a below) – located on the northern side of the Bruxner Highway east of Dump Road and extending laterally from the road formation to the fenceline/road corridor boundary. There are approximately eight (8) additional mature trees in this area not captured in the survey information but require removal so that excess spoil can be placed and finished. Removal of vegetation will also improve intersection sight distance at Dump Road.

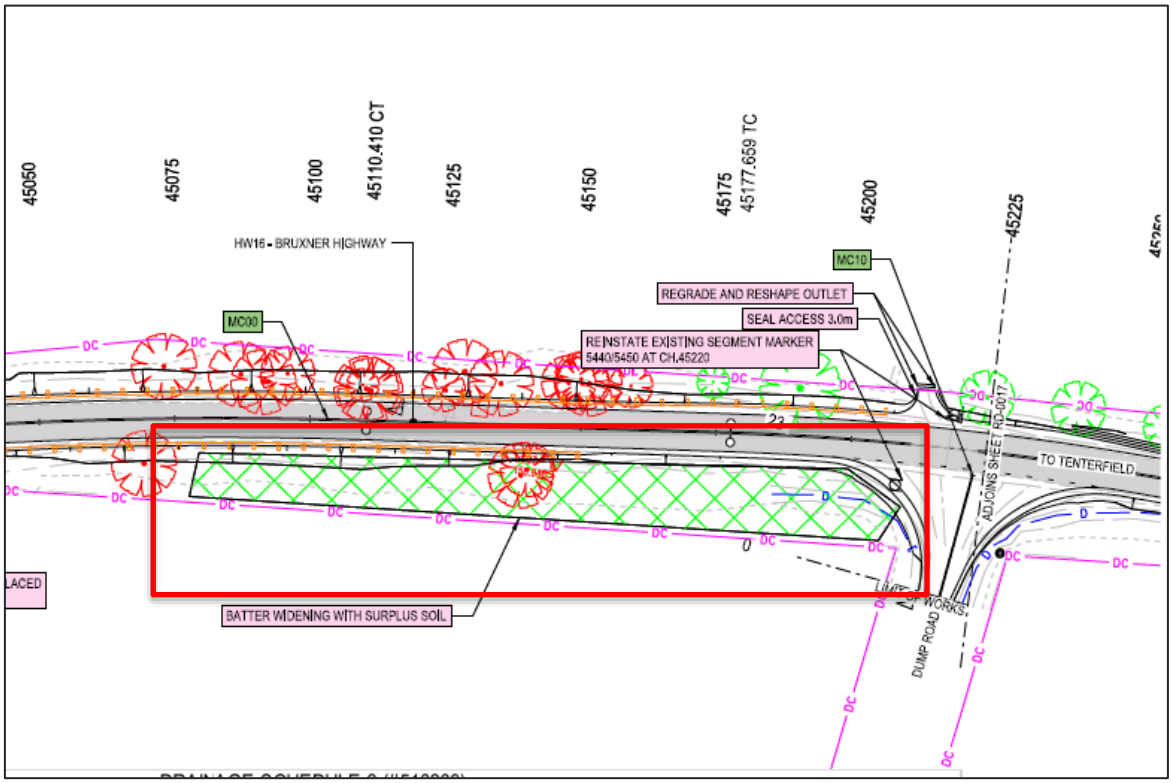


Figure 2a (Source: TfNSW Draft IFC design)

Site 2 - (depicted by the red bounded area in Figure 2b below) – located on the northern side of the Bruxner Highway west of Dump Road and extending laterally from the road formation to the fenceline/road corridor boundary. There are approximately three (3) additional smaller trees in this area not captured in the survey information but require removal so that excess spoil can be placed and finished. Removal of vegetation will also improve intersection sight distance at Dump Road and on the inside of the curve to/from the west.

