2015, compared to 0.7% of all dwellings). This is significant as the site coverage of these types of dwellings is likely to be greater than detached houses.

- Figure 15 shows the spatial distribution of these dwelling types across the catchment.

Table 11: dwelling type across SMP Study Area

Dwelling type	Total across study area	% across study area	Total of dwellings built since 2000	% across study area built since 2000
House	15497	88.7%	2401	81.1%
Units or Flats	324	1.9%	45	1.5%
Independent Living Unit	20	0.1%	27	0.9%
Retired and Aged Accommodation	30	0.2%	0	0.0%
Institutional Residential Accommodation N.E.C.	2	0.0%	0	0.0%
Maisonette	858	4.9%	159	5.4%
Townhouse - Defined as Home Unit With Both Ground and First Floor Areas	122	0.7%	48	1.6%
Row House	185	1.1%	218	7.4%
Private Hotels and Boarding Houses and Boarding Houses	3	0.0%	0	0.0%
Religious Quarters - Monasteries Etc.	5	0.0%	2	0.1%
Unfinished House	116	0.7%	0	0.0%
Vacant Land with Minor Improvements (Urban)	20	0.1%	0	0.0%
Vacant Land-Urban	297	1.7%	0	0.0%
OTHER	0	0.0%	60	2.0%

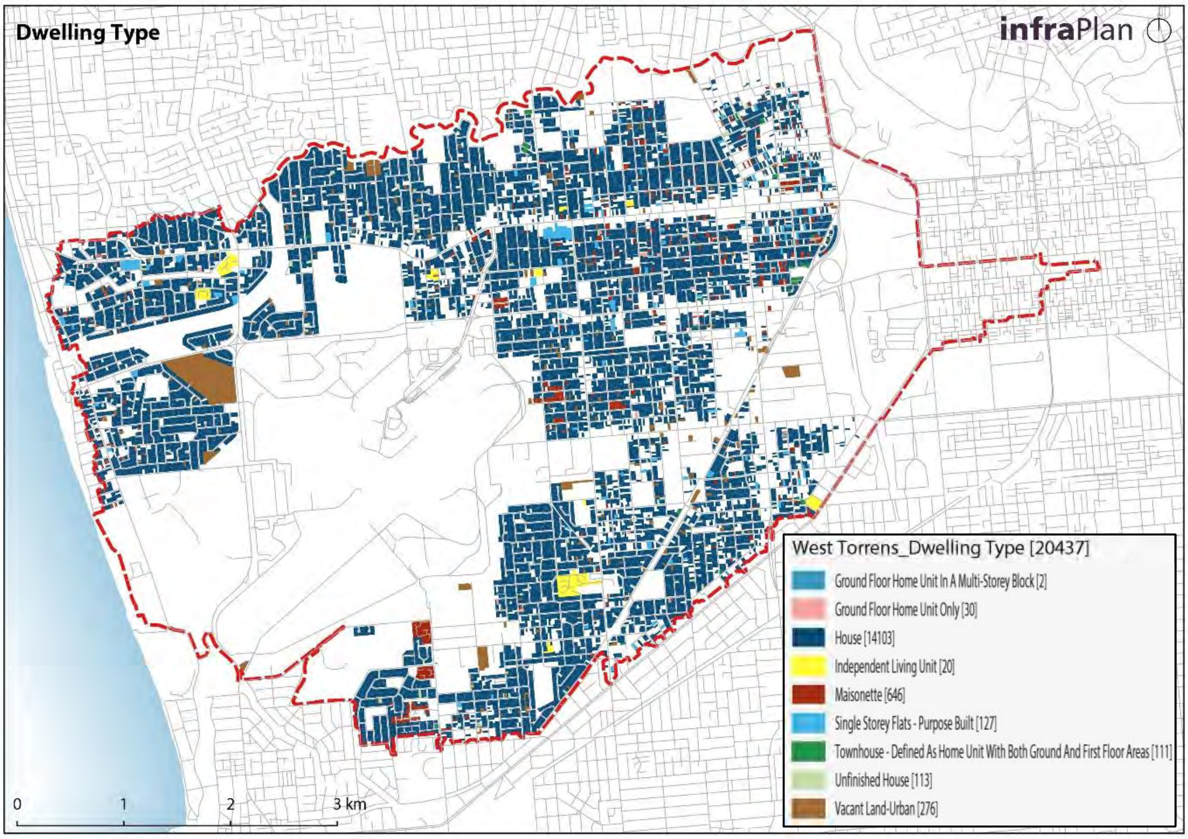


Figure 15 Dwelling type (all dwellings)

This shift in housing type is typical of inner-suburban areas across many of Australia's major cities as densification of established suburbs becomes more desirable than development on the fringe. The introduction of the Urban Growth Boundary for metropolitan Adelaide is anticipated to encourage more of this development in the coming years.

As would be expected within an established area, increased dwelling yields come at the cost of reduced average parcel sizes. Average parcel sizes are compared for recent and historic developments in in this part of the assessment.

Table 12 shows that site areas for detached homes and rows and maisonettes have, in the last 15 years, been below the historic average for the catchment. On the other hand, parcel size averages for Row and Maisonette developments for this period have been consistently above the historical average with the exception of anomalous data for 2001 and 2014 which reduce the recent average to a deceptively small 154m². These changes are reflective of changing desires in housing types and the way people use their homes, with less time spent in and caring for a home garden, resulting in reduced land parcels and increasing percentage of impermeable area on residential land parcels. Based on figures from the early 2000's, units and apartments have also become larger (though the 2010 average is misleading) as professionals begin to adopt this lifestyle option instead of the traditional detached home on a quarter-acre block, dictating change in the nature of housing stock in this category.

Parcel size data for townhouses, flats and institutional residential developments (e.g. retirement living) is flawed due to replicated parcel values for multiple dwelling developments. As a result, these dwelling types have not been included in this part of the assessment.

Table 12: Comparison of parcel sizes by development type

Parcel size (m²) by year and development type - summary table

Year	Detached Homes	Rows and Maisonettes	Units / Apartments
2000	428.6	282.1	281.2
2001	407.1	5.7	
2002	419.5	316.7	
2003	489.6	194.3	
2004	449.6	409.6	444.8
2005	507.2	337.1	315.1
2006	484.5	344.1	429.6
2007	495.6	378.7	329.0
2008	478.6	371.5	
2009	453.0	346.9	
2010	467.4	367.2	888.9
2011	487.4	283.5	
2012	487.7	377.7	
2013	472.5	370.8	
2014	500.3	85.9	306.7
2015	413.9		
2000-2015 average	**466.4**	**154.0**	**388.5**
historical averages	642.6	254.6	335.4

Parcel size below 16 year average

Parcel size above 16 year average

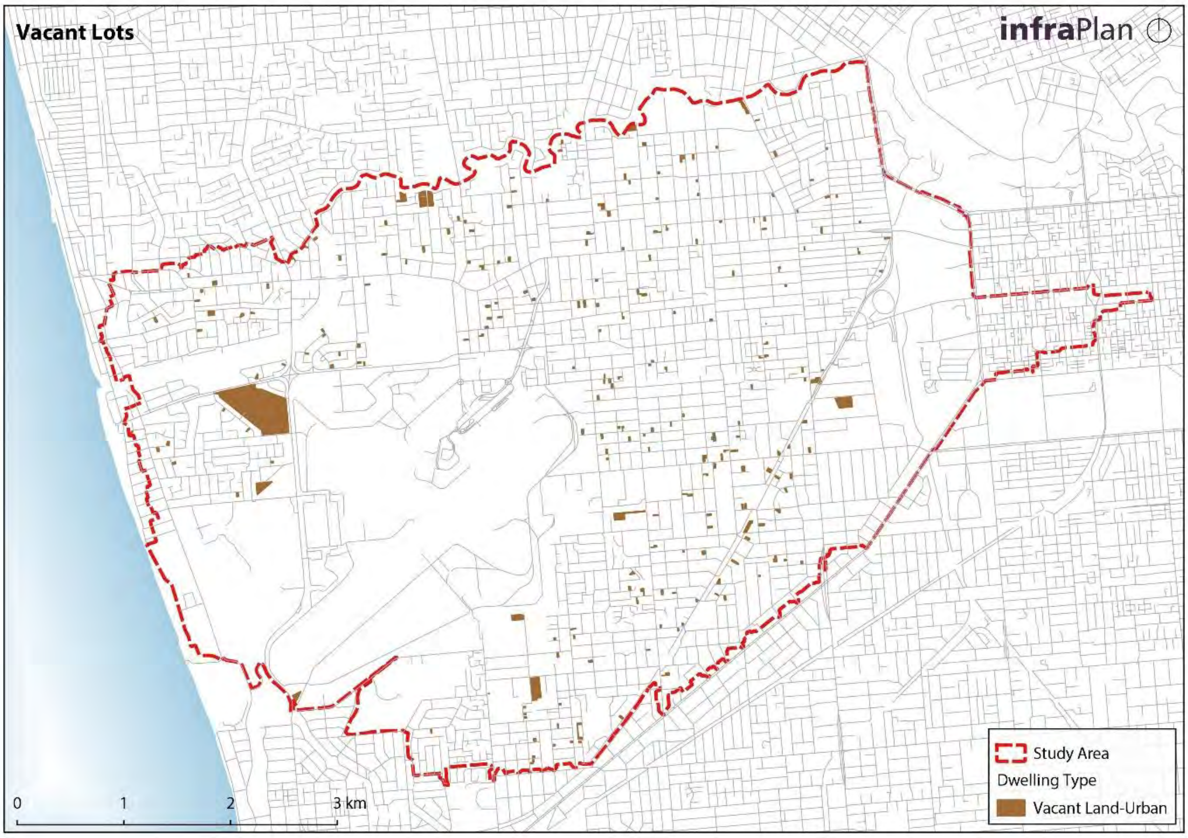


Figure 16: Vacant Lots

3.4 Population Projections (Forecasts)

The State Government develops population projections which are applied by State agencies for multiple uses including infrastructure assessment and planning, land use supply monitoring and fiscal policy.

Population forecasts are not assessed on small scale geographies (i.e. SA1 or SA2) therefore it is not possible to reproduce specific population forecasts for the study area. However, figures are based on an LGA level and provide some context for the potential population increase in a broader catchment which encompasses the study area.

The following tables outline the projected population growth under a medium growth scenario: "*The medium series is the likely outcome at the time of publication, while the high and low series enable management of risks if a population trend that is higher or lower than the medium series emerges*"[1].

Note: Population trends and forecasts must be reviewed with some caution, as they may not take into consideration some land use constraints, and development potential linked to historical dwelling growth. The development potential scenarios in Section 4 in this report provide the land use and policy context required to refine the possible population projections. The population projections released from the state government also note that "*Users of these projections should be aware that they represent only one possible*

[1] http://www.dpti.sa.gov.au/planning/population

future population outcome based on an assumption of continued population growth and a spatial distribution that is a reflection of current and likely government policies… Users of these projections should note that unforeseen policy, economic and societal changes may result in population outcomes different from those presented here"[2].

Table 13: Population Projections for South Australian Local Government Areas, 2011-31 (February 2016 release)

Local Government Area (LGA)	Population Projections: Population on 30 June				
	2011	2016	2021	2026	2031
West Torrens (C)	57,026	58,950	61,662	64,688	68,025
Charles Sturt (C)	108,680	115,715	122,152	128,301	133,477
Adelaide (C)	20,920	23,753	27,308	30,096	32,887
Total of Study Area (LGAs)	186,626	198,418	211,122	223,085	234,389
Greater Adelaide	1,345,080	1,416,420	1,488,821	1,560,468	1,628,083

Table 14: Population change between Census periods (persons) between 2011 and 2031

Local Government Area (LGA)	Population change between Census periods (persons)			
	2011 - 2016	2016 - 2021	2021 - 2026	2026 - 2031
West Torrens (C)	1,924	2,712	3,026	3,337
Charles Sturt (C)	7,035	6,437	6,149	5,176
Adelaide (C)	2,833	3,555	2,788	2,791
Total of Study Area (LGAs)	11,792	12,704	11,963	11,304
Greater Adelaide	71,340	72,401	71,647	67,615

Table 15: Percentage of population change between Census periods (2011 – 2031)

Local Government Area (LGA)	Percentage of population change between Census periods			
	2011 - 2016	2016 - 2021	2021 - 2026	2026 - 2031
West Torrens (C)	3.26%	4.40%	4.68%	4.91%
Charles Sturt (C)	6.08%	5.27%	4.79%	3.88%
Adelaide (C)	11.93%	13.02%	9.26%	8.49%
Total of Study Area (LGAs)	5.94%	6.02%	5.36%	4.82%
Greater Adelaide	5.04%	4.86%	4.59%	4.15%

Table 16: Average annual population growth 2011 - 2031

Local Government Area (LGA)	Average Annual Growth			
	2011 - 2016	2016 - 2021	2021 - 2026	2026 - 2031
West Torrens (C)	0.65%	0.88%	0.94%	0.98%
Charles Sturt (C)	1.22%	1.05%	0.96%	0.78%
Adelaide (C)	2.39%	2.60%	1.85%	1.70%
Total of Study Area (LGAs)	1.19%	1.20%	1.07%	0.96%
Greater Adelaide	1.01%	0.97%	0.92%	0.83%

[2] http://www.dpti.sa.gov.au/__data/assets/pdf_file/0015/253122/Explanatory_Notes_Projections_2011-2036.pdf

3.4.1 Population Forecast Summary

Based on the 2011 population, forecasts demonstrate that growth across the broader study area is expected at a rate of 1.28% per annum for the 20-year period between 2011 and 2031, resulting in an additional 47,763 persons. This growth is higher in comparison to the rest of Greater Adelaide which is expected to growth at a rate of 1.05% per annum, resulting in an additional 283,003 persons. The growth rate across the study area is expected to gradually climb from 2,358 persons per annum from 2011 to 2016, to 2,541 persons per annum from 2016 to 2021, falling to 2,261 per annum from 2026 to 2031.

Across the broader study area:

- The City of West Torrens is expected to have a population increase of 10,999 persons (23.0% of the total population growth across the broader study area). Population growth is expected to accelerate over the period between 2011 and 2031, from 384 persons per annum between 2011 and 2016 up to 667 persons per annum between 2026 and 2031. West Torrens expects to see moderate population growth compared to other LGA's within the study area
- The City of Charles Sturt is expected to have a population increase of 24,797 persons (51.9% of the total population growth across the broader study area). Population growth is expected to gradually decline from the period between 2016-2031, from a rate of 1407 persons per annum between 2011-2016 down to 1035 persons per annum between 2021 and 2026.
- The City of Adelaide is expected to have a population increase of 11,967 persons (25.1% of the total population growth across the broader study area). Population growth is expected to accelerate over the period between 2016 and 2021, from a rate of 567 persons per annum between 2011-2016 up to 711 persons per annum between 2016 and 2021. Growth is expected to decrease slightly between 2021 and 2031 to an average of 557 persons per annum.

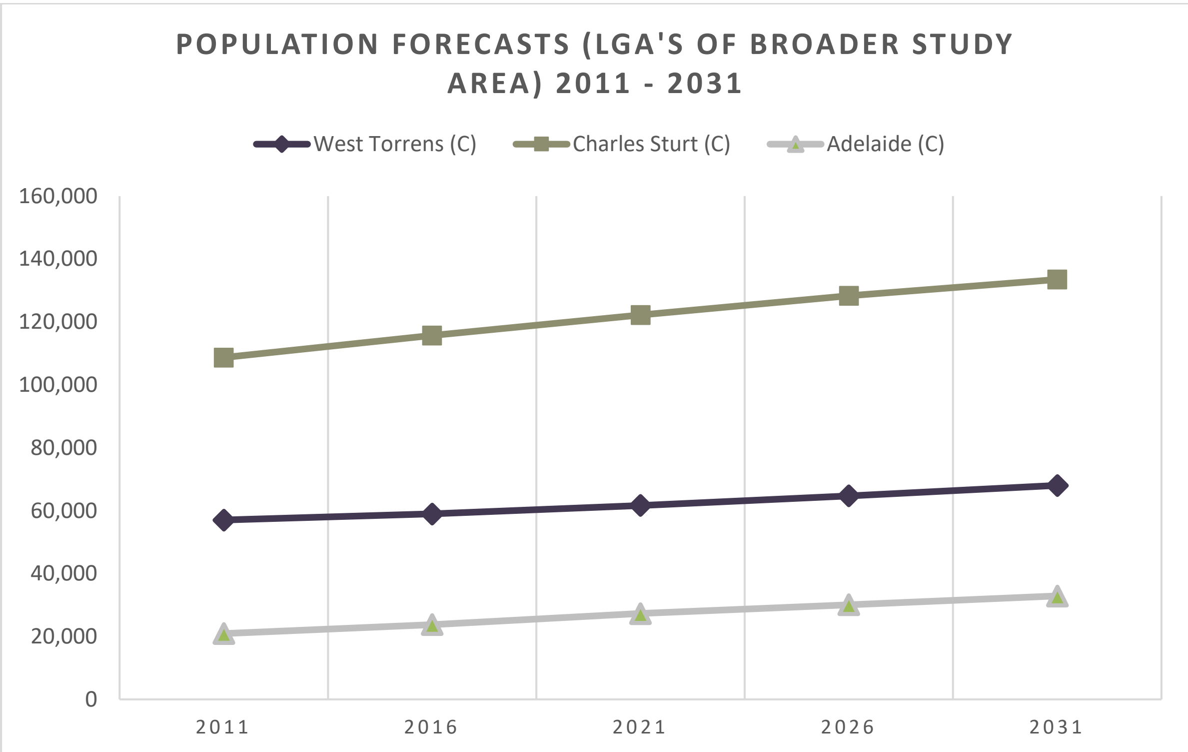


Figure 17: Population forecasts for LGA's of the Study Area (2011-2031): Line Graph

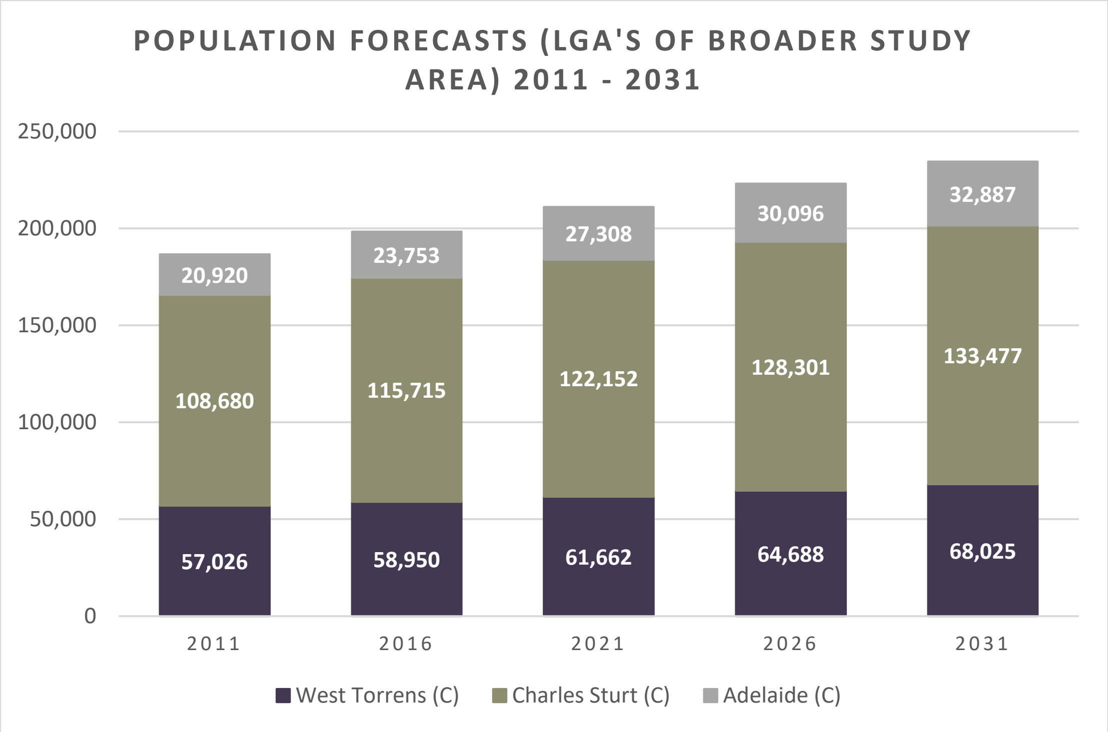


Figure 18: Population forecasts for LGA's of the Study Area (2011-2031): Stacked bar graph

4. Development Scenarios

InfraPlan have undertaken population and dwelling number projections for the Sturt Stormwater Catchment to estimate the overall number of new and additional dwellings to be built over the forecast period to 2046. A number of approaches have been utilised, based on various sources of data. These approaches reflect various industry practice and include an assessment founded on a market based, residential development assessment tool developed by infraPlan and ipData.

As with any forecasting and estimating exercise there are a range of supply and demand factors which will influence the eventual outcome. The following scenarios broadly respond to various supply and demand factors which will influence the future development outcomes for the Stormwater Catchment Area. The assessments result in several residential development yields which provides a range to apply to the stormwater calculations.

4.1 Scenario 1 - Projection on existing growth trends within the catchment

InfraPlan have estimated future development potential based on historic activity within the catchment but has applied two fundamental growth potential approaches to determine the overall dwelling increase over the forecast period to 2046. Scenario 1A applies analysis of building activity within the catchment since the year 2000 which shows that on average 182 homes have been built within the catchment each year. Applying the metropolitan Adelaide average dwelling replacement rate of 1.7 provides a nett figure of 107 additional dwellings per year. **Forecast to the year 2046, Scenario 1A equates to 3,320 additional homes within the catchment above the 2015 total.**

Scenario 1B considers an average rate of growth based on recent historical activity. InfraPlan graphed homes built in the catchment from 2001 to 2015 and projected a linear trendline to indicate future building activity, as shown in Figure 19. This analysis shows that new home builds within the catchment has remained consistent over the last 15 years with external factors being largely responsible for spikes of activity in 2008 and 2012. These spikes are observed throughout metropolitan Adelaide. A slowly increasing number of new builds per year, starting at 173 in 2016 to 178 in 2046 gives a total of 5,428 new builds to 2046. When calculated at the average metropolitan Adelaide replacement rate of 1.7, **Scenario 1B equates to 3,190 additional homes within the catchment compared to 2015 numbers**.

The projected trendline shown in Figure 19 is indicative only and has a reasonably limited statistical accuracy based on limited sample size and variability in recent data.

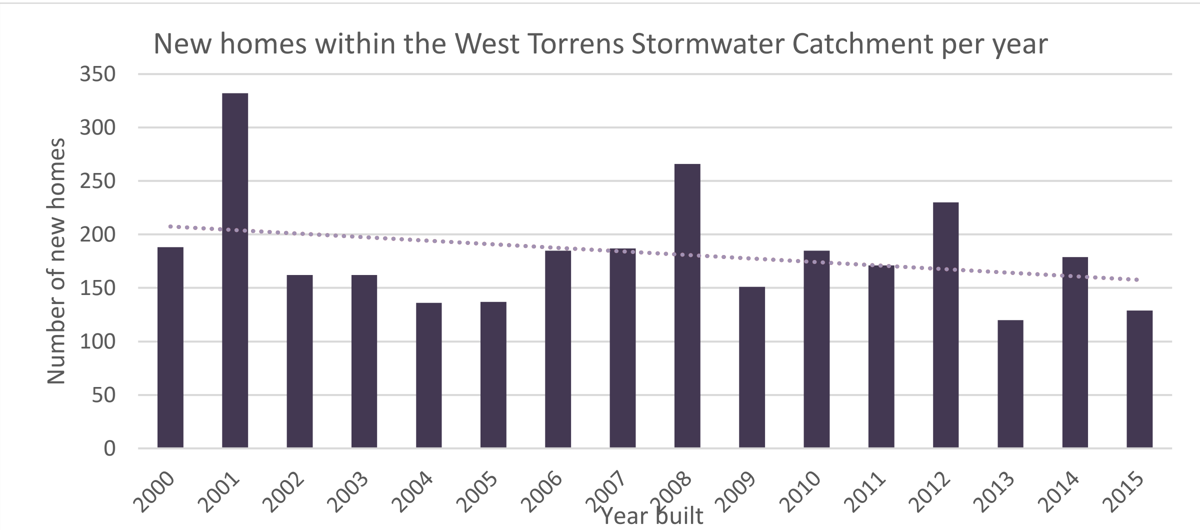


Figure 19: New home projections within the Catchment by year built, based on historical building activity and linear trendline

4.2 Scenario 2 – Projections based on Government Population Policy

Scenario 2 projections are based on data sourced from the ABS 2011 Census, 2015 dwelling data for the catchment and population growth projections contained within the South Australian Government's 30-Year Plan. Known population and household density data from the 2011 ABS Census has been combined with Government population projections for the Adelaide and Outer Adelaide Statistical Divisions (ASD/OASD) for Low, Medium and High growth scenarios and Medium growth scenarios for individual LGAs. After processing this large database, it was determined that at the end of 2015 there were 19,091 dwellings within the catchment boundaries.

The infraPlan household projections were calculated using the following procedure:

Step 1 – Projected growth rates for the ASD extended to 2046 based on the trendline from 2031 to 2041. This was applied to Low, Medium and High scenarios.

Step 2 – Published LGA growth rates were extended to 2046 assuming the published rate represents the Medium growth scenario. High and Low scenario rates were calculated from the Medium growth rate using ASD High and Low growth rate relationships to the ASD Medium rate. Each LGA now has an individual Low, Medium and High scenario growth rate projected to 2046.

Step 3 – Determine approximate 2015 catchment dwellings per LGA using known 2015 catchment dwelling numbers and 2011 proportions of homes within the catchment for each of the contributing LGAs (Adelaide, Charles Sturt and West Torrens).

Step 4 – Apply calculated single year growth rate to determine 2016 catchment dwellings per LGA and forecast every 5 years to 2046.

Step 5 – Produce overall catchment projections of population and dwellings for Low, Medium and High growth scenarios and therefore dwelling increase in each case to 2046.

Projected catchment populations for the Low, Medium and High growth scenarios are given in Table 17. The dwelling projections are broken down for each of the LGAs. These figures and the catchment total, under the three growth scenarios and shown in

Table 17: West Torrens Stormwater Catchment population projections to 2041 for Low, Medium and High population growth scenarios

Catchment population projections					2015 total	41,557	
	2016	**2021**	**2026**	**2031**	**2036**	**2041**	**2046**
Low	43,118	44,642	45,887	47,108	48,113	48,925	49,519
Medium	**43,212**	**45,341**	**47,586**	**49,985**	**52,227**	**54,337**	**56,289**
High	43,357	46,027	49,002	52,264	55,420	58,504	61,479

Table 18: Projected dwellings within the West Torrens Stormwater Catchment in 5-year intervals by LGA based on 2015 dwelling data

Scenario	LGA	2015	2016	2021	2026	2031	2036	2041	2046
Low growth scenario	ADELAIDE		1,237	1,353	1,425	1,492	1,548	1,595	1,630
	WEST TORRENS		16,683	17,209	17,662	18,117	18,492	18,793	19,013
	CHARLES STURT		1,408	1,462	1,501	1,532	1,557	1,577	1,591
	Total		**19,328**	**20,023**	**20,588**	**21,141**	**21,597**	**21,965**	**22,234**
Medium growth scenario	ADELAIDE	1,112	1,245	1,407	1,537	1,667	1,793	1,915	2,030
	WEST TORRENS	16,185	16,713	17,448	18,265	19,160	19,995	20,779	21,502
	CHARLES STURT	1,332	1,413	1,487	1,559	1,619	1,675	1,727	1,774
	Total	**18,629**	**19,371**	**20,342**	**21,360**	**22,447**	**23,463**	**24,420**	**25,306**
High growth scenario	ADELAIDE		1,256	1,461	1,637	1,820	2,005	2,192	2,378
	WEST TORRENS		16,760	17,681	18,760	19,973	21,142	22,280	23,375
	CHARLES STURT		1,420	1,514	1,608	1,691	1,769	1,844	1,916
	Total		**19,437**	**20,656**	**22,005**	**23,484**	**24,916**	**26,316**	**27,668**

shows an overall increase of 6,680 dwellings in the Medium growth scenario, 3,600 in the Low growth scenario and 9,040 in the High growth scenario. **Therefore Scenario 2 will result in a yield range of 3,600-9,040 additional residential dwellings, with a likely increase of 6,680 dwellings.**

Projection calculations show that 80% of growth in the catchment is expected to take place within the City of West Torrens, with 5,317 additional dwellings built to 2046 under the Medium growth scenario. 918 (14%) are forecast for the City of Adelaide and 442 (6%) within the portion of the City of Charles Sturt that lies inside the West Torrens Stormwater Catchment.

4.3 Scenario 3 – Capital Value / Site Value analysis

Government agencies have traditionally based residential development projections on a Capital Value to Site Value ratio assessment (CV/SV) which determines the likely development potential of a land parcel based on the relationship between Capital Value (capital improvements on a land parcel such as buildings) and Site Value, the inherent value of the land itself. Where Capital improvements are low in value (the CV/SV is less than 1.3) there is potential for short-term redevelopment, with development likelihood reducing as the CV/SV increases. Parcels with CV/SV of between 1.3 and 2 are considered medium-term prospects while a CV/SV of more than 2 is a long-term prospect. In the forecast period, 40% of properties with a CV/SV of less than 1.3 are anticipated to be redeveloped as well as 30% of those above 1.3.

The traditional approach to determining the overall development yield using the CV/SV approach is to make a basic assessment of the site area and frontage to determine the highest yielding development type; detached homes, semi-detached homes, group, row and flats developments. This approach consistently overstates the likely development potential as it defaults to the highest yielding development type (usually flats) so the 'rule of thumb' multipliers have been applied to reduce the growth projections to be in line with observed development rates.

After determining the likelihood of a land parcel being developed, the future yield is determined based on the parcel size. Figure 20 and Figure 21 show parcels within the catchment colour coded by CV/SV and Parcel Area respectively. It is notable that there is a strong correlation between parcels with a CV/SV above 2 and parcel areas above 1500m^2 and that the majority have a CV/SV value greater than 1.3. Note also that the areas of greatest character and historical value generally have CV/SV values over 1.3.

