

Surface water

Surface water is defined as water that flows over or is stored on the surface of the earth either permanently or for short time frames, such as seasonally.

The quantity and quality of surface water is important to the health and sustainability of Adelaide’s urban freshwater rivers, creeks and ultimately the marine environment of Gulf St Vincent. There are multiple locations where the T2D Project intersects watercourses within water catchments, and obstruction of existing flow paths in these areas has the potential to alter the existing flood risk. If not considered and incorporated into the design, this could pose additional flood risk to the community, surrounding properties and infrastructure within and adjacent to the project corridor.

The T2D Project corridor crosses three major watercourses: the River Torrens / Karrawirra Parri, the Keswick Creek and Brownhill Creek / Willawilla.



Existing environment

The current hydrological catchments (a boundary where all surface water runoff drains to a specific watercourse or water body), flooding risks and surface water quality were assessed as part of the project planning.

The project corridor is mainly within the Patawalonga Basin and River Torrens / Karrairra Parri catchments which are historically highly modified to a point where drainage is provided by a system of underground pits, pipes and culverts. These transfer water runoff from the surrounding areas to one of the major watercourses that flow out to the Gulf St Vincent.

The project’s potential impact on each watercourse regarding potential flooding impacts has been investigated with mitigation measures identified and confirmed for incorporation into the design. These assessments also considered future climate change scenarios and related potential extreme events.

While the existing surface water quality within and adjacent to the project corridor does not always meet the water quality guideline values set by the Environment Protection Authority (EPA), the design of the project will minimise further degradation of water quality during both construction and operation.

Potential impacts to the existing environment

The key surface water construction impacts identified that will need suitable mitigation measures include the following:

- dewatering, spills and leaks, release of hazardous materials or litter into the receiving watercourses that would worsen water quality through the catchment area
- extreme stormwater discharge has the potential to change the direction and flow of surface water, subsequently increasing flood risk frequency and severity in low lying areas
- construction activities causing riverbed or riverbank erosion or construction dewatering which could cause temporary impacts to water quality and the management of flows within the local drainage network.

Operational impacts to receiving water courses needing to be mitigated include:

- project infrastructure causing changes in surface water flow paths potentially increasing flood risk that could affect residents or built assets within the floodplain

- increased amount of sealed roadways from the project increases runoff resulting in contaminants being released into watercourses particularly from traffic
- increased water flows to receiving waters causing bed or bank erosion, worsening water quality
- an extreme flood event during the operation of the tunnel which could negatively impact on road user and public safety.

Alternatives, mitigation and opportunities

Surface water mitigation measures will include the requirement to manage and treat construction dewatering and construction site surface water flows to meet with EPA water quality requirements when site re-use is not possible and discharging water off site is required.

Water Sensitive Urban Design (WSUD) elements, including swales and detention basins will be incorporated to manage pollutants generated from the operation and maintenance of the infrastructure.

A Soil Erosion and Drainage Management Plan will be prepared as part of the Construction Environmental Management Plan (CEMP).

The Department's Master Specification has specific requirements applicable to the mitigation of impacts to surface water including environmental design, planning, drainage and protecting waterways.

The contractor delivering the project must follow Master Specification requirements for environmental management and protection including sustainability in construction measures. Operation and maintenance of the T2D Project will also follow Master Specification requirements for environmental management and protection including preparation and implementation of a flood mitigation strategy.

These and many other criteria included in the design are expected to be sufficient to mitigate the negative impacts identified in the surface water assessment.

Approvals, permits and authorisations

The following approvals are required in relation to surface water: wastewater treatment licence in accordance with Schedule 1, Section 3(4)(b) of the *Environment Protection Act 1993* refers to license for the operation of a wastewater treatment plant. This would apply to the operation of water treatment facilities and discharge of treated water.

Section 4(6) describes earthworks drainage and is a separate license type under the act.

Section 4(4) describes a dredging license for excavation works in watercourse and is a separate license type under the act.

Under Sections 104 (3) and (4) of the *Landscape South Australia Act 2019*, a permit is required for water affecting activities unless the works are approved under another act, such as the *Planning Development and Infrastructure Act 2016*, the *Environment Protection Act 1993* or the *Native Vegetation Act 1991*.

Water Affecting Activity Permits will be required for each of the three watercourses (River Torrens / Karrawirra Parri, Keswick Creek and Brownhill Creek / Willawilla) that pass through the project corridor. Under the *Water Industry Act 2012*, the project's final stormwater solution will require EPA approval.

Scan the QR code to view the suite of assessments included in the PAR or visit T2D.sa.gov.au/PAR.