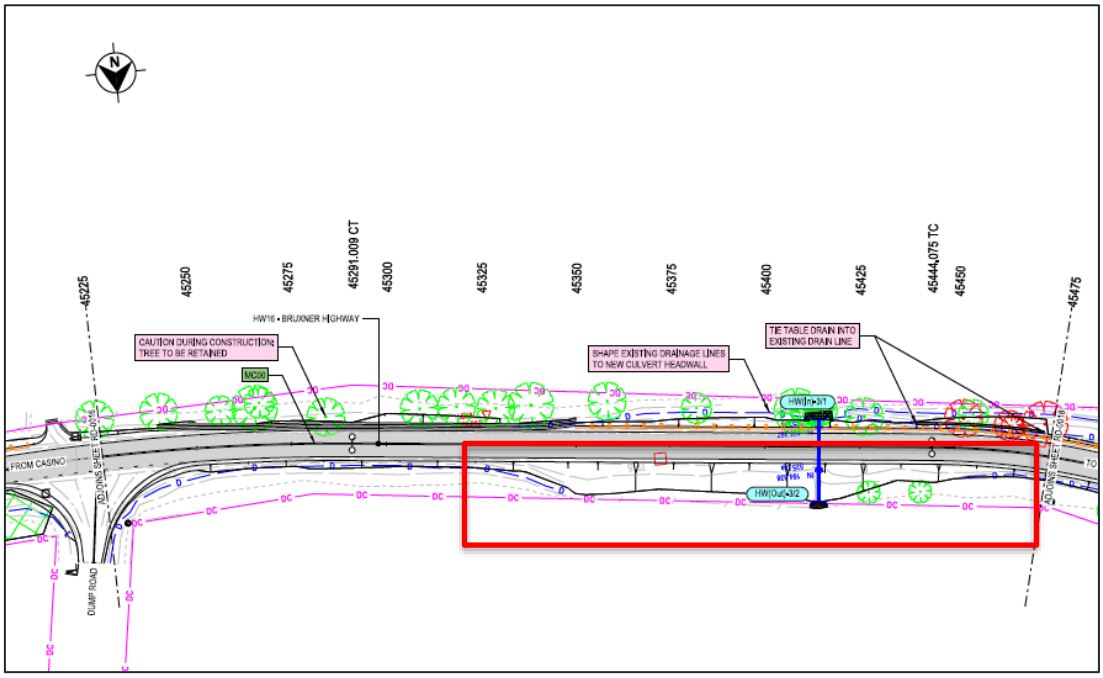


Figure 2b (Source: TfNSW Draft IFC design)

Need for the proposed modification

During a site inspection and pre-delivery handover meeting with the project team, it was recommended that additional ancillary sites and excess spoil areas be assessed for inclusion into the determination and as a result, also impact up to eleven (11) additional mature trees that will require removal.

Options considered

The options considered for the proposed modification included:

Option 1- Do Nothing

This option does nothing to address the change proposal to utilise existing ancillary areas, identify additional areas for receiving excess spoil and remove the additional trees for safety and constructability reasons.

Option 2 – Revise the design to avoid the tree removal and adopt existing assessed ancillary sites

This option is to modify the design to avoid the additional ancillary sites and tree removal. Options including shifting the alignment, adjusting the batters, shoulder and verge widths were investigated however are already at minimum or tolerable widths and slopes. It has been identified that there are also insufficient ancillary sites included with the proposal, or areas that were not originally considered necessary that are

now required to efficiently construct the project.

Option 3 – Remove the trees and include additional ancillary sites

Removal of the trees is necessary as the design cannot be modified and there are insufficient spoil disposal areas to accommodate the quantity of excess spoil that will be generated from the project. Removal of the trees is the safest option as it eliminates risks with trees becoming unstable during construction and operationally results in flatter roadside areas for road safety and maintenance. Additional ancillary sites are required to accommodate the size and number of plant required to construct the project efficiently and safely.

Option 3 is the preferred option

Consultation

Consultation has occurred with the Transport Development and Delivery Project Team members and Tammie Tribe, Transport Senior Environment & Sustainability Officer to determine the most effective engineering solution to minimise negative impacts throughout the road corridor.

Impact assessment

Attachment A addresses the environmental factors specified in section 171 of the Environmental Planning and Assessment Regulation 2021.

Soil

No additional impacts are likely to occur as a result of the proposed works.

Waterways and water quality

Ancilliary Area C (figure 1c) – vehicle parking and turn around area east of Tabulam Rivulet is located approximately 30m from a waterway and there is potential for impacts from the proposed parking area if runoff is not appropriately managed and erosion and sediment control are not in place. This has potential to negatively impact the waterway by reducing water quality. The creek is identified habitat for the threatened fish Purple Spotted Gudgeon (*Mogurnda adspersa)* so it is important that measures are in place to avoid impacts to the creek.

In addition to the existing safeguards in the approved MWREF the following safeguard is also recommended:

- A vegetated buffer is to be retained on the western side of the proposed parking area, a minimum of 10m wide.

No additional impacts are likely to occur as a result of the proposed works.

Noise and vibration

No additional impacts are likely to occur as a result of the proposed works.