InfraPlan have applied an amended CV/SV approach, in part due to the inherent overstatement of yield from the traditional CV/SV model and also due to not having parcel frontage data with which to assess development types. It has been assumed that parcels less than 500m^2 will not be subdivided as Council policy generally prevents this through minimum parcel size requirements. Parcels between 500 and 800m^2 are assumed to yield 2 dwellings (an increase of 1), 800 to 1200m^2 parcels yield an increase of 2 and those from 1200 to 1500m^2 will yield an increase of 3 dwellings. Land parcels over 1500m^2 have not been considered in this assessment. Development of parcels over 1500m^2 are generally considered major projects which require internal roads and infrastructure and carry minimum public open space requirements. Analysis of the catchment also shows that the majority of these sites fall in protected watershed areas or are subject to policy restrictions. This assessment assumes that all existing parcels deemed developable currently have a single dwelling. The assessment process is documented below in Table 19.

Table 19: Capital to Site Value ratio assessment summary

		Land size (m2)					
		0	500	800	1200	1500	min
CV/SV		500	800	1200	1500	2000	max
min	max	0	+1	+2	+3	0	← Yield increase by area
1	1.3	1008	6679	2411	140	78	10316
1.3	2	3074	2867	598	51	26	6616
2	10	1373	500	163	31	22	2089
Totals by land size		5455	10047	3172	222	126	Totals by CV/SV

Development potential		Land size (m^2) **Yield increase**				
CV/SV		0 to 500	500 to 800	800 to 1200	1200 to 1500	1500 to 2000
1 - 1.3	40%	0	2672	1929	168	0
1.3 - 2	30%	0	860	359	46	0
2 +	30%	0	150	98	28	0
		Total development potential				**6,310**

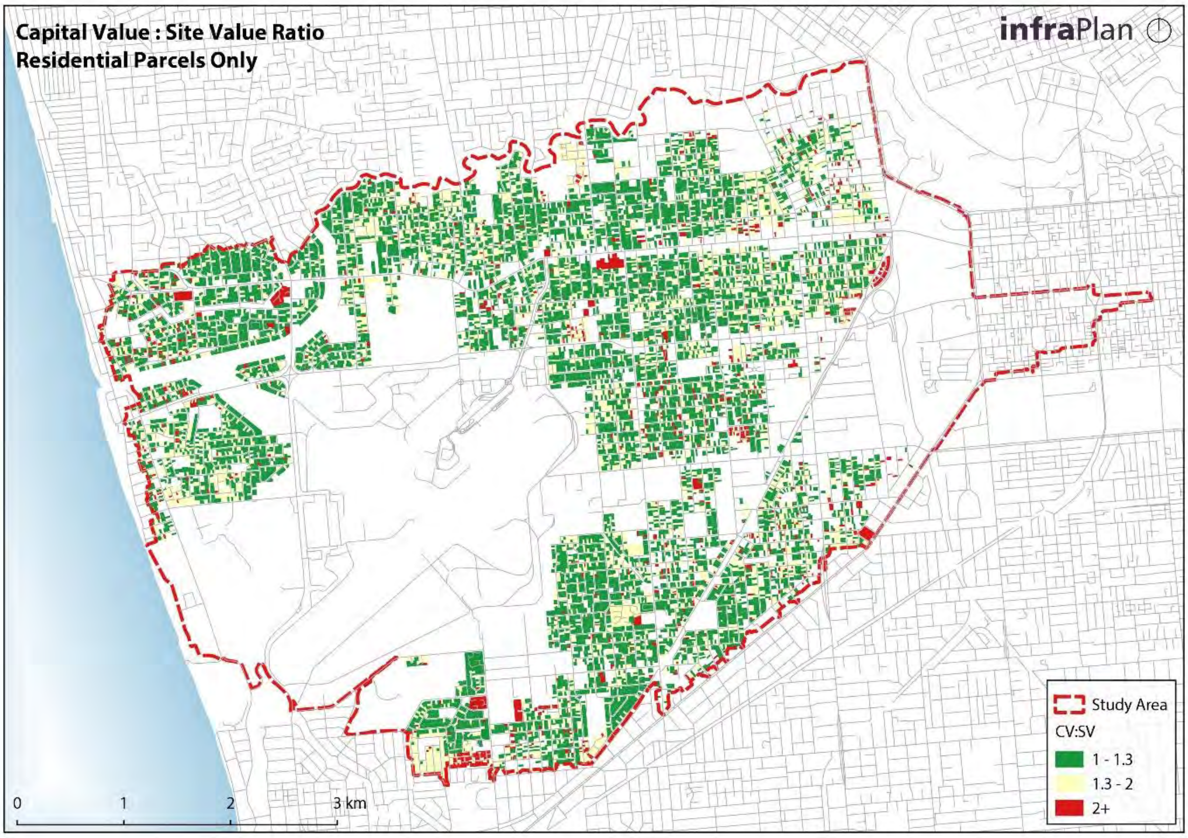


Figure 20: The catchment colour coded by CVSV Ratio

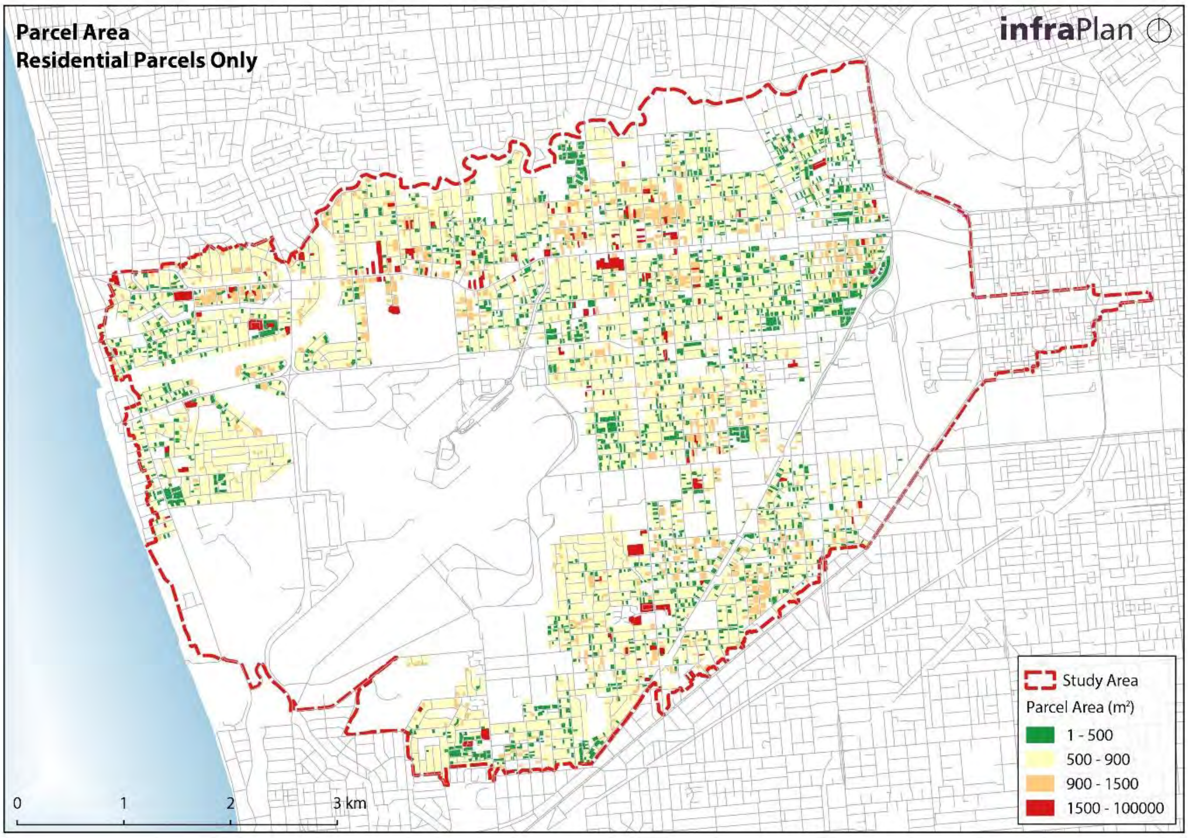


Figure 21: The catchment colour coded by Parcel Area

Using these assumptions and analysis conditions, **it has been calculated that the development potential under Scenario 3 will yield an additional 6,310 dwellings**. Note that a majority of these (4,769) are derived from parcels with existing CV/SV below 1.3.

InfraPlan have also provided for a flexible policy approach to this analysis allowing for changeable parcel size categories and 'rule of thumb' multipliers to be applied. If medium density row and townhouse dwellings were permitted such that parcels of between 800 and 1,200m^2 were assumed to yield an additional 3 dwellings and 1,200 to 1,500m^2 parcels yielded 4 additional dwellings, **the results show an increase of 10,360 dwellings above the 2015 numbers**.

4.4 Scenario 4 – the Residential Development Algorithm approach

InfraPlan and ipData have developed a market based tool using sales and development data to determine the redevelopment potential of individual land parcels. The Residential Development Algorithm was originally intended as an alternative to the Maximum Yield model which is based on CV/SV assessment and a rudimentary approximation of development potential based on fundamental dimensions of the land parcel. In practice, it has been shown that the Maximum Yield approach overstates the total number of developments and returns development types that are not reflective of actual market behaviour. As a result, arbitrary corrective factors have been applied to better approximate future development based on observed activity.

The Residential Development Algorithm applies complete Council policy dwelling footprint conditions to assess developability, the size and type of construction and saleability is determined using market cost and development profitability algorithms. As a result, infraPlan is able to more accurately predict the most likely development type per parcel (based on a profit model) and the volume of parcels across a council area or catchment likely to be subdivided. The overall dwelling increase across a study area is determined as a final output.

While the tool has not yet been applied to all parts of the West Torrens Stormwater Catchment, it has been used to assess other areas of metropolitan Adelaide and by identifying similar characteristics we have selected an area suitable for comparison. The City of Charles Sturt has been selected as a comparable area due to similar characteristics to the most developable parts of the Sturt Stormwater Catchment, including distance from the city, accessibility via major arterial routes and public transport coverage and housing stock type and age. Observations of the output from these assessments have been applied to the housing stock within the West Torrens Stormwater Catchment in order to draw some generalised conclusions with regard to the overall redevelopment potential within the catchment. Development policy differences will affect the total development outcome but the results of the study area serve as a reasonable indicator of development potential within the region.

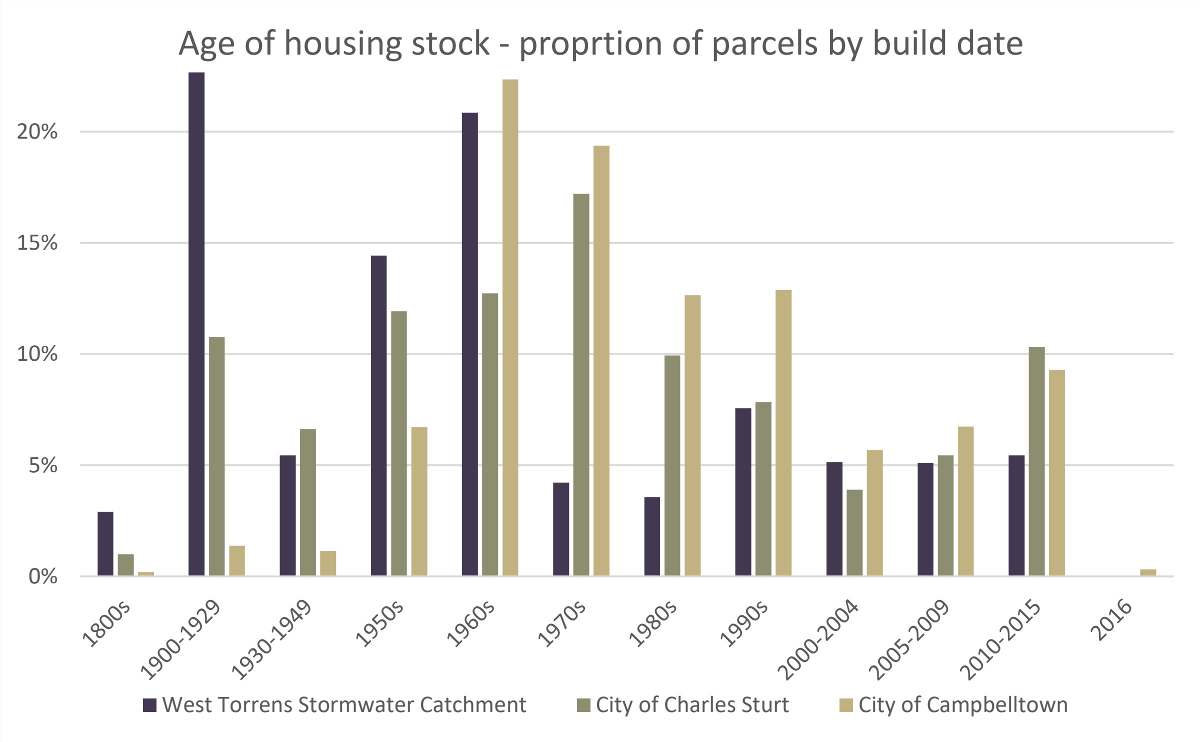


Figure 22: Comparison of housing stock by build date of the West Torrens Stormwater Catchment, the City of Charles Sturt and the City of Campbelltown

Figure 22 shows that a significant proportion of post-World War II development occurred in both the West Torrens Catchment and the City of Charles Sturt but that development continued at a high rate in the City of Charles Sturt throughout the 1970s and 80s whereas the West Torrens Stormwater Catchment area experienced little development in these decades. Since the 1990s the proportion of developments within the two areas is very similar until the last five years. Homes built between 1950 and 1990 are considered most likely to be redeveloped. Homes older than this are regarded as character homes of a region, are generally protected by historical or character zoning constraints and/or hold sufficient value within the home itself to negate redevelopment profitability. Homes constructed within 15-20 years are usually considered inappropriate for replacement as they generally carry high capital value in the home. The broad similarities within the redevelopable housing stock enables us to make comparison of the two regions.

Housing development within the catchment area in the decades following WWII make up a considerable volume of the overall existing stock in the Catchment and includes a range of house type and quality. Homes of lower quality construction and of lesser architectural value may provide additional profitable redevelopment opportunities in the catchment area and increase the overall potential yield from profitable subdivision and development. The City of Charles Sturt analysis assessed 53,949 residential parcels while the Catchment contains 19,091 residential parcels. Narrowing the assessment to parcels with homes built between 1950 and 2000 results in volumes of 32,166 for the City of Charles Sturt and 10,090 for the West Torrens Stormwater Catchment. This provides an overall parcel volume in the Catchment less than 1/3rd the assessment volume within the City of Charles Sturt.

Analysis of the City of Charles Sturt shows a projected profitable yield increase (forecast profit above 10%) of 11,048 additional dwellings on the filtered land parcels. The equivalent condition yields **5,001 additional dwellings within the West Torrens Stormwater Catchment**. This assessment is based on development plan policies and controls such as those in the City of Charles Sturt. If development plans are amended to permit greater density, such as in parts of the City of Campbelltown, and these average profiles included in development projections applied to the study catchment, the profitable redevelopment estimate is shown to rise to **10,359 additional dwellings**.

A full assessment of the catchment using the Residential Development Algorithm requires additional data on the parcels within the catchment, detailed inputs of building policy requirements and limitations and a comprehensive study of recent real estate sales data within the region. This assessment is intended as a comparative and indicative study only.

4.5 Residential Development Scenarios: Summary

As shown in the previous sections, the Scenarios result in a range of possible residential development outcomes for the West Torrens Stormwater Catchment Area. All the following assumptions are documented above and are forecast to the year 2046 above 2015 levels (i.e. a 30-year timeframe).

Scenario 1 (projection on existing trends) will result in 3,190 to 3,320 **additional dwellings.**

Scenario 2 (projections based on published Government Population Policy) will result in a yield range of 4,560-11,450 additional residential dwellings, with an average (medium population scenario) **increase of 8,460 dwellings.**

Scenario 3 (capital value / site value analysis) will result in an additional 6,310 dwellings or 7,580 in a medium density scenario.

Scenario 4 (Residential Development Algorithm approximation through comparison to the City of Charles Sturt) will result in an additional 5,000 dwellings or 10,360 where policies allow for medium density development**.**

4.6 Development Potential: Spatial Attribution

To develop an indicative distribution of redevelopment parcels throughout the catchment area, InfraPlan created an algorithm to assess the likely development location of the first 5,800 additional dwellings within the catchment area. This value was determined as the mid-range figure of the four scenarios stated in Section 4.5.

To calculate the likelihood of development of each eligible parcel, the algorithm includes assessments of the following characteristics:

- age of the existing dwelling(s)
- capital to site value ratio
- parcel size (m^2)
- parcel zoning
- existing land use
- development plan subdivision conditions
- historical significance

Parcels in Conservation Policy Areas were excluded from the assessment, while parcels in Urban Corridor Zones and Medium Density Policy Areas were given a higher loading to reflect Council preference for development in these zones. Parcels in exclusively Commercial and Industrial zones were not included in this assessment. This has excluded some Urban Corridor Zone frontages which could be developed as mixed-use developments. Generally, these types of developments will not increase permeable areas due to the nature and scale of existing land uses and structures.

The calculation allowed for varying development density and scale depending on the precinct and the conditions of the Development Plan (2016). It should be noted that due to existing redevelopment conditions affecting parcels within the catchment, those parcels within the City of Charles Sturt were excluded for this assessment. Parcels within the City of Adelaide were excluded due to the existing impermeable area percentage being high and therefore less likely to change with densification.

Infill potential was assessed for each parcel throughout the stormwater catchment and all parcels were ranked according to a weighted score representing developability and potential profitability. This determined an indicative proportional split across the zones and an indicative number of redevelopment parcels and resulting additional dwellings within each zone. The top ranked parcels within each zone were then chosen to meet the projected new dwelling calculation for each zone. The outcome of this analysis identified a total of 1,917 parcels with a projected yield increase of 5,780 new dwellings with an average replacement rate of 4. The average replacement rate by region varied from 2.0 in Low Density Residential Zones to 10.7 in Urban Corridor Zones.

The result of these calculations and projections is shown as an indicative development spatial distribution in Figure 23. This figure shows two major regions of development, aligned to major arterial roads and around Urban Corridor Zones. This map is designed to be indicative only for the purposes of calculating impermeable area increase and should not be taken to indicate the precise location of future development.

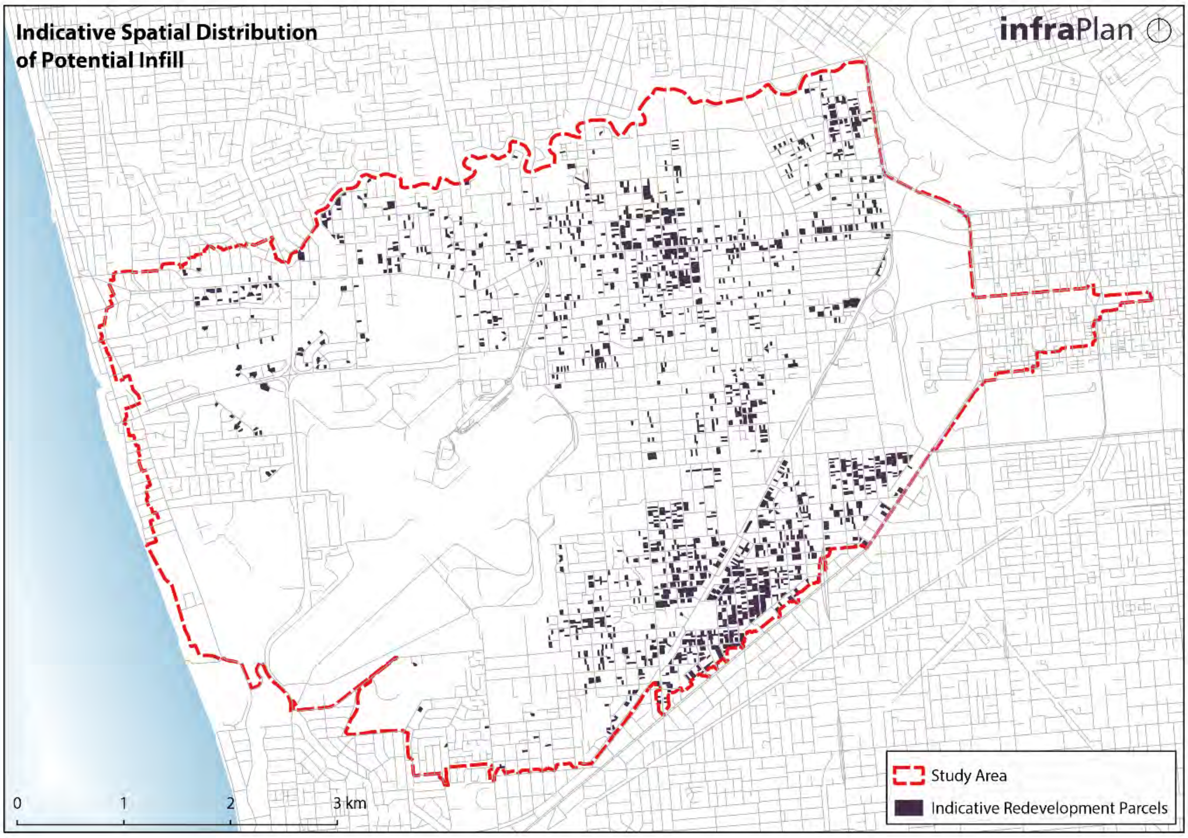


Figure 23 Indicative spatial distribution of redevelopment parcels

5. Transport and Infrastructure Assessment

Transport infrastructure requires consideration for stormwater management, especially in the context of urban infill and development. Increased housing density within the catchment may result in increased traffic loading on major arterials and cross-catchment routes, which may require road infrastructure: however, the catchment is relatively well served by public transport with bus routes covering all major arterial roadways. Major cycle routes connect to the city and local centres. As such, this catchment provides good opportunities to increase density and if focussed around transport hubs, it may be possible to minimise traffic impacts to the road network and thereby delay the need for additional road capacity.

Despite this, to determine the most likely locations for transport improvements, a review of The Integrated Transport and Land Use Plan released by the State Government in 2015 outlines many of the intended transport/infrastructure projects across the West Torrens Stormwater Catchment Area.

The following is a list of the key transport investments proposed within the Integrated Transport and Land Use Plan with relevance to the Sturt Stormwater Management Plan.

- Progressively upgrade South Road as part of a strategy to develop the non-stop North-South Corridor, including grade separation with key east-west arterial routes and provision of at-grade service roads, any interim works and detour works during construction (including North-South Corridor – Darlington, and Complete the North-South Corridor – Anzac Highway to Darlington);
- West*LINK* – trams along Henley Beach Road and to Adelaide Airport. The tram network (Ade*LINK*) is currently the subject of a detailed Business Case;
- Partner with local councils to complete the Airport Bikeway, including crossings of arterial roads;
- Upgrade intersections along Sir Donald Bradman Drive to reduce congestion and improve reliability of travel times to the airport, and provide upgrades for taxi, commercial vehicle and bus access via Richmond Road; and
- Area Wide: Supply of additional and expanded Park and Rides at key nodal points on the train, tram and bus networks.

Transport infrastructure upgrades have the potential to increase impermeable surface areas within the catchment area, particularly if road widening is required. However, land acquisition (potentially required for road widening) also presents unique opportunities to employ stormwater retention basins and other Water Sensitive Urban Design devices in the remaining land reserve following the completion of road projects.

The following maps provide a spatial annotation of the above list of projects identified in ITLUP:

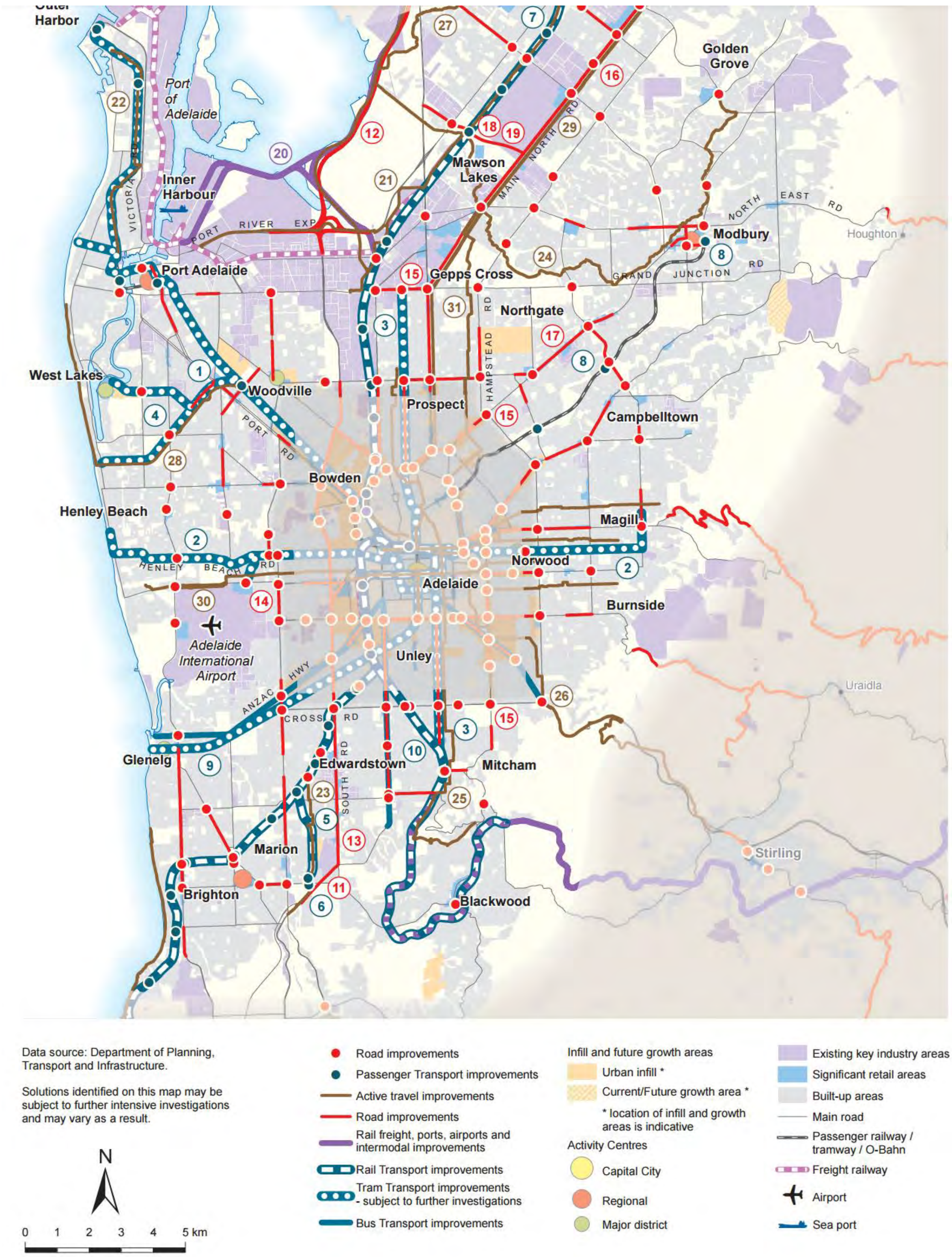


Figure 24 Infrastructure, Transport and Land Use projects within the Adelaide Metropolitan area as shown in ITLUP, 2015

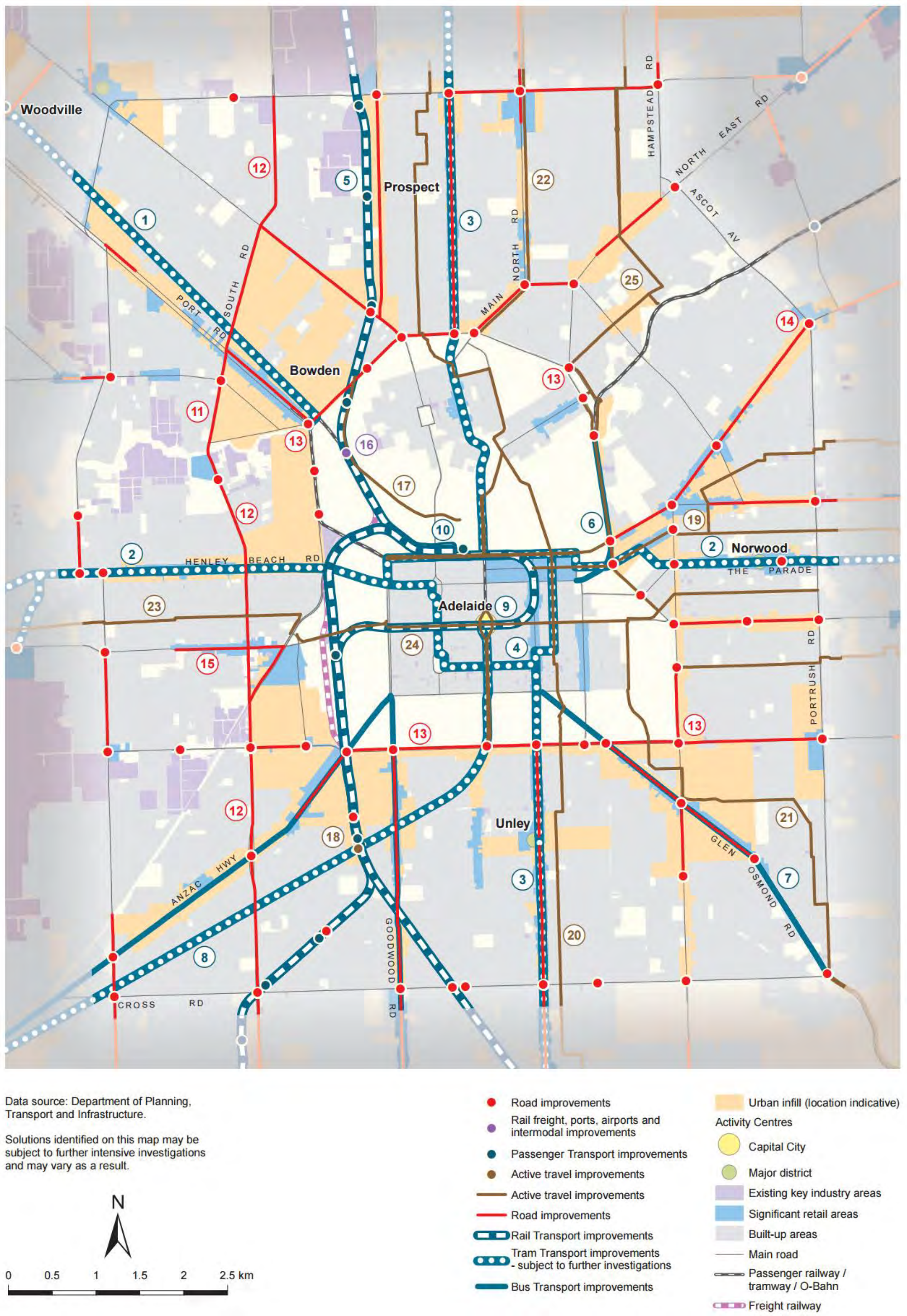


Figure 25 Infrastructure, Transport and Land Use projects within the City of Adelaide and inner suburban areas as shown in ITLUP 2015

South Road Corridor (North South Corridor):

The proposed upgrades along the North South Corridor (the South Road), are likely the most significant infrastructure works to occur within the catchment areas. Development on the North South Corridor, beginning with the Darlington Precinct and in future extending the length of South Road within the catchment, is likely to result in an increased impervious surface area due to road widening and additional lane creation. Stormwater collected on this future roadway presents possible risks in increased volume, concentrated peak flows and increased pollutants carried in stormwater collected from roadways. Upgrades to South Road may also present more opportunity to install WSUD features within the roadways, providing source control, treatment and retention, reducing the overall scale of treatment sites within the catchment.

