

5.3.5. Richmond River flood impacts

Design

The soft soil sites on the Richmond River floodplain would be in two general locations:

- South and north of Tuckombil Canal (both sides of the canal levee but no works in the canal) (site SS-08)
- South of the Duck Creek crossing near Ballina, from five kilometres south of the crossing to 500 metres south of Duck Creek crossing (site SS-09).

The predicted impacts on flooding behaviour due to the construction of these embankments were assessed using the same hydraulic flood models used in assessment of the project, as detailed in Section 2.2.5.

Flood level impacts

Figure 5-7 and Figure 5-8 show that the predicted impacts of the soft soil sites in the vicinity of Tuckombil Canal would be very minor. This is because only 33 per cent of the floodplain would be blocked by the embankments (1.5 kilometres of the total 4.5 kilometres). The area that is blocked is also an area with lower flow rates than the remainder of the floodplain.

Figure 5-9 and Figure 5-10 show the predicted impacts of the soft soil sites in the vicinity of Ballina for the 20 year ARI and 100 year ARI flood events respectively. These impacts are presented as a cumulative impact of the Ballina Bypass and the soft soil sites. This is consistent with other flood impact assessments in the Ballina area.

Figure 5-10 shows that the embankments near Duck Creek would result in increases in flood level to the west of the early works of up to 25 millimetres in the 100 year ARI flood event. To the east of the embankments, flood levels would be raised to a maximum of 15 millimetres with the majority of the floodplain being impacted by less than 10 millimetres. Flood level impacts within the Emigrant Creek floodplain are less than 50 millimetres except for a small (less than one hectare) area within a densely vegetated, tight meander of Emigrant Creek. A small area of impact greater than 50 millimetres would occur within the Ballina Bypass project boundary.

The project soft soil sites would meet the flood management objectives for this area during construction.

Flood inundation duration impacts

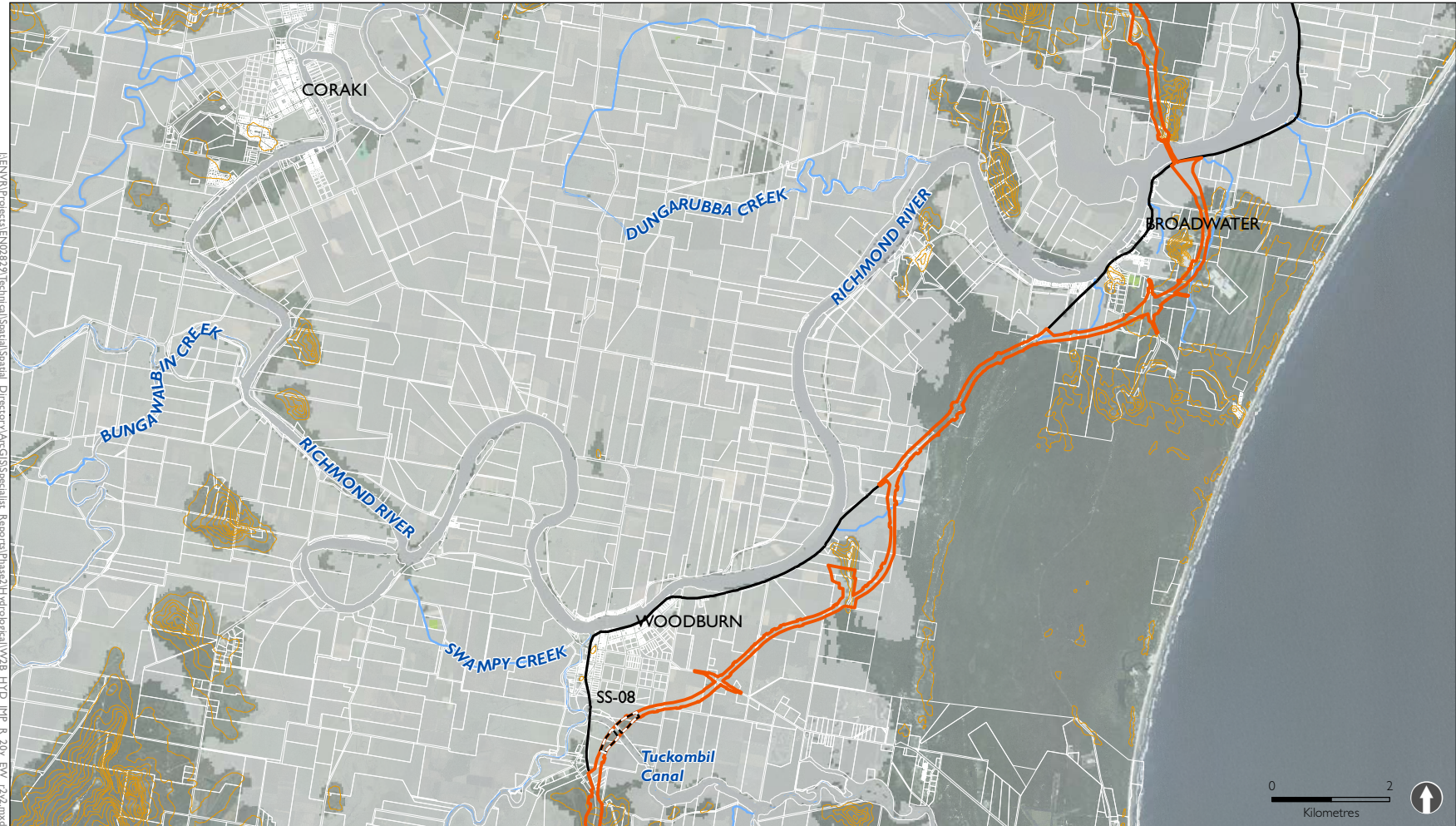
Based on a review of the results, there is less than five per cent increase in flood duration. As the blocked floodplain only conveys a minor proportion of the flow rates for the whole floodplain, the soft soil sites would only result in minor changes (less than five percent) to flood inundation durations.

