SAKKARA

Riverstone West
Flood Impact Assessment Update

October 2021

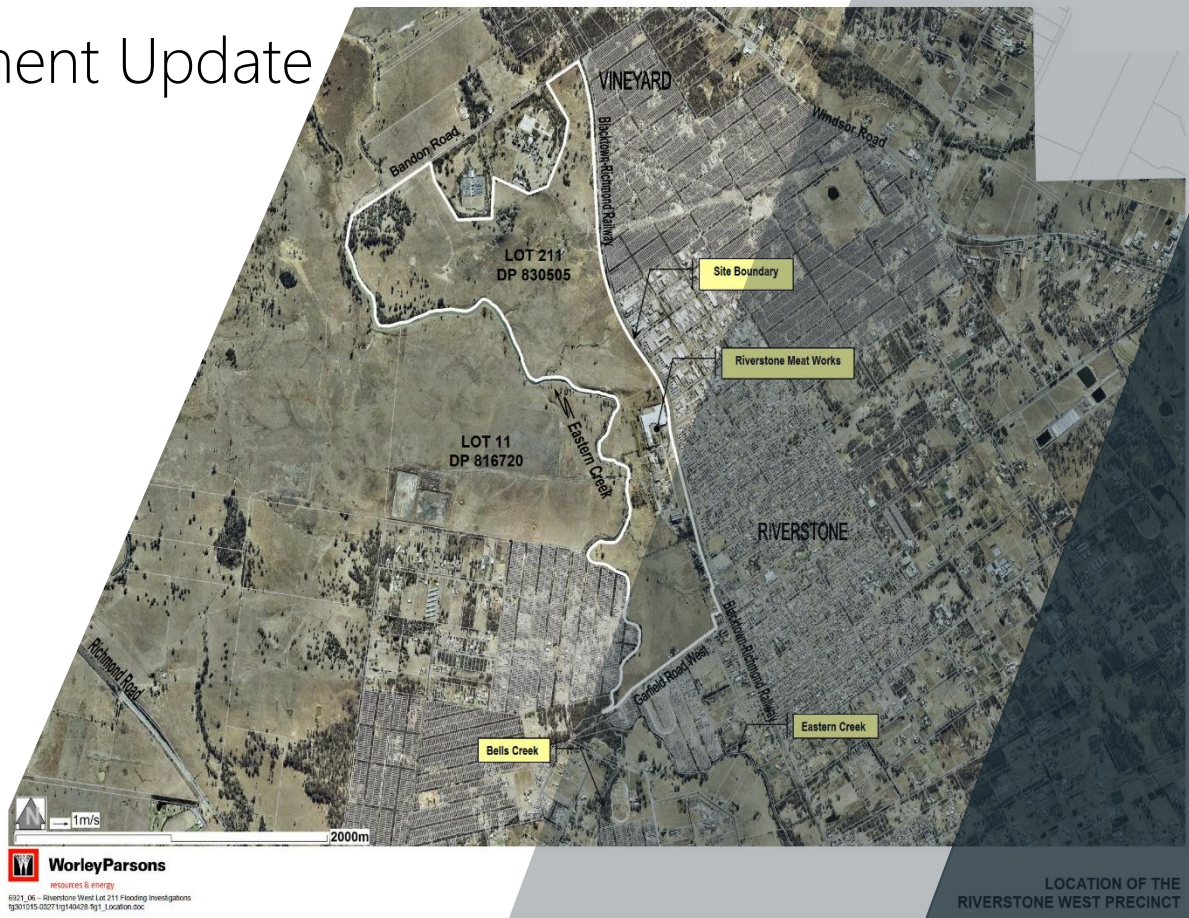


FIGURE 1

LOCATION OF THE
RIVERSTONE WEST PRECINCT

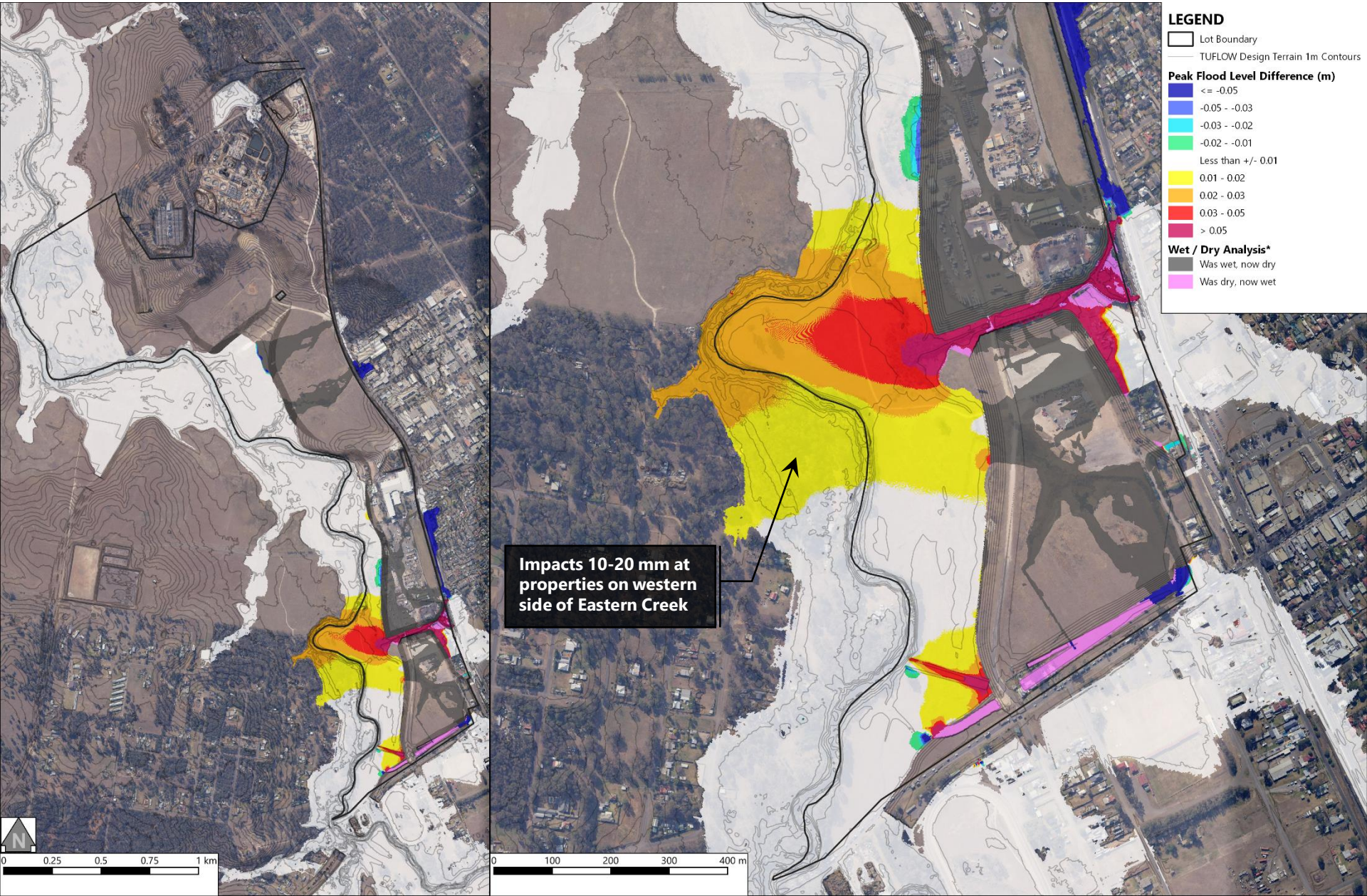
Advisian
Worley Group

advisian.com

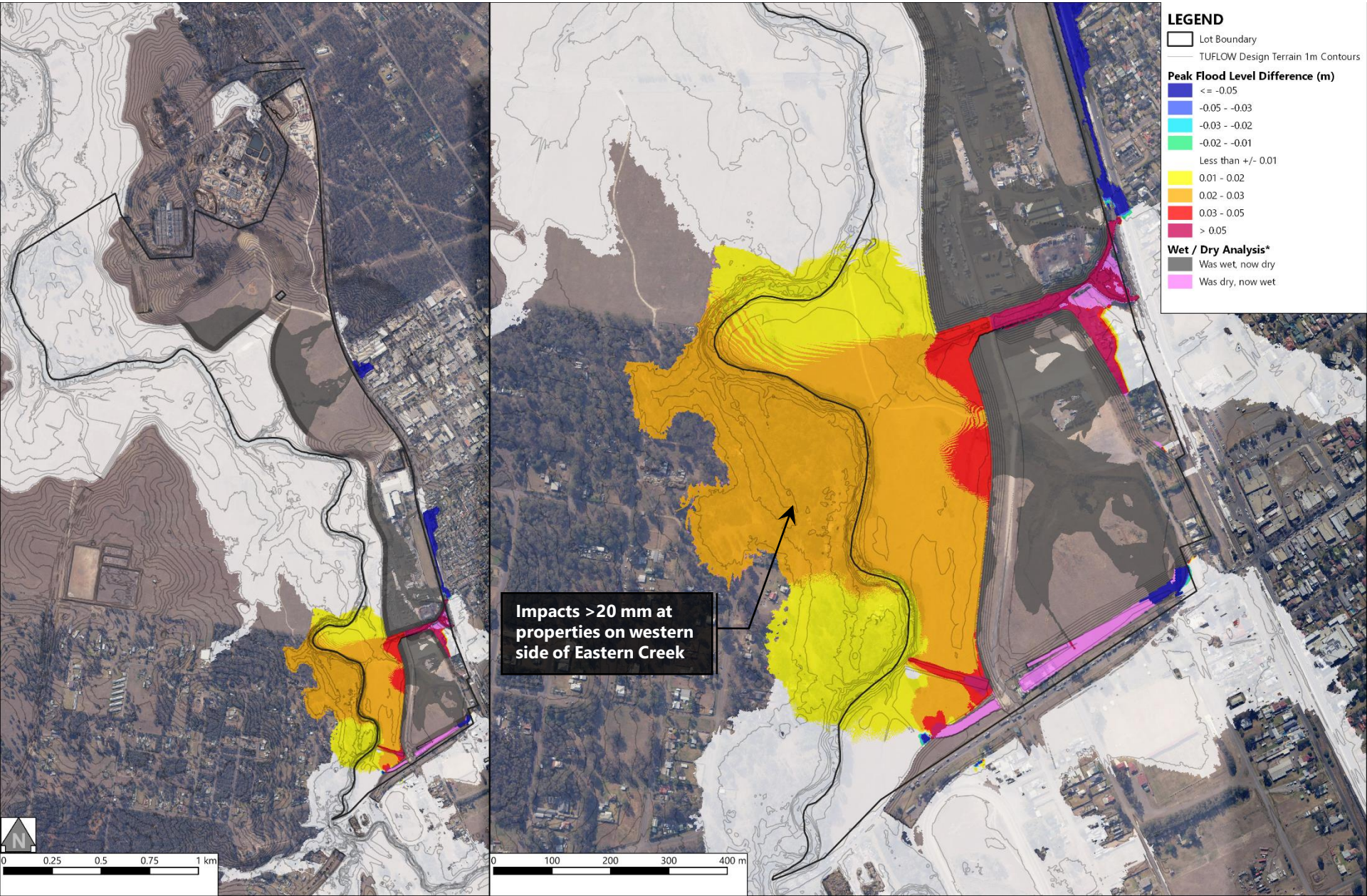