Risks to stormwater and catchment flooding associated with the North-South Corridor project are two-fold. Up-stream flow paths and system connections to the downstream components are likely to be affected if a lowered road option is constructed. This arrangement has been employed in the under-construction Torrens to Torrens Project and the proposed Darlington scheme. Increased impermeable areas in the North-South Corridor project site at South Road will also produce increased collected stormwater volumes, potentially increasing peak flow volumes and carrying larger pollutant loads. However, should the stormwater discharge from future South Road projects be mitigated and managed prior to entering the existing stormwater system, these works could deliver solutions to existing capacity and flow rate problems, mitigating flooding risks downstream of the project site. Upstream flooding risks will need to be managed by ensuring the flow regime within and around future South Road Project sites is retained at the current capacity at a minimum and if this is not sufficient, improvements to flow patterns and the stormwater network may be undertaken at this stage to improve the upstream capacity.

Metropolitan Adelaide Road Widening Program

Some roads within the catchment area are also subject to the provisions of the Metropolitan Adelaide Road Widening Program (or MARWP). This Plan requires all proposed developments to obtain consent from the Commissioner of Highways and that all new developments to be set back from the existing street frontage: each corridor subject to MARWP has different setback requirements, specified in meters. This requirement is imposed so that there is provision for future road purposes. Given that the road improvements identified in ITLUP, MARWP requires consideration, if a road is identified in MARWP it does not necessarily mean that it is intended to be widened. The region does not include a lot of road widening allowances under MARWP but does include numerous intersections identified where widening may be required. Affected intersections within (or immediately adjacent to) the West Torrens Stormwater Catchment area are found on Grange Road, Henley Beach Road, Sir Donald Bradman Drive and Richmond Road.

The MARWP plans also show possible future connections from William Street, Beverley to Holbrooks Road and through Underdale to Marion Road. These road diversion projects would both require suburban land acquisition. Some of the identified intersections (such as South Road intersections at Grange Road and Port Road) and sections of Richmond Road have been subject to road projects recently or ongoing that address the allowances provided under MARWP. Figure 26 and Figure 27 show the parts of the study area affected by MARWP.

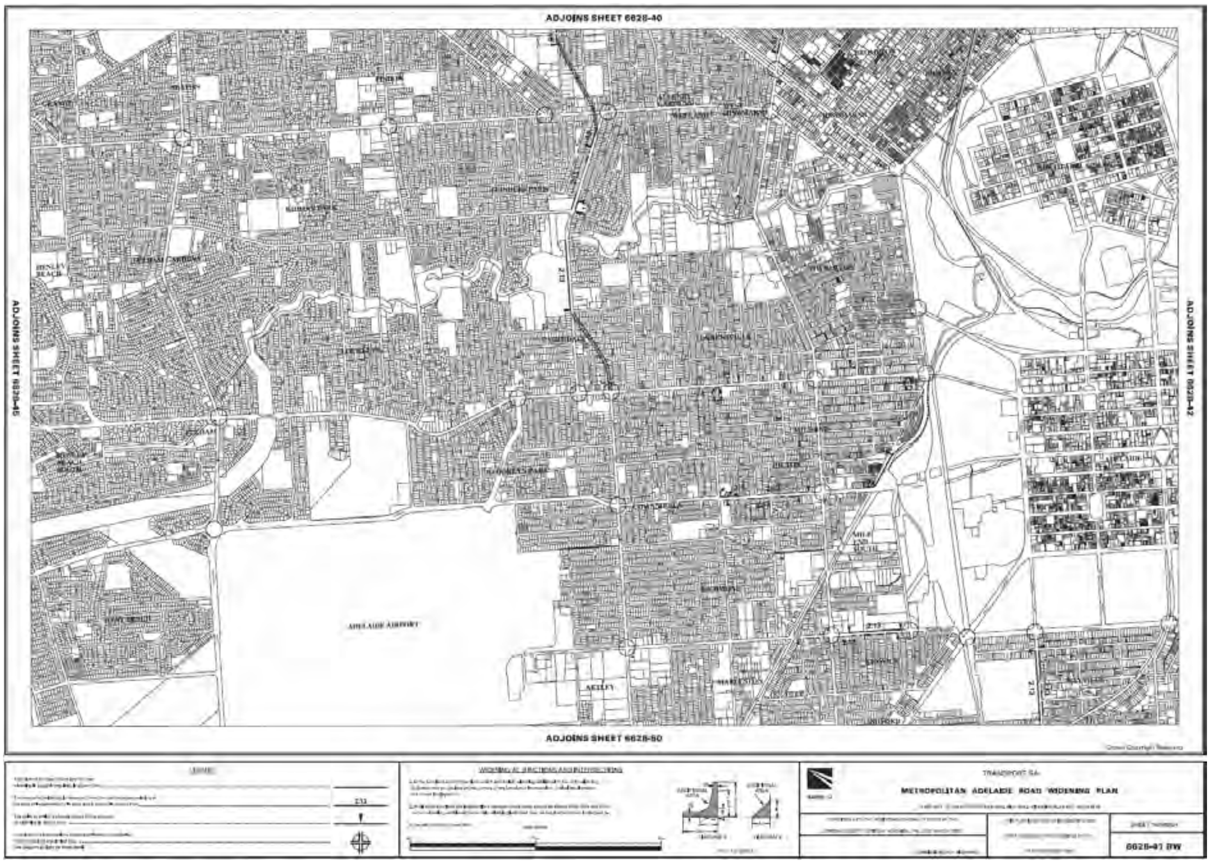


Figure 26: MARWP requirements (Sheet 6628-41, western suburbs)

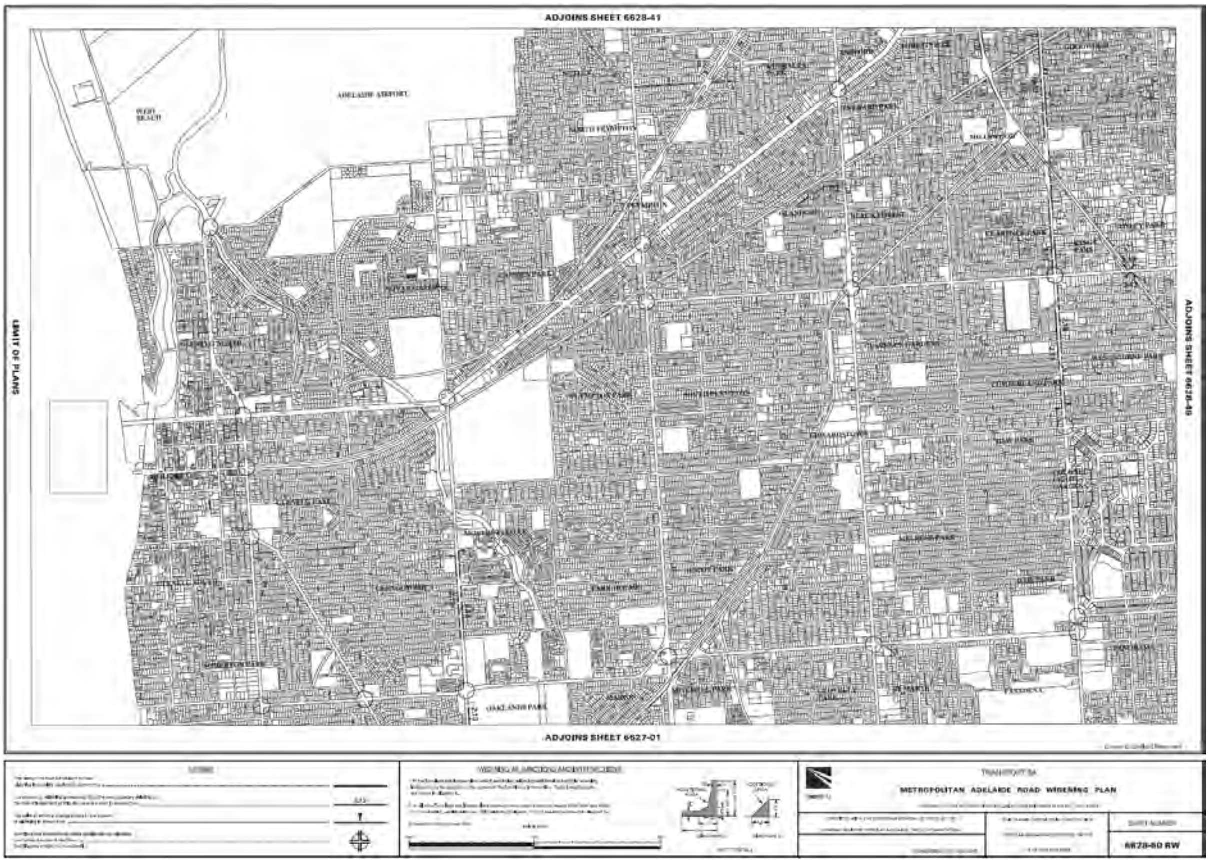


Figure 27 MARWP requirements (Sheet 6628-50, south-western suburbs)

6. Conclusion

The assessments contained within this report have been commissioned for application into the West Torrens Catchment Stormwater Management Plan. Flow models will be applied by Southfront using the calculations and assumptions developed by InfraPlan. Based on the outputs of this report InfraPlan will continue to work with Southfront in the application of:

- Infill/development scenarios (outlined in section 4)
- Spatial distributions of dwellings (outlined in section 3)
- General increase in impervious areas based on the refinement outputs (outlined in section 4.6)
- Transport infrastructure potential (outlined in section 5)

Although InfraPlan has applied its professional judgement in developing this report, it should be noted that the development scenarios and spatial distribution assumptions are an approximate judgement of how development might occur across the West Torrens Stormwater catchment. The prediction of development potential is especially difficult, and is subject to many external and uncontrollable factors. For example, it is difficult to predict future market conditions (both in the housing industry as well as broader economic conditions) which will have a significant bearing on infill development. It is also difficult to predict the future policy directions of councils and the State Government which may have significant bearing on the outcomes of development across not only the West Torrens Stormwater Catchment area, but metropolitan Adelaide in general.

For the purposes of this report, InfraPlan has applied industry best practice assessment and calculations for development potential and urban infill, as well as its own assessment methods and investigations developed specifically for this report. Despite this, actual future populations/development potential and infill locations will likely vary from these projections, especially given the assessments have been applied over a 30-year timeframe. Therefore, it is recommended that the outputs of this report be reviewed on a semi-regular basis and be recalibrated using updated relevant data to ensure that the Development Potential Scenarios (section 4) and Spatial Distribution of Dwellings (section 3) remain relevant. This is especially important given the likely implications on infrastructure investment and resource suitability for the West Torrens Stormwater Catchment assets.

7. Appendices

7.1 Appendix A: Development Plan Zones within the Study Area

*Dev. Plan Code – **AD** (Adelaide City), **CHST** (Charles Sturt) and **WETO** (West Torrens).*

DEV. PLAN CODE*	ZONE	ZONE MEANING	POLICY	POLICY MEANING	PRECINCT	PRECINCT MEANING	DEV. CATEGORY
AD	CC	Capital City Zone	13	Central Business Policy Area			COMMERCIAL
AD	CC	Capital City Zone	14	Main Street Policy Area			COMMERCIAL
AD	CC	Capital City Zone					COMMERCIAL
AD	CF	City Frame Zone					RESIDENTIAL
AD	CiL	City Living Zone	32	South Central Policy Area			RESIDENTIAL
AD	CiL	City Living Zone	33	South West Policy Area			RESIDENTIAL
AD	MS(A)	Main Street (Adelaide) Zone					COMMERCIAL
AD	PL	Park Lands Zone	22	Southern Park Lands Policy Area			RECREATION
AD	PL	Park Lands Zone	23	Western Park Lands Policy Area			RECREATION
AD	PL	Park Lands Zone	24	River Torrens West Policy Area			RECREATION
AD	Rb	Riverbank Zone	27	Medical Policy Area			COMMUNITY FACILITIES
CHST	AdSh	Adelaide Shores					RECREATION
CHST	Af	Airfield					INFRASTRUCTURE
CHST	CstOS	Coastal Open Space					ENVIRONMENTAL CONSTRAINT
CHST	LCe	Local Centre					COMMERCIAL
CHST	LCe	Local Centre	7	Local Shopping			COMMERCIAL
CHST	MOSS	Metropolitan Open Space System	8	Linear Park (River Torrens/Karrawirra Parri)			OPEN SPACE
CHST	R	Residential	16	Mid Suburban			RESIDENTIAL
CHST	R	Residential	17	Western Edge			RESIDENTIAL
WETO	AdSh	Adelaide Shores					RECREATION
WETO	Af	Airfield					INFRASTRUCTURE
WETO	BG	Bulky Goods					COMMERCIAL

WETO	C	Commercial	1	Arterial Roads			COMMERCIAL
WETO	C	Commercial	1	Arterial Roads	1	Intersection	COMMERCIAL
WETO	C	Commercial	1	Arterial Roads	2	Richmond Road	COMMERCIAL
WETO	C	Commercial	1	Arterial Roads	3	Sir Donald Bradman Drive (Mile End)	COMMERCIAL
WETO	C	Commercial	1	Arterial Roads	4	South Road (Keswick)	COMMERCIAL
WETO	C	Commercial	1	Arterial Roads	5	South Road (Mile End)	COMMERCIAL
WETO	C	Commercial	1	Arterial Roads	6	South Road (Mile End South)	COMMERCIAL
WETO	C	Commercial	2	District Commercial			COMMERCIAL
WETO	C	Commercial	3	Local Commercial			COMMERCIAL
WETO	C	Commercial	4	Office Park			COMMERCIAL
WETO	CstMar	Coastal Marina					ENVIRONMENTAL CONSTRAINT
WETO	CstOS	Coastal Open Space					ENVIRONMENTAL CONSTRAINT
WETO	Cu	Community	5	Recreation	7	Mile End	COMMUNITY FACILITIES
WETO	Cu	Community	5	Recreation	8	Open Space	COMMUNITY FACILITIES
WETO	Cu	Community	5	Recreation			COMMUNITY FACILITIES
WETO	Cu	Community					COMMUNITY FACILITIES
WETO	DCe	District Centre	6	Brickworks			COMMERCIAL
WETO	DCe	District Centre	7	Kurralta Park			COMMERCIAL
WETO	In	Industry	9	Netley			INDUSTRIAL
WETO	In	Industry	10	Mixed Use			INDUSTRIAL
WETO	In	Industry					INDUSTRIAL
WETO	LCe	Local Centre					COMMERCIAL
WETO	NCe	Neighbourhood Centre	11	Hilton			COMMERCIAL
WETO	NCe	Neighbourhood Centre	12	Marleston			COMMERCIAL
WETO	NCe	Neighbourhood Centre	13	Novar Gardens			COMMERCIAL
WETO	NCe	Neighbourhood Centre	14	Richmond			COMMERCIAL
WETO	NCe	Neighbourhood Centre	15	Tennyson Street			COMMERCIAL
WETO	NCe	Neighbourhood Centre	16	Thebarton			COMMERCIAL

WETO	OS	Open Space					OPEN SPACE
WETO	R	Residential	18	Medium Density			RESIDENTIAL
WETO	R	Residential	19	Medium Density			RESIDENTIAL
WETO	R	Residential	20	Low Density			RESIDENTIAL
WETO	R	Residential	21	Low Density			RESIDENTIAL
WETO	R	Residential	22	Ashford Character			RESIDENTIAL
WETO	R	Residential	23	Cowandilla / Mile End West Character			RESIDENTIAL
WETO	R	Residential	25	Lockleys Character			RESIDENTIAL
WETO	R	Residential	26	Novar Gardens Character			RESIDENTIAL
WETO	R	Residential	27	Thebarton Character			RESIDENTIAL
WETO	R	Residential	28	Torrensville Character			RESIDENTIAL
WETO	R	Residential	29	Elston Street Conservation			RESIDENTIAL
WETO	R	Residential	30	Mile End Conservation			RESIDENTIAL
WETO	R	Residential	31	Richmond Conservation			RESIDENTIAL
WETO	R	Residential	32	Rose Street Conservation			RESIDENTIAL
WETO	R	Residential	33	Torrensville East Conservation			RESIDENTIAL
WETO	UrC	Urban Corridor	34	Boulevard			COMMERCIAL
WETO	UrC	Urban Corridor	35	High Street			COMMERCIAL
WETO	UrC	Urban Corridor	36	Transit Living			COMMERCIAL
WETO	UrC	Urban Corridor	37	Business			COMMERCIAL

Appendix C

West Torrens Catchment SMP - Hydrogeological Assessment WGA (2020)

Southfront

West Torrens Catchment SMP - Hydrogeological Assessment

DRAFT

Project No. WGA201812
Doc No. WGA201812-RP-HG-0001
Rev. A

25 September 2020

Revision History

Rev	Date	Issue	Originator	Checker	Approver
A	25/9/2020	Draft for Comment	R Martin	M Gogoll	R Martin

CONTENTS

Appendices

List of Figures

List of Tables

1 INTRODUCTION

1.1 BACKGROUND

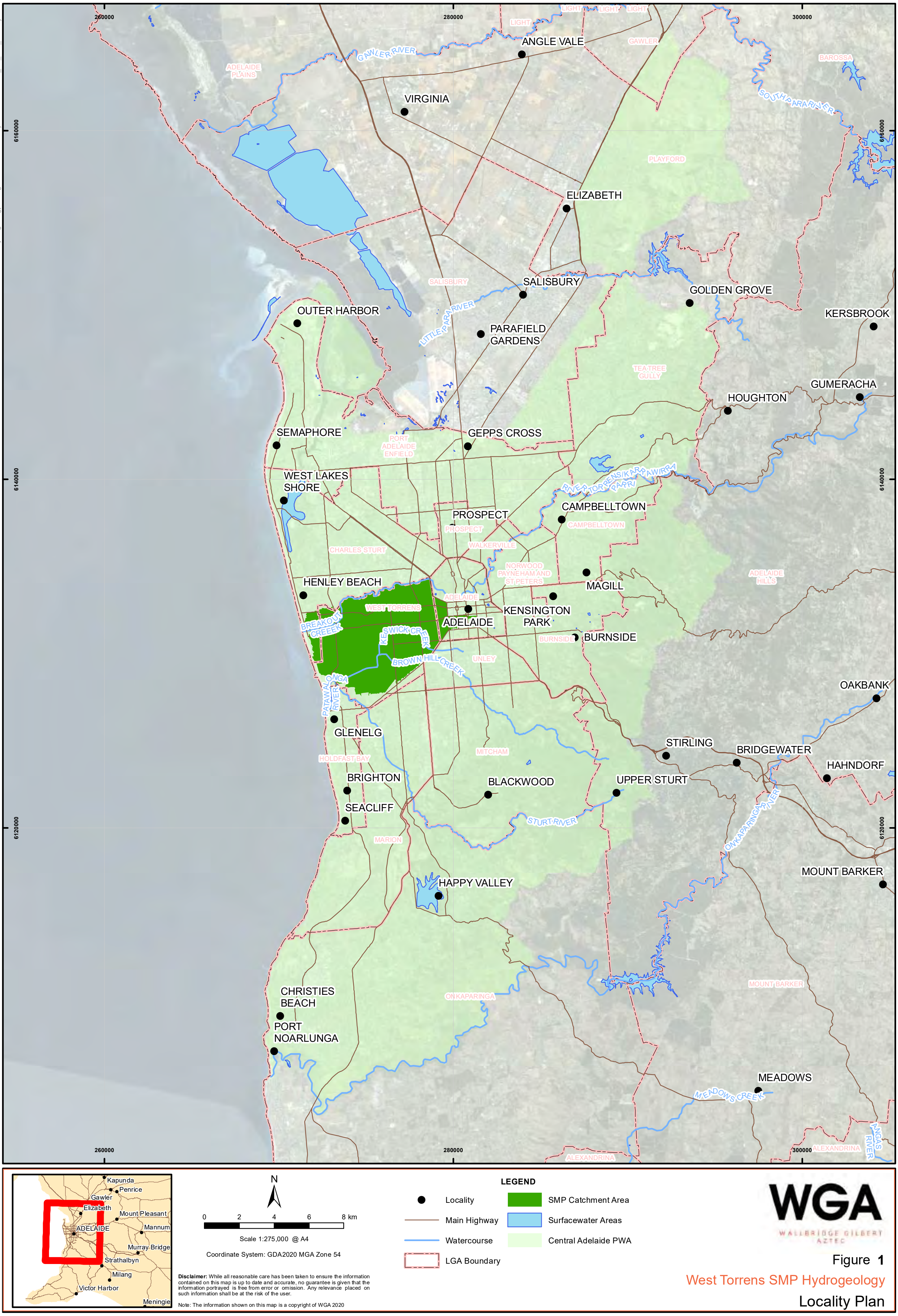
Southfront Pty Ltd (Southfront) engaged Wallbridge Gilbert Aztec (WGA) to complete a desktop review of the local hydrogeology and assess the potential for Managed Aquifer Recharge (MAR) as part of the development of the West Torrens Catchment Stormwater Management Plan (SMP). The hydrogeological assessment provides a summary of the local groundwater system to assist in developing an integrated approach to managing stormwater in the area.

The West Torrens Catchment (Figure 1) originates from within the Adelaide CBD and extends west to the coast. Three local government areas overlap across the catchment. The head of the catchment is located within the Adelaide Central Business District (CBD) within the Local Government Area (LGA) administered by the City of Adelaide. The northeast portion of the catchment known as Breakout Creek/River Torrens lies within the LGA administered by the City of Charles Sturt, whilst the bulk of the catchment falls within the City of West Torrens LGA.

1.2 SCOPE OF SERVICES

The scope of services for the delivery of this work has included:

- A review of the geology within the study area.
- A hydrogeological review which incorporated interrogation of the government's groundwater database and publicly available information.
- An estimate of groundwater use within the study area.
- Assessment of MAR feasibility within the study area.
- Comment on operational MAR systems and potential for new MAR systems in the study area.
- Summary of the current MAR regulatory framework.



ANGLE VALE
VIRGINIA
ELIZABETH
SALISBURY
GOLDEN GROVE
KERSBROOK
OUTER HARBOR
PARAFIELD GARDENS
GUMERACHA
HOUGHTON
SEMAPHORE
GEPPS CROSS
WEST LAKES SHORE
CAMPBELLTOWN
PROSPECT
MAGILL
HENLEY BEACH
KENSINGTON PARK
ADELAIDE
BURNSIDE
OAKBANK
GLENELG
STIRLING
BRIDGEWATER
HAHNDORF
BRIGHTON
BLACKWOOD
UPPER STURT
SEACLIFF
MOUNT BARKER
HAPPY VALLEY
CHRISTIES BEACH
PORT NOARLUNGA
MEADOWS
GAWLER RIVER
SOUTH PARA RIVER
LITTLE PARA RIVER
RIVER TORRENS/KARRAWIRRA PARRI
BREAKOUT CREEK
KESWICK CREEK
BROWN HILL CREEK
PATAWALONGA RIVER
STURT RIVER
ONKAPARINGA RIVER
MEADOWS CREEK
ANGAS RIVER
LIGHT
GAWLER
BAROSSA
ADELAIDE PLAINS
PLAYFORD
SALISBURY
TEA TREE GULLY
PORT ADELAIDE ENFIELD
CHARLES STURT
PROSPECT
WALKERVILLE
NORWOOD PAYNEHAM AND ST PETERS
ADELAIDE HILLS
ADELAIDE
WEST TORRENS
BURNSIDE
UNLEY
HOLDFAST BAY
MITCHAM
MARION
ONKAPARINGA
MOUNT BARKER
ALEXANDRINA
260000
280000
300000
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Document Path: V:\2020\201800 - 201899\201812 - West Torrens SMP Hydrogeology\Design\Sketches\GIS\Projects\WGA201812_AA_GIS_Locality.mxd
Kapunda
Penrice
Gawler
Elizabeth
Mount Pleasant
ADELAIDE
Mannum
Murray Bridge
Strathalbyn
Milang
Victor Harbor
Meningie
N
0 2 4 6 8 km
Scale 1:275,000 @ A4
Coordinate System: GDA2020 MGA Zone 54
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Any reliance placed on such information shall be at the risk of the user.
Note: The information shown on this map is a copyright of WGA 2020
LEGEND
Locality
Main Highway
Watercourse
LGA Boundary
SMP Catchment Area
Surfacewater Areas
Central Adelaide PWA
WGA
WALLBRIDGE GILBERT AZTEC
Figure 1
West Torrens SMP Hydrogeology
Locality Plan

2 PHYSIOGRAPHY

2.1 STUDY AREA

The West Torrens Catchment covers an area of approximately 39 km^2 (**Figure 1**). Prior to European settlement, the lower reaches of the River Torrens spread out across the plains to form a range of swamps, wetlands and reedbeds (Kraehenbuehl 1996) extending south and north of the present-day Torrens River discharge point through Breakout Creek. Post European settlement, the catchment has been heavily engineered to manage stormwater runoff from the built environs. The main drainage lines of Keswick Creek and Brownhill Creek, which transect the catchment, have been heavily engineered to transport water quickly toward the coast where it is discharged through the Patawalonga River.

The River Torrens marks the northern boundary of the catchment. Keswick Creek flows westerly from the confluence of Park Lands Creek and Glen Osmond Creek before entering the West Torrens Catchment at Anzac Highway, opposite the Keswick Army Barracks. Keswick Creek is a heavily engineered concrete lined channel and drains through the suburbs of Keswick, Mile End, Hilton, Richmond and finally around the eastern side of Adelaide Airport to its confluence with Brown Hill Creek.

Brownhill Creek has its headwaters in the Mount Lofty Ranges and drains through the suburbs of Mitcham and Unley before entering the West Torrens Catchment at Ashford, south of the Keswick Army Barracks (**Figure 1**). The confluence of Brownhill Creek and Keswick Creek occurs at Beare Reserve located on the eastern border of Adelaide Airport. Brownhill Creek flows along the southern boundary of Adelaide Airport and joins with Sturt Creek in the southwestern corner of the catchment. The confluence of Brownhill Creek and Sturt Creek forms the head of the Patawalonga Creek which is the exit point to sea for water draining the West Torrens catchment and adjacent Sturt River Catchment.

A large portion of the catchment (approximately 7 km^2) comprises the Adelaide Airport and associated commercial buildings whilst the combined open areas of the Glenelg Golf Course (south of the Airport); West Beach Parks Golf, West Beach Caravan Park, Barratt Reserve and Adelaide University Sports Fields (West of Adelaide Airport) have a combined open area of approximately 2.1 km^2 and Kooyonga Golf Course (north of Adelaide Airport) has an open area of approximately 0.58 km^2. The combined area comprising large open spaces (excluding smaller sporting ovals) is approximately 9.7 km^2 or 25% of the 39 km^2 catchment area.

2.2 TOPOGRAPHY

Along the western coastal margin of the catchment remnant sand dunes rise from the shore line to heights of 10 m above Australian Height Datum (m AHD) before dropping to around 2 m AHD at Military Road which runs parallel with the shoreline along the back of the dunes. Pre-European settlement the dunes most likely acted as a barrier to stormwater discharge associated with large storm events and resulted in the formation of swamps and marshes across the lower lying landscape behind the dunes.

Most of the vacant land immediately east of Military Road, including the Adelaide Airport, has a typical elevation of approximately 2 m AHD. Drainage trenches have been constructed around Adelaide Airport to prevent waterlogging of the lower lying land.

From the eastern boundary of Adelaide Airport, the topography rises to approximately 42 m AHD in the Adelaide CBD. The steepest change in elevation (20 m AHD to 30 m AHD) occurs along the rail line at Keswick which fringes the Adelaide CBD. This change in elevation aligns along the approximate axis of the Para Fault in this location. From the rail line west to the coast along fault axis there is no evidence of any significant elevation change which would indicate surface expression of the fault line.

2.3 CLIMATE

The Adelaide region experiences cool, wet winters and hot, dry summers. Higher rainfall is recorded in winter, typically during the months of April and October however significant variations in intensity and distribution are observed seasonally. Due to the sharp increase in elevation of the Mount Lofty Ranges, rainfall typically increases across the Adelaide Plains because of the orographic influence of the ranges

Various rainfall gauging stations have been in operation at one time or another either within or surrounding the West Torrens Catchment. **Table 1** presents a list of the currently active climate stations within and immediately surrounding the West Torrens Catchment. Historically there have been multiple stations in operation but many of them have been closed. Adelaide Airport (BoM Station number 023034) has continuous daily rainfall records from 1955 to present.

Table 1: Currently Active Bureau of Meteorology BoM Climate Stations in and Around the West Torrens Catchment

BoM Station Number	Station Name	Easting (GRS80 2020)	Northing (GRS80 2020)	Period of Record
23034	Adelaide Airport	273533.82	6129692.977	1955 – Aug 2020
23011	Nth Adelaide	280760.813	6133199.207	1883 – Aug 2020
23024	Seaton	272482.364	6135216.829	1912 – Aug 2020
23098	Morphettville RC	275415.167	6127519.501	1947 - Aug 2020
23115	Keswick	279013.983	6129827.302	2001 – Aug 2020
23140	Mitchell Park	277349.868	6123127.059	2007 - Aug 2020
23137	Regency Park	277885.104	6138679.482	2007 - Aug 2020
23090	Kent Town [1]	282588.173	6133242.866	1977 – Jun 2020

Notes: [1] Kent Town station closed end Jun 2020

The average annual rainfall for the period of record for the eight gauging stations presented in **Table 1** ranges from 346.8 mm at Regency Park (BoM Station No. 23137) through to 547.1 mm at Kent Town (BoM Station No.23090). The period of record for the Regency Park BoM gauging station starts in 2007 and it is considered that the record for this site may be skewed by the lower than average rainfall experienced across Adelaide over the past decade.