Air quality

No additional impacts are likely to occur as a result of the proposed works.

Aboriginal heritage

No additional impacts are likely to occur as a result of the proposed works. A new AHIMS search was carried out to include extended areas to which there were no new finds highlighted in the results. Advice was also received from the Aboriginal Cultural Heritage Officer Malcolm Saunderson that a new PACHCI assessment was not required. A Native Title check was also undertaken and also concluded the additional areas are located on land that is extinguished from Native Title.

Non-Aboriginal heritage

No additional impacts are likely to occur as a result of the proposed works.

Biodiversity

The Determined MWREF Report prepared by Ecologists RECONECO assessed all trees through the road corridor in this section for potential removal. Additional surveys were completed on November 22nd 2022 to assess the additional trees proposed to be removed.

An additional 27 trees are required to be removed as part of the proposed modification to the approved MWREF. Details of the trees to be removed are provided in Table 1.

Table 1 Tree proposed to be removed and offset requirements

Common name	Scientific name	DBH (cm)	Koala food tree	Contains hollows	Tree offset required
Swamp Box	*Lophostemon suaveolens*	23	N	N	4
Forest Red Gum	*Eucalyptus tereticornis*	40	Y	N	4
Grey Ironbark	*Eucalyptus siderophloia*	11	N	N	2
Forest Red Gum	*Eucalyptus tereticornis*	42	Y	N	4
Large-leaved Spotted Gum	*Corymbia henryi*	13	N	N	2
Grey Ironbark	*Eucalyptus siderophloia*	35	N	N	4
Grey Ironbark	*Eucalyptus siderophloia*	33	N	N	4
Large-leaved Spotted Gum	*Corymbia henryi*	51	N	N	8
Grey Box	*Eucalyptus moluccana*	75	Y	N	8
Forest Red Gum	*Eucalyptus tereticornis*	30	Y	N	4
Grey Box	*Eucalyptus moluccana*	47	Y	N	4
Forest Red Gum	*Eucalyptus tereticornis*	34	Y	N	4
Forest Red Gum	*Eucalyptus tereticornis*	15	Y	N	2
Grey Box	*Eucalyptus moluccana*	28	Y	N	4

Common name	Scientific name	DBH (cm)	Koala food tree	Contains hollows	Tree offset required
Grey Box	*Eucalyptus moluccana*	13	Y	N	2
Grey Box	*Eucalyptus moluccana*	24	Y	N	4
Grey Box	*Eucalyptus moluccana*	14	Y	N	2
Forest Red Gum	*Eucalyptus tereticornis*	33	Y	N	4
Forest Red Gum	*Eucalyptus tereticornis*	37	Y	N	4
Forest Red Gum	*Eucalyptus tereticornis*	105	Y	N	16
Forest Red Gum	*Eucalyptus tereticornis*	99	Y	Y	8
Forest Red Gum	*Eucalyptus tereticornis*	33	Y	N	4
Swamp Box	*Lophostemon suaveolens*	18	N	N	2
Swamp Box	*Lophostemon suaveolens*	21	N	N	4
Wattle	*Acacia spp.*	9	N	N	2
Swamp Box	*Lophostemon suaveolens*	21	N	N	4
Swamp Box	*Lophostemon suaveolens*	27	N	N	4
				Total tree offset required	122

As described in Transport for NSW Tree and hollow replacement guidelines, trees are to be replaced at a ratio of:

- Very large tree (DBH greater than 100cm) – Plant a minimum 16 trees
- Large tree (DBH between 50cm and 100cm) - Plant minimum eight trees
- Medium tree (DBH greater than 20 cm, but less than 50cm) - Plant minimum four trees
- Small tree (DBH greater than 5cm, but less than 20cm) – Provide at least two trees

To offset the removal of the 27 trees described in Table 1 above, 122 trees are required to be planted. Planted trees should be provided in accordance with relevant guidelines, or a payment into TfNSW Conservation Fund is required in accordance with contributions detailed in TfNSW Tree and hollow replacement guidelines.

Tree hollow replacement requirements include providing three (3) artificial hollows for every occupied hollow removed. Guidelines state you are to assume 20% occupancy rate. For every five hollows identified (or where less than five hollows will be impacted), assume one hollow will be occupied and requires replacement. Where hollows are inspected during the clearing process, actual occupation can used as the basis for the replacement requirement. One (1) tree proposed to be removed was identified as having a large basal hollow, triggering the requirement for replacement of three (3) artificial hollows (refer Table 2).