The Brief

- The Cardno modelling undertaken for DPIE identified increases in peak flood levels on adjoining properties for the following events:
  - 1% AEP Local Flood
  - 1% AEP Local Flood with 20% AEP Hawkesbury-Nepean tailwater
  - 1% AEP Local Flood with 1% AEP Hawkesbury-Nepean tailwater (the joint probability of this event is much rarer than a 1% AEP)
- Sakkara / Advisian investigated an alternative design to avoid off-site increases in peak flood levels

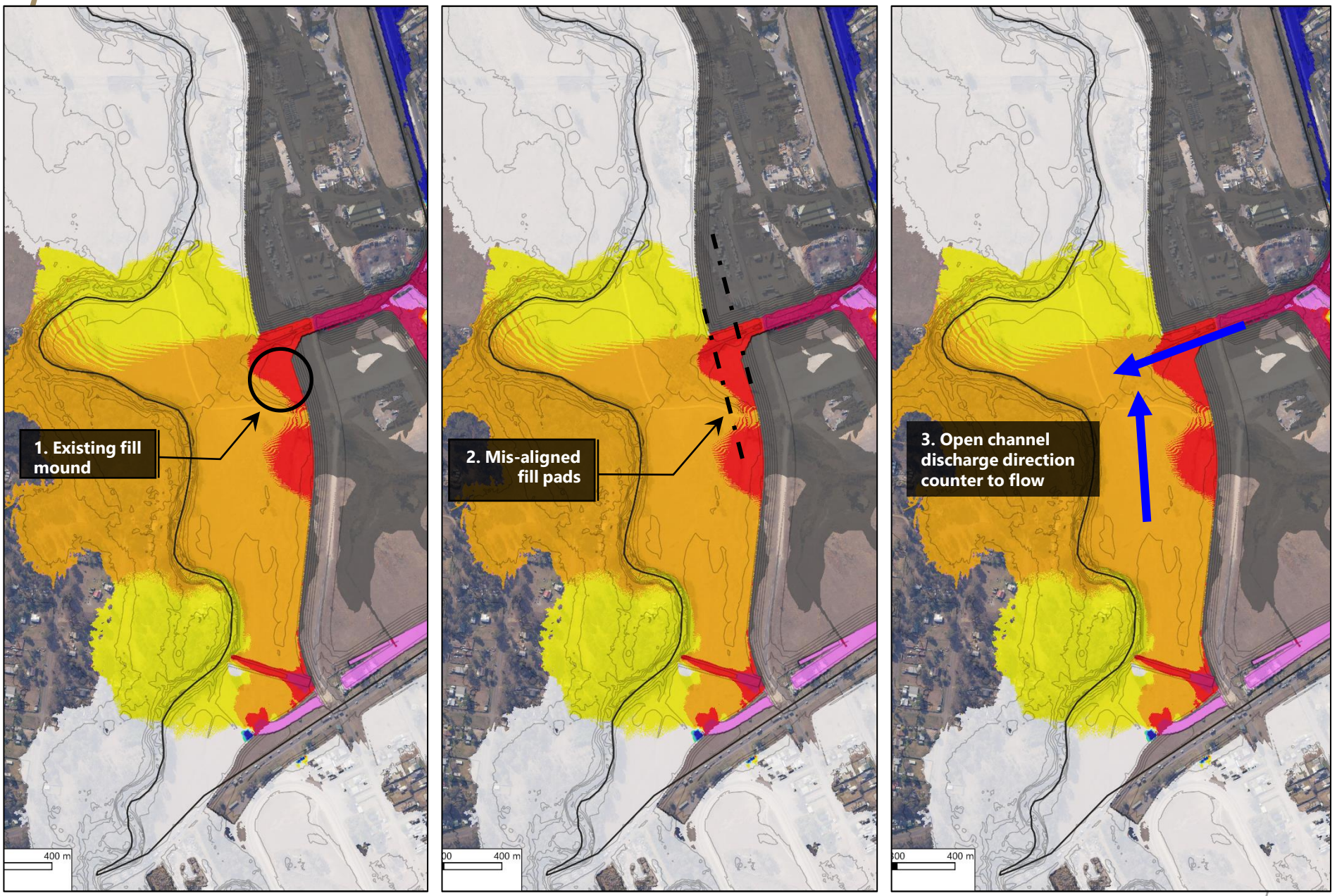
Cardno Design Scenario: Local 1% AEP (no tailwater)