Comparison of the average annual rainfall across all stations listed in **Table 1** for their period of record against the period 2007 to August 2020 show the annual mean rainfall at North Adelaide and Morphettville Racecourse has decreased by 72 and 61 mm. The annual average rainfall recorded at Adelaide Airport and Kent Town for the period 2007 to August has decreased by 37 and 26 mm respectively when compared against the average annual rainfall for the period of record. The remaining stations show no appreciable change in average rainfall as the period of record starts in 2001 or 2007.

Figure 2 presents the average monthly rainfall for the period January 2007 to August 2020 for the eight closest BoM gauging stations to West Torrens Catchment. In general rain fall is lower in the north west increasing across the catchment south easterly in response to the orographic influence of the Mount Lofty Ranges.

Figure 3 presents the rainfall isohyets for the eight active BoM gauging stations for the period 2007 to August 2020. A common period has been selected for all records to reflect the most recent rainfall trends rather than using the entire period of record. The general rainfall pattern from the isohyet contours shows rainfall increasing from north west to south east across the catchment.

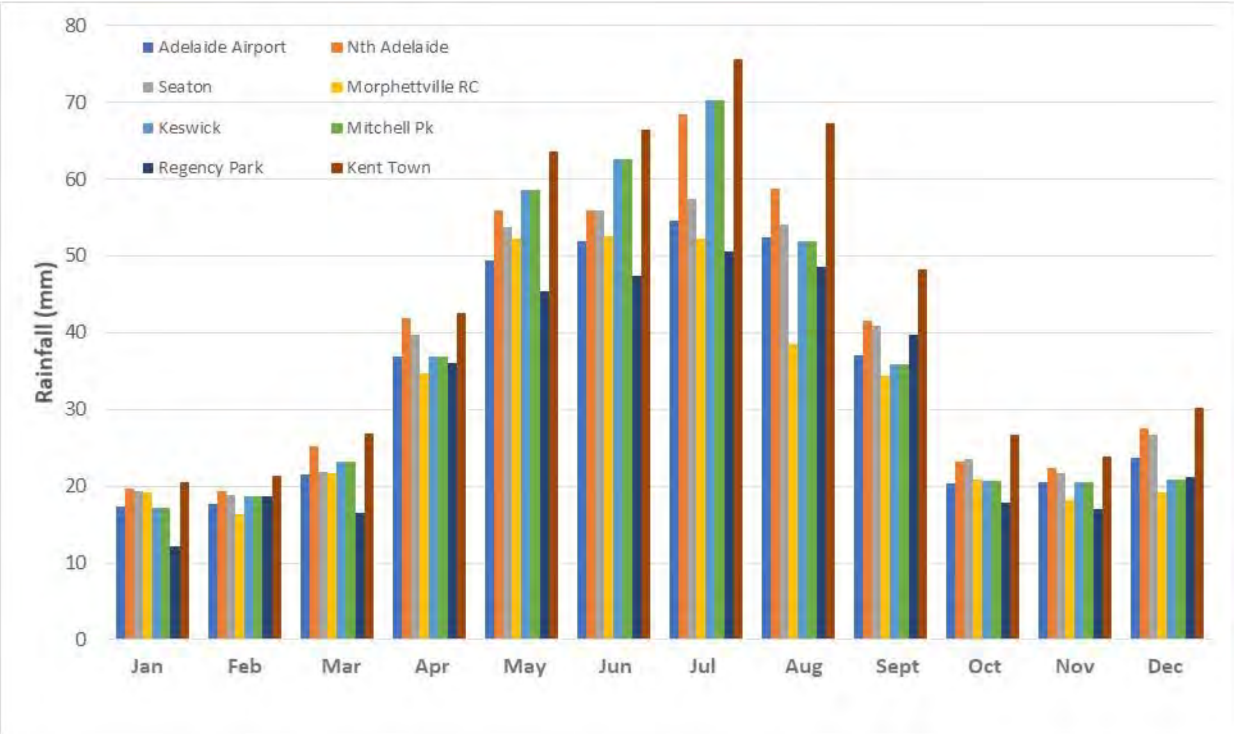
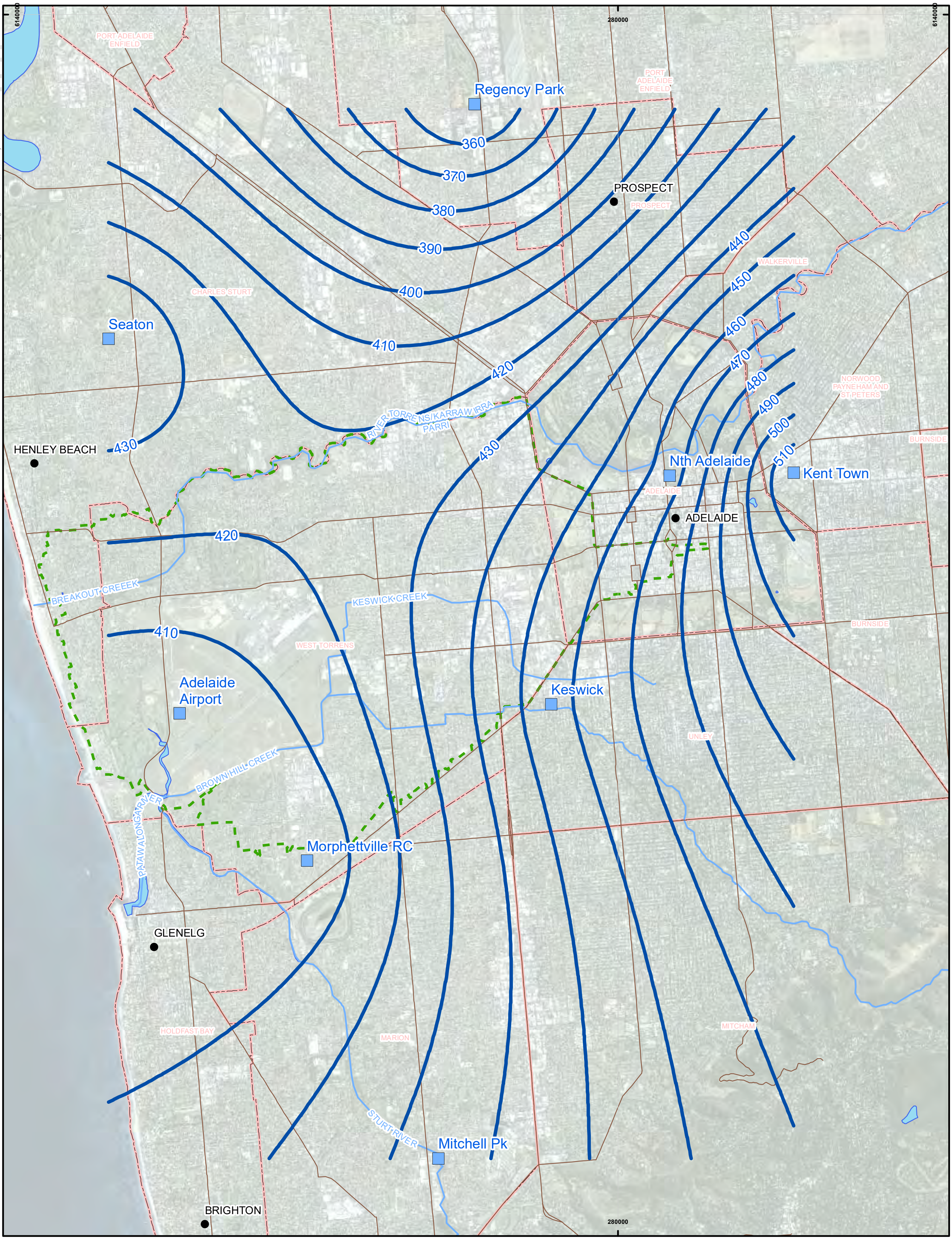
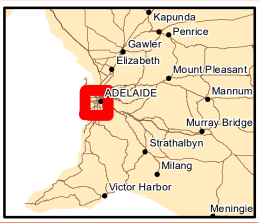


Figure 2: Average Monthly Rainfall for Period Jan 2007 to June 2020 for the Active BoM Stations





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Scale 1:75,000 @ A4

Coordinate System: GDA2020 MGA Zone 54

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Note: The information shown on this map is a copyright of WGA 2020

LEGEND

- Locality
- Rainfall Station
- Rainfall Isohyets
- Main Highway
- Watercourse
- SMP Catchment Area
- LGA Boundary
- Surfacewater Areas

WGA
WALLBRIDGE GILBERT AZTEC

Figure 3
West Torrens SMP Hydrogeology
Average annual rainfall (2007-2020)

2.4 WATER RESOURCES MANAGEMENT AREA

The portion of the River Torrens/Karrawirra Parri that flows across the Adelaide Plains and forms the northern boundary of the West Torrens Catchment is a Prescribed Watercourse under the Western Mount Lofty Ranges Water Allocation Plan. A licence is required to take water from the Torrens River for irrigation or industrial purposes.

The West Torrens Catchment lies within the Central Adelaide Prescribed Wells Area (CA PWA). The CA PWA was officially prescribed on 7 June 2007. Prescription establishes a water allocation and licensing framework to protect water resources from overuse and to ensure water users are not adversely affected by other water users.

The Prescription covers the groundwater (bores/wells) resources of the region but does not apply to the use of water from wells for domestic purposes, including the irrigation of less than 0.4 hectares (backyard bores), or for watering stock.

Although the CA PWA is prescribed, at the time of preparing this report, licences to take groundwater had not yet been issued and there is currently no comprehensive metering of extractions. The most recent estimate of use from all aquifers across the CA PWA is about 10,000 to12,000 ML/a. Groundwater extraction from the T1 aquifer is concentrated near Thebarton, where there is industrial extraction, and in the West Lakes / Grange area where there is seasonal irrigation. Long-standing cones of depression in the potentiometric (pressure) level surface have formed in these areas but long-term groundwater level trend appears to have stabilised suggesting a new equilibrium has been reached.

3 GEOLOGY / HYDROGEOLOGY

3.1 REGIONAL GEOLOGICAL SETTING

3.1.1 Regional Geology and Stratigraphy

The West Torrens Catchment occurs mainly within the St Vincent Basin, an intracratonic sedimentary basin formed by rejuvenated Palaeozoic faults during the continental separation of Australia and Antarctica in the Eocene (Cooper, 1979). Basin strata are up to 700 m thick and were laid down in a shallow graben bounded by folded and block-faulted Proterozoic and Palaeozoic rocks (Drexel and Priess, 1995).

St Vincent Basin has been subdivided into several sub-basins, the largest being the Adelaide Plains Sub-basin. The Golden Grove, Noarlunga and Willunga Embayment's are asymmetric tectonic valleys in which the wedge of sediments dip gently southwards and thicken towards their faulted south eastern margins (Drexel and Priess, 1995). The West Torrens Catchment is bisected by the northeast/southwest trending Para Fault which separates the Adelaide Plains sub basin from the Golden Grove Embayment (**Figure 4**).

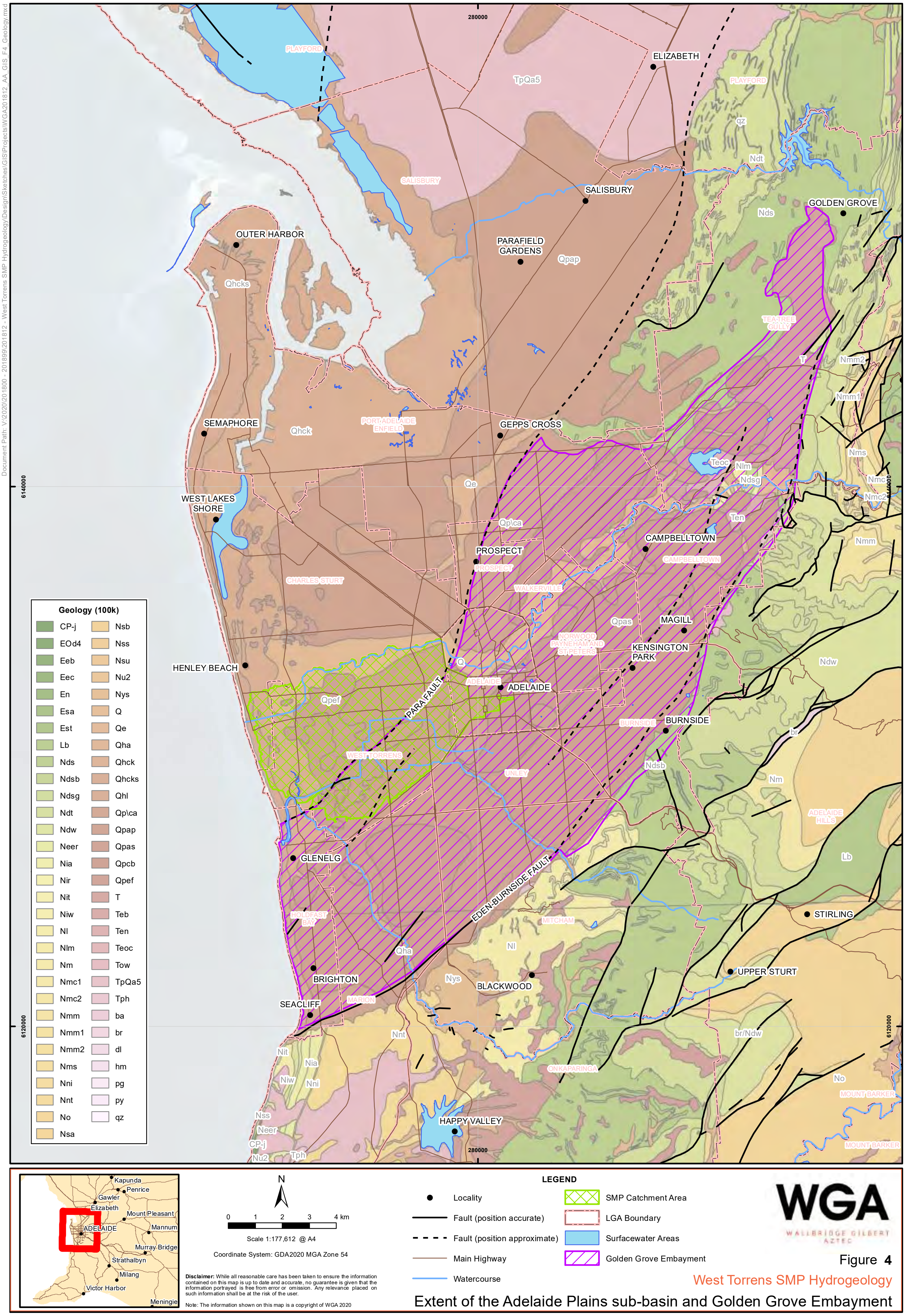
The major stratigraphic and equivalent hydrostratigraphic units of the Adelaide Plains sub-basin and the Golden Grove Embayment are presented in **Table 2**.

The Tertiary sedimentary aquifers constitute the largest and most important groundwater resource in terms of general use in the Adelaide Plains Sub-basin and Golden Grove Embayment. The Quaternary aquifers are relatively thin and of limited extent. They have typically been developed for abstraction by small-scale users for stock and domestic purposes in areas where the groundwater has favourable salinity.

The hydrostratigraphy of the Adelaide Plains Sub-basin uses the same nomenclature as the Golden Grove Embayment (**Table 2**) but is less complex because of the greater aquifer continuity and uniformity. The Q4 aquifer consists entirely of the sandy Carisbrooke Sand formation, and in some locations (e.g. throughout Golden Grove Embayment) can be in direct hydraulic connection with the underlying first Tertiary (T1) aquifer.

The Adelaide Plains Sub-basin is the most extensive portion of the St Vincent Basin and extends from the Para Fault in the south and east to beyond the northern limit of the Northern Adelaide Plains Prescribed Well Area (NAP PWA). The Golden Grove Embayment extends south from the Para Fault and is bounded in the east by the Eden Burnside Fault which marks the boundary for the uplifted Mount Lofty Ranges which delineate the western margin of the Adelaide Geosyncline

Quaternary and Tertiary sediments thicken to the south, reaching a maximum thickness of about 120 and 500 m in the metropolitan area between the River Torrens and the Para Fault. The hydrostratigraphy of the Adelaide Plains Sub-basin is much simpler than the Golden Grove Embayment because of the greater uniformity and extent of the key geological units.



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GEPPS CROSS
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CAMPBELLTOWN
PROSPECT
MAGILL
KENSINGTON PARK
HENLEY BEACH
ADELAIDE
BURNSIDE
GLENELG
STIRLING
UPPER STURT
BRIGHTON
BLACKWOOD
SEACLIFF
HAPPY VALLEY
PARA FAULT
EDEN-BURNSIDE FAULT
PLAYFORD
SALISBURY
TEA TREE GULLY
PORT ADELAIDE ENFIELD
CHARLES STURT
PROSPECT
WALKERVILLE
CAMPBELLTOWN
NORWOOD PAYNEHAM AND ST PETERS
ADELAIDE
BURNSIDE
WEST TORRENS
UNLEY
ADELAIDE HILLS
HOLDFAST BAY
MITCHAM
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MOUNT BARKER
Geology (100k)
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Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Any relevance placed on such information shall be at the risk of the user.
Note: The information shown on this map is a copyright of WGA 2020
LEGEND
Locality
Fault (position accurate)
Fault (position approximate)
Main Highway
Watercourse
SMP Catchment Area
LGA Boundary
Surfacewater Areas
Golden Grove Embayment
WGA
WALLBRIDGE GILBERT AZTEC
Figure 4
West Torrens SMP Hydrogeology
Extent of the Adelaide Plains sub-basin and Golden Grove Embayment

Table 2. Stratigraphy and Hydrostratigraphy of the Adelaide Plains Sub-Basin and Golden Grove Embayment (source Gerges 2006 and Zulfic et. al. 2008)

Age		Adelaide Plains Sub-Basin: Stratigraphy	Adelaide Plains Sub-Basin: Hydrostratigraphy	Adelaide Plains Sub-Basin: Description	Golden Grove Embayment: Stratigraphy	Golden Grove Embayment: Hydrostratigraphy	Golden Grove Embayment: Description
QUATERNARY	Holocene	Semaphore Sand, modern alluvium, overbank sands, and beach gravels. Saint Kilda Formation	Perched / Unconfined Aquifer Unconfined Aquifer	Thin sand aquifers near coast and perched aquifers in the overbank sediments adjacent to Gawler River. Thin sand, shell aquifer near coast	Semaphore Sand, modern alluvium, overbank sands, and beach gravels.	Unconfined Aquifer	Thin sandy aquifers restricted mainly to coastal areas
QUATERNARY	Pleistocene	Pooraka Formation Keswick Clay	Aquitard	Alluvial deposit with interbeds of clay, sand, gravel, and pebbles Green/grey clay with reddish/brown mottling	Pooraka Formation	Aquitard	Alluvial deposit with interbeds of clay, sand, gravel, and pebbles
QUATERNARY	Pleistocene				Keswick Clay	Aquitard	Green/grey clay with reddish/brown mottling
QUATERNARY	Pleistocene	Hindmarsh Clay	Aquitard Q1 to Q3 Aquifers	Mainly clay aquitard with discrete laterally discontinuous interbedded sandy aquifers.	Hindmarsh Clay	Aquitard Q1 to Q6 Aquifers	Mainly clay aquitard with discrete laterally discontinuous interbedded sandy aquifers.
QUATERNARY	Pliocene?	Carisbrooke Sand	Q4 Aquifer	Confined sandy aquifer, most significant along eastern margin of NAP. Typically comprises thick (10 m) shell layer at base. Direct hydraulic connection with PWF (T1 and T2 Aquifers) north of Gawler River.	Carisbrooke Sand	T1 Aquifer	Confined sandy aquifer medium- to fine- grained calcareous **sand** with some ferruginous and possibly some inter-bedded silt layers
TERTIARY	Pliocene	Hallett Cove /Dry Creek Sand	T1 Aquifer: T1a Aquifer	Confined sandy aquifer thickening to the south-west	Hallett Cove /Dry Creek Sand	T1 Aquifer	Shelly dark grey to brownish-grey sand, silt, and clay. Highly fossiliferous sandstone. Occurs over whole area west of Para Fault in a restricted area between Brown Hill Creek and the coast
TERTIARY	Pliocene	Croydon Facies	T1 Aquifer: Semi confining bed	Fossiliferous sand and silt, glauconitic. Thin shelly and sandstone interbeds occur over whole area west of Para Faut	Croydon Facies	T1 Aquifer: Semi confining bed	Fossiliferous sand and silt, glauconitic. Thin shelly and sandstone interbeds occur over whole area west of Para Fault
TERTIARY	Miocene to Oligocene	Port Willunga Formation: Upper Limestone	T1 Aquifer: T1b Aquifer	Confined aquifer thickening to the south and south west	Port Willunga Formation: Upper Limestone	T1 Aquifer	Yellow fossiliferous sand, limestone grading to white hard limestone. Occurs over area west of Para Fault and west of Sturt River as a thin strip along the coast
TERTIARY	Miocene to Oligocene	Port Willunga Formation: Munno Para Clay Member	Confining bed (Absent north of the Gawler River) Dark grey, stiff, calcareous clay. Comprises beds of clay separated by two bands of white to grey limestone.		Port Willunga Formation: Munno Para Clay Member	Confining bed limited to western areas. Dark grey, stiff, calcareous clay. Comprises beds of clay separated by two bands of white to grey limestone	
TERTIARY	Miocene to Oligocene	Port Willunga Formation: Lower Limestone	T2 Aquifer	Thick confined aquifer with 3 facies variants mainly sandy at the base, thinning in north and north east of NAP where it is undifferentiated from T1 and in direct hydraulic connection with Q4 Aquifer.	Port Willunga Formation: Lower Limestone	T2 Aquifer	Thick confined aquifer with 3 facies variants consists of coarse **sands** and gravels bound with limestone with varying lignitic content
TERTIARY	Miocene to Oligocene	Port Willunga Formation: Ruwarung Member	T2 Aquifer: Confining bed	Pale grey glauconitic rich marl/clay, pyritic	Port Willunga Formation: Ruwarung Member	T2 Aquifer: Confining bed	Pale grey glauconitic rich marl/clay, pyritic
TERTIARY	Miocene to Oligocene	Port Willunga Formation: Aldinga Member	T2 Aquifer	Aquitard Clay Unit Sandy Unit T3 Aquifer	Port Willunga Formation: Aldinga Member	T2 Aquifer	Clay, stiff, grey to dark grey, carbonaceous. Glauconitic, pyritic. Shell remains grading to sand and silt

	Eocene	Chinaman Gully Formation	Confining bed	Mainly confining bed with minor thin sandy aquifer	Chinaman Gully Formation	Confining bed	Grey to black carbonaceous silt and clay. Highly pyritic, lignitic
		Blanche Point Formation		Grey, friable shelly siltstone grading to alternating hard and soft siltstone bands (cherty). Glauconitic, large *Turritella* shells	Blanche Point Formation	Confining bed	Grey, friable shelly siltstone grading to alternating hard and soft siltstone bands (cherty). Glauconitic, large *Turritella* shells.
		Tortachilla Limestone	T3 Aquifer	Thin confined aquifer	Tortachilla Limestone	T3 Aquifer	Thin confined fine sandy aquifer thickest in north east areas
		South Maslin Sand			South Maslin Sand		Dark grey carbonaceous sand and silt. Pyritic and glauconitic
		Clinton Formation	Confining bed (not laterally extensive across NAP)		Clinton Formation	Confining bed	Pale grey, white clay, sandy. Pyritic. Highly carbonaceous, lignite layers
		North Maslin Sand	T4 Aquifer	Confined sandy aquifer.	North Maslin Sand	T4 Aquifer	Thin confined sandy aquifer Pale grey, yellow and brown, clayey, silty, and gravely pyritic sand

Within the Adelaide Plains Sub-basin, the T1 aquifer can be subdivided into two sub-aquifers, which, whilst often in direct hydraulic connection, have different lithological properties. The T1a sub-aquifer is a sandy unit and requires well screening, whilst the T1b sub-aquifer occurs as semi-consolidated or consolidated limestone. The T1b sub-aquifer is preferred by many groundwater users because of typically higher well yields and the ability to complete the well with an open-hole production interval (Hodgkin, 2004).

The Golden Grove Embayment is defined as that portion of the St Vincent Basin bounded by the Eden-Burnside and Para faults. The most recent detailed hydrogeological studies of the embayment have been by Gerges (1996 and 1999). Tertiary and Quaternary sediments within the Golden Grove Embayment thicken to the southwest and reach over 400 m near the coast. However, they are typically only 10 to100 m thick north and east of the Adelaide CBD and between 100 to 250 m thick south of the CBD.

The hydrostratigraphy of the Golden Grove Embayment is complicated because of erosional and depositional boundaries, lateral facies changes and faulting. Consequently, multiple geological formations can be juxtaposed together and form effectively single aquifer systems or result in aquifers laterally abutting against aquitards.

3.1.2 Structural Controls

The Para Fault is aligned along a northeast/southwest axis and bisects the West Torrens Catchment. The Para Fault splinters as it crosses the eastern catchment boundary at the northern extent of the Keswick Rail Terminal (Figure 4). The southern splinter extends offshore south of Glenelg. The northern splinter runs along the approximate line of the Adelaide Airport southern boundary and extends offshore north of Glenelg.

Depending on the nature of the bounding faults, the T1 aquifer in the Golden Grove Embayment can be hydraulically connected to Quaternary or Tertiary aquifers west of the Para Fault.

The major fault systems are transmissive in many areas, permitting significant lateral groundwater throughflow from fractured rock aquifers in the Adelaide Hills westwards into the adjoining Tertiary aquifers (Gerges, 1996). Over the western portion of the West Torrens Catchment there is an approximate offset of 25 to 30 m on the downthrown Adelaide sub-basin side of the Para Fault. Closer to the Adelaide CBD the offset is some 70 m on downthrown Adelaide Plains Sub-basin side of the Para Fault (Gerges 2006). Generally, through the Adelaide CBD on the upthrown side of the Para Fault the T1 aquifer is absent and the Port Willunga Formation that hosts the second Tertiary (T2) aquifer throughout the Adelaide Plains Sub-basin is intersected at depths of less than 10 m below ground level.

3.2 HYDROGEOLOGICAL SETTING AND AQUIFER DESCRIPTIONS

3.2.1 Quaternary Aquifers – Hindmarsh Clay

The mottled reddish brown and yellow Hindmarsh Clay is the major Quaternary sedimentary unit across the Adelaide Plains Sub-basin and Golden Grove Embayment.

In coastal margins, thin unconfined aquifers or perched watertable aquifers can occur within quartz-sand sediments of the Semaphore Sands (dune sands) or shelly sands of the St Kilda Formation. These aquifers have been predominantly accessed by small-scale stock and domestic users in areas of low salinity. The aquifers beneath the dunes can be in direct connection with the sea and consequently at risk of seawater intrusion.

In the western metropolitan area, the Hindmarsh Clay consists of mottled clays and silts of fluviatile and estuarine origin and may host up to six thin confined aquifers. The continuity and extent of individual aquifers is uncertain, but it is considered that they represent the now buried drainage lines associated with the creeks and rivers that meandered across the plains emanating from the Mount Lofty Ranges (WGA 2018) .

These aquifers are designated Q1 to Q6 in order of increasing depth (Gerges, 1996). Within the Hindmarsh Clay sequence, the aquifers occur as interbeds of sand and gravel that range in thickness from 1 to18 m but are rarely much thicker than two metres. Note that not all six Quaternary aquifers are intersected in drillholes at all locations across the Adelaide Plains sub-basin and Golden Grove Embayment.

The most transmissive sections of the Q1 aquifer and areas of lower salinity are usually located adjacent to major surface drainage lines or beneath the sand dunes. Away from the present-day drainage lines the salinity in the Q1 aquifer typically exceeds 2,000 milligrams per litre (mg/L). The Hindmarsh Clay generally forms a confining layer to the underlying Quaternary Carisbrooke Sand aquifer (Martin and Hodgkin, 2005).

Reported airlift yields for wells completed within the Quaternary aquifers range from 0.1 litres per second (L/s) up to 20 L/s. Of the 695 potentially active domestic wells (refer section 3.3.2) that take groundwater from the Quaternary aquifers, 434 have a reported yield. The average reported airlift yield for the 434 wells is 2 L/s. Four percent of the wells have a reported yield greater than 10 L/s.

Of the 695 potentially active domestic wells completed in the Quaternary aquifers 639 have a recorded salinity. The reported salinity ranges from 300 (mg/L) to in excess of 5,000 mg/L. Six percent of the wells have a reported groundwater salinity greater than 5,000 mg/L. Care needs to be taken when interpreting salinity information as the information will be biased towards areas of lower groundwater salinity.

The Carisbrooke Sand Formation (Q4 aquifer across the Adelaide Plains Sub-basin) is up to 20 m thick in some places but more typically around 10 m thick. This unit is not well differentiated in the West Torrens Catchment study area and is lumped into the group of Quaternary Aquifers.

Wells within the Carisbrooke Sand is aquifer are typically low yielding (>5 L/s) and require screening and extensive development to minimise the production of fine sands. There are no reported aquifer hydraulic properties available for this unit.

Zulfic (2002) and Zulfic, *et. al*., (2008) identify the Carisbrooke Sand to be present over large areas of the Adelaide Plains Sub-basin and suggest that in some areas the Carisbrooke Sand is hydraulically connected to the overlying Quaternary aquifers, however; there is no conclusive evidence to support this hypothesis and further work is required.

Salinity of the groundwater in the Carisbrooke Sand is highly variable and reported to be in the range of 800 mg/L to greater than 7,500 mg/L (Gerges 1996, 2006, Hodgkin, 2004 and Zulfic, *et. al*., 2008).

Groundwater flow in the Quaternary aquifers is not well understood due to the poor definition of these aquifer units spatially and vertically throughout the Hindmarsh Clay. The general hypothesis is that flow in the upper Q1 aquifer across the plains occurs towards the present-day drainage lines. In the coastal areas discharge from the perched aquifers within the dunes occurs as seepage along the foreshore. Flow in the deeper confined Quaternary aquifers is thought to occur from east to west.

3.2.2 Dry Creek – Hallett Cove Sand and Upper Port Willunga Formation (T1/T1a/T1b Aquifer)

Within the Golden Grove Embayment and Adelaide Plains Sub-basin, the T1 aquifer is defined as the shallowest Tertiary aquifer system present. Within the embayment, the T1 aquifer can consist of any one or several formations of the entire Tertiary sequence comprising the Hallett Cove Sand, Dry Creek Sand and Port Willunga Formation.

The Hallett Cove Sandstone and Dry Creek Sand are of shallow marine origin and comprise shelly, dark grey to brown sand, silt, and clay, often highly fossiliferous (Gerges, 1996) have a combined thickness of 30 to 50 m. Where the Dry Creek and Hallett Cove Sand are separated from the underlying Upper Port Willunga Formation they are collectively referred to as the T1a aquifer.

