8 Scenario Modelling

A series of scenarios were modelled to determine the catchment flood behaviour under these possible conditions. The following variables were tested:

- Conduit blockage – 50% blocked (for the 1% AEP event) and 100% blocked (for the 20% AEP event)
- Climate change – catchment rainfall increased by 10%, 20% and 30% for the 1% AEP 120 minute catchment derived flood event without sea level rise (increased tailwater)
- Climate change – increased rainfall by 30% combined with increased tailwater of 0.9m for the 1% AEP 120 minute catchment derived flood event

Sea Level Rise on catchment derived flood events is represented by Figures 85 to 87, which also show the sensitivity analysis of tailwater level.

8.1 Conduit Blockage

Stormwater pits can potentially block through a number of factors, including the build-up of leaf litter, parked cars and garbage bins. Blockages to culverts and bridges within the study area can occur by the accumulation of debris washed down from upstream. This debris, from observations in other similar catchments, can include vegetation and trees, cars and garbage bins.

Blockage to stormwater drainage conduits was modelled for a 50% blockage in the 1% AEP event and 100% blockage in the 20% AEP event. This effectively removes the capacity of all pipes within the system. A notable increase in flood level in the vicinity of North Steyne and Denison is observed with flood levels increasing 0.35m and 0.5m for the 50% Blockage and 100% Blockage events respectively. Minor increases in flood depth are observed throughout the study area and can be viewed in **Figures 91 to 96** in **Appendix C**.

8.2 Climate Change – Rainfall

The average rainfall intensity for the 1% AEP 120 minute duration storm was increased by 10%, 20% and 30% for the analysis.

Differences of the peak water level were compared to the base model for the rainfall increases and decrease. **Figures 97 to 99** in **Appendix C** show the differences throughout the study area. Impacts due to variations in rainfall intensity are widespread across the study area, although there are certain areas that are more significantly affected than others. The average change is generally low within the flood extent. Larger differences occur at isolated locations, which generally coincide with larger flow paths and storage areas.

8.3 Climate Change – Rainfall and Sea Level Rise

To test the combination of sea level rise and increased rainfall intensity, tailwater levels were increased by 0.9m and the average rainfall intensity was increased by 30%. **Figures 100 to 103** in **Appendix C** show the differences throughout the study area. Within areas that are not directly linked to the foreshore, increases in depths are generally less than 0.1 meters, with a few isolated locations of depth increases of up to 0.2 meters.