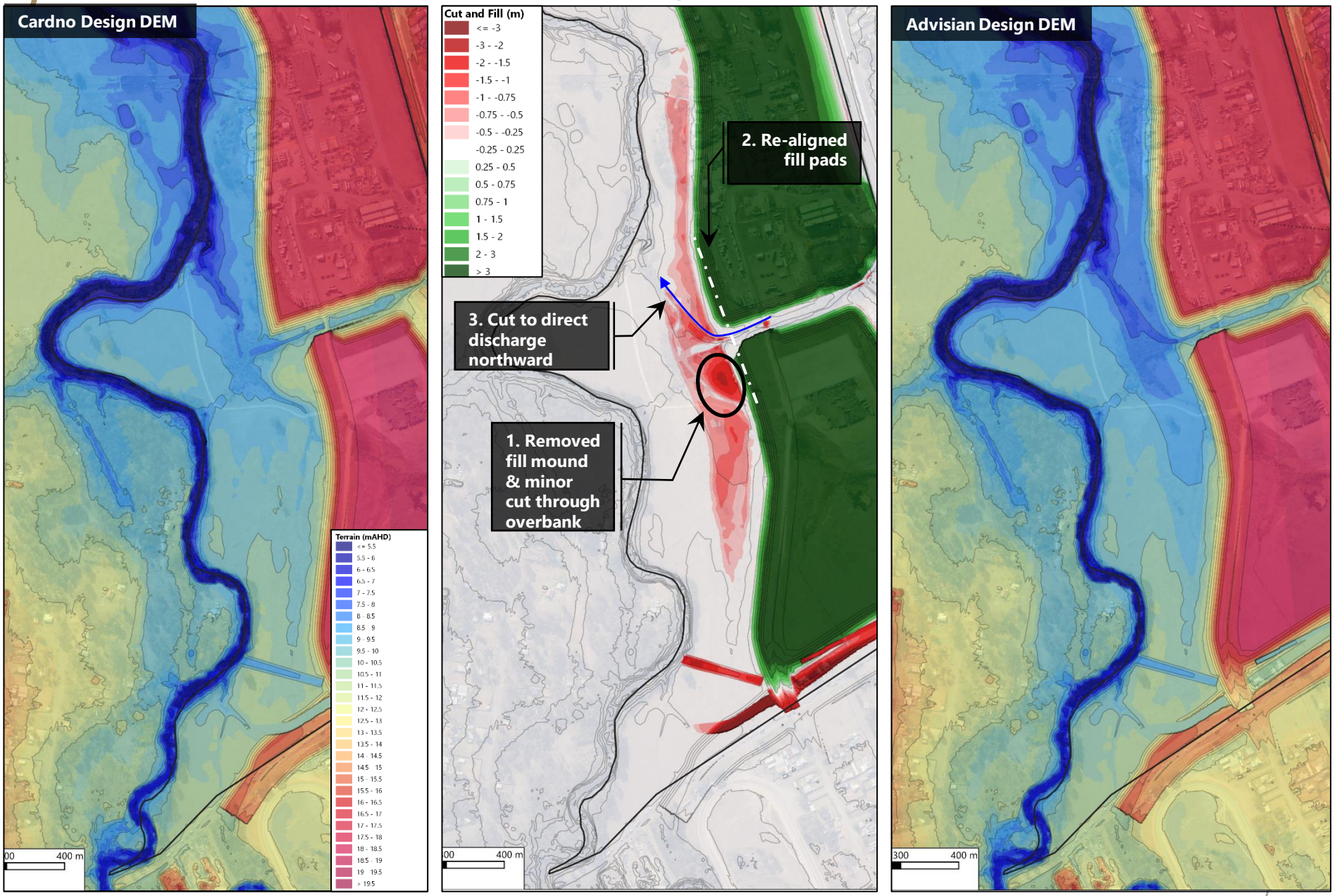
Cardno Design Scenario: Local 1% AEP + 20% AEP H-N TWL