.

Table 2 – Hollows proposed for removal and offset requirements

Common name	Scientific name	DBH (cm)	Number of hollows (m)	Size class
Forest Red Gum	*Eucalyptus tereticornis*	99	1	15cm+
		Hollows removed		**1**
		Artificial hollow offset required		3

Whilst generally there are impacts to biodiversity values as a result of tree removal, there is no significant impact to overall threatened species, populations and ecological communities as a result of the removal of the twenty seven (27) additional trees in the zones identified or trees that are bounded by the impact area.

Traffic and transport

No additional impacts are likely to occur as a result of the proposed works.

Socio-economic issues

No additional impacts are likely to occur as a result of the proposed works.

Landscape character and visual impacts

No additional impacts are likely to occur as a result of the proposed works.

Waste

Additional waste will be generated from the tree removal, trees are proposed to be mulched and trunks unable to be mulched disposed off-site at registered facilities or reused onsite as habitat provision in locations where they will not be a traffic hazard. Waste management plan to be updated to reflect change in volume and area to receive waste as relevant.

Cumulative impacts

No additional impacts are likely to occur as a result of the proposed works.

Summary of additional or revised safeguards

A summary of additional or revised safeguards are included in the table below. A complete list of safeguards as amended is provided in Attachment B.

Safeguards	
Soil	No additional safeguards
Waterways and water quality	A vegetated buffer is to be retained on the western side of the Ancillary Area C, a minimum of 10m wide.
Noise and vibration	No additional safeguards

Air quality	No additional safeguards
Non-Aboriginal heritage	No additional safeguards
Aboriginal heritage	No additional safeguards
Biodiversity	No additional safeguards
Trees	A Tree Replacement Plan should be developed detailing the planting and management of 122 trees (or in accordance with tree planting ratios detailed in Table 1) to compensate for trees removed OR make payment into TfNSW Conservation Fund in accordance with contributions detailed in TfNSW Tree and hollow replacement guidelines.
Traffic and transport	No additional safeguards
Socio-economic	No additional safeguards
Landscape character and visual amenity	No additional safeguards
Waste	Consider impacts from additional tree stumps not able to be tub mulched.
Cumulative impacts	No additional safeguards

Licences, permits or approvals

All relevant licenses, permits, notifications and approvals needed for the Little Creek – Tabulam Rivulet project and when they need to be obtained are listed in the MWREF – Little Creek – Tabulam Rivulet final. There are no changes to these requirements.

Conclusion

All relevant safeguards identified in the MWREF – HW16 Little Creek – Tabulam Rivulet would be applied to this work. No additional or revised safeguards are required.

Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) applies to the proposed modification. The proposed modification has been reviewed in the context of the MWREF and considered against the requirements of sections 5.5 and 5.7 ofthe EP&A Act.

In considering the proposed modification this assessment has examined and taken into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of that activity asaddressed in this memo, and associated information. This assessment is considered to be in accordance with the factors specified in section 171 of the *Environmental Planning and Assessment Regulation 2021*.

The Little Creek to Tabulam Rivulet project including the proposed modification described in this memo will have some minor additional environmental impacts which can be ameliorated satisfactorily. Having regard to the safeguards and management measures proposed, it is considered that the expected environmental impacts are unlikely to be significant and an environmental impact statement is not required under Division 5.2 of the EP&A Act.

The assessment has considered the potential impacts of the activity on the biodiversity values listedunder the *Biodiversity Conservation Act 2016* and the *Fisheries Management Act 1994*.

The MWREF including the proposed modification described in this memo will not significantly affect biodiversity values listed under the *Biodiversity Conservation Act 2016*. Therefore,the concurrence of the Coordinator General of the Environment, Energy and Science Group (EES) of Department of Planning and Environment and a species impact statement or a Biodiversity DevelopmentAssessment Report (BDAR) is not required.

In addition to the above, the assessment considered the effect of the activity on:

3. Conservation agreements under the *National Parks and Wildlife Act 1974*.
4. Plans of management under the *National Parks and Wildlife Act 1974*.
5. Biodiversity stewardship sites under the *Biodiversity Conservation Act 2016*.
6. Wilderness areas under the *Wilderness Act 1987*.

The assessment has also addressed the potential impacts of the activity on matters of national environmental significance and any impacts on the environment of Commonwealth land and concluded that there will be no significant impacts. Therefore, there is no need for a referral to be made to the Australian Government Department of Agriculture, Water and the Environment for a decision by the Australian Minister for the Environment on whether assessment and approval is required under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or for application of the EPBC Act strategic assessment for Transport activities assessed under Part 5 of the EPBC Act.