The Upper Port Willunga Formation is a confined aquifer consisting of sand and limestone and where the unit is separated from the Hallett Cove Sandstone and Dry Creek Sand by the Croydon facies it is referred to as the T1b Aquifer (Gerges 1996 and 2006).

Elsewhere, if the Croydon facies is absent this unit, inclusive of the Hallett Cove Sandstone and Dry Creek Sand, is referred to as the T1 aquifer. The T1 aquifer, inclusive of the Hallett Cove Sandstone and Dry Creek Sand, has a thickness of 30 to 50 m.

Across the West Torrens Catchment there are 141 wells reported in the WaterConnect database to be completed in the T1 aquifer. 109 of the wells have a reported airlift yield which ranges from 0.15 L/s up to 30 L/s with an average of 10 L/s.

The WaterConnect database contains records on groundwater salinity for 121 of the 141 wells reported to be completed in the T1 aquifer in the West Torrens Catchment. The reported salinity ranges from 400 mg/L up to 3,500 mg/L. It should be noted that the salinity results are likely to be biased towards the lower salinity groundwater areas as the low salinity groundwater has been sought to meet large scale irrigation or industrial demands.

Groundwater flow in the T1 aquifer west of the Para Fault in the Adelaide Plains Sub-basin occurs from east to west. Flow in the Golden Grove Embayment east of the Para Fault is more complex. From the CBD the apparent direction of groundwater flow occurs in a south-westerly direction before trending in a more east to west direction where the Tertiary sediments are more closely aligned each side of the Para Fault.

At some distance offshore, in the Gulf St Vincent, the Tertiary aquifers are thought to crop out or be overlain by a thin layer of marine sediments allowing discharge of groundwater through the sea bed, or conversely, infiltration of seawater from/to the Tertiary aquifers. Little information exists to identify the exact distance offshore, a large-scale drilling investigation program or offshore geophysics would be required to address this data gap.

3.2.3 Munno Para Clay Confining Bed

The Munno Para Clay member consists of a stiff blue-grey calcareous clay and contains two thin (<30 cm) interbeds of white to grey limestone. It is typically 5 to 10 m thick and acts as a highly effective regional confining bed across most of the Adelaide Plains sub-Basin and Golden Grove Embayment separating the overlying T1 aquifer from the underlying second Tertiary (T2) aquifer. Bresciani *et. al.* (2015) estimate the vertical hydraulic conductivity of the Munno Para Clay to be $<3.4\times10^{-6}$ m/day. Gerges (2006) estimates the vertical hydraulic conductivity of the Munno Para Clay across the NAP to range from 1.2×10^{-6} to 2.6×10^{-7} m/d. DWLBC (2008) reports vertical hydraulic values for the Munno Para Clay between 1.7×10^{-5} to 2.6×10^{-7} m/d. Typically, the vertical hydraulic conductivity is a 10^{th} of the horizontal conductivity.

3.2.4 Lower Port Willunga Formation (Second Tertiary (T2) Aquifer)

Throughout most of the Adelaide Plains Sub-basin area and Golden Grove Embayment, the T2 aquifer consists of well-cemented limestone of the lower Port Willunga Formation which underlies the Munno Para Clay. Martin and Gerges (1997), Martin (1999 and 2005) and Gerges (2001) recognise three facies subunits within the T2 aquifer:

1. T2a Sub-Aquifer: mostly pale-grey to white well cemented limestone / sandstone.
2. T2b Sub-Aquifer: a pale yellow to orange brown limestone / sandstone, friable to moderately cemented and occasionally interbedded with highly calcareous fossiliferous sand; and
3. T2c Sub-Aquifer: mainly interbedded sand (possibly the Aldinga Member) and very friable limestone with occasional silt and clay.

The basal unit of the T2 aquifer comprises the Ruwarung and Aldinga Members; however, only a few drillholes intersect these units. The Ruwarung Member is a glauconite rich fossiliferous marl containing chert nodules. It is not well differentiated and currently most mapping incorporates this sub-unit as part of the overall T2 aquifer; however, it has the properties of a regional confining bed (WGA, 2018).

The combined thickness of the main three sub-aquifer facies units identified by Martin and Gerges (1997) Martin (1999 and 2005) and Gerges (2001) is 30 to 40 m.

In the West Torrens catchment study area only 18 wells are reported to be completed in the T2 aquifer in the WaterConnect database. Five of the 18 wells are used for managed aquifer recharge (MAR). Reported groundwater salinity in the T2 aquifer ranges between 450 mg/L to 5,580 mg/L. Fourteen of the 18 wells have a reported airlift yield and the reported range spans 1.3 to 30 L/s. The average yield for the 14 wells is 15 L/s.

Groundwater flow in the T2 aquifer west of the Para Fault in the Adelaide Plains Sub-basin occurs from the recharge area in the Mount Lofty Ranges to the coast (east to west). Groundwater flow east of the Para Fault in the Golden Grove Embayment is more complex. From the CBD the apparent direction of groundwater flow occurs in a south-westerly direction before trending in a more east to west direction where the Tertiary sediments align along the Para Fault offset.

3.2.5 Maslin Sands (Third Tertiary (T3/T4) Aquifer)

The Blanche Point Formation acts as an aquitard between the T2 aquifer and the underlying South (T3 aquifer) and North Maslin Sands (T4 aquifer). Little is known about these aquifers or their lateral extent as very few wells penetrate these aquifers across the Adelaide Plains sub-basin. No wells penetrate these units within the West Torrens Catchment study area. Although only a limited number of wells penetrate these units across the Adelaide Plains Sun-basin they are described as predominantly fine-grained marine sediments with a combined thickness that ranges from about 50 to 150 m.

Both the T3 and T4 aquifers are reported to be hyper saline with recorded salinity up to 80,000 mg/L in the deeper T4 aquifer. Yields, where reported, are typically less than 10 L/s and flow is inferred to be from east to west however there are insufficient wells to construct a reliable potentiometric surface to confirm flow directions.

4 GROUNDWATER DEMAND

4.1 GROUNDWATER WELLS

Publicly available groundwater information from the Department for Environment and Water (DEW) WaterConnect database was sourced and interrogated. The downloaded dataset returned 1702 wells constructed within the West Torrens Catchment boundary. It should be noted that the database may not capture all the wells across the study area. Often domestic wells into the shallow aquifer are installed without being captured in the database as landowners are unaware that a licence to construct a bore is required. A summary of the well information is presented in Table 3.

Table 3: Groundwater Wells by Target Aquifer and Purpose for Construction in the West Torrens Catchment (*source: WaterConnect September 2020*).

Aquifer	Purpose	Total No of wells.	Number Abandoned (ABD) Wells	Number Backfilled (BKF) wells	Total Potentially "Active" Wells
Quaternary Wells	UNK	405	7	45	372
	DOM/IRR	429	8	4	417
	MON/OBS	134	2	1	131
	INV/ENV	473	0	33	440
	DRN	63	1	0	62
	ENG	102			102
Total Number of Wells Completed in Quaternary Aquifer		**1606**	**18**	**64**	**755**
Tertiary T1 Wells	UNK	79	2	11	67
	DOM/IRR	9	0	2	9
	MON/OBS	25	5	10	23
	IND	17	0	3	16
	DRN	2	0	0	2
	GTH	5	0	5	0
	MAR	2	0	0	2
Total Number of Wells Completed in The Tertiary (T1) Aquifer		**139**	**6**	**24**	**119**
Tertiary T2 Wells	UNK	5	0	1	4
	MON/OBS	3	1	0	3
	IND	3	1	0	3

	INV	2	0	0	2
	MAR	5	0	0	5
Total Number of Wells Completed in The Tertiary (T2) Aquifer		**18**	**2**	**1**	**17**

Key: UNK = Unknown; DOM/IRR = Domestic/Irrigation; MON/OBS = Monitoring / Observation
INV/ENV = Investigation / Environmental; DRN = Drain; ENG = Engineering
IND = Industrial; GTH = Geothermal; MAR = Managed Aquifer Recharge

4.1.1 Quaternary Aquifers

To determine the number of potentially operational wells to support estimating the groundwater use in the study area the data was filtered based on well purpose. This approach may still overestimate the number of “active” wells.

The Quaternary aquifers are not differentiated in the study area and the results identify 1606 of the 1763 wells are completed in one of the Quaternary aquifers (Q1 to Q6). The information in **Table 3** is summarised as follows:

- Of the 1606 wells 405 do not have a purpose assigned (Unknown (UKN)) but for the purpose of this evaluation are assumed to be active unless they are identified in the database as abandoned (ABD) – 7 wells or backfilled (BKF) - 45 wells

- 429 of the wells are identified in the database to be constructed for the purpose of Domestic (DOM) or Irrigation (IRR) and considered to be active unless they are identified in the database as abandoned (ABD) 8 wells or Backfilled (BKF) - 4 wells

Without a detailed field survey to assess the state and condition of all the wells it is assumed that there are a total of 770 wells that are potentially operational and have the capacity to take groundwater from the Quaternary aquifers.

- 134 of the wells are identified in the database for the purpose of Monitoring (MON) or Observation (OBS) and 437 are identified to be Investigation (INV) or Environmental (ENV) wells.

These four descriptions for the well purpose are used to describe wells constructed to complete detailed site investigation surveys for environmental purposes. These wells are usually only active for the duration of the site investigations which may be a few months or up to less than 5 years. Generally, they are used to monitor groundwater levels or to collect samples for water quality analysis for the duration of the site investigation study.

63 wells have been constructed for the purpose of drainage (DRN) and groundwater is not actively taken from these wells.

The database records 102 wells have been constructed for the purpose of engineering (ENG). Such wells are usually constructed to inform site geotechnical investigations for buildings, footings, or roads. Like the INV/ENV wells these types of wells only have a life for the duration of the project (usually months).

Under the *Landscape South Australia Act* (2019), formerly the *Natural Resources Management Act* (2004) wells should be backfilled by a licenced well driller under Permit. The permit along with a drillers Schedule 8 form would then be returned to the department and the records updated. Unfortunately, the process for decommissioning wells is not often followed and wells are backfilled without Permits.

4.1.2 Tertiary Aquifers

A total of 139 wells are identified in the database to be completed in the T1 aquifer in the study area. The MON/OBS wells may be associated with Environmental site assessments or they may be former Engineering and Water Supply Department (now SA Water) wells that were used up until the late 1950s as part of Adelaide's Water Supply. After 1960 these wells were converted to groundwater level or salinity monitoring wells. At one time 33 wells completed in the T1 aquifer were used as part of the T1 aquifer groundwater monitoring network. Currently only 9 wells are actively monitored to support resource condition assessments.

107 wells are assumed to be actively taking water from the T1 aquifer and include wells with the purpose identified to be IND, IRR, UNK, and MAR (refer Table 3). At present there are no licenced allocations for taking water assigned to these T1 wells and use is not metered.

In the study area 18 wells are reported to be completed in the T2 aquifer (refer Table 3). Fewer wells are completed in the T2 aquifer due to the greater depth and increased cost of drilling. In general, the quality of water in the T1 and the yields meet the required demands of users and therefore there is no requirement to drill deeper.

Table 4: Groundwater Information Summary (*source: WaterConnect September 2020*)

Aquifer	Salinity Range, Total Dissolved Salts (mg/L)	Standing Water Level (m bgl)	Airlift Yield (L/s)
Quaternary (Q1 to Q6)	Of the 789 potentially active wells completed in the Quaternary aquifer 690 have a recorded salinity value: • 131 record a salinity <1200 mg/L • 452 record a salinity <3,000 mg/L • 107 record a salinity >3,000 mg/l	Maximum drilled depth <5 m the average SWL is 2.1 m bgl. Maximum drilled depth <10 m the average SWL is 4.0 m bgl. Maximum drilled depth <20 m the average SWL is 7.3 m bgl. Maximum drilled depth <50 m the average SWL is 9.0 m bgl. >50 m Maximum drilled depth the average SWL is 10.8 m bgl.	460 wells return a result for airlift yield. The average yield is 2 L/s
T1 Aquifer	Of the 139 wells reported to be completed in the T1 aquifer 121 have a reported salinity result. • 104 record a salinity value less than 1,200 mg/L	The average SWL for the T1 aquifer is 12.9 m bgl.	109 wells have a reported result for the airlift yield. The average yield is 10.6 L/s.

	• 35 have a recorded salinity <3,000 mg/L		
T2 Aquifer	Of the 18 wells reported to be completed in the T2 aquifer 17 have a reported salinity result. • 15 record a salinity value less than 1,200 mg/L • 1 have a recorded salinity <3,000 mg/L • 1 has a recorded salinity >3,000 mg/L.		14 wells have a reported result for the airlift yield. The average yield is 14.5 L/s

Using the filtered information sourced from the WaterConnect database and presented in **Table 3** and **Table 4**, **Figure 5** through **Figure 13** have been prepared to show the spatial distribution of groundwater wells, groundwater quality and yield within in the study area.

4.2 ESTIMATED GROUNDWATER USE

Groundwater use is not currently metered in the West Torrens Catchment. An estimation of groundwater use by aquifer has been made using typical volumes from areas where use is metered in South Australia. Groundwater use is presented in **Table 5** and has been estimated for the Quaternary aquifers based on the potential number of active wells identified in **Table 3**.

The estimated used presented in Table 5 for the Quaternary aquifers assumes that on average a typical suburban house block uses 500 L/year. A salinity of 3,000 mg/L is the upper limit of tolerance for domestic use which would typically be for garden irrigation or non-contact internal house use. Therefore, wells with a reported salinity greater than 3,000 mg/L have been excluded from the calculation of use presented in Table 5.

Wells completed in the T1 aquifer typically support irrigation demand for sporting ovals or schools where the demand ranges between 4 to 6 ML/year/hectare depending on the prevailing climate conditions. Most of the irrigation wells in this area are on golf courses and sporting ovals. In section 2.1 the golf courses and sporting ovals cover an estimated area of 2.68 km2 (268 ha) in the catchment. The estimated area for golf courses and sporting ovals has been used to determine the groundwater take from the T1 aquifer.

There are a reported 14 active industrial wells taking water from the T1 aquifer. In the absence of any metered data a broad estimate of use has been made based on the average yield (10 L/s) and an assumed pumping schedule of 8 hrs per day per 5 day week which equates to approximately 75 ML/well/a. The same assumptions of pumping from Industrial wells and irrigation wells completed in the T2 aquifer has been applied.

Table 5: Estimated Groundwater Use

Aquifer	Estimated Number of "Active" Taking Wells	Estimated Taking (ML)	Estimated Total Groundwater Use (ML)
Quaternary (Q1 to Q6)	583[1]	0.0005 per well	0.29
T1 Aquifer	75 IRR	5 ML/ha over 268 ha	1,340
	14 IND	75 ML/well	1,050
T2 Aquifer	5 IRR	5 ML/ha over ~10 ha	50
	3 IND	75 ML/well	225

Note: [1] 583 wells return a reported salinity result less than 3,000 mg/L. This is assumed to be the upper limit of salinity for domestic use.

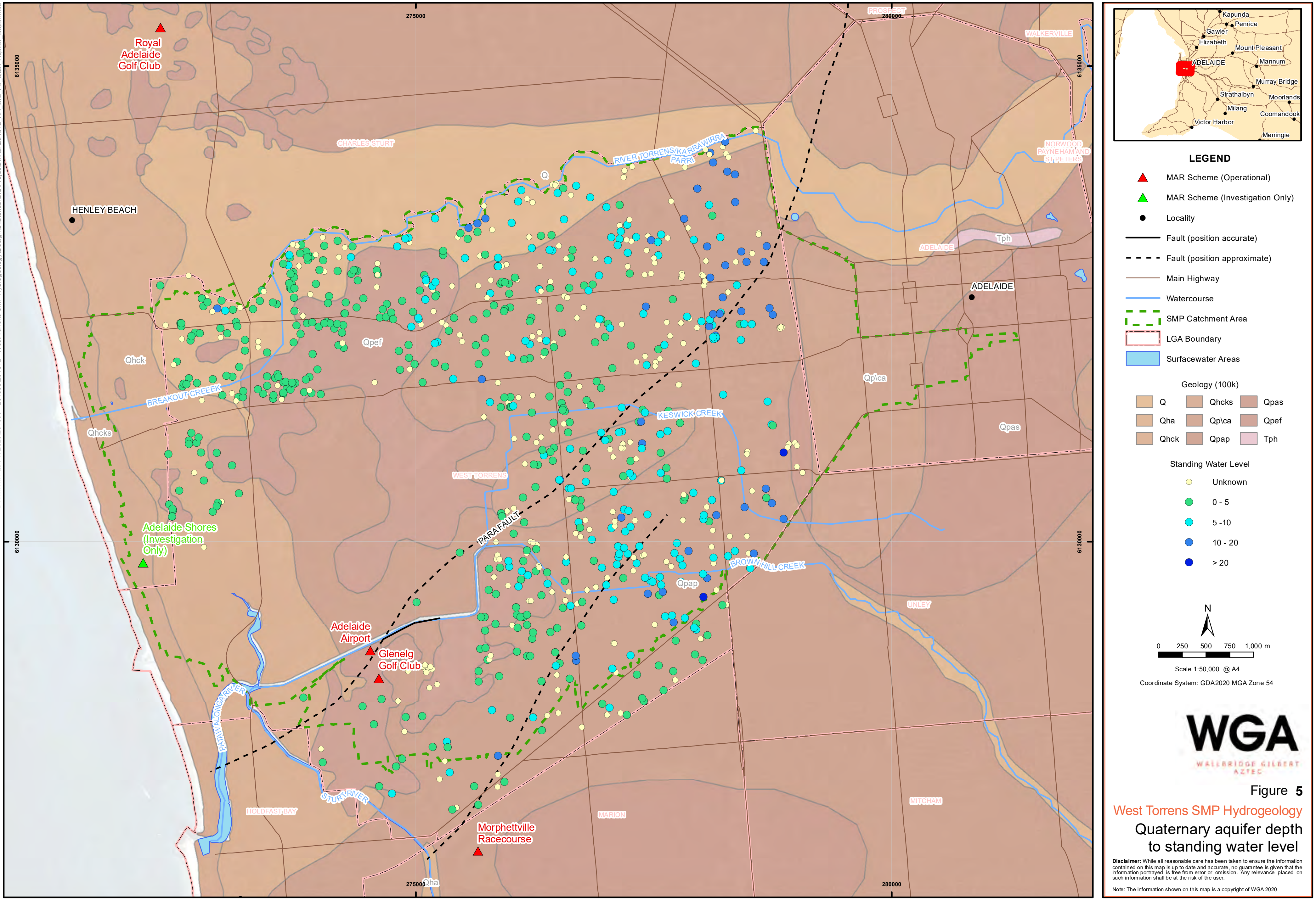

Figure 5
West Torrens SMP Hydrogeology
Quaternary aquifer depth to standing water level

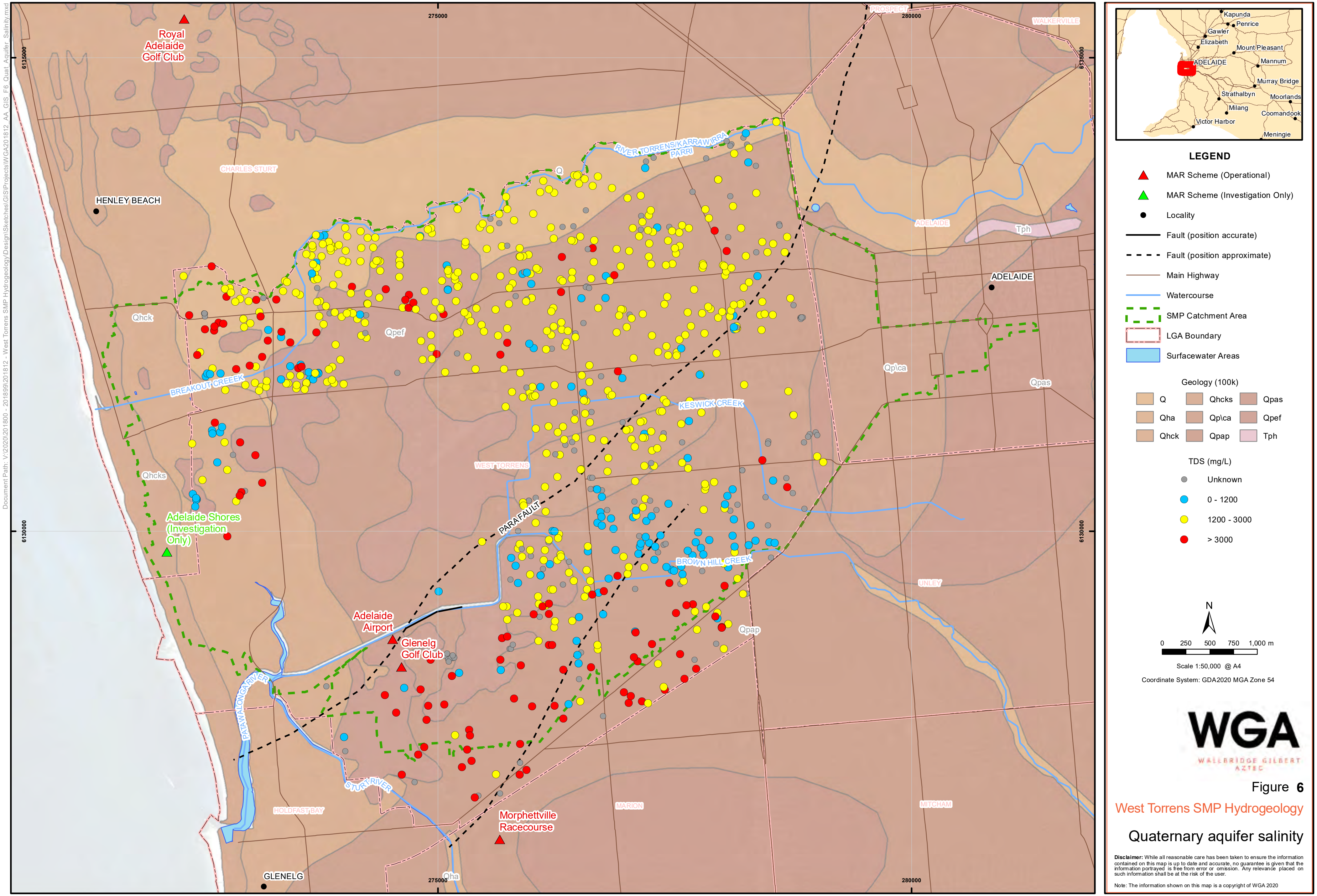
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Figure 6
West Torrens SMP Hydrogeology
Quaternary aquifer salinity
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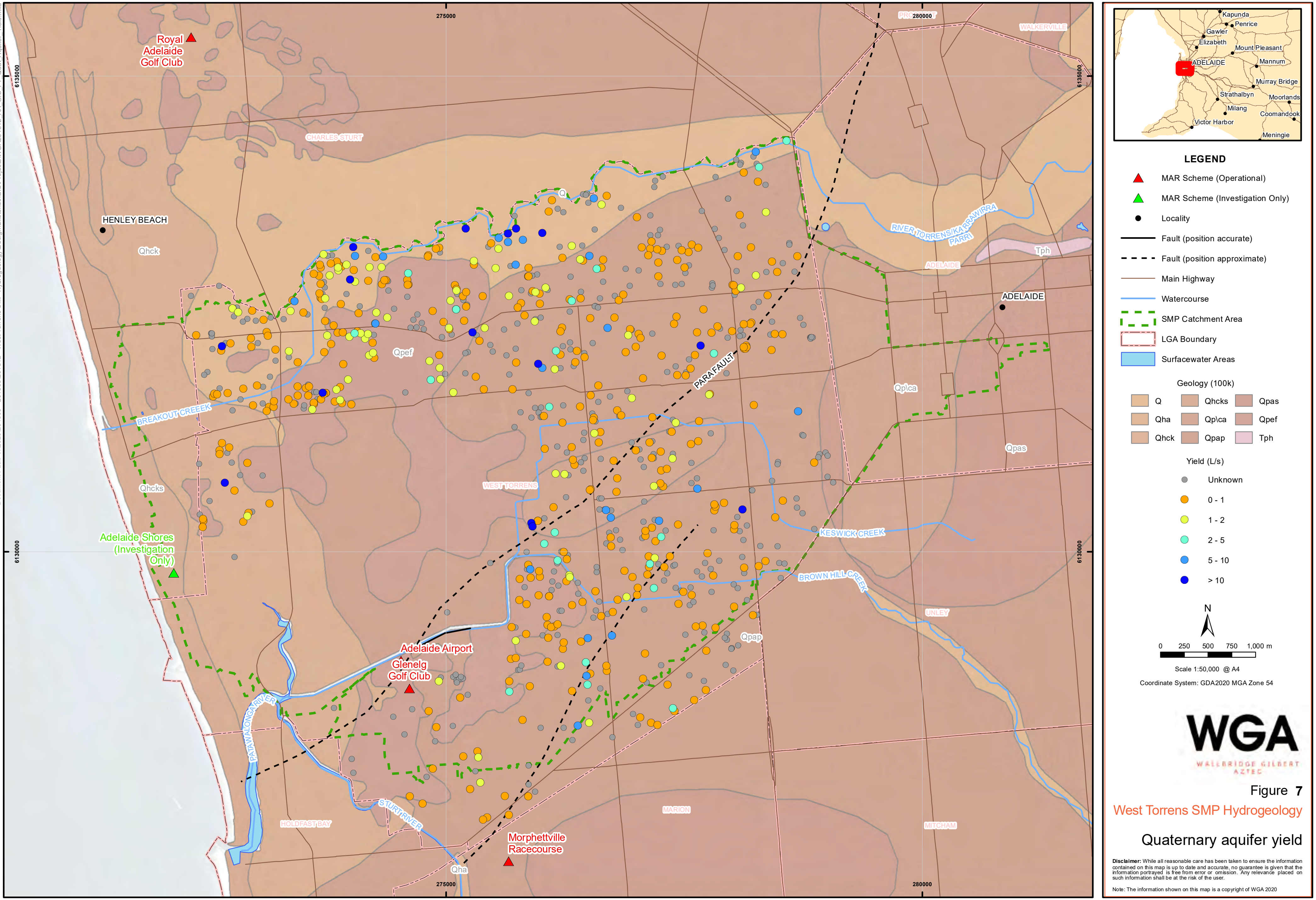

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Figure 7
West Torrens SMP Hydrogeology
Quaternary aquifer yield
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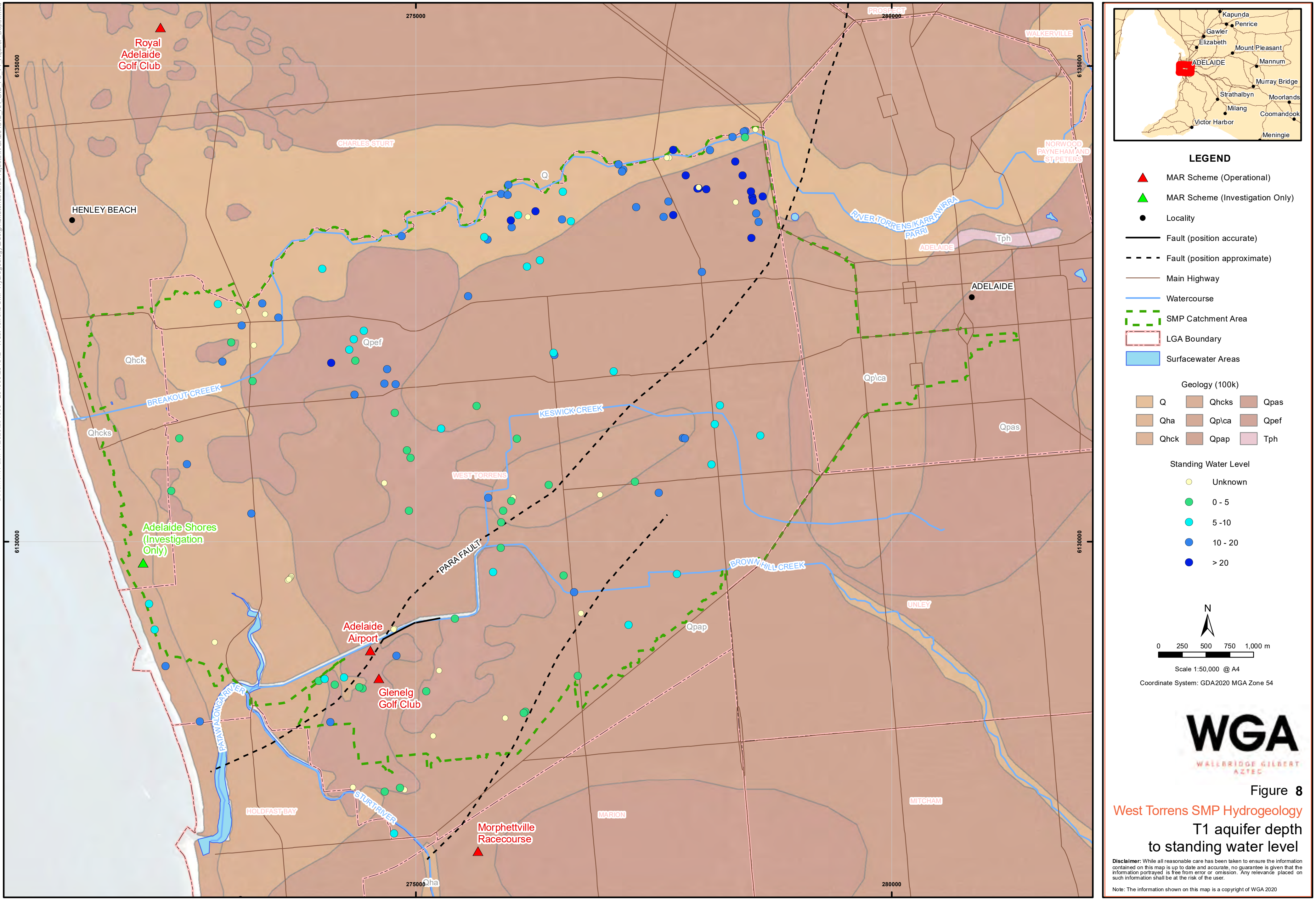
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Figure 8
West Torrens SMP Hydrogeology
T1 aquifer depth to standing water level
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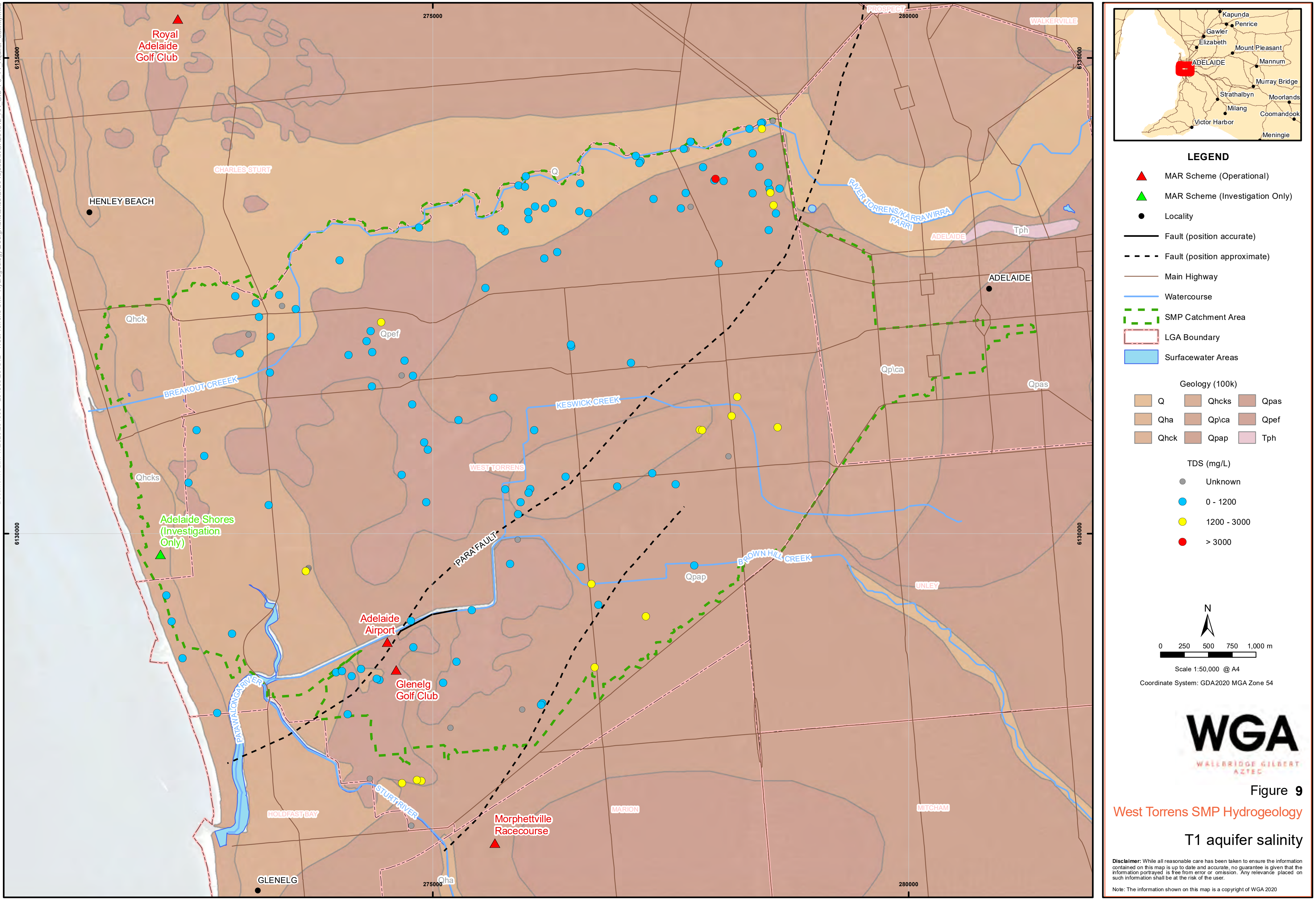

