



OUT21/10163

Daniel Gorgioski
Planning and Assessment Group
NSW Department of Planning, Industry and Environment

daniel.gorgioski@planning.nsw.gov.au

Dear Mr Gorgioski

**M1 Pacific Motorway extension to Raymond Terrace (SSD-7319) –
Environmental Impact Statement (EIS)**

I refer to your email of 27 July 2021 to the Department of Planning, Industry and Environment (DPIE) Water and the Natural Resources Access Regulator (NRAR) about the above matter.

Transport for New South Wales proposes to construct the M1 Pacific Motorway extension to Raymond Terrace. This will include a 15 kilometre motorway; a viaduct over the Hunter River floodplain, new bridge crossings over the Hunter River and local waterways, and adjustment of some waterways.

Our recommendations regarding controlled activities; surface water management, the Hunter Valley Flood Mitigation Scheme; and ground water management are provided in **Attachment A**.

In particular we are concerned about the potential for impacts of the project on the Hunter River banks and floodplains and require a commitment to remediate any disturbances.

Any further referrals to DPIE Water and NRAR can be sent by email to landuse.enquiries@dpie.nsw.gov.au or to the following coordinating officer within DPIE Water:

Simon Francis – Senior Project Officer
E: simon.francis@dpie.nsw.gov.au
M: 0428 926 117

Yours sincerely

A handwritten signature in blue ink, appearing to read 'M Isaacs'.

Mitchell Isaacs
Chief Knowledge Officer
Department of Planning, Industry and Environment: Water
3 September 2021

Attachment A

Detailed advice to DPIE Planning & Assessment regarding the M1 Pacific Motorway extension to Raymond Terrace (SSD-7319) – EIS

DPIE Water and NRAR provide the following recommendations.

1.0 Controlled Activities

1. Pre-approval Recommendation:

- a. The realignment of Purgatory Creek should mimic natural stream design by incorporating natural hydrological function and not include 90 degree sharp meanders. The watercourse reconstruction should tie into upstream and downstream sections of the watercourse and not limit any connectivity in the area.

Explanation

The proposal to realign the 2nd order watercourse (of Purgatory Creek) appears to realign it at nearly 90 degrees in part (as indicated by Figure E-1: Project key features (map 1 of 2)).

Any re-alignment of Purgatory Creek should mimic natural stream design to prevent changes in hydraulic, hydrologic, geomorphic and ecological functions of the watercourse. The watercourse reconstruction should not limit any connectivity to both upstream and downstream sections of the watercourse. For further information of what should be considered when re-aligning a watercourse, please see the NRAR Guidelines for Controlled Activities – In-stream works:

https://www.dpie.nsw.gov.au/_data/assets/pdf_file/0005/386204/licensing_approvals_controlled_activities_instream_works.pdf

2. Post Approval Recommendations

- a. Works on waterfront land and within watercourses must be in accordance with NRAR Guidelines for Controlled Activities on Waterfront Land. This includes outlets and watercourse crossings. The NRAR Guidelines can be found at:
<https://www.industry.nsw.gov.au/water/licensing-trade/approvals/controlled-activities/guide>.
- b. Proposed revegetation within riparian zones should consider NRARs guidelines for Vegetation Management Plans and accommodate a fully structured vegetated riparian zone using indigenous species, which can be found at:

<https://www.dpie.nsw.gov.au/nrar/how-to-apply/controlled-activities/guidelines-for-controlled-activities>.

Revegetation should also include a maintenance component post-revegetation.

2.0 Hunter Valley Flood Mitigation Scheme

3. Post Approval Recommendation

- a. The final construction plans must be provided to the Hunter Valley Flood Mitigation Scheme (HVFMS) team for assessment to receive formal consent under section 256 of the *Water Management Act 2000*.

Explanation

HVFMS provides “in principle” consent under section 256 (1) (a) and (b) for the extension works. This allows for the finalisation of the designs for the M1 highway upgrade to Raymond Terrace. Formal consent under section 256 of the *Water Management Act 2000* cannot be provided until the final construction plans are provided to the HVFMS team for assessment. These final designs will need to provide details on the following:

- Location of piers relative to the Hunter Valley Flood Mitigation Scheme assets, ideally the bridge piers should not be located on any levees;
- Scour protection must be provided around piers in close proximity to the levee to minimise erosion during flood events;
- A revised flood model of the final design is to be provided identifying the hydraulic impacts for the design events exceeding the 10% AEP.

Note: The HVFMS has recently joined DPIE Water. Further information on the HVFMS can be found at:

<https://www.environment.nsw.gov.au/topics/water/floodplains/hunter-valley-flood-mitigation-scheme>

3.0 Surface Water Remediation and Mitigation

4. Pre-approval Recommendation:

The applicant should make a commitment to remediate any disturbance to the banks and adjacent floodplain of the Hunter River resulting from construction, both during and following the construction phase in any area of land under its control.

This should include remediation and rehabilitation of banks and floodplain of the Hunter River and other affected watercourses along the M1 extension corridor. Remediation and rehabilitation actions should be consistent with rehabilitation plans formed by Hunter Central Coast Local Lands Services and/or any actions under the Hunter Valley Flood Mitigation Scheme (see [Recommendation 3](#) above).