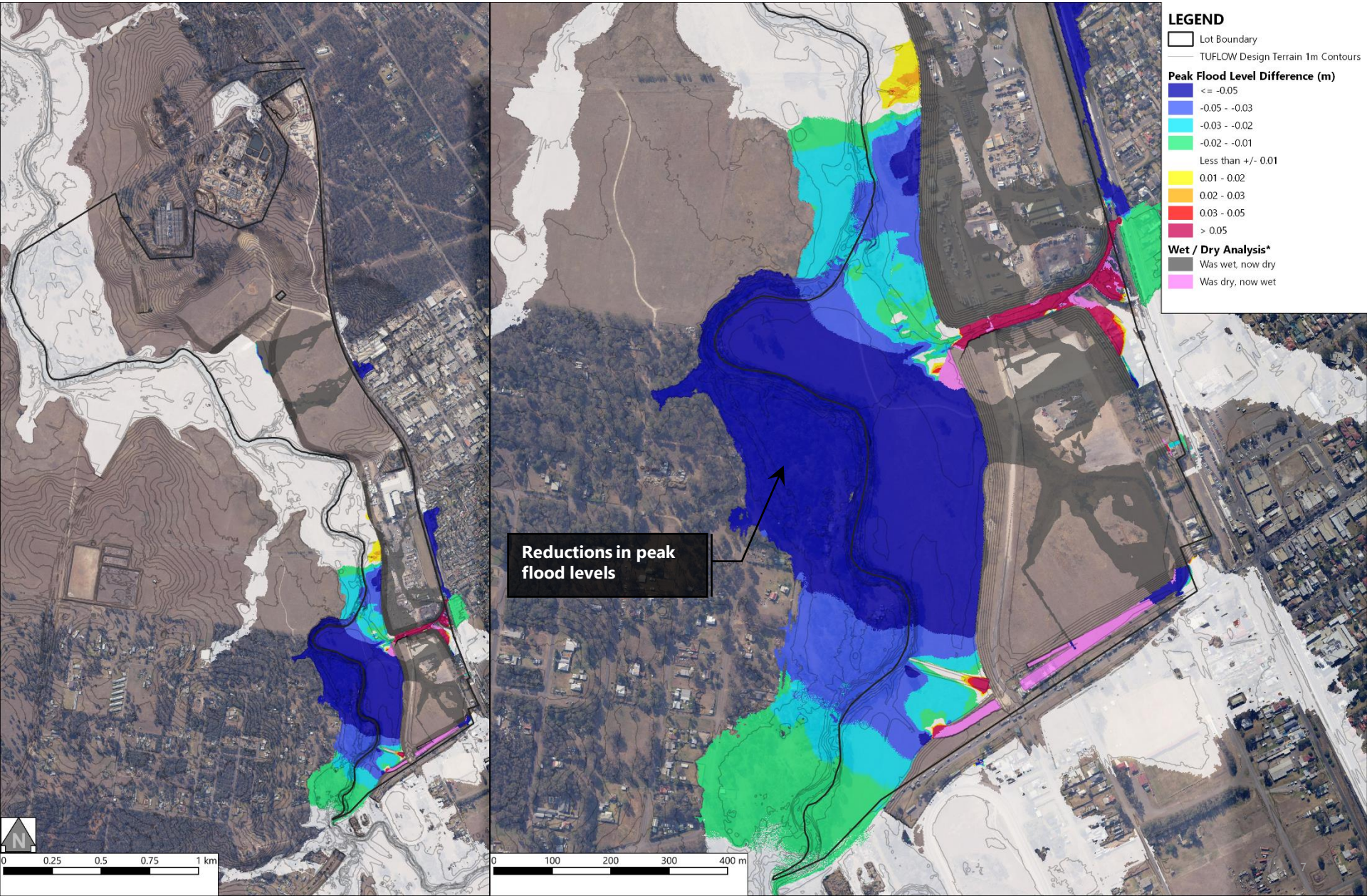
The Problem


1. Existing fill mound
2. Mis-aligned fill pads
3. Open channel discharge direction counter to flow
400 m
400 m
400 m

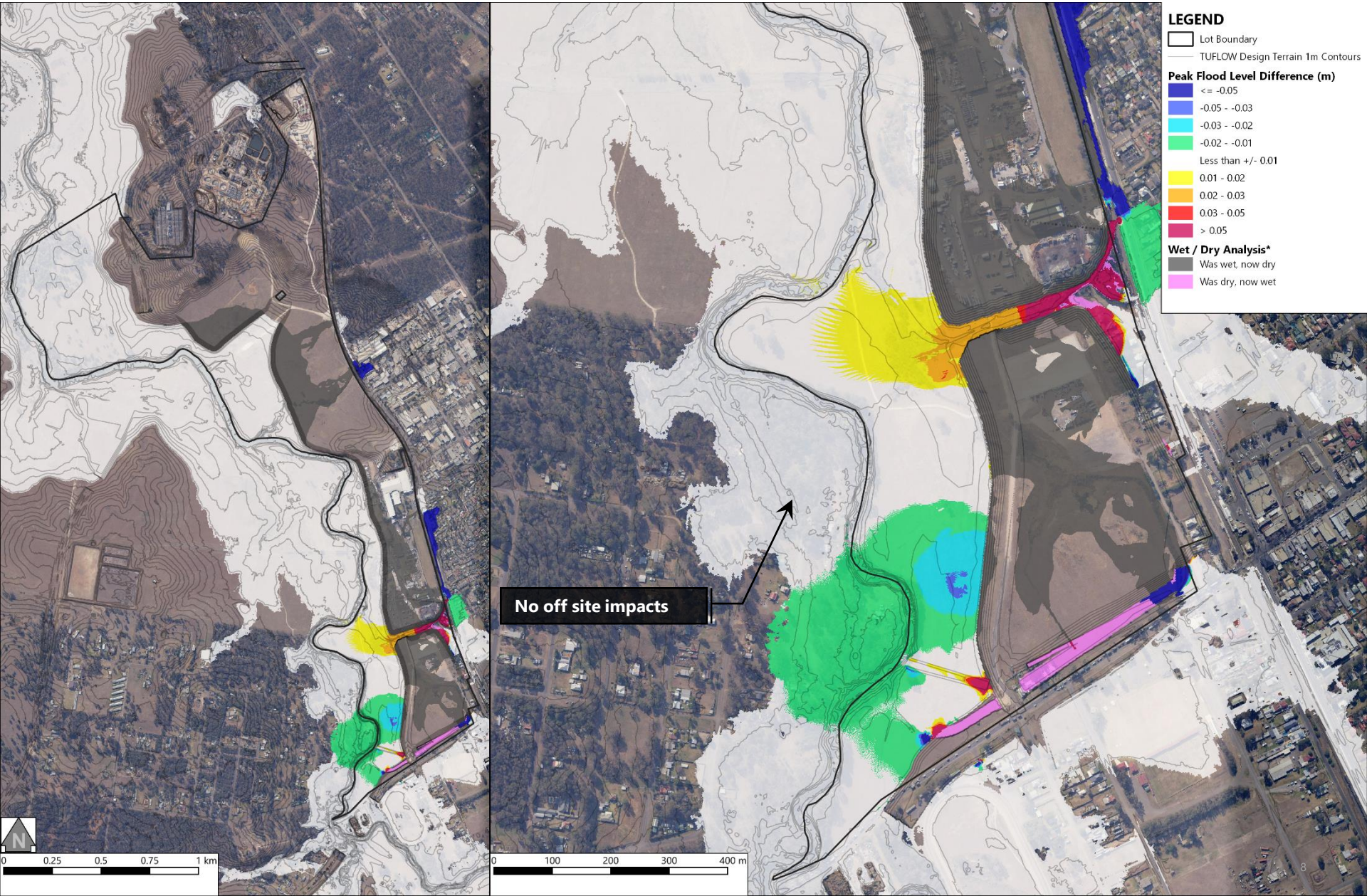
The Solution - Advisian Refined Design



Advisian Refined Design: Local 1% AEP (no tailwater)