This memo is considered to be of adequate quality and meets all relevant requirements.

The proposed modification has been characterised in the context of the Little Creek – Tabulam Rivulet project and is considered to be consistent with that project's objectives and key features. While the proposed modification would increase the overall environmental impacts of the determined project, itis substantially the same as the activity described and assessed in the determined REF and does not constitute an entirely new activity.

Certification

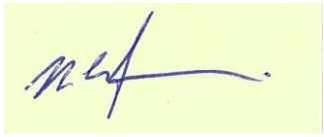
This memo provides a true and fair description of the scope and potential impacts of the proposal to modify the Little Creek – Tabulam Rivulet MWREF.

Prepared by:

Angus Underwood

Ecologist – ReconEco

Reviewed by:



Ross Gersekowski

Project Contract Manager

Recommendation

It is recommended that the proposal to modify the Little Creek – Tabulam Rivulet MWREF to accommodate a change in the number of trees to be removed as described in this memo, proceed subject to the implementation of all safeguards and management measures identified in this memo and in the MWREF – HW16 Little Creek – Tabulam Rivulet MWREF and compliance with all other relevant statutory approvals, licences, permits and authorisations. Consideration of this proposed modification has examined and taken into account, to the fullest extent possible, all matters likely to affect the environment by reason of the activity and established that the activity is not likely to significantly affect the environment. The memo has concluded that there will be no significant impacts on matters of national environmental significance or the environment of Commonwealth land.

Recommended by:

Lester Piggott

A/Manager Environment and Sustainability North

Determination

Determined by:

David Pattison
Senior Manager Project Services North
Date: 20/12/2022

Appendices

Appendix A – Section 171 EP&A Regulation checklist

Appendix B - Complete list of safeguards

Appendix C – HW16 Bruxner Highway S5440-5450 Little Creek – Tabulam Rivulet MWREF

Please return this paperwork to: Ross Gersekowski

Appendix A: Environmental Planning and Assessment Regulation 2021 checklist

The following factors, listed in section 171(2) of the Environmental Planning and Assessment Regulation 2021, have been considered to assess the likely impacts of the proposal on the natural and built environment. This consideration is required to comply with sections 5.5 and 5.7 of the EP&A Act.

Environmental factor		Impact
(a)	**Any environmental impact on a community?** The proposed work may cause minor short-term environmental impactson the community, such as delays to traffic and noise impacts on residents, however the potential impacts would be minimised with the implementation of the safeguards as detailed in this addendum memo. The maintenance works would have no environmental impact on a community in the long-term and road users would benefit from safer travelling conditions.	N/A
(b)	**Any transformation of a locality?** The proposed work would not transform the locality, as works would generally be contained within the existing road formation and be carriedout on existing Transport assets.	N/A
(c)	**Any environmental impact on the ecosystems of a locality?** The proposal would have potential environmental impacts on the ecosystems of a locality, however the potential impacts would be minimised with the implementation of the safeguards in attachment B ofthis addendum memo.	Minimal impacts previously assessed in REF
(d)	**Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?** The proposal would not reduce the aesthetic, recreational, scientific orother environmental quality or value of the locality, as works would generally be contained with the existing road formation.	N/A
(e)	**Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?** The proposal would potentially have an effect on a locality, place or building of significance or other special value for present or future generations, however the effect would be minimal due to the limited scopeof works for the maintenance activities covered in this addendum memo, and the potential impacts would be minimised with the implementation of the safeguards given in attachment B of this addendum memo.	N/A
(f)	**Any impact on habitat of any protected animals (within the meaning of the Biodiversity Conservation Act 2016)?** The proposal would not have any impact on the habitat of any protectedanimals due to the limited scope of works for the proposed activities andthe implementation of the safeguards given in attachment B of this addendum memo.	N/A
(g)	**Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?**	N/A