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Figure 9
West Torrens SMP Hydrogeology
T1 aquifer salinity
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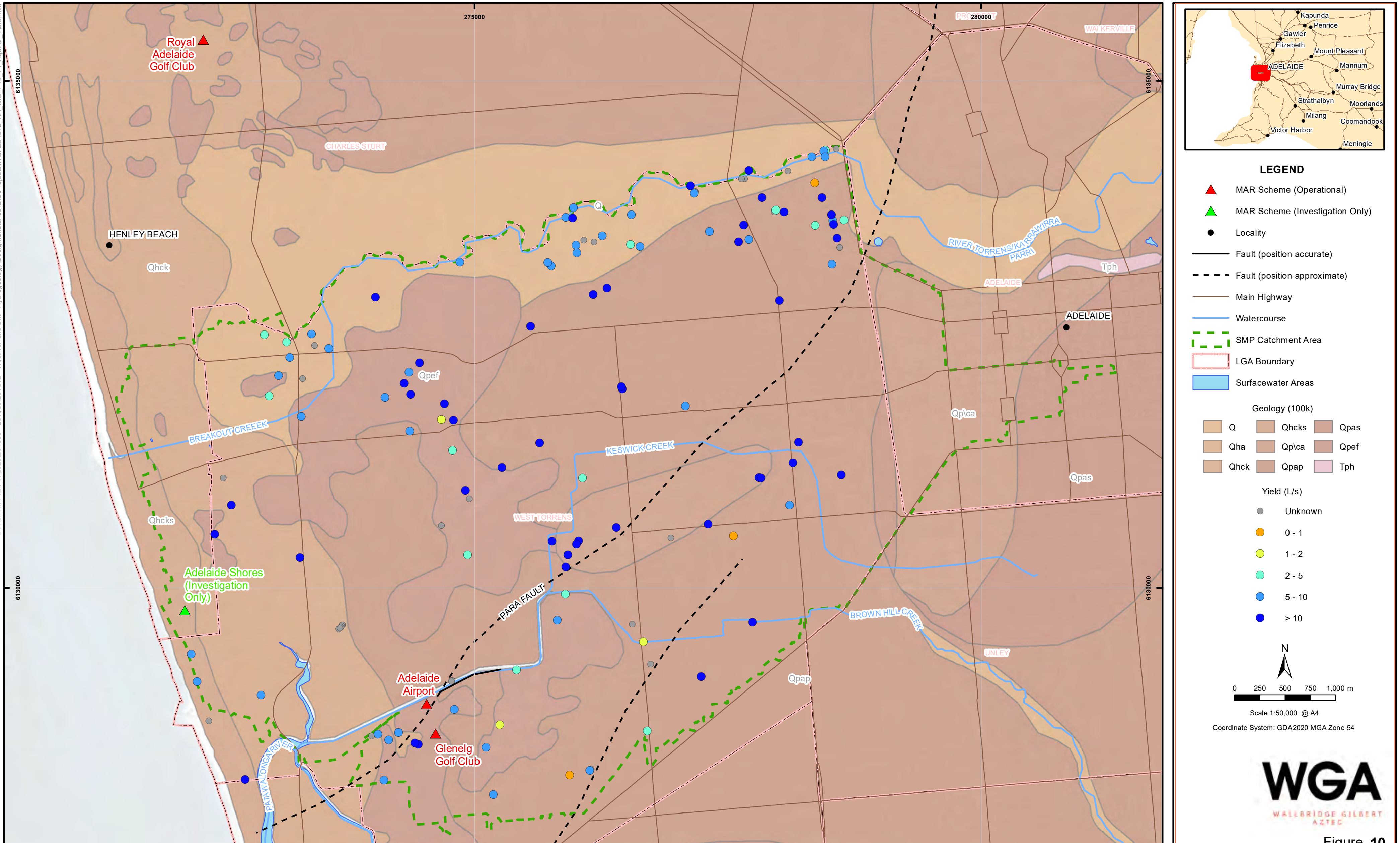

Figure 10
West Torrens SMP Hydrogeology
T1 aquifer yield

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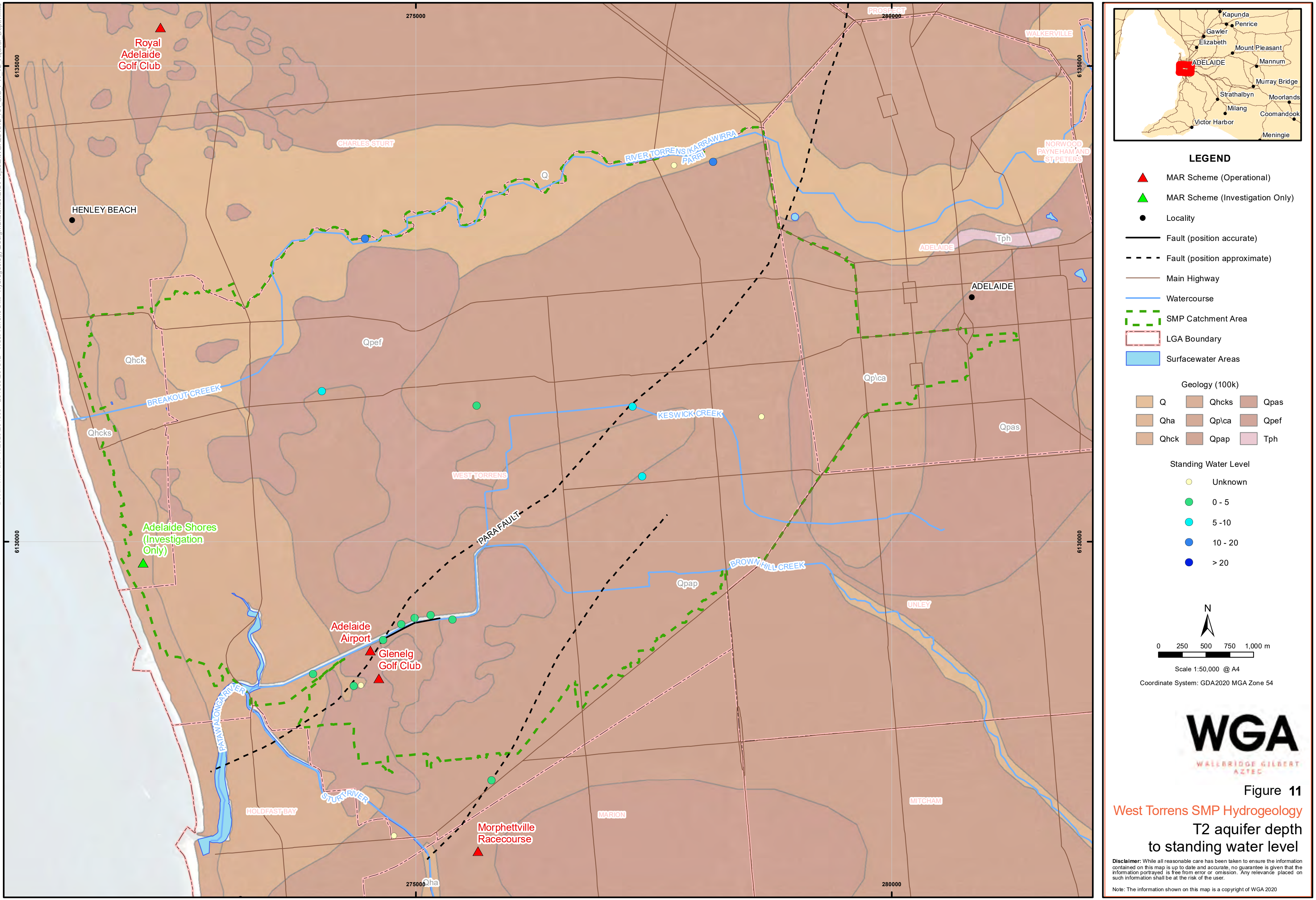
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Figure 11
West Torrens SMP Hydrogeology
T2 aquifer depth to standing water level
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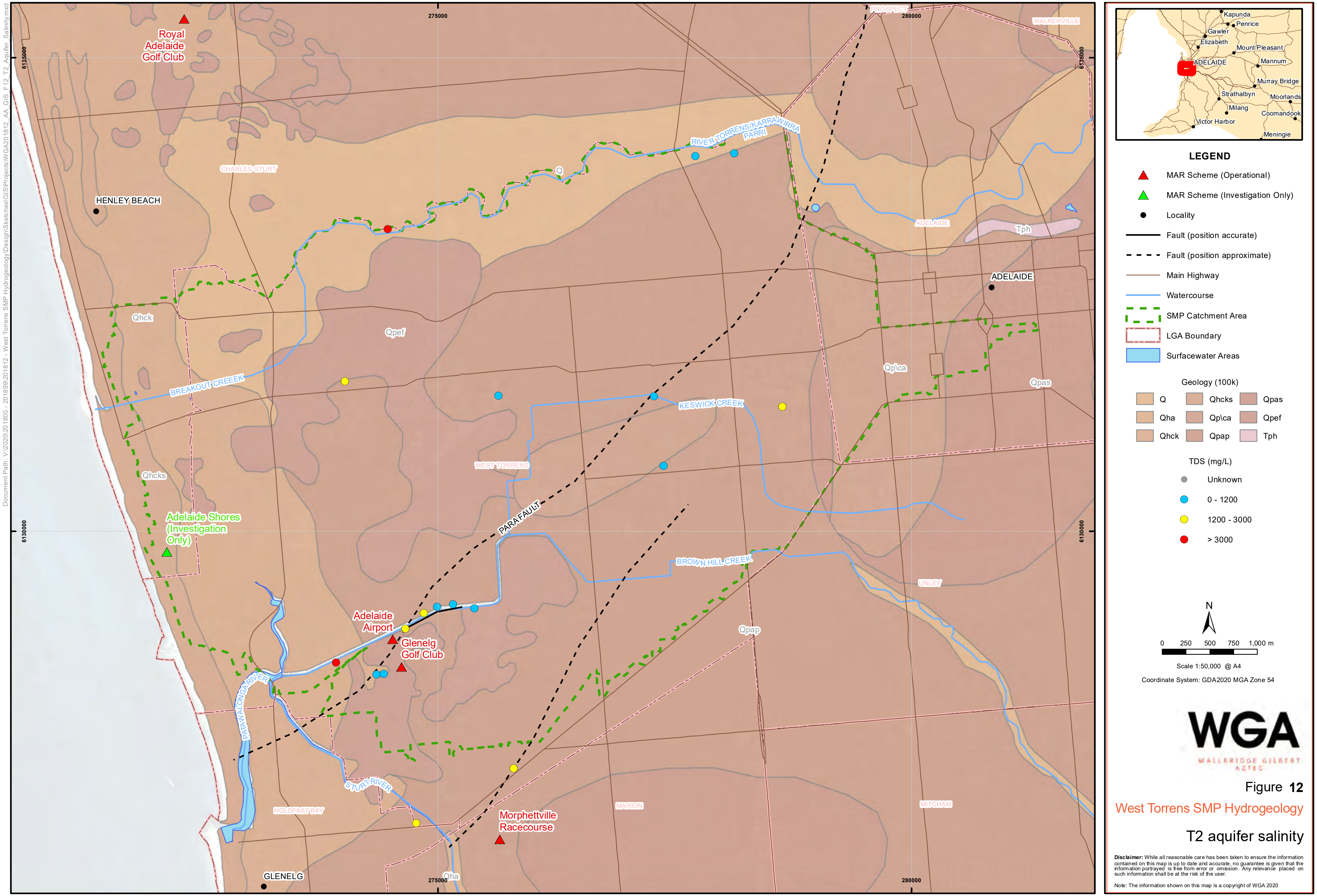
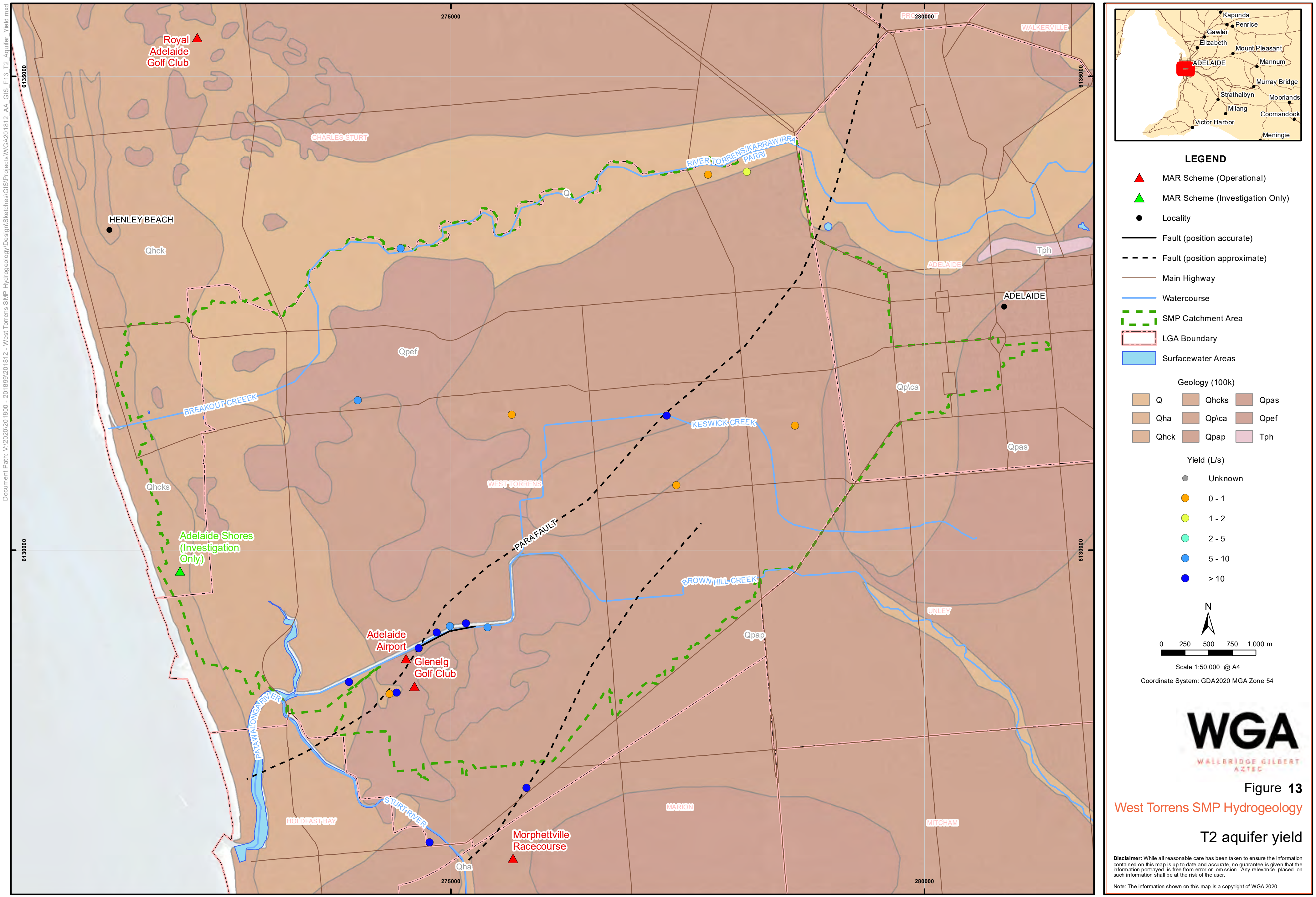


Figure 12
West Torrens SMP Hydrogeology
T2 aquifer salinity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Coordinate System: GDA2020 MGA Zone 54
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Figure 13
West Torrens SMP Hydrogeology
T2 aquifer yield
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5 MAR FEASIBILITY

5.1 EXISTING MAR SYSTEMS

Two operational MAR systems occur within the West Torrens Catchment located at Adelaide Airport and Glenelg Golf Club (refer Figure 5). A brief description of the two schemes is presented below from Kretschmer (2017).

5.1.1 Adelaide Airport

The Adelaide Airport scheme is located on James Melrose Road on the southern side of the airport. The scheme commenced injection in 2014.

The scheme has four wells which target the T2 aquifer and a designed injection capacity of around 300 ML/a. The wells are between 220 to 280 m deep and the native groundwater salinity varies significantly between 970 to4,300 mg/L. Salinity does increase with depth in some areas of the T2 aquifer which explains some of this variability, however this site is made more complex because it is bisected by the Para Fault.

The scheme is operated by SA Water and sources water from Brown Hill Creek, which has largely been constrained to a manmade concrete-lined drain. The creek has a large catchment extending to the hills resulting in good flows in wet years which can maintain high injection rates. The water is treated through vertical infiltration biofilters and sand filters.

5.1.2 Glenelg Golf Club

The MAR scheme is operated by the Glenelg Golf Club and commenced injection in 2011. This scheme is unusual because it injects water into two separate aquifers. Of the three MAR wells, two target the T1 aquifer and one targets the T2 aquifer. This came about because the Para Fault, bisects the site. Notably the T2 well located south of the fault is 210 m deep and open between 150–210 m, which is not dissimilar in depth to the T1 well north of the fault which is 196 m deep and open between 155–196 m. The T2 well can yield approximately 13 L/s compared to 8 to 9 L/s in each T1 well.

The scheme captures water from the Brown Hill Creek diversion drain located along the southern boundary of Adelaide Airport. The creek's large catchment maintains periods of steady stormwater flow which is captured to supply the scheme. Harvested stormwater initially flows into a gross pollutant trap, then a deep sedimentation pond, before flowing through two large wetlands. The wetlands treat the stormwater to a standard sufficient to avoid clogging of the injection wells without any additional treatment such as media filters.

In recent years, the scheme has injected in the order of 110 ML/a., with the maximum scheme capacity in a high rainfall year of the order of 200 ML/a.

5.2 MAR INVESTIGATION SITES

5.2.1 West Beach Parks Golf

In 2007 investigations into the feasibility of MAR at the West Beach Parks Golf (formerly Adelaide Shores) was undertaken by Resource and Environmental Management (REM) and included the construction and testing of a well (6628-23539) completed in the T1 aquifer. Source water for recharge and reuse was to include stormwater runoff and drainage water from Adelaide Airport.

The preliminary investigations confirmed that the aquifer at this location was suitable for MAR however, lack of funding and uncertainty about the reliable harvest volumes of drainage water from the airport catchment resulted in the project not progressing beyond the feasibility stage. At the same time water from the Adelaide to Glenelg Pipeline (GAP) water became available for the West Beach Parks Golf course.

5.3 POTENTIAL FOR MAR

This assessment is limited to the evaluation of the aquifer capacity only. It is noted that opportunities for developing additional MAR schemes in the West Torrens Catchment that harvest urban stormwater runoff are constrained by the following factors:

- The Para Fault which bisects the study area and may limit opportunities for recharge on the upthrown side of the fault (Golden Grove Embayment) in the eastern quadrant of the study area.
- The availability of open space to install large holding basins to maximise capture of stormwater flows especially where the drainage network is designed to enable rapid conveyance of stormwater through the catchment.
- Potential demand nodes for using the captured stormwater especially where schemes already exist and there is competition from other water supply sources e.g. GAP Water.
- The concentration of schemes along the coastal margin between Glenelg and Grange has resulted in increased pressures in the aquifer and impacts on existing users. Further MAR schemes along the coastal margin may increase the problem.
- Potential to intercept water in the upper catchment impacting on the opportunity to harvest water by the schemes (Adelaide Airport and Glenelg Golf Course) located in the lower catchment.

Whilst the above factors present constraints they do not necessarily preclude the development of further MAR schemes within the catchment. On the downthrown side of the Para Fault the aquifer characteristics are more favourable as evidenced by successful schemes already in operation.

Feasibility criteria developed by WGA to evaluate the suitability of an aquifer for MAR are set out in Table 6. These criteria only assess the hydrogeological conditions; the economic feasibility, source water supply reliability and demand need to be considered and would be an independent study completed as a standalone project.

Table 6: Desirable Aquifer Criteria to Support the Successful Implementation of MAR Schemes.

Criteria	Preferred	Reason
Groundwater Gradient	Low	Depending on the ambient groundwater salinity, groundwater flow velocity is important to an MAR scheme as it largely determines the recovery efficiency (which quantifies how much of the injected water (that is suitable for the intended end-use) is actually recovered during extraction.
Well Yield	>10 L/s, lower injection rates are acceptable depending on the volume target of the scheme	Well yield of a groundwater extraction bore provides a good approximation of the rate at which surface water can be injected into that bore. The well construction also impacts on the yields, not just the aquifer characteristics.
Depth to Water	> 10 m bgl	Depth to groundwater is important when considering MAR in an unconfined aquifer because it helps to determine the available storage volume. A sufficient depth to groundwater should be maintained when injecting water to avoid losses due to evaporation or issues associated with potential water logging in an unconfined aquifer. In an unconfined aquifer, the aquifer pressure impacts the engineering requires to overcome the head pressure plus also the requirement to manage artesian conditions.
Groundwater Quality	Poorer or equal quality of injected water	Ambient groundwater needs to be equal or poorer quality to the injected surface water to avoid polluting the ambient groundwater.
Aquifer Characteristics	High storage (>200 ML) High effective porosity Competent rock Permeability Aquifer thickness Unconfined or confined	Aquifer characteristics are important as they determine well completion/ yield and influence the ongoing operation of the scheme in the form of levels of pre-treatment and operational intervention.

From the information presented in Section 3 and the criteria set out in **Table 6**, the suitability of the aquifers underlying the study area for MAR is presented in **Table 7**.

Table 7: Aquifer Feasibility Assessment for MAR

Hydrogeological Zone	Aquifer	Groundwater Gradient	Yield (L/s)	SWL (m bgl)	TDS (mg/L)	MAR Feasible
Criteria		Low	>10 L/s	>10	>300	
Adelaide Plains	Quaternary Aquifer	✓	×	×	✓	×
	T1 Aquifer	✓	✓	✓	✓	✓
	T2-T3 Aquifer*	? unknown	✓	✓	✓	✓
Golden Grove Embayment	Quaternary Aquifer	✓	×	×	✓	×
	T1 Aquifer	✓	✓	✓	✓	✓
	T2-T3 Aquifer*	? unknown	✓	✓	✓	✓

The Quaternary aquifer is not considered a viable aquifer for moderate to large volumes, however; may be suitable for small scale systems requiring less than 20 ML/a. Groundwater contamination has been reported in various locations across the West Torrens Catchment, which is an additional risk that would require evaluation if the Quaternary aquifers were to be considered for MAR. The SA EPA would be a key contact if considering MAR in the Quaternary aquifers to ensure known contaminated areas are avoided.

The potential for MAR at any location is governed by three main variables:

1. A suitable aquifer to store the harvested water.
2. A reliable supply of source water (stormwater, wastewater, groundwater).
3. A demand for the harvested water.

Each of the above variables have sub elements that need to be investigated to an appropriate level of detail to quantify potential risks before committing to a MAR system. For example, under variable 2 above, sub elements that need to be investigated include:

- The timing regarding the availability of the source water through flow modelling.
- Quality of the raw source water and level of treatment required.
- Volumes that can be reliably captured through flow modelling.

A challenge for any new scheme will be finding a suitable location for detention of any captured water. However, detention sites do not need to be co-located with the recharge site if the MAR method is via aquifer storage and recovery wells. The most promising open spaces that could be utilised for detention are along the coastal stretch of the catchment and the lower Torrens River (Breakout Creek). Opportunities for detention could consider capture of stormwater runoff in constructed box culverts located beneath footpaths or medium strips along major roads. Cost benefit analysis of the various detention options and scheme configurations would need to be undertaken.

6 REGULATORY REQUIREMENTS

6.1 MANAGED AQUIFER RECHARGE REGULATORY REQUIREMENTS

In South Australia there are legislative requirements to construct and operate a MAR system. The requirements are implemented to mitigate against adverse harm to the environment or human health. The following legislation or guidance should be reviewed as part of the planning, design, construction, and operations process for a MAR system:

- Occupational Health and Safety and Welfare Act, 2012
- Protection of Marine Waters (Prevention of Pollution from Ships) Act, 1987
- South Australian Public Health Act, 2011
- Native Vegetation Act, 1991
- Environment Protection Act, 1993
- Environment Protection (Water Quality) Policy, 2015
- Agricultural and Veterinary Chemicals Code Act, 1994
- Petroleum Products Regulation Act, 1995
- State Records Act, 1997
- The Landscape South Australia Act, 2019 which replaced the Natural Resources Management Act, 2004
- Aboriginal Heritage Act, 1988
- Water Service Association of Australian Codes (WSAA)
- Dangerous Substance Act, 1979
- Adelaide and Mount Lofty Ranges Natural Resources Management Board, Natural Resources Management Plan
- Local Government (Stormwater Management) Amendment Act, 2007
- Water Industry Act, 2012
- Office of Technical Regulator Policies

- Essential Services Commission of South Australia Codes and Guidelines
- Australian Guidelines for Water Recycling: Managing Health and Environmental Risks Phase 1 (NWQMS, 2006)
- Australian Guidelines for Water Recycling: Stormwater Harvesting and Re-use (NWQMS, 2009)
- Australian Guidelines for Water Recycling: Managed Aquifer Recharge (NWQMS, 2009).

Key stakeholders associated with the regulation of MAR systems in South Australia include:

Department of Health

- South Australian Environment Protection Authority
- Department for Environment and Water
- Adelaide and Mount Lofty Ranges Natural Resources Management Board
- Stormwater Management Authority
- Local municipal council

The study area is located within the Central Adelaide prescribed wells area, a Water Allocation Plan for this area is currently being developed and aims to:

- Protect the groundwater resources for all water users, now and into the future
- Provide greater certainty for water users
- Ensure water is provided to groundwater-dependent ecosystems

The implementation of a MAR system in this area is likely to be considered as a water affecting activity. If the MAR approach is to use a well to recharge and recover water (aquifer storage and recovery) a permit to construct a well will be required. A drainage and discharge permit will be required to carry out any pre commissioning testing and a MAR licence (issued by the EPA) to operate the scheme will be required.

If the water for the MAR scheme is to be sourced from the River Torrens an allocation to extract the water from the Prescribed watercourse will be required. If a dam or weir is to be installed in any of the water courses to support diversion a water affecting activity permit will be required.

In the absence of an endorsed water allocation plan for the region, MAR allocations are being issued under Section 105 of the *Landscape South Australia Act, 2019.* MAR licences are issued by the SA EPA.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 CONCLUSIONS

This report presents an overview of the hydrogeological setting of the aquifer systems that lie beneath the West Torrens Catchment area to support the development of the stormwater management plan. The hydrogeological framework is complicated by the Para Fault that bisects the catchment area separating the Adelaide sub-basin from the Golden Grove Embayment. There is up to a 30 m displacement across the Para Fault between the upthrown Golden Grove Embayment and the downthrown Adelaide Sub-basin.

Up to six aquifers can be intersected in drillholes in the Quaternary sediments the most significant aquifer in the Quaternary sequence is the Carisbrooke Sands Formation. A large proportion of wells take water from the first or second Quaternary aquifers for domestic use either garden watering or non-contact use within the house.

There are two main Tertiary confined aquifers T1 and T2 which support large scale irrigation, typically of sporting ovals and golf courses, or Industrial demands.