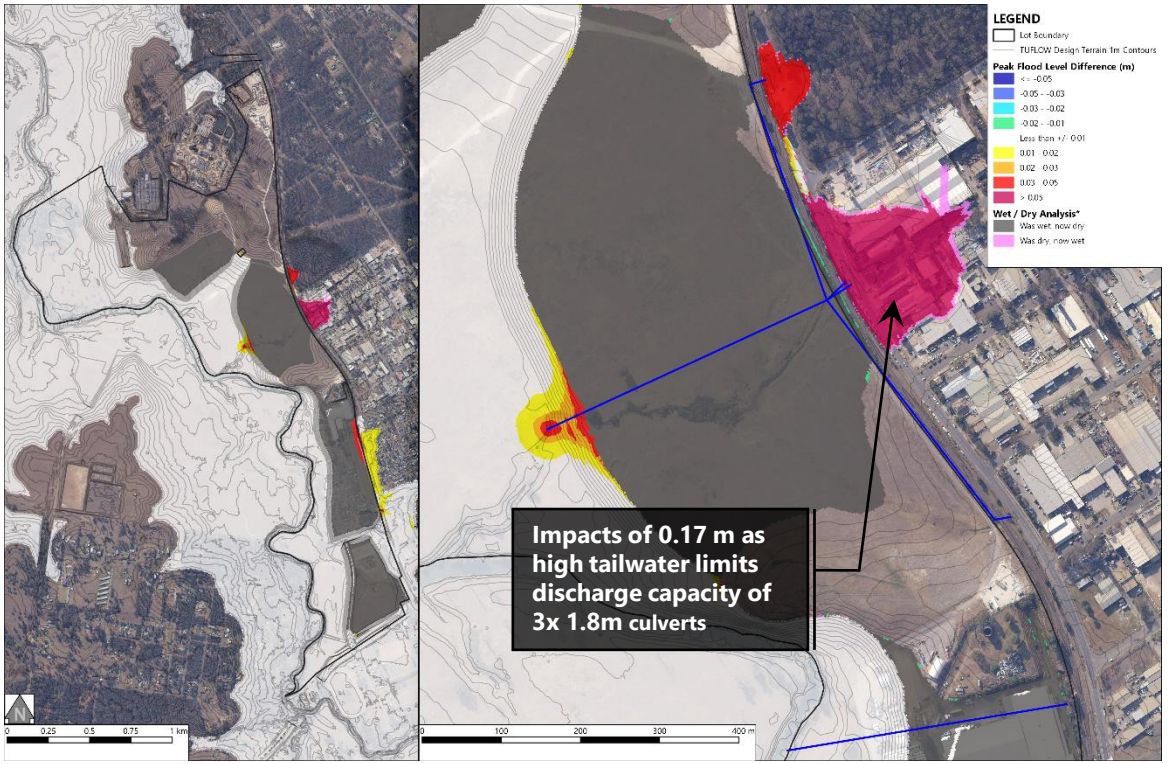


Advisian Refined Design: Local 1% AEP + 20% AEP H-N TWL

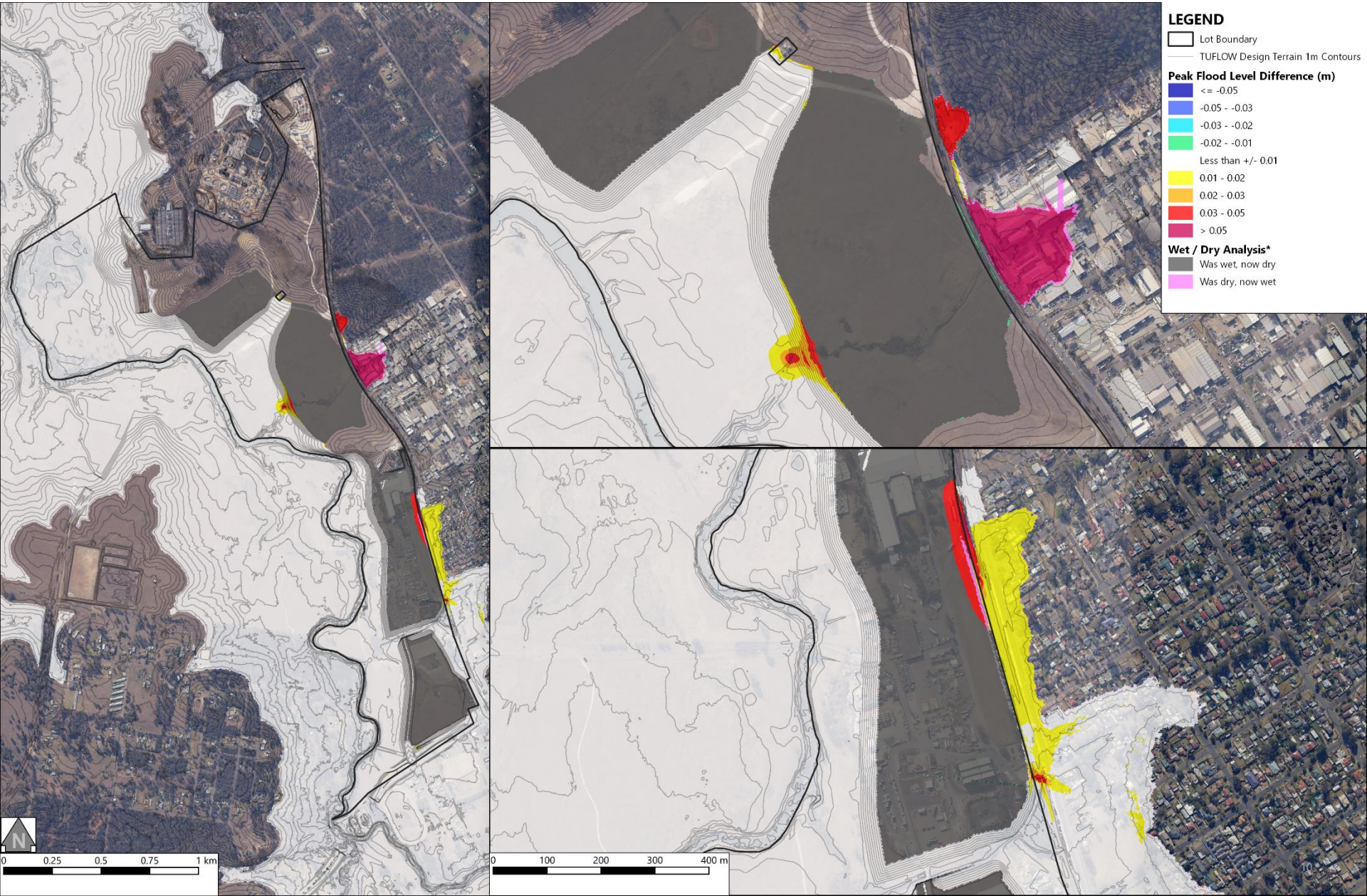


Cardno Design Scenario: Local 1% AEP + 1% AEP H-N TWL

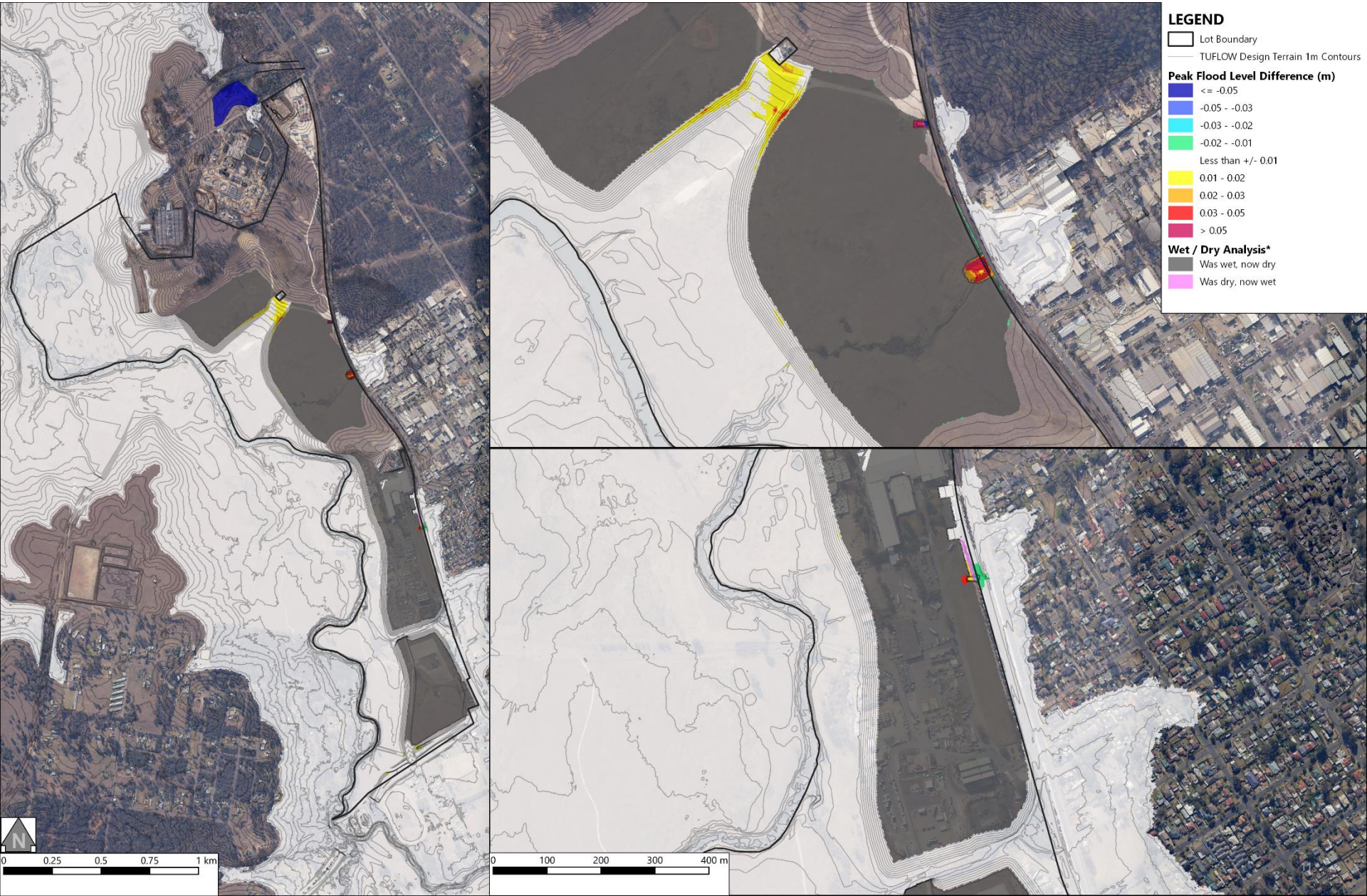
- **Flood event scenario**
  - The *peak* of a 1% AEP flood in Eastern Creek caused by an intense 2 hour storm coincides with the *peak* of a 1% AEP flood in the Hawkesbury-Nepean River caused by sustained and widespread heavy rainfall over three days or more
  - Such an occurrence would be much rarer than a 1% AEP - e.g. if fully independent, the AEP would be about 1 in 10,000 (1/100 x 1/100)
  - Cardno modelling indicated impacts on drainage of local stormwater catchment at Princes St. No impacts were identified along Eastern Creek.
- **Princes Street Culvert Design**
  - Cardno simulations include 3 x 1800 mm circular pipe culverts.
  - Advisian found that it is possible to negate off-site flood impacts, however very large culvert sizes are required to discharge the small local catchment flows without causing any increase in upstream peak flood levels.



