Transport for NSW

M1 Pacific Motorway extension to Raymond Terrace

Managing Water - FAQ

July 2025

Australian Government | BUILDING AUSTRALIA

NSW GOVERNMENT

Transport for NSW acknowledges the Wonnarua, Worimi and Awabakal people as the Traditional Custodians of the lands on which we work and pays respect to Elders past and present.

Drainage basin at Tomago

The Australian and NSW governments are investing in the M1 Pacific Motorway extension to Raymond Terrace. There are a number of controls in place to help us responsibly manage water during construction and operation of the project. In this update, we explain how the project has been designed to minimise impacts and safeguard important water sources, systems and behaviours.

Water sources

Surface water

Surface water is located above the Earth's surface and is found in rivers, streams, lakes, ponds and other natural watercourses.

Storm and floodwater

Storm and floodwater is water originating from rain. Specifically, floodwater refers to an overflow of water onto land that is usually dry. Once storm and floodwater falls it becomes surface water and may end up in rivers, streams or another watercourse. It may also replenish groundwater.

Groundwater

Groundwater is water located below the Earth's surface. It flows through porous soils and rocks before eventually connecting to a surface water system. It is a renewable resource which replenishes naturally over time.

How we use water

Water is used on construction sites for a number of reasons including dust control, washing plant and equipment, concrete and asphalt batching, material conditioning, drinking water, amenities and landscaping and revegetation. In responsibly using water in the region, the project adheres to the requirements set out in its Environment Protection Licence (EPL) and Minister's Conditions of Approval (CoA), granted on 8 November 2022 which do allow for minor impacts.

You can access these documents at **nswroads.work/m12rtportal**

We also obtain licences and/or permits for each water source when required and we are recycling water where possible. Regular monitoring helps us ensure water usage practices are sustainable and have no detrimental impacts on overall water supply, quality or the environment.

Water management

Water is an important resource to be shared and used responsibly. Preventing impacts on water quality is a key focus for the M1 extension project because we know dirt, chemicals and other forms of pollution can be harmful to our drinking water and important marine species.

How we manage water

To minimise the risk of impacts on water quality, we focus on drainage, erosion prevention and sediment control throughout the design, construction and operation of the project. This helps us to prevent, capture and redirect site runoff so we can keep the surrounding environment and waterways clean.

Additional measures and constraints have also been put in place around important ecological areas for enhanced protection.

Regular monitoring helps us ensure water usage practices are sustainable

Drainage is critical to the safe operation and durability of a road

Drainage infrastructure

Drainage is critical to the safe operation and durability of a road. Temporary drainage is equally important during construction and is installed as early as possible to manage environmental impacts.

A drainage system is designed to move water away from the road and filter it before it is released to the surrounding environment. It must cater for water that crosses the road (cross drainage) and water that runs parallel to the road (longitudinal).

The drainage system on the M1 extension has been designed to minimise rubbish, nutrients and other road contaminants from entering our waterways.

Did you know?

By adopting a viaduct instead of an embankment across the Hunter River floodplain, the project has avoided substantial upstream flooding impacts including impacts to drainage capacity and flood storage as well as groundwater and level impacts. Other impacts, such as local afflux and erosion and scour directly downstream of the project were also minimised during the design development.

Once operational, the project will improve the accessibility of the M1 Pacific Motorway, New England Highway and Pacific Highway between Black Hill and Raymond Terrace including across the Hunter River floodplain during flood events. This is particularly significant as the Pacific Highway forms an important flood evacuation and emergency access route during floods.

Fast facts

This project requires:

- ✓ 19.5 km of drainage pipes
- ✓ 190,000 tonnes of asphalt
- ✓ 600,000 tonnes of rock imported.

A typical drainage system includes:

	Name	Description	Purpose
	Vegetated swale drain (newly constructed)	A broad, shallow earth channel usually lined with grass or vegetation.	Guides water away from the road and into water treatment infrastructure. The vegetation removes sediment and slows the water to prevent erosion.
	Open concrete drain	A channel used to divert water.	Redirects water to water treatment infrastructure while preventing damage and erosion.
	Pipes	Cylindrical structures placed under and/or alongside the road. They range in diameter and are made of concrete.	Carries water through to its desired location, which may be a natural watercourse, man made pondwater treatment infrastrure or other drainage structures.
	Pit	A precast concrete box which connects pipes together underground. May have a grate on top to let water in.	Collects water and helps it move through pipes. May also be used to change the direction of water.
	Culverts	One or multiple tunnel-like concrete structures placed under the road, typically surrounded by soil. May be shaped like a box or cylinder.	Provides cross drainage by allowing water to flow under a road. May also be used for animal connectivity.
	Energy dissipaters	Large obstructions such as rocks usually positioned at the base of outlets from chutes, drains and culverts.	Prevents erosion by reducing the velocity of water discharged into the environment.
	Bridges	Elevated structure which allows the road to pass over water or land. Did you know there are 11 bridges between Black Hill and Raymond Terrace? On average, that's almost 1 bridge per kilometre.	Provides a larger opening for cross drainage and is often used for larger water courses and floodplains. May also be used for animal connectivity.

Erosion and sediment controls

Roads can impede the natural flow paths of stormwater runoff and can concentrate water flows, increasing the erosive forces in the drainage network. For this reason, we consider erosion in all aspects of the construction and operation of the road and we aim to design drainage to follow existing natural patterns where possible.

Erosion and sediment controls aim to prevent or reduce soil erosion, trap and retain sediment and isolate and treat water before it enters the drainage system and surrounding waterways.

Key measures used to control soil erosion and sediment include:

	Name	Description	Purpose
	Geotextile fabric covers	A textile product placed over a soil surface.	Protects soil from being mobilised and carried byin the water and wind action.
	Soil binder	A tackifying agent (sometimes dyed green) often found on sloped or hard-to-access soil surfaces.	Reduces erosion from wind, water and sometimes traffic by binding topsoil.
	Cover crop vegetation	Vegetation, such as grasses, which grow and die off rapidly.	The root structure and dead foliage holds the soil together while permanent vegetation grows.
	Sediment fencing	A textile material trenched into the ground and positioned vertically like a fence.	Traps suspended sediment and reduces runoff velocity while still enabling water to flow through.
	Silt curtain and hydrocarbon boom	Floating containment barrier holding a vertical textile skirt.	Separates the construction zone and allows capture of contaminants including suspended sediment and hydrocarbons.

	Name	Description	Purpose
	Water quality basins	Constructed open water ponds connecting to a drainage system.	Provides water quality treatment to surface water runoff from the road prior to discharge.
	Bioswale drain with baffle board	Shallow channels featuring layers of drainage, filter media, and vegetation.	Manage stormwater runoff by retaining and treating pollutants through physical, biological, and chemical processes.

Monitoring program

The project team implemented a water quality monitoring program to assess the impacts of the M1 extension project on surface and groundwater quality in the surrounding environment before and during construction. Water quality will continue to be monitored during the first year of operation or until results demonstrate the site has stabilised and there is no further need for sampling. Additional mitigation and management measures will be assessed as required.

Aerial image of viaduct construction near Tarro

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