An evaluation of the available drill hole data sourced from the WaterConnect database was undertaken to estimate the total groundwater taking from the various aquifers in the study area. Filters were applied to the data to provide a reasonable approximation of the number of operational wells in each aquifer. Groundwater use is not metered in this area and therefore assumptions based on metered use from other similar locations (i.e. Northern Adelaide Plains and typical irrigation demands) were applied to provide a reasonable estimate of groundwater use by aquifer.

Estimated groundwater use from the Quaternary aquifers is approximately 0.3 ML/a (rounded); 2,390 ML/a. from the Tertiary T1 aquifer and 275 ML/a. from the Tertiary T2 aquifer. The extraction volumes from the Tertiary T1 aquifer should be used with caution as some of the wells may no longer be operational therefore the estimated extraction volume may be overestimated.

Using the available information an assessment concerning the suitability of the aquifers for MAR was completed. This evaluation looks specifically at the aquifers and does not consider source water supply, source water quality, potential demand, or source water reliability. Such studies would be completed as part of a detailed MAR site feasibility assessment.

The Tertiary aquifer system on the downthrown side of the Para Fault (i.e. north western side) is the most prospective aquifer if additional MAR systems were to be implemented in the West Torrens Catchment. Implementation of additional MAR systems in this catchment will face several challenges, and careful evaluation concerning viability would be required. The challenges include:

- The availability of open space to install large holding basins to maximise capture of stormwater flows especially where the drainage network is designed to enable rapid conveyance of stormwater through the catchment.

- Potential demand nodes for using the captured stormwater especially where schemes already exist and there is competition from other water supply sources e.g. GAP Water.

- The concentration of schemes along the coastal margin between Glenelg and Grange has resulted in increased pressures in the aquifer and impacts on existing users. Further MAR schemes along the coastal margin may increase the problem.

- Potential to intercept water in the upper catchment impacting on the opportunity to harvest water by the schemes (Adelaide Airport and Glenelg Golf Course) located in the lower catchment.

Whilst the above factors present constraints they do not necessarily preclude the development of further MAR schemes within the catchment. On the downthrown (northwest) side of the Para Fault the aquifer characteristics are more favourable as evidenced by successful schemes already in operation.

Challenges for any new scheme will be finding a suitable location for detention of any harvested water. However, detention sites do not need to be co-located with the recharge site if the MAR method is via aquifer storage and recovery wells.

Innovative opportunities for detention could consider capture of stormwater runoff in constructed box culverts located beneath footpaths or medium strips along major roads.

7.2 RECOMMENDATIONS

If MAR were to be implemented the following studies would need to be completed to further assess the viability of the scheme:

- Studies to determine the optimum location for detention basins and treatment facilities

- Water quality evaluation to determine the required levels of pre-treatment

- Demand analysis to confirm market and a price survey to determine what third party users may be prepared to pay.

- Reliability modelling to confirm stormwater harvest volumes.

- Cos benefit analysis on the various detention, treatment, and transmission options.

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APPENDIX A

GROUNDWATER WELL INFORMATION

Quaternary Wells

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662800355	278698.82	6131476.33	-9999	19.49			-9999	1385	2/06/1950	9.47	1/01/1917	8.89	27/03/1915	16/09/1914	49.68	49.68
662800695	276414.73	6130944.27	-9999	9.09	OPR	DOM	-9999	-9999	<Null>	-9999	<Null>	4	8/01/1990	8/01/1991	10	10
662800722	275105.17	6132748.3	-9999	9.79			-9999	2278	31/08/2005	2.5	31/08/2005	6	31/08/2005	31/08/2005	31	33
662800724	277125.73	6129953.26	15	22.13629	OPR	DOM	-9999	-9999	<Null>	0.7	14/09/1982	6.7	14/09/1982	14/09/1982	13.4	13.4
662800725	278740.7	6131234.27	-9999	19.35			-9999	-9999	<Null>	-9999	<Null>	6.1	10/04/1915	10/04/1915	48.16	48.16
662800726	278751.73	6131224.21	-9999	19.42	ABD		-9999	1300	11/03/1915	-9999	<Null>	1.22	11/03/1915	11/03/1915	90.4	90.4
662803921	275896.69	6130303.32	6	11.808653			-9999	1956	6/04/1934	18.95	6/04/1934	4.57	6/04/1934	<Null>	9.14	9.14
662807547	276437.7	6133758.28	-9999	10			-9999	1430	24/11/1961	-9999	<Null>	-9999	<Null>	<Null>	-9999	-9999
662807548	276234.58	6129049.13	-9999	15.866148			-9999	2995	23/11/2009	0.333	23/11/2009	5	23/11/2009	23/11/2009	20	20
662807550	278143.78	6132134.64	-9999	15.18		DOM	-9999	1311	7/12/2001	0.8	7/12/2001	10	7/12/2001	7/12/2001	22	24
662807551	273911.89	6132308.29	-9999	6.12		DOM	7.6	2426	25/08/2001	1	7/09/1995	4.6	7/09/1995	7/09/1995	16.5	16.5
662807554	275673.76	6133008.18	-9999	10.27		DOM	7.2	2233	24/03/1993	-9999	<Null>	-9999	<Null>	22/03/1993	15	15
662807559	278868.38	6130241.65	-9999	32.370894			-9999	-9999	<Null>	-9999	<Null>	14	10/08/2015	10/08/2015	18	18
662807560	275057.75	6132288.3	-9999	9.82			-9999	3084	6/10/1934	-9999	<Null>	-9999	<Null>	<Null>	14.02	14.02
662807564	277916.86	6130518.2	-9999	17.63		DOM	-9999	1586	29/07/1997	0.125	29/07/1997	9	29/07/1997	29/07/1997	18	18
662807565	277936.77	6128814.23	-9999	22.11			-9999	-9999	<Null>	-9999	<Null>	3	1/01/1983	1/01/1983	10	10
662807566	276383.76	6129560.26	-9999	11.46			-9999	1613	12/02/1947	-9999	<Null>	9.14	12/02/1947	<Null>	13.41	13.41
662807567	277322.77	6129777.25	-9999	17.19			-9999	-9999	<Null>	-9999	<Null>	6	18/09/1982	18/09/1982	13	13
662807575	272489.73	6131892.23	-9999	4.38			-9999	1542	13/03/1936	-9999	<Null>	2.44	13/03/1936	<Null>	-9999	-9999
662807577	273144.73	6131840.26	-9999	5.01			-9999	10224	16/03/1936	-9999	<Null>	1.83	16/03/1936	<Null>	-9999	-9999
662807578	274146.76	6132241.28	-9999	7	OPR	DOM	7.8	2194	29/10/1992	1.5	26/10/1992	5	29/10/1992	26/10/1992	15.2	15.2
662807581	276170.77	6128799.25	-9999	9.62	OPR	DOM	7.3	3007	12/02/1992	-9999	<Null>	2	12/02/1992	7/02/1992	12	12
662807585	275116.76	6132713.33	-9999	9.88		DOM	6.8	2437	1/11/1994	-9999	<Null>	-9999	<Null>	1/11/1994	16	16
662807587	272998.7	6132430.26	-9999	5			-9999	1559	9/01/1914	-9999	<Null>	8.53	9/01/1914	9/01/1914	121.01	121.01
662807589	273789.72	6132184.27	5	13.709621	OPR	DOM	7.5	2227	16/10/1989	1	23/09/1989	2.4	16/10/1989	23/09/1989	9.7	9.7
662807590	274257.73	6132400.32	6	11.993894			7.8	1923	13/02/1981	6.82	6/02/1981	2.13	6/02/1981	6/02/1981	10.97	10.97

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662807594	274041.82	6132843.08	-9999	6.44		DOM	7.4	2210	13/02/1996	2	13/02/1996	-9999	<Null>	13/02/1996	18	18
662807595	273953.14	6133020.02	-9999	7.19		DOM	-9999	2245	22/11/2000	2.5	22/11/2000	-9999	<Null>	22/11/2000	13.5	13.5
662807597	273988.73	6132860.3	6	12.808446			-9999	1744	2/01/1946	12.63	2/01/1946	3.66	2/01/1946	<Null>	-9999	-9999
662807598	273439.77	6131993.22	-9999	5	OPR	DOM	7.4	3511	14/03/1992	1	14/03/1992	3	14/03/1992	14/03/1992	6	6
662807599	276465.69	6133754.3	-9999	10.06			7	1955	27/10/1967	-9999	<Null>	-9999	<Null>	<Null>	6.71	6.71
662807602	277258.74	6130854.24	13	19.314734			7.6	2301	12/02/1980	1	12/02/1980	3	12/02/1980	12/02/1980	12.45	12.45
662807603	277151.77	6128203.36	-9999	17.33		DOM	6.7	11074	27/01/1995	0.25	27/01/1995	-9999	<Null>	27/01/1995	18	18
662807604	277001.83	6129548.31	-9999	15		DOM	-9999	2460	21/08/1999	0.5	21/08/1999	9	21/08/1999	21/08/1999	32	32
662807606	273419.68	6131561.27	-9999	4.98			6.5	1295	26/10/1971	-9999	<Null>	-9999	<Null>	<Null>	-9999	-9999
662807611	272775.75	6129947.29	-9999	4.67			-9999	5840	1/11/1942	-9999	<Null>	-9999	<Null>	<Null>	-9999	-9999
662807613	275981.85	6129738.32	-9999	8.38	OPR	DOM	-9999	-9999	<Null>	0.133	6/01/1997	5.6	6/01/1997	6/01/1997	9.6	9.6
662807618	272670.75	6130728.23	3	9.031965			-9999	957	3/03/1952	12.63	1/01/1952	-9999	<Null>	<Null>	-9999	-9999
662807620	275821.72	6132485.25	8	12			-9999	-9999	<Null>	1.26	28/12/1984	3.5	28/12/1984	28/12/1984	10	10
662807624	277191.62	6129938.44	15	21.02494	OPR	DOM	7.7	734	4/04/1990	1.5	27/02/1990	7.2	4/04/1990	27/02/1990	16.5	16.5
662807626	277181.7	6130988.34	-9999	12.65		DOM	6.9	1995	30/12/1994	-9999	<Null>	-9999	<Null>	30/12/1994	15	15
662807627	277671.94	6132168.19	-9999	13.02		DOM	8	1636	17/08/1996	30	17/08/1996	-9999	<Null>	17/08/1996	30	30
662807628	277011.77	6128185.28	-9999	16.3			7.4	3840	1/01/1984	-9999	<Null>	-9999	<Null>	1/01/1984	9	9
662807629	273679.32	6132989.62	-9999	5.42			-9999	1670	19/04/2007	0.7	19/04/2007	5	19/04/2007	19/04/2007	10.5	10.5
662807631	276448.71	6132091.26	-9999	9.35	OPR	IRR	-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	1/01/1983	8	8
662807632	273891.88	6132603.27	-9999	5.64		DOM	7.1	2245	21/07/1995	1.25	21/07/1995	-9999	<Null>	21/07/1995	9.5	9.5
662807633	273949.7	6132712.26	-9999	5.93	OPR	DOM	7.9	1984	12/11/1990	-9999	<Null>	0	12/11/1990	17/10/1990	12	12
662807634	273856.73	6132302.26	5	10.29331	OPR	DOM	-9999	-9999	<Null>	0.5	3/01/1989	4	3/01/1989	3/01/1989	11	11
662807635	273385.71	6132646.22	-9999	4.97	OPR	DOM	6.9	2990	4/12/1991	0.9	4/12/1991	4.3	4/12/1991	4/12/1991	5.7	5.7
662807636	273725.77	6132426.22	-9999	5.12	OPR	DOM	7.8	2375	21/11/1991	1.2	21/11/1991	4	21/11/1991	21/11/1991	12	12
662807637	272528.51	6132300.44	-9999	8.432416	BKF		-9999	-9999	<Null>	-9999	<Null>	3.4	31/07/2014	24/09/2010	0	4
662807638	276135.7	6129215.3	10	14.44727	OPR	DOM	8.1	2063	3/04/1991	1	15/03/1991	5.2	3/04/1991	15/03/1991	10.5	10.5
662807639	276687.76	6133743.3	14	16.460006	OPR	DOM	7.4	2756	14/07/1988	1	23/12/1987	8.2	14/07/1988	23/12/1987	15	15

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662807641	276551.72	6131408.26	8	12.873613	OPR	IRR	-9999	-9999	<Null>	0.01	1/01/1987	5.3	1/01/1987	1/01/1987	5.5	5.5
662807642	274741.7	6132411.27	-9999	6.75			-9999	4490	14/04/1949	-9999	<Null>	2.29	14/04/1949	<Null>	-9999	4.27
662807643	278128.03	6132132.93	-9999	15.07		DOM	-9999	888	5/12/2001	0.8	5/12/2002	10	5/12/2001	5/12/2001	19	19
662807644	272445.86	6130348.1	-9999	5.05		DOM	-9999	539	22/10/2003	1	22/10/2003	1.5	22/10/2003	22/10/2003	5.5	5.5
662807647	276581.86	6132978.39	-9999	12.03		DOM	-9999	-9999	<Null>	4	2/01/1995	-9999	<Null>	2/01/1995	17.5	17.5
662807648	276949.74	6132338.27	-9999	11.36			8.1	1625	19/11/1981	-9999	<Null>	4.5	4/04/1981	4/04/1981	6.5	6.5
662807649	277315.76	6133208.32	-9999	14.93	OPR	DOM	7.9	603	18/10/1985	-9999	<Null>	7	28/10/1985	15/10/1985	15.5	15.5
662807650	277827.77	6130472.3	18	23.560153	OPR	DOM	7.8	2047	14/07/1989	0.3	14/07/1989	5.2	14/07/1989	14/07/1989	11.2	11.2
662807651	278124.88	6132392.21	-9999	15.26		DOM	-9999	1720	14/03/2002	0.8	14/03/2002	11	14/03/2002	14/03/2002	20	20
662807652	278096.9	6132778.24	-9999	16.09		DOM	-9999	2047	28/11/1997	1.5	28/11/1997	14	28/11/1997	28/11/1997	30	30
662807653	276291.94	6129753.25	-9999	10.87		DOM	7.3	1957	29/03/1995	2	28/03/1995	-9999	<Null>	28/03/1995	18.5	18.5
662807654	276886.77	6132098.31	10	14.631604	OPR	DOM	7.8	1928	11/10/1988	0.3	1/07/1988	5	11/10/1988	1/07/1988	10	10
662807655	278416.76	6132123.36	-9999	17.19		DOM	7.7	1575	20/08/1996	0.5	22/08/1996	9	22/08/1996	22/08/1996	30	30
662807682	276630.16	6130565.34	-9999	18.602565			-9999	-9999	<Null>	-9999	<Null>	5.9	17/02/2014	17/02/2014	9	9
662807683	278221.76	6129337.3	23	28.166071			-9999	2660	7/12/1951	0.25	7/12/1951	1.52	7/12/1951	<Null>	4.88	4.88
662807684	277433.72	6130290.21	17	20.821488			-9999	700	16/11/1949	0.13	16/11/1949	6.71	16/11/1949	<Null>	9.14	9.14
662807685	272437.68	6130262.21	3	7.193827			7.7	682	5/12/2007	1.25	15/03/1985	2.5	15/03/1985	15/03/1985	6	6
662807686	276961.71	6128300.27	-9999	15.45			6.5	9170	7/05/1968	-9999	<Null>	4.57	7/05/1968	<Null>	9.14	9.14
662807687	277472.12	6133171	-9999	15.3		DOM	-9999	2443	18/04/2001	0.5	18/04/2001	11	18/04/2001	18/04/2001	15	18
662807688	277686.59	6129743.28	-9999	20.07		DOM	7.5	694	24/03/1993	-9999	<Null>	-9999	<Null>	19/03/1993	21	21
662807694	278554.1	6129876.99	-9999	25.84		DOM	-9999	528	22/06/2001	-9999	<Null>	12	22/06/2001	22/06/2001	16	16
662807695	272535.21	6132300.55	-9999	8.209296	BKF		-9999	-9999	<Null>	-9999	<Null>	3.2	31/07/2014	<Null>	0	6
662807696	277248.75	6130720.25	-9999	14.15			-9999	-9999	<Null>	1.25	20/08/1986	5.6	25/08/1986	20/08/1986	34	34
662807697	275461.77	6132178.26	-9999	8.44		DOM	7.3	2075	7/04/1994	-9999	<Null>	-9999	<Null>	2/04/1994	15	15
662807698	277229.74	6129874.21	-9999	16.35	OPR	DOM	7.4	597	13/04/1992	-9999	<Null>	9	13/04/1992	2/04/1992	18	18
662807700	278155.17	6132142.03	-9999	15.26		DOM	-9999	1602	2/03/2001	-9999	<Null>	11	2/03/2001	2/03/2001	24	24
662807701	276415.73	6132736.23	-9999	10.54			-9999	2684	26/08/1914	-9999	<Null>	-9999	<Null>	<Null>	-9999	-9999

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662807702	277092.7	6130168.23	14	20.716578	OPR	DOM	7.2	1334	25/07/1983	0.38	1/05/1983	-9999	<Null>	1/05/1983	9.14	9.14
662807705	276958.12	6129732.01	-9999	14.73		DOM	-9999	2432	13/11/1999	0.5	13/11/1999	10	13/11/1999	13/11/1999	34	34
662807706	277776.77	6129823.18	-9999	20.62		DOM	7	699	28/11/1992	-9999	<Null>	9	7/12/1992	<Null>	-9999	18
662807710	276227.76	6133572.32	-9999	10.5			-9999	2027	2/09/1914	-9999	<Null>	-9999	<Null>	<Null>	-9999	-9999
662807712	276032.74	6131083.31	6	9.354249	OPR	DOM	7.8	1828	3/02/1989	0.6	2/04/1984	-9999	<Null>	2/04/1984	18	18
662807713	275990.72	6132464.31	-9999	9.25	OPR	DOM	7.1	1973	30/03/1991	-9999	<Null>	5	30/03/1991	30/03/1991	9	9
662807714	275846.82	6129818.25	-9999	6.67		DOM	7.1	1850	20/03/1995	-9999	<Null>	-9999	<Null>	20/03/1995	16.5	16.5
662807715	277746.7	6129988.27	20	24.093659	OPR	DOM	7.7	1172	9/11/1988	0.3	1/05/1988	7.5	9/11/1988	1/05/1988	12.5	12.5
662807716	278373.69	6132696.28	17	22.283749			7.7	1132	2/11/1981	0.45	2/11/1981	8.2	2/11/1981	2/11/1981	14.6	14.6
662807720	276451.73	6132046.27	8	14.077896	OPR	DOM	7.4	1826	11/10/1988	0.25	1/07/1988	3	11/10/1988	1/07/1988	8	8
662807721	274191.79	6132993.31	-9999	7.39		DOM	7.6	2108	3/04/1995	1.5	3/04/1995	-9999	<Null>	3/04/1995	18	18
662807722	276721.73	6131636.3	-9999	9.17			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	-9999	-9999
662807726	276298.71	6132527.25	-9999	9.63			-9999	3517	22/10/1914	-9999	<Null>	-9999	<Null>	<Null>	-9999	-9999
662807727	275863.11	6132986.04	-9999	10.92		DOM	-9999	2380	29/03/2000	1	29/03/2000	6.6	29/03/2000	29/03/2000	14	18
662807728	277381.73	6131035.28	-9999	12.7	OPR	DOM	-9999	-9999	<Null>	-9999	<Null>	11	21/01/1990	21/01/1990	11	11
662807729	274227.69	6132199.22	6	16.87026	OPR	DOM	7.8	2426	8/01/1986	0.5	1/01/1985	2.1	16/01/1986	8/01/1986	14	14
662807730	277321.68	6131893.26	-9999	11.49		DOM	7.8	1600	24/02/2005	-9999	<Null>	-9999	<Null>	28/11/1994	12	12
662807731	275091.75	6132804.29	10	14.045733			6.9	849	20/09/1978	0.75	1/09/1978	4.5	1/09/1978	1/09/1978	15	15
662807732	276228.69	6131542.32	-9999	7.98			-9999	2770	26/08/1914	-9999	<Null>	-9999	<Null>	<Null>	-9999	-9999
662807733	276950.7	6131150.3	1.74	17.501031	OPR	DOM	-9999	-9999	<Null>	-9999	<Null>	7	8/04/1991	8/04/1991	13	13
662807734	275865.72	6131672.27	-9999	7.2			-9999	2445	26/08/1914	-9999	<Null>	-9999	<Null>	<Null>	-9999	-9999
662807735	277123.75	6133115.28	-9999	14.07	OPR	DOM	8.1	1457	21/10/1992	1	5/08/1992	9	21/10/1992	5/08/1992	14.5	14.5
662807736	274180.77	6133165.31	-9999	8.09			-9999	2327	16/03/1936	-9999	<Null>	5.33	16/03/1936	<Null>	6.4	6.4
662807737	274386.9	6132848.28	-9999	8.13		DOM	-9999	1928	6/05/1999	-9999	<Null>	5	6/05/1999	6/05/1999	12	12
662807740	276379.71	6128175.24	-9999	11.24			-9999	871	10/11/1934	5.68	1/01/1934	-9999	<Null>	1/01/1914	37.19	37.19
662807742	273713.71	6132835.29	-9999	5.52	OPR	DOM	7.9	1010	20/09/1991	-9999	<Null>	3	<Null>	20/09/1991	-9999	9
662807743	274021.75	6133203.33	-9999	6.12		DOM	6.3	1895	27/10/1994	60	27/10/1994	-9999	<Null>	27/10/1994	18	18

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662807744	276501.74	6128203.21	-9999	12.2		DOM	7.7	2375	12/02/2012	2	23/11/1995	-9999	<Null>	23/11/1995	16	16
662807745	277796.68	6132823.33	-9999	15.78		DOM	7.1	2075	29/03/1995	-9999	<Null>	-9999	<Null>	29/03/1995	18	18
662807747	274763.7	6132342.22	-9999	6.97	OPR	DOM	7.2	2432	20/01/1992	-9999	<Null>	4.5	20/01/1992	14/01/1992	15	15
662807748	276532.76	6131458.3	-9999	9.06			-9999	229	28/03/1958	-9999	<Null>	2.13	28/03/1958	<Null>	9.45	9.45
662807749	273680.7	6132673.3	-9999	5.07	OPR	DOM	7.1	1100	4/11/1991	1	4/11/1991	4	4/11/1991	4/11/1991	11	11
662807752	277366.85	6131263.24	-9999	11.57		DOM	-9999	1462	<Null>	0.5	12/04/1997	11	12/04/1997	12/04/1997	31	31
662807753	272751.85	6132558.33	-9999	5	ABD	DOM	-9999	-9999	<Null>	0.125	20/11/1997	4.2	20/11/1997	20/11/1997	0	17
662807754	278018.68	6129661.24	-9999	22.45	OPR	DOM	6.8	1362	29/10/1992	-9999	<Null>	9	29/10/1992	24/10/1992	18	18
662807755	275905.71	6130267.24	6	12			-9999	1959	1/01/1934	18.95	1/01/1934	3.66	1/01/1934	<Null>	9.14	9.14
662807765	277113.76	6129762.27	-9999	15.54			7.6	534	9/05/1988	1	7/04/1988	6	9/05/1988	7/04/1988	19	19
662807766	275203.77	6133401.22	-9999	10			-9999	1285	1/01/1950	11.37	1/01/1950	7.62	1/01/1950	<Null>	36.58	36.58
662807767	277636.71	6129795.23	-9999	19.7	OPR	DOM	7.4	945	<Null>	-9999	<Null>	-9999	<Null>	1/11/1983	13.4	13.4
662807768	278086.83	6134073.31	-9999	15.3	ABD		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	2/12/1998	0	4
662807769	272811.84	6132518.3	-9999	5		DOM	-9999	2347	2/12/1997	2	2/12/1997	4	2/12/1997	2/12/1997	11.5	11.5
662807770	275336.74	6127842.25	-9999	7.54	BKF		7.4	6176	4/05/1983	1.6	4/05/1983	1.8	4/05/1983	4/05/1983	14.6	14.6
662807772	275287.73	6133017.23	10	12			7	1830	20/02/1969	1.26	20/02/1969	3.05	20/02/1969	<Null>	13.72	13.72
662807774	278159.7	6130281.25	-9999	21.29	OPR	IRR	-9999	-9999	<Null>	-9999	<Null>	11.5	9/12/1985	9/12/1985	15	15
662807776	275677.69	6128873.27	-9999	6.5			8.5	3943	11/12/1980	0.75	11/12/1980	3.13	16/06/1986	11/12/1980	-9999	9.6
662807777	278047.82	6132956.46	-9999	16.88			7	3252	26/04/1983	-9999	<Null>	-9999	<Null>	<Null>	-9999	-9999
662807779	275395.74	6131711.22	6	13.336754	OPR	DOM	7.4	2909	19/10/1988	0.2	10/10/1988	6	19/10/1988	10/10/1988	12	12
662807781	276646.87	6132843.23	-9999	11.64		DOM	-9999	2001	19/01/1998	-9999	<Null>	7.2	19/01/1998	19/01/1998	20	20
662807783	276295.38	6132656.05	-9999	10.14		DOM	-9999	2471	3/02/2004	1	3/02/2004	6	3/02/2004	<Null>	26	26
662807784	274925.15	6132071.01	-9999	8.24		DOM	-9999	2574	30/11/1999	1	30/11/1999	4.5	30/11/1999	30/11/1999	12	12
662807786	276515.13	6130654.99	-9999	9.83		DOM	-9999	1396	17/01/1999	0.5	17/01/1999	13	17/01/1999	17/01/1999	30	30
662807787	275928.76	6132422.27	8	13.031696			7.3	2143	10/07/1985	1.5	<Null>	3.7	10/07/1985	10/07/1985	11	11
662807789	275845.68	6130002.26	-9999	5.9			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	-9999	-9999
662807793	275717.71	6133530.29	-9999	10.02			-9999	2001	6/11/1961	-9999	<Null>	-9999	<Null>	<Null>	35.05	35.05

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662807794	276595	6132569	-9999	12			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	10	10
662807795	277018.77	6132959.32	-9999	13.12			7.2	2284	20/05/1983	-9999	<Null>	7	4/06/1983	4/06/1983	10	10
662807796	276004.15	6131421.01	-9999	7.51		DOM	-9999	2149	13/08/2001	-9999	<Null>	4.5	1/07/2001	1/07/2001	8.84	8.84
662807797	275216.75	6132599.24	-9999	10.08			6.7	1900	8/12/1967	-9999	<Null>	4.27	8/12/1967	<Null>	7.62	7.62
662807798	277256.72	6130158.25	-9999	15.54			-9999	671	24/02/1938	5.05	24/02/1938	8.53	24/02/1938	1/01/1938	76.2	76.2
662807800	276784.69	6130228.29	-9999	12.51			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	27/02/1962	12.19	12.19
662807801	276730.71	6130361.28	-9999	12.06			-9999	843	24/04/1934	8.84	24/04/1934	2.74	24/04/1934	1/01/1934	71.02	71.02
662807802	276677.76	6130441.23	-9999	11.56			-9999	799	13/12/1933	7.58	13/12/1933	2.44	13/12/1933	1/01/1914	70.1	70.1
662807803	277166.83	6131163.35	-9999	11.64		DOM	6.7	1973	1/07/1996	-9999	<Null>	6.5	1/07/1996	1/07/1996	14	14
662807804	277223.73	6133334.27	-9999	14.25			7	1962	20/12/1984	-9999	<Null>	7.6	1/11/1984	1/11/1984	10	10
662807805	277237.72	6130326.28	-9999	15.57			-9999	-9999	<Null>	8.84	<Null>	7.01	<Null>	<Null>	-9999	66.14
662807822	274078.16	6132511.97	-9999	6.64		DOM	-9999	1832	29/11/1999	1	29/11/1999	4	29/11/1999	29/11/1999	12	12
662807823	272513.8	6130538.54	-9999	5.06			-9999	1636	30/08/2007	-9999	<Null>	3.6	30/10/2007	30/10/2007	6.1	6.1
662807824	276478.72	6133767.27	-9999	10.01			-9999	1442	10/02/1959	-9999	<Null>	-9999	<Null>	<Null>	-9999	-9999
662807827	278284.73	6134045.26	-9999	16.92			-9999	1370	21/10/1954	3.79	1/01/1954	-9999	<Null>	1/01/1946	36.27	36.27
662807829	272402.75	6130926.24	-9999	4.83			7.5	2030	28/02/1969	-9999	<Null>	1.52	28/02/1969	<Null>	9.14	9.14
662807839	275462.77	6129886.28	-9999	5.19			6.7	1212	26/06/1967	-9999	<Null>	0	13/12/1933	1/01/1933	90.53	90.53
662807841	275881.76	6129817.22	7	14.864527			-9999	-9999	<Null>	6.32	<Null>	-9999	<Null>	<Null>	8.53	8.53
662807842	272536.64	6132296.12	-9999	8.170336	BKF		-9999	-9999	<Null>	-9999	<Null>	3.4	31/07/2014	24/09/2010	0	4
662807851	277041.68	6130973.15	-9999	12.38		DOM	6.9	2357	3/05/1993	-9999	<Null>	-9999	<Null>	12/04/1993	21	21
662807853	274591.84	6132683.07	-9999	9.06		DOM	7	1979	11/02/1995	-9999	<Null>	-9999	<Null>	11/02/1995	12	12
662808038	278298.73	6130062.31	-9999	23.33			-9999	785	24/10/1914	-9999	<Null>	-9999	<Null>	<Null>	-9999	-9999
662808039	275008.72	6129364.28	-9999	4.85			7.5	827	20/08/1976	-9999	<Null>	0	20/08/1976	<Null>	-9999	-9999
662808047	273867.68	6133019.25	7	13.764524	OPR	DOM	8.1	1608	5/09/1983	0.5	19/08/1983	4	19/08/1983	19/08/1983	9	9
662808049	275146.96	6128468.38	-9999	5.25		DOM	7.3	8402	6/11/1996	1.25	6/11/1996	-9999	<Null>	6/11/1996	11	11
662808051	275223.68	6128503.23	-9999	5.34			-9999	956	1/01/1914	-9999	<Null>	-9999	<Null>	<Null>	-9999	-9999
662808054	275875.73	6128586.21	-9999	8.55			-9999	11738	6/05/1949	0.63	6/05/1949	2.74	6/05/1949	<Null>	60.96	60.96