Cardno Design Scenario: Local 1% AEP + 1% AEP H-N TWL



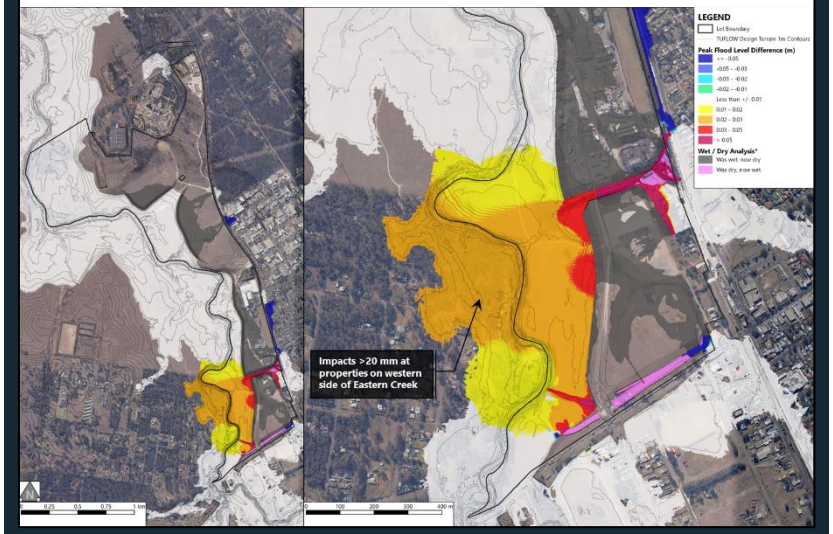
Advisian Refined Design: Local 1% AEP + 1% AEP H-N TWL



Conclusion:

Previously identified flood impacts can be resolved

Cardno Design Scenario: Local 1% AEP + 20% AEP H-N TWL



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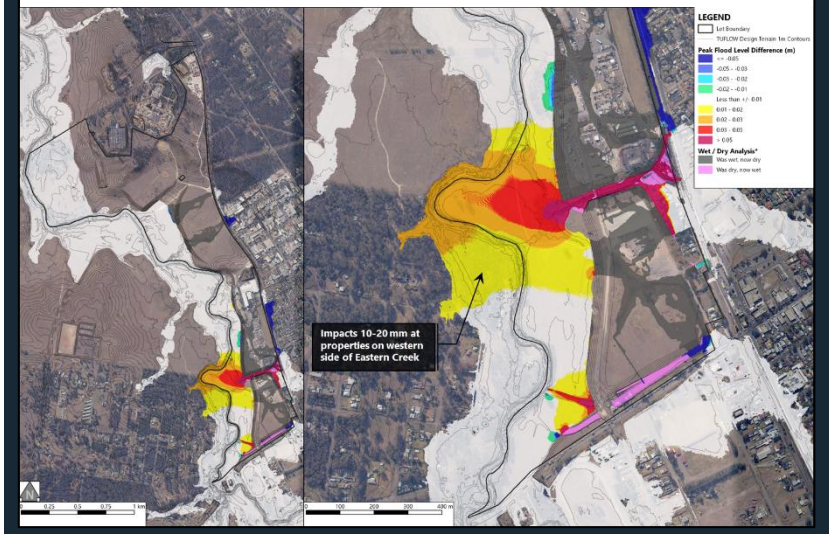
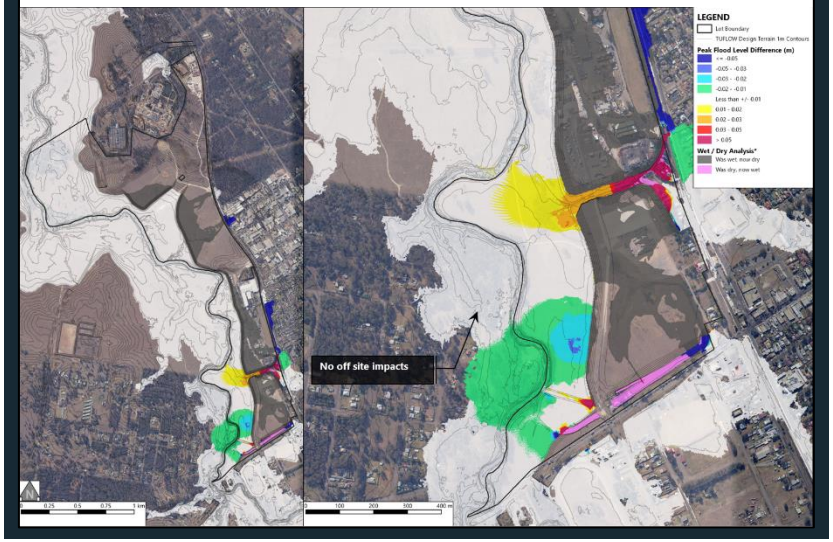


Advisian Refined Design: Local 1% AEP + 20% AEP H-N TWL



Advisian Refined Design: Local 1% AEP (no tailwater)