	The proposal would not endanger any species of animal, plant or other form of life, whether living on land, in water or in the air due to the limited scope of works for the proposed activities and the implementation of thesafeguards given in attachment B of this addendum memo.	
(h)	**Any long-term effects on the environment?** The proposal would have positive long-term effects on the environment due to improved safety for road users. There are no anticipated negative long-term effects on the environment from the maintenance works due to the limited scope of these works and the implementation of the safeguardsgiven in attachment B of this addendum memo.	N/A
(i)	**Any degradation of the quality of the environment?** The proposal would potentially degrade the quality of the environment in the short-term, however the potential impacts would be minimised with the implementation of the safeguards given in attachment B of this addendum memo.	N/A
(j)	**Any risk to the safety of the environment?** The proposal would have minimal risk to the safety of the environment due to the limited scope of works for the maintenance activities covered inthis addendum memo, and the potential impacts would be minimised with the implementation of the safeguards given in attachment B of this addendum memo.	No more than previously assessed in the REF
(k)	**Any reduction in the range of beneficial uses of the environment?** The proposal would cause a minor reduction in the use of the road from lane closures, which would potentially increase travelling time for road users in the short-term. There would be no long-term reduction in the range of beneficial uses of the environment as a result of the maintenanceworks.	N/A
(l)	**Any pollution of the environment?** The proposal would potentially cause pollution of the environment, however the potential impacts would be minimised with the implementation of the safeguards given in attachment B of this addendummemo.	N/A
(m)	**Any environmental problems associated with the disposal of waste?** The waste generated during the proposal would be contained and removed for disposal to approved recycling facilities or to licensed landfillin accordance with the safeguards in attachment B of this addendum memo. No environmental problems are anticipated for the disposal of waste.	None that wasn't previously assessed in the REF.
(n)	**Any increased demands on resources, natural or otherwise which are, or are likely to become, in short supply?** The proposal would not significantly increase demands on resources,which are, or are likely to become, in short supply. Relatively small amounts of materials would be required for the proposed work. The safeguards listed in attachment B of this addendum memo would be implemented to minimise any impacts.	N/A
(o)	**Any cumulative environmental effect with other existing or likely future activities?** The proposal has the potential to have cumulative environmental effects with other existing or likely future activities, however the effects would be minimal due to the limited scope of works for the activities covered in this addendum memo,	N/A

	and the potential impacts on the environment would beminimised with the implementation of the safeguards given in attachment B of this addendum memo.	
(p)	**Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?** Refer to any safeguards proposed to minimise impacts.	N/A
(q)	**Any impact on applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1?** NIL.	N/A
(r)	**Any impact on other relevant environmental factors?** In considering the potential impacts of this proposal all relevant environmental factors have been considered, refer to impact assessmentsection of this addendum memo.	N/A

Appendix B: Environmental Planning and Assessment Regulation 2021 checklist

Environmental safeguards for the Little Creek – Tabulam Rivulet project are listed below. Additional safeguards identified in this addendum minor works REF memo are included in bold and italicised font. The safeguards will be incorporated into the CEMP and implemented during construction and operationof the proposed modification, should it proceed. These safeguards will minimise potential adverse impacts arising from the proposed works on the surrounding environment.

Safeguards for the proposed work	
Soil	E1. Erosion and sediment control measures are to be implemented and maintained to: • Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets. • Reduce water velocity and capture sediment on site. • Minimise the amount of material transported from site to surrounding pavement surfaces. • Divert clean water around the site (in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book)). E2. Erosion and sedimentation controls are to be checked and maintained on a regular basis (including clearing of sediment from behind barriers) and records kept and provided on request. E3. Erosion and sediment control measures are not to be removed until the works are complete, and areas are stabilised. E4. Work areas are to be stabilised progressively during the works. E5. A progressive erosion and sediment control plan is to be prepared for the works. E6. The maintenance of established stockpile sites is to be in accordance with the Transport for NSW Stockpile Site Management Guideline (EMS-TG-10).
Waterways and water quality	W1. There is to be no release of dirty water into drainage lines and/or waterways. W2. Water quality control measures are to be used to prevent any materials (e.g., concrete, grout, sediment etc) entering drain inlets or waterways. W3. Excess debris from cleaning and washing is removed using hand tools. W4. All fuels, chemicals and liquids are to be stored in an impervious bunded area a minimum of 50 metres away from: • Rivers, creeks, or any areas of concentrated water flow • Flooded or poorly drained areas • Slopes above 10%. W5. Refuelling of plant and equipment is to occur in impervious bunded areas located a minimum of 50 metres from drainage lines or waterways. W6. An emergency spill kit is to be kept on site at all times and maintained throughout the construction work. The spill kit must be appropriately sized for the volume of substances at the work site. W7. All workers will be advised of the location of the spill kit and trained in its use. W8. If an incident (e.g. spill) occurs, the Transport for NSW Environmental Incident Classification and Reporting Procedure is to be followed and the Transport for NSW Contract Manager notified as soon as practicable.