Explanation

The Hunter River supports a number of high value and threatened ecological communities. This area located in near proximity to Ramsar wetlands to the south and east of the site and the good condition section of the Hunter River (North Arm). Several tributaries to the Hunter River provide fish habitat, including Purgatory Creek, Windeyers Creek and Toohrnbing / Ironbark Creek.

The applicant has not proposed any mitigation for altered hydraulic effects caused by any constriction of flood discharge. Mitigation measures are proposed for increases above 20% in stormwater discharge caused by the project. This is not clearly explained. As the banks of the Hunter River in proximity to the proposed highway bridge have been sensitised to scour and erosion, an appropriate monitoring and response regime is required. The monitoring and remediation programs should include objectives, timeframes, frequency and duration to be implemented.

Note: DPIE Water has assessed the application in terms of key risks to the Hunter River and the Hunter tidal pool, and this takes into account the 2014 River Styles assessment of the Hunter River and its estuary and recent estuary process model and Hunter River Estuary Water Quality Model. This reference is as follows:

- W. Glamore, S. Mitrovic, J. Ruprecht, K. Dafforn, P. Scanes, A. Ferguson, D. Rayner, B. Miller, M. Dieber, T. Tucker, P Rahman, I. King. *The Hunter River Estuary Model Australasian Coasts and Ports 2019 Conference* – Hobart 10-13 September 2019.

Background and key risks

The Hunter River between Maitland and Ash Island has been extensively reconstructed, with alternate bank reshaping and rock-lined armouring sections. Minimal riparian vegetation cover exists on the Hunter River channel upstream of Tomago Point at the location of the proposed river crossing. Estuarine riparian vegetation is nearly continuous on the left bank of the Hunter River from Tomago Point downstream to Fullerton Cove.

Altered hydro-geomorphic processes were identified as a major hazard in the Hunter River from 1870 onwards. The river channel has expanded and simplified due to mechanical

disturbance and vegetation and large wood removal from the river channel, leading to very large volumes of mobilised sediment migrating along the river into Newcastle Harbour.

Channel configuration of the Hunter River at Hexham has significantly altered due to loss of protective riparian vegetation and increased boat wash channel fretting. The banks of the Hunter River have increased vulnerability to toe scour, fretting and failure.

Serious river bed aggradation has affected the hydraulic function of the river and, in combination with large wood removal and vegetation stripping, has largely destroyed channel complexity and habitat. Loss of geomorphic complexity may alter hydrologic behaviour during flood events. Channel bed aggradation may influence flood inundation due to reduced fluctuation of tidal flows.

In-channel flood depths are controlled by the level of channel aggradation in the reach of the proposal. Channel bed aggradation is a significant historical consequence to channel degradation in the mid to lower Hunter catchment. Alteration or mitigation of channel aggradation is complex and very difficult to achieve any measurable change. Although the proponent has not proposed river dredging, we note that dredging works would be unlikely to displace sufficient materials to alter channel hydraulic competence and are not proposed or recommended for this site.

5. Post Approval Recommendations

The approved Water Management Plan (WMP) for the proposal should:

- a. Include mitigation of any local alteration of flood velocities or scour potential that may occur as a result of construction of elements of the bridge crossing on the Hunter River and also any watercourses affected by crossings or disturbance during construction of the M1 extension.

The WMP should specify the level of risk of flow concentration and resulting scour of bed and/or banks of watercourse channels that are affected by culvert controlled crossings or bridges as part of the project.

- b. Incorporate a risk analysis of flood scour and damage to bed and banks of affected watercourses and any mitigation and/or rehabilitation measures that will be undertaken to protect the Hunter River and other affected watercourses for the project. Any such measures should be designed in consultation with DPIE Water and the Hunter Central Rivers Local Lands Services.

4.0 Groundwater Modelling/Monitoring and Impacts

6. Post Approval Recommendations:

- a. The proponent should clarify that there are 24 months of continuous baseline data used in the project assessment and modelling.

Additionally, the proponent is to continue the groundwater monitoring program prior to construction to obtain a suitable up-to-date set of baseline data.

Explanation

The proponent outlined baseline monitoring results from several monitoring instances over the period September 2016 to July 2017, plus the use of other historical data from various studies. However, it is unclear if the baseline data meets the 24 months of continuous data recommended in the NSW Aquifer Interference Policy (2012) for assessment and modelling purposes.

The groundwater monitoring program must be continued prior to construction to obtain a suitable up-to-date set of baseline data. This data is to inform any updates to the groundwater model, final project design, applications for and water supply works and use approvals and the WMP for the project.

Any monitoring that relates to the Tomago Groundwater Source is considered to be of high importance by DPIE Water.

- b. The proponent should detail all Trigger Action Response Plans (TARPs) in the WMP for the project.

Explanation

The impact assessment outlines the baseline data set and nominated a performance targets for groundwater limited to the discharge of groundwater to the surface water system. No specific TARPs were presented in the event that volumes are greater than anticipated and or water quality changes. Further prescriptive detail will be required in the WMP for the project.

End Attachment A