Flood velocity and direction impacts

Due to the minor fraction of the floodplain that would be blocked by the embankments there would only be minor changes to flood velocity and flow directions.

Velocities in the floodplain remain below one metre per second, where they are currently below one metre per second. Where velocities are more than one metre per second the increase in velocities is less than 20 per cent.

Figure 5-7 Soft soil site flood impacts 20 year ARI event: Mid Richmond River



- The project
- Existing Pacific Highway
- 10m ground level contours (indicative)
- Soft soil site

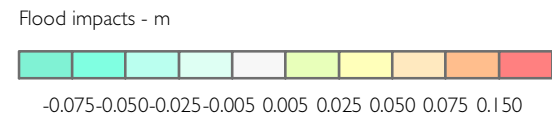
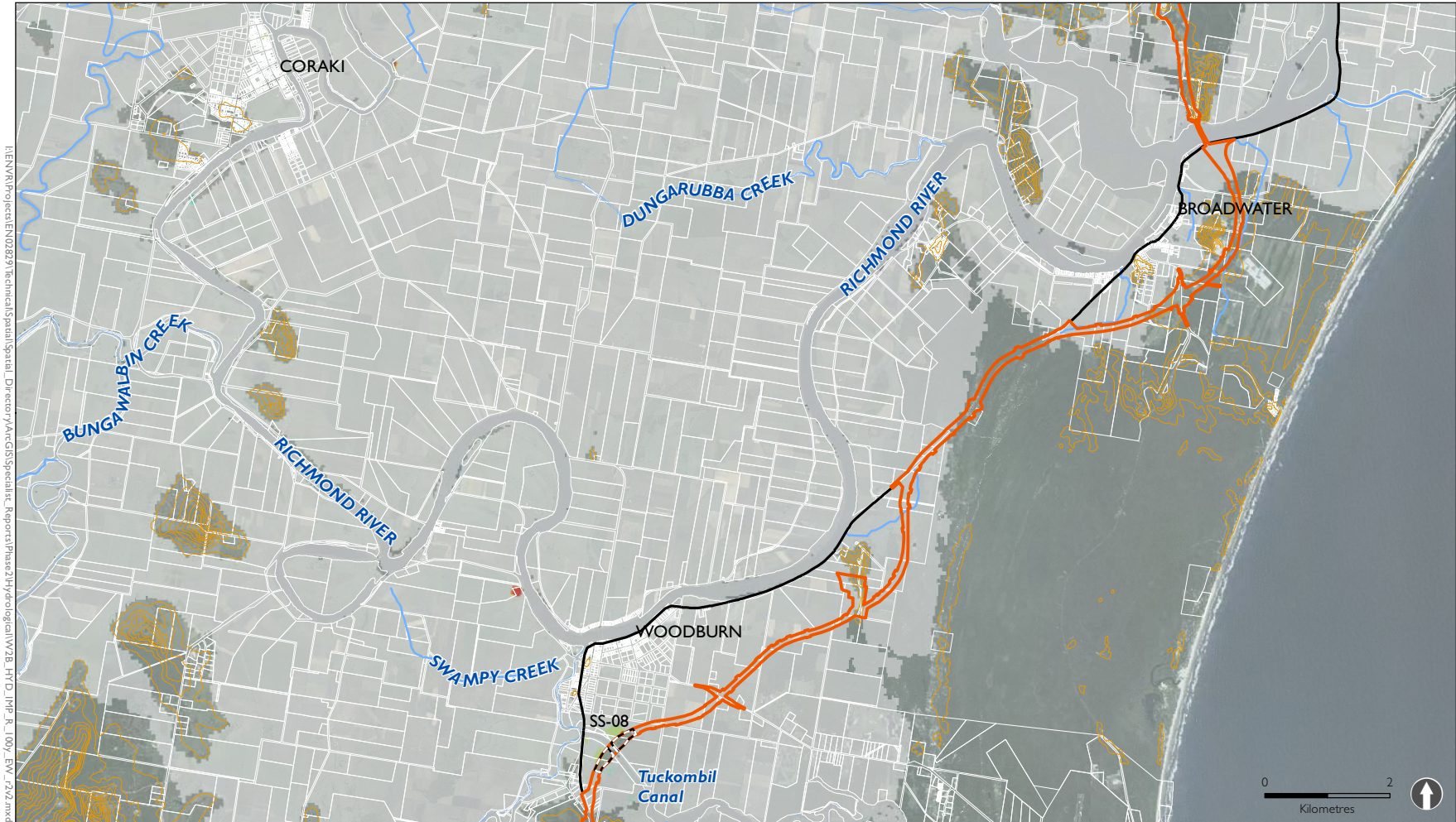


Figure 5-8 Soft soil site flood impacts 100 year ARI event: Mid Richmond River



- The project
- Existing Pacific Highway
- 10m ground level contours (indicative)
- Soft soil site

Flood impacts - m



-0.075 -0.050 -0.025 -0.005 0.005 0.025 0.050 0.075 0.150