Safeguards for the proposed work	
	W9. Visual monitoring of local water quality (i.e. turbidity, hydrocarbon spills/slicks) is to be undertaken on a regular basis to identify any potential spills or deficient silt curtains or erosion and sediment controls. W10. Timing the works should consider risk of flooding events which are more likely in the wet season which for the area is from December – March. Works undertaken during this period should monitor forecast rainfall and plan for the occurrence of flooding events which may impact construction works. W11. If water is found to be flowing at any culverts, prepare a combined Water Deviation plan / Dewatering Plan / Work Method Statement to address potential impacts specific to the activity and provide additional mitigation measures to be included in the CEMP. W12. Where water is flowing through culverts there needs to be a deviation of clean water flow around the culvert outlet during works to avoid sedimentation and maintain clear water flow. ***W 13. A vegetated buffer is to be retained on the western side of the Ancilliary Area C, a minimum of 10m wide.***
Noise and vibration	N1. Works to be carried out during normal work hours (i.e., 7am to 6pm Monday to Friday) except for Saturdays where hours will be 8am to 6pm. Any work that is performed outside normal work hours or on Sundays or public holidays must have measures in place to minimise noise impacts. Note extended Saturday work hours 8am to 6pm. N2. Noise impacts are to be minimised in accordance with Transport for NSW Construction Noise Estimator. N3. Letter box drops are to be completed to all residents located less than 115 metres from the works. All noise complaints will be addressed if/when received with respite options provided on a case-by-case basis. N4. Implement measures, including allowing adequate distance that rollers and other vibration producing equipment can come to adjacent buildings and/or using non-vibration producing equipment, to minimise or prevent vibration impacts.
Air quality	A1. Measures (including watering or covering exposed areas) are to be used to minimise or prevent air pollution and dust. A2. Works (including the spraying of paint and other materials) are not to be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely. A3. Vegetation or other materials are not to be burnt on site. A4. Vehicles and vessels transporting waste or other materials that may produce odours or dust are to be covered during transportation. A5. Stockpiles or areas that may generate dust are to be managed to suppress dust emissions in accordance with the Transport for NSW Stockpile Site Management Guideline (EMS-TG-10).
Non-Aboriginal heritage	If unexpected heritage items are uncovered during the works, all works must cease in the vicinity of the material/find and the steps in the Transport for NSW *Standard Management Procedure: Unexpected Heritage Items* must be followed. Transport for NSW Senior Environment Specialist – Heritage must be contacted immediately.
Aboriginal heritage	If Aboriginal heritage items are uncovered during the works, all works in the vicinity of the find must cease and the Transport for NSW Aboriginal cultural heritage officer and regional environment manager contacted immediately. Steps in the Transport for NSW *Standard Management Procedure: Unexpected Heritage Items* must be followed.

Safeguards for the proposed work	
Biodiversity	F1. There is to be no disturbance or damage to threatened species or areas of outstanding value. F2. Works are not to harm threatened fauna (including where they inhabit bridges or other structures e.g. timber fence posts). F3. Environmental protection areas should be established to ensure the boundary of areas to be cleared are clearly identified and all other vegetation is retained. Areas of Bailey's Cypress Pines shown in Figure 6 and Plates 10 to 11 in the original determined MWREF must be included in Environmental Protection Areas. Furthermore, weed control is to be undertaken within the Environmental Protection Area to promote the growth of Bailey's Cypress Pines and reduce weed competition with immature specimens. F4. An experienced, licensed ecologist or appropriately trained Transport for NSW staff is to undertake pre-clearing surveys prior to vegetation removal to inspect trees for the presence of fauna. If fauna is identified a licensed ecologist is to be engaged to perform any spotter catcher duties required. F5. An experienced ecologist or appropriately trained Transport for NSW staff is to undertake spotter catcher role during removal of hollow bearing trees. F6. Tree limbs containing hollows should be removed by arborist prior to felling trees and lowered to ground undamaged to avoid direct impacts to fauna occupying hollow. F7. If unexpected threatened fauna or flora species are discovered, stop works immediately and follow the Transport for NSW Unexpected Threatened Species Find Procedure in the Transport for NSW Biodiversity Guidelines 2011 – Guide 1 (Pre-clearing process). F8. Each tree hollow removed should be replaced at a ratio of 1:2 (i.e., 2 boxes for each hollow removed) to compensate for loss of tree hollows. This can be achieved through installation of nest boxes or creation of hollows using a boring device, or sections of tree hollows can be removed, modified, and installed in surrounding unimpacted vegetation. Of the eleven (11) replacement hollows a range of entry and cavities sizes should be used to account for the suite of species occurring locally. F9. All pathogens (e.g. Chytrid, Myrtle Rust and Phytophthora) are to be managed in accordance with the Transport for NSW Biodiversity Guidelines - Guide 7 (Pathogen Management), DECC Statement of Intent 1: Infection of native plants by Phytophthora cinnamomi (for Phytophthora) and Arrive Clean, Leave Clean, Commonwealth of Australia 2015. F10. Weeds are to be managed according to requirements under the Biosecurity Act, 2015 and Guide 6 (Weed Management) of the Transport for NSW Biodiversity Guidelines 2011. F11. Fauna handling must be carried out in accordance with the requirements the Transport for NSW Biodiversity Guidelines - Guide 9 (Fauna Handling). F12. Works are not to create an ongoing barrier to the movement of wildlife.
Trees	T1. Pruning of mature trees is to be in accordance with Part 5 of the Australian Standard 4373-2007 Pruning of amenity trees. T2. Work limits are to be clearly delineated in the field prior to commencement. T3. There is to be no disturbance beyond the limit of works without prior assessment. ***T 4. A Tree Replacement Plan should be developed detailing the planting and management of 122 trees (or in accordance with tree planting ratios***

Safeguards for the proposed work	
	detailed in Table 1) to compensate for trees removed OR make payment into TfNSW Conservation Fund in accordance with contributions detailed in TfNSW Tree and hollow replacement guidelines.
Traffic and transport	R1. Where possible, current traffic movements and property accesses are to be maintained during the works. Any disturbance is to be minimised to prevent unnecessary traffic delays. R2. A traffic control plan will be prepared in accordance with the 'Traffic control at work sites manual' (RMS, 2018) and Australian Standard 1742.3 Manual of uniform control devices. R3. Notify NSW SES where there are likely to be significant delays in the operation of the roads affected by the upgrades.
Socio-economic	C1. Notification is to be given to road users and adjacent properties prior to the works taking place. The notification is to include: • Details of the proposal. • The duration of works and working hours. • Any changed traffic or access arrangements. • How to lodge a complaint or obtain more information. • Contact name and details. C2. All complaints are to be recorded on a complaint register and attended to promptly. C3. Existing access for nearby and adjoining properties is to be maintained at all times during the works unless otherwise agreed to by the affected property owner. C4. TfNSW is to liaise with / notify Indigenous Native Title/Land Use Agreement claimants prior to starting any of the proposed works.
Landscape character and visual amenity	V1. Landscaping is to be managed in accordance with Transport for NSW Landscape guideline, 2013. V2. Works to be carried out in accordance with Transport for NSW EIA-N04 Guideline for Landscape Character and visual impact assessment.
Waste	M1. A Waste Management Plan must be prepared that follows the Transport for NSW Technical Guide: Management of road construction and maintenance waste. M2. Resource management hierarchy principles are to be followed: • Avoid unnecessary resource consumption as a priority. • Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling, and energy recovery). • Disposal is undertaken as a last resort. (in accordance with the Waste Avoidance & Resource Recovery Act 2001). M3. If vegetation is to be mulched and transported off site for beneficial reuse, it is to be assessed for the presence of weeds, pests, and other diseases, and a Mulch Management Plan prepared in accordance with the Transport for NSW Technical Procedure: Mulch Management. M4. Bulk project waste (e.g. fill) sent to a site not owned by the Transport for NSW (excluding EPA licensed landfills and resource recovery facilities) is to have prior formal written approval from the landowner, in accordance with Environmental Direction No. 20 – Legal Off-site Disposal of Transport for NSW Waste. This includes waste transported for reuse, recycling, disposal, or stockpiling. M5. There is to be no disposal or re-use of construction waste on to other land. M6. Waste is not to be burnt on site. M7. Waste material, other than vegetation and tree mulch, is not to be left on site once the works have been completed.

Safeguards for the proposed work	
	M8. Working areas are to be maintained, kept free of rubbish, and cleaned up at the end of each working day. M9. Tree mulch can be reused onsite to stabilise soil by spreading on embankments (no more than 100m thick) within the road reserve. Tree mulch will not be spread on the lower slopes of stream banks.

Appendix C: HW16 Bruxner Highway S5440-5450 Little Creek – Tabulam Rivulet MWREF