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662808055	275662.68	6128532.25	-9999	7.29			-9999	985	4/04/1946	3.79	4/04/1946	0.61	4/04/1946	1/01/1939	60.96	60.96
662808057	275041.69	6132643.21	8	12.734416	OPR	DOM	7.2	2132	14/09/1984	1.5	14/09/1984	4	14/09/1984	14/09/1984	11	11
662808058	276076.74	6133579.28	-9999	10.5	OPR	DOM	7.8	1513	10/02/1992	1.1	2/02/1991	8	10/02/1992	2/02/1991	15	15
662808060	272634.76	6132118.29	-9999	5.01	OPR	DOM	7.5	3910	13/11/1991	1.1	13/11/1991	4	13/11/1991	13/11/1991	8	8
662808072	277733.12	6128961.96	-9999	20.18		DOM	-9999	1895	29/02/2000	0.5	3/02/2000	4.5	3/02/2000	3/02/2000	18	18
662808074	276382.76	6129679.23	-9999	11.4			-9999	-9999	<Null>	-9999	<Null>	2.77	2/10/1969	<Null>	-9999	-9999
662808076	277638.74	6130664.27	15	19.269937			-9999	1742	13/08/1934	8.84	13/08/1934	5.18	13/08/1934	<Null>	12.5	12.5
662808077	276487.69	6129093.29	-9999	11.87			-9999	913	13/12/1933	7.58	13/12/1933	5.49	13/12/1933	<Null>	81.69	81.69
662808078	276464.71	6128841.31	-9999	11.61			-9999	871	14/12/1933	2.53	14/12/1933	0.61	14/12/1933	<Null>	76.2	76.2
662808079	276472.68	6128695.21	-9999	11.71			-9999	971	6/05/1949	10.1	6/05/1949	7.62	6/05/1949	1/01/1934	60.96	60.96
662808080	276482.77	6128604.22	-9999	11.97			-9999	871	6/05/1949	3.79	1/01/1949	-9999	<Null>	<Null>	54.86	54.86
662808083	278537.73	6133034.24	-9999	19.12			-9999	2101	18/09/1914	-9999	<Null>	-9999	<Null>	<Null>	18.29	18.29
662808092	273204.7	6132013.25	-9999	5			-9999	7893	4/02/1952	-9999	<Null>	3.05	4/02/1952	<Null>	-9999	4.27
662808095	276695.72	6129349.24	-9999	13.39			-9999	829	21/08/1934	-9999	<Null>	-9999	<Null>	<Null>	84.12	84.12
662808097	276741.71	6129120.27	-9999	13.51			-9999	1070	28/08/1934	10.1	28/08/1934	3.66	28/08/1934	28/08/1934	54.86	54.86
662808098	277143.74	6133330.32	-9999	13.96	OPR	DOM	-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	1/02/1984	11	11
662808099	276947.7	6131617.3	10	13.877486	OPR	DOM	7.8	994	24/09/1982	1.8	24/09/1982	3	24/09/1982	24/09/1982	9.1	9.1
662808119	277411.82	6131953.07	-9999	11.9		DOM	7.3	1647	26/04/1995	-9999	<Null>	-9999	<Null>	26/04/1995	16.5	16.5
662808121	275309.72	6131841.3	6	13.745845	OPR	DOM	7.7	2354	20/11/1989	1.2	14/10/1989	2.4	20/11/1989	14/10/1989	8	8
662808122	275346.79	6132218.28	-9999	9.23		DOM	-9999	1928	6/12/1996	0.2	6/12/1996	4	6/12/1996	6/12/1996	12	12
662808123	277474.69	6132820.26	-9999	14.71			7.2	2030	15/01/1982	-9999	<Null>	-9999	<Null>	1/01/1979	-9999	9.75
662808124	277142	6133540	-9999	14.04	OPR	DOM	7.8	1216	8/02/1990	-9999	<Null>	0	8/02/1990	20/12/1989	17	17
662808125	277712.76	6129153.31	-9999	19.97			-9999	2213	8/11/1945	-9999	<Null>	10.67	8/11/1945	<Null>	31.09	31.09
662808126	276836.75	6131437.21	10	13.546636			7.4	2517	24/03/1987	1	14/02/1986	3	13/03/1986	14/02/1986	11	11
662808127	273682.4	6132816.01	-9999	5.28	OPR	DOM	7.4	1428	20/09/1991	1	4/09/1991	2.4	20/09/1991	4/09/1991	9	9
662808128	277949.69	6129079.27	-9999	21.46			-9999	743	7/01/1949	-9999	<Null>	6.71	17/07/1945	1/01/1945	53.34	53.34
662808129	278065.74	6129019.27	-9999	22.51	ABD		-9999	1315	11/01/1946	-9999	<Null>	0	7/04/1994	1/01/1945	0	50.9

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662808130	277995.71	6128983.27	-9999	22.09			-9999	4633	2/08/1945	-9999	<Null>	-9999	<Null>	<Null>	-9999	-9999
662808131	277996.71	6128986.36	-9999	22.09			-9999	3055	27/08/1945	-9999	<Null>	-9999	<Null>	<Null>	-9999	-9999
662808132	277996.71	6128986.36	-9999	22.09			-9999	3374	23/10/1945	-9999	<Null>	-9999	<Null>	<Null>	-9999	-9999
662808133	275861.89	6127428.38	-9999	10.17		DOM	7.4	7190	13/12/1995	0.5	13/12/1995	-9999	<Null>	13/12/1995	20	20
662808134	273862.69	6132988.27	7	13.433317	OPR	DOM	7.7	2113	15/12/1983	1.6	15/12/1983	3.3	15/12/1983	15/12/1983	12.6	12.6
662808159	278498.72	6129884.24	-9999	25.54			-9999	728	6/11/1914	-9999	<Null>	-9999	<Null>	<Null>	-9999	-9999
662808996	273881.94	6131598.15	-9999	4.94		DOM	7.2	2664	21/02/1996	1.5	21/02/1996	-9999	<Null>	21/02/1996	18	18
662808998	277621.9	6129218.24	-9999	19.24	OPR	DOM	-9999	3827	4/04/1997	1	4/04/1997	9.5	4/04/1997	4/04/1997	24	24
662810693	277180.69	6130689.29	14	18.027799			7.4	2058	22/02/1979	1.5	22/02/1979	4.26	22/02/1979	22/02/1979	9.14	9.14
662810992	275387.74	6127185.28	-9999	9.3			7.9	3714	1/03/1985	1	1/03/1985	3	1/03/1985	1/03/1985	20	20
662810994	277323.77	6128602.26	17	24.391655			-9999	2570	3/09/1959	0.14	3/09/1959	2.13	3/09/1959	<Null>	3.96	3.96
662811197	272641.86	6132163.31	-9999	5		DOM	-9999	3804	11/11/2013	12	4/11/1996	4	4/11/1996	4/11/1996	15	15
662811509	275178.69	6132652.25	-9999	10.1			7.5	1945	8/02/1980	-9999	<Null>	-9999	<Null>	1/01/1980	-9999	-9999
662811547	276301.71	6132203.21	-9999	9.15		DOM	7.2	2227	15/02/1995	-9999	<Null>	-9999	<Null>	15/02/1995	18	18
662811550	277816.99	6130498.13	-9999	17.09		DOM	7.4	1222	21/11/1995	0.5	21/11/1995	-9999	<Null>	21/11/1995	24	24
662811586	277646.86	6133198.29	-9999	16.11		DOM	7.1	2014	6/01/1996	1	6/01/1996	-9999	<Null>	6/01/1996	18	18
662811595	273405.69	6132633.29	-9999	4.97			-9999	2270	20/04/1936	7.58	1/01/1936	-9999	<Null>	<Null>	25.91	25.91
662811596	274350.96	6132857.42	-9999	7.95		DOM	-9999	2681	23/09/2003	1.3	23/09/2003	4.5	23/09/2003	23/09/2003	11	12
662811623	277959.76	6133713.3	16.19	21.755524		OBS	7.3	1591	24/02/1988	-9999	<Null>	11.45	21/09/1991	16/06/1981	14	121
662811686	276536.68	6132198.08	-9999	9.81		DOM	-9999	-9999	<Null>	-9999	<Null>	4	<Null>	26/10/1989	13	13
662811748	273663.9	6132906.7	-9999	5.69		DOM	-9999	2245	31/01/2003	1	31/01/2003	9	31/01/2003	31/01/2003	18.2	18.2
662811772	276511.7	6128721.26	-9999	11.98	BKF		-9999	-9999	<Null>	1	26/08/1983	3.3	26/08/1983	26/08/1983	12.8	12.8
662811785	277959.76	6133713.3	16.19	21.755524	BKF	OBS	7.4	1429	24/02/1988	-9999	<Null>	11.45	21/09/1991	25/03/1981	0	121
662811861	276062.75	6128844.22	-9999	8.82			7.4	2058	1/09/1982	0.5	1/09/1982	3	1/09/1982	1/09/1982	15.24	15.24
662811872	276434.72	6133062.25	10	13.72847			7	1608	29/04/1987	0.5	1/04/1987	5.5	29/04/1987	1/04/1987	12.5	12.5
662811893	273547	6131643.13	-9999	4.97		DOM	7.3	2295	1/10/1995	1	1/10/1995	-9999	<Null>	1/10/1995	12	12
662811898	276171.65	6129128.16	-9999	10.48	OPR	DOM	7.1	3576	2/10/1992	-9999	<Null>	2.7	2/10/1992	19/09/1992	15	15

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662811899	277156.13	6133265.97	-9999	14.41		DOM	-9999	2340	20/12/2000	1.25	20/12/2000	9.2	20/12/2000	20/12/2000	17	17
662811937	277949.76	6129140.21	-9999	21.32			-9999	1959	14/09/1949	-9999	<Null>	2.44	14/09/1949	1/01/1949	-9999	5.49
662811941	272961.52	6130423.98	-9999	4.76			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	2.13	2.13
662811942	272752.68	6131490.3	-9999	5			6.7	1955	24/10/1967	-9999	<Null>	-9999	<Null>	<Null>	3.66	3.66
662812034	272861.75	6132423.19	-9999	5		DOM	7.4	2704	2/02/1996	-9999	<Null>	-9999	<Null>	2/02/1996	14	14
662812035	273136.7	6131523.27	4	10.466914			7.6	1692	30/08/1982	0.6	30/08/1982	1.9	30/08/1982	30/08/1982	6	6
662812036	278718.89	6132458.24	-9999	19.69		DOM	-9999	2517	22/10/1998	-9999	<Null>	14	22/10/1998	22/10/1998	21	21
662812037	276441.73	6131178.25	-9999	9.07			-9999	2299	30/11/1944	-9999	<Null>	-9999	<Null>	<Null>	8.53	8.53
662812046	274238.76	6132280.3	-9999	7.03			-9999	-9999	<Null>	-9999	<Null>	2	30/05/1984	30/05/1984	8	8
662812052	275606.67	6132338.11	-9999	8.73		DOM	8.2	1759	1/03/1994	-9999	<Null>	3.6	1/03/1994	1/03/1994	6	6
662812053	277778.75	6131250.3	-9999	14.56			-9999	2313	4/09/1934	-9999	<Null>	4.88	4/09/1934	<Null>	10.36	10.36
662812054	277580.15	6129546.96	-9999	19.36		DOM	-9999	1188	5/03/2001	1	5/03/2001	6.1	5/03/2001	5/03/2001	18	18
662812055	277612	6132071	-9999	12.78		DOM	-9999	1418	19/11/2001	1	19/11/2001	7	19/11/2001	19/11/2001	18	18
662812056	277921.69	6133175.23	-9999	16.93			-9999	3013	28/08/1914	-9999	<Null>	8.38	28/08/1914	<Null>	19.36	19.36
662812059	272908.75	6130376.29	3	6.738517	UKN		7.3	22408	11/11/1982	1.5	11/11/1982	3.3	11/11/1982	11/11/1982	6.6	6.6
662812062	278352.7	6129902.23	-9999	24.57			-9999	871	16/05/1983	0.6	10/05/1983	9.1	10/05/1983	10/05/1983	14.6	14.6
662812099	275983.69	6132609.32	8	13.8979			7.5	302	16/09/1975	0.3	16/09/1975	2.9	16/09/1975	16/04/1972	5	5
662812100	276433.71	6129476.24	-9999	11.82	OPR	DOM	7.4	1373	2/03/1984	0.4	2/03/1984	-9999	<Null>	2/03/1984	18	18
662812129	276372.17	6132114.98	-9999	9.2		DOM	-9999	1867	29/03/2001	0.8	29/03/2001	7.8	29/03/2001	29/03/2001	15	15
662812131	276265.74	6131045.29	-9999	8.54			-9999	2344	<Null>	-9999	<Null>	-9999	<Null>	<Null>	16.76	16.76
662812143	277246.82	6133388.33	-9999	14.42		DOM	6.7	1714	4/04/1996	-9999	<Null>	-9999	<Null>	4/04/1996	18	18
662812151	274231.77	6132093.32	-9999	6.02		DOM	-9999	-9999	<Null>	2	15/11/1995	-9999	<Null>	15/11/1995	12.5	12.5
662812154	276626.87	6129328.24	-9999	13.03		DOM	-9999	3396	8/12/1998	1	8/12/1998	6	8/12/1998	8/12/1998	18	18
662812182	276408.17	6133071.99	-9999	12.14		DOM	-9999	2681	13/04/2000	2	13/04/2000	7	13/04/2000	13/04/2000	17	17
662812277	278124.73	6132152.24	15	20.549519	OPR	DOM	8	1105	13/03/1985	1.25	13/03/1985	8	13/03/1985	13/03/1985	42	42
662812289	277576.89	6130723.26	-9999	14.62		DOM	-9999	1564	3/10/1997	-9999	<Null>	8.4	3/10/1997	3/10/1997	17	18
662812293	274601.79	6132813.18	8	12.725575			-9999	2030	17/09/1951	0.51	17/09/1951	5.18	17/09/1951	<Null>	11.58	11.58

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662812295	272592.7	6131656.25	3	9.886964	UKN		7.2	1021	7/02/1982	1.2	7/02/1982	2.1	7/02/1982	7/02/1982	6	6
662812296	278480.73	6130060.29	-9999	24.45	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	25/02/1983	20	20
662812306	276553.75	6131243.26	8	13.405418	OPR	DOM	7.7	2160	10/03/1985	2.5	10/03/1984	-9999	<Null>	10/03/1984	20	20
662812307	276490.76	6128442.25	-9999	12.05	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	1/03/1983	-9999	15
662812309	272945.76	6132243.24	5	9.484447	OPR	DOM	7.5	2938	11/03/1988	1	22/09/1987	2.4	11/03/1988	22/09/1987	9	9
662812312	272643.73	6131145.26	3	5.836808			7	6845	5/02/1968	1.26	5/02/1968	2.13	5/02/1968	<Null>	9.14	9.14
662812313	275993.76	6128152.23	-9999	8.95			6.8	12163	20/07/1982	-9999	<Null>	2.13	1/07/1982	1/07/1982	18.29	18.29
662812334	278251.19	6132906.35	-9999	17.21			-9999	2448	24/01/2006	2.5	24/01/2006	12	24/01/2006	24/01/2006	36	36
662812338	278027.73	6130281.26	20	26.987401	OPR	DOM	8	1177	10/07/1985	1	<Null>	7.7	27/02/1985	27/02/1985	18.5	18.5
662812339	274806.17	6133104.02	-9999	10.13		DOM	-9999	1591	21/11/2000	0.8	21/11/2000	6	21/11/2000	21/11/2000	14	16
662812345	274921.51	6128641.8	-9999	4.83	BKF		-9999	11098	18/01/2007	1.5	18/01/2007	-9999	<Null>	18/01/2007	0	10
662812346	274025.71	6132962.23	8	11.734851	OPR	DOM	7.5	2426	29/03/1985	0.5	29/03/1985	2	29/03/1985	29/03/1985	10	10
662812359	276851.95	6130023.26	-9999	13.86		DOM	-9999	827	28/01/1997	-9999	<Null>	6.8	28/01/1997	28/01/1997	14	14
662812361	275227.7	6132102.24	-9999	8.55			-9999	2084	18/08/1934	-9999	<Null>	7.32	18/08/1934	<Null>	9.45	9.45
662812363	276231.69	6128156.29	-9999	10.15	OPR	DOM	7.4	4049	12/04/1989	-9999	<Null>	8	12/04/1989	1/01/1989	11	11
662812366	276692.72	6132355.3	-9999	10.75			-9999	2159	26/09/1949	7.58	1/01/1949	-9999	<Null>	1/01/1932	39.62	39.62
662812372	278056.75	6130369.21	-9999	20.18			-9999	971	21/10/1914	-9999	<Null>	-9999	<Null>	<Null>	42.7	42.7
662812376	276616.82	6128563.44	-9999	12.9		DOM	-9999	9574	28/12/1996	-9999	<Null>	4.5	28/12/1996	28/12/1996	15	15
662812386	275936.77	6132729.27	9	12.352373			5.9	938	13/09/1983	1.6	13/09/1983	1.8	13/09/1983	13/09/1983	7.3	7.3
662812471	276596.83	6131578.31	-9999	8.98		DOM	-9999	2036	23/02/1998	-9999	<Null>	4.5	23/02/1998	23/02/1998	13.5	13.5
662812477	273716	6131658	-9999	4.94		DOM	-9999	1027	6/02/2002	1	6/02/2002	2.8	6/02/2002	6/02/2002	7	7
662812479	278206.9	6132408.3	-9999	15.88		DOM	-9999	1867	29/11/1997	0.5	29/11/1997	10	29/11/1997	29/11/1997	30	30
662812483	278161.74	6129498.23	-9999	22.77			-9999	1385	29/09/1934	-9999	<Null>	-9999	<Null>	<Null>	7.62	7.62
662812486	277286.59	6129698.34	-9999	16.85		DOM	6.8	977	24/11/1994	-9999	<Null>	-9999	<Null>	24/11/1994	15	15.5
662812488	276681.74	6130088.14	-9999	12.66		DOM	7	1172	3/05/1993	-9999	<Null>	-9999	<Null>	15/04/1993	24	24
662812531	274006.69	6127825.25	-9999	5			7.9	1027	26/03/1974	-9999	<Null>	-9999	<Null>	<Null>	2.44	2.44
662812537	276602.71	6131151.22	9	13.338366			7	2615	30/01/1968	0.3	30/01/1968	3.96	30/01/1968	<Null>	6.1	6.1

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662812562	279065.75	6130731.23	-9999	28.07			-9999	2199	6/02/1935	-9999	<Null>	-9999	<Null>	<Null>	12.8	12.8
662812664	274251.19	6132402.03	-9999	7.64		DOM	-9999	2380	31/01/2001	1.5	31/01/2001	5.2	31/01/2001	31/01/2001	12	12
662812800	275104.76	6132547.31	8	14.752134			7	408	23/12/1971	2.53	23/12/1971	6.1	23/12/1971	1/01/1968	7.62	7.62
662812804	275891.74	6132716.29	-9999	10.02			-9999	871	13/07/1934	-9999	<Null>	3.05	13/07/1934	<Null>	18.29	18.29
662812822	277569.11	6131133.04	-9999	12.71		DOM	7.4	1680	23/02/2005	1	29/09/2000	7	29/09/2000	29/09/2000	19.5	19.5
662812829	277603.77	6128440.27	-9999	19.69			7.2	4640	21/02/1979	0.13	26/02/1979	4	26/02/1979	26/02/1979	12	12
662812855	277291.85	6129838.21	-9999	16.88		DOM	7.3	523	19/12/1995	1	19/12/1995	-9999	<Null>	19/12/1995	18	18
662812930	273682.72	6131603.31	-9999	4.92	OPR	DOM	7.8	933	20/09/1991	1	20/09/1991	3.5	20/09/1991	20/09/1991	9	9
662812956	276166.74	6129883.27	-9999	10.21			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	1/10/1983	6	6
662812962	276490.72	6133669.22	-9999	10.52			-9999	1501	24/11/1961	-9999	<Null>	7.32	24/11/1961	<Null>	38.71	38.71
662812970	275553.7	6133299.27	-9999	10			-9999	-9999	<Null>	10.1	1/01/1950	12.19	1/01/1950	<Null>	30.48	30.48
662812974	273506.88	6131543.23	-9999	4.96		DOM	-9999	1524	21/09/1998	-9999	<Null>	2.5	21/09/1998	21/09/1998	12	12
662812978	278027.7	6132699.3	-9999	15.47			-9999	2259	15/10/1914	-9999	<Null>	-9999	<Null>	<Null>	9.14	9.14
662812982	277466.9	6129593.3	-9999	18.46		DOM	-9999	440	18/03/1998	-9999	<Null>	10.5	18/03/1998	18/03/1998	24	24
662812994	278281.92	6132628.23	-9999	16.79		DOM	7	1524	24/05/1995	-9999	<Null>	-9999	<Null>	24/05/1995	18	18
662812995	277250.74	6132819.24	-9999	13.79			-9999	1530	11/08/1934	-9999	<Null>	3.66	11/08/1934	<Null>	8.53	8.53
662812997	275894.75	6131413.25	-9999	7.19			8	1479	1/11/1983	-9999	<Null>	2	28/10/1983	28/10/1983	8	8
662813027	276815.42	6132645.15	-9999	11.72			-9999	1867	23/08/2007	1	23/08/2007	6.6	23/08/2007	23/08/2007	12	12
662813040	274881.63	6128008.29	-9999	5.67		DOM	6.7	8899	25/10/1994	-9999	<Null>	-9999	<Null>	25/10/1994	16.5	16.5
662813056	275471.74	6133245.31	11	15.207204	OPR	DOM	7.5	1973	23/02/1983	1	23/02/1983	5.1	23/02/1983	<Null>	-9999	16.7
662813064	272611.56	6132798.09	-9999	5	RHB	DOM	-9999	3443	22/01/2004	-9999	<Null>	-9999	<Null>	7/11/2003	8.5	14
662813070	274571.35	6131676.29	-9999	12.533889	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	0	10
662813081	275290.77	6133057.27	10	12.288624			7.5	1770	17/02/1969	1.89	17/02/1969	5.18	17/02/1969	<Null>	22.86	22.86
662813115	275866.89	6132898.27	-9999	10.43		DOM	-9999	2601	<Null>	1	3/01/1997	6.5	3/01/1997	3/01/1997	18	18
662813125	277226.78	6132898.24	-9999	13.75		DOM	7.1	2025	12/11/1994	1	12/11/1994	-9999	<Null>	12/11/1994	22.5	22.5
662813191	276926.89	6132798.24	-9999	12.16		DOM	-9999	1546	18/01/1998	-9999	<Null>	6	18/01/1998	18/01/1998	12	12
662813192	276452.69	6130988.27	-9999	9.19			-9999	2156	25/05/1937	-9999	<Null>	3.05	25/05/1937	<Null>	9.14	9.14

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662813221	274559.03	6128083.79	-9999	5.03	BKF	DOM	-9999	6389	19/10/2001	-9999	<Null>	2.4	19/10/2001	19/10/2001	0	10
662813228	275647.72	6133346.31	-9999	10.01			-9999	1430	1/01/1950	11.37	1/01/1950	10.67	1/01/1950	<Null>	36.58	36.58
662813232	276770.75	6132693.31	-9999	11.39			7.7	628	7/08/1975	-9999	<Null>	3.2	7/08/1975	<Null>	3.7	3.7
662813237	277180.77	6129619.28	16	21			7	1320	14/11/1967	3.79	14/11/1967	4.88	14/11/1967	<Null>	8.84	8.84
662813241	273111.65	6131483.13	-9999	4.99		DOM	7	1906	10/02/1995	0.75	10/02/1995	-9999	<Null>	10/02/1995	6	6
662813264	278146.95	6132163.1	-9999	15.24		DOM	7.1	1384	26/05/1995	-9999	<Null>	11.1	26/05/1995	26/05/1995	18	18
662813271	278280.71	6129852.31	-9999	24.32	OPR	DOM	7.5	517	24/01/1983	1	24/01/1983	5.7	24/01/1983	24/01/1983	-9999	13.7
662813273	274936.88	6131818.13	-9999	6.83		DOM	7.6	2510	19/10/1995	2	19/10/1995	-9999	<Null>	19/10/1995	16	16
662813274	275954.71	6132918.29	-9999	10.65			-9999	2399	30/11/1944	-9999	<Null>	-9999	<Null>	<Null>	6.1	6.1
662813275	274021.71	6127680.21	-9999	4.9	BKF		-9999	-9999	<Null>	-9999	<Null>	1.8	13/09/1983	13/09/1983	7.9	7.9
662813287	275901.88	6132903.12	-9999	10.49		DOM	7.1	2488	3/01/1995	-9999	<Null>	-9999	<Null>	3/01/1995	10.5	15
662813293	277511.61	6132933.27	-9999	15.09		DOM	7.1	2132	13/12/1994	-9999	<Null>	-9999	<Null>	13/12/1994	15	15
662813316	272911.82	6132453.41	-9999	5		DOM	7.2	2688	10/11/1992	-9999	<Null>	11	10/11/1992	7/11/1992	11.5	11.5
662813363	276659.76	6130450.46	-9999	18.014181			-9999	-9999	<Null>	-9999	<Null>	5.3	19/01/2015	19/01/2015	9	9
662813394	278226.85	6132573.28	-9999	16.34		DOM	7.1	1239	25/05/1995	-9999	<Null>	11.4	25/05/1995	25/05/1995	18	18
662813395	274177.6	6132290.15	-9999	7.18		DOM	-9999	860	24/08/2003	2	24/08/2003	4.9	24/08/2003	24/08/2003	14	14
662813397	272456.72	6131863.32	-9999	4.2		DOM	6.8	3145	4/01/1995	-9999	<Null>	-9999	<Null>	4/01/1995	7.8	7.8
662813435	278251.7	6134204.29	-9999	15.36			-9999	1170	15/02/1949	7.33	15/02/1949	12.04	15/02/1949	15/02/1949	27.61	27.61
662813438	272837.76	6131605.3	-9999	4.98			8.2	1455	5/12/1967	-9999	<Null>	-9999	<Null>	<Null>	3.05	3.05
662813452	278009	6132808	-9999	16.04		DOM	7	2025	21/01/1996	0.5	21/01/1996	-9999	<Null>	21/01/1996	24	24
662813486	276166.76	6131108.24	-9999	8.2			7	1830	27/11/1967	-9999	<Null>	2.13	27/11/1967	<Null>	4.88	4.88
662813522	275659.7	6128642.28	-9999	7.34			7.3	5181	9/05/1988	0.95	26/02/1988	3	9/05/1988	26/02/1988	11	11
662813540	277276.18	6133945.87	-9999	25.068983	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	23/10/2014	0	25
662813564	276147.77	6130822.82	-9999	8.76		DOM	-9999	2069	15/07/2004	1.5	15/07/2004	-9999	<Null>	15/07/2004	25	25
662813571	273291.73	6132447.31	-9999	4.98			-9999	4290	2/03/1961	-9999	<Null>	1.83	2/03/1961	<Null>	2.59	2.59
662813575	277956.82	6132253.16	-9999	14.26		DOM	7.5	1591	28/12/1994	-9999	<Null>	-9999	<Null>	28/12/1994	16.5	16.5
662813590	273723.76	6132566.25	-9999	5.1	OPR	DOM	-9999	-9999	<Null>	-9999	<Null>	0	<Null>	9/02/1992	10	10

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662813591	272539.74	6132134.24	-9999	5			6.7	3137	16/01/1983	-9999	<Null>	-9999	<Null>	16/01/1983	8.23	8.23
662813607	275207.29	6132580.47	-9999	10.06			-9999	2036	11/09/2007	1	11/09/2007	4	11/09/2007	11/09/2007	10	10.5
662813621	274816.89	6128328.25	-9999	4.93		DOM	7.1	7924	6/09/1996	1	6/09/1996	-9999	<Null>	6/09/1996	12	12
662813630	275647.73	6133256.29	11	8.026464			-9999	-9999	<Null>	10.1	1/01/1950	3.05	1/01/1950	<Null>	10.97	10.97
662813639	277340.77	6131264.27	-9999	11.43			8	2372	23/10/1973	-9999	<Null>	2.74	22/10/1973	<Null>	4.88	4.88
662813718	277568.74	6129629.3	-9999	18.99		DRN	7.8	1121	20/08/1986	-9999	<Null>	6.1	20/08/1986	1/07/1986	41.6	41.6
662813722	273634.17	6131680.03	-9999	4.95		DOM	-9999	1116	25/04/2001	-9999	<Null>	1.86	25/04/2001	25/04/2001	4	4
662813723	275936.9	6132448.22	-9999	9.22		IRR	-9999	-9999	<Null>	-9999	<Null>	4.5	19/12/1997	19/12/1997	8	8
662813726	276106.99	6129603.2	-9999	10.1		DOM	-9999	-9999	<Null>	-9999	<Null>	5	14/04/1996	14/04/1996	9	9
662813826	275326.83	6127903.27	-9999	7.28	OPR	DOM	-9999	6332	19/04/1997	1	26/04/1997	6	26/04/1997	26/04/1997	22	22
662813828	273185.7	6131523.27	4	10.672813			8	1861	30/09/1982	0.7	30/09/1982	1.8	30/09/1982	30/09/1982	5.1	5.1
662813846	277001.83	6133518.22	-9999	13.15		DOM	-9999	1788	18/01/1999	1	18/01/1999	10	18/01/1999	18/01/1999	18	20
662813848	278603.08	6133247.08	-9999	19.89			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	6/01/2005	20	20
662813849	277831	6133940	-9999	19.510313			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	12/08/2013	16	16
662813853	277081.75	6129393.31	-9999	15.41			-9999	-9999	<Null>	-9999	<Null>	6	1/04/1985	1/04/1985	9.5	9.5
662813863	275403.69	6132354.32	8	11.729623			7.2	2171	8/03/1983	1.5	8/03/1983	3.04	8/03/1983	8/03/1983	9.1	9.1
662813864	277761.72	6131653.36	-9999	13.24		DOM	8.2	955	31/01/1994	2.5	24/01/1994	-9999	<Null>	24/01/1994	14	14
662813868	275686.72	6129208.26	-9999	5.72			7	2030	8/11/1967	0	8/11/1967	4.62	8/11/1967	<Null>	4.72	4.72
662813899	272966.91	6131543.25	-9999	5		DOM	-9999	2352	23/05/1997	0.76	23/05/1997	2.6	23/05/1997	23/05/1997	5.7	5.7
662813909	272617.7	6131030.28	3	7.07368			9.5	994	13/05/1982	1.25	13/05/1982	1.8	13/05/1982	13/05/1982	6	6
662813912	276026.83	6131428.25	-9999	7.57		DOM	-9999	1939	3/03/1997	1	3/03/1997	7.3	3/03/1997	3/03/1997	20	20
662813913	276797.73	6130775.27	10	16.313012			7.6	2727	2/04/1987	0.3	1/02/1987	4	2/04/1987	1/02/1976	11	11
662813924	274952.76	6132260.3	-9999	8.55	OPR	DOM	7.6	1912	18/09/1990	-9999	<Null>	7	16/05/1990	18/04/1990	14	14
662813941	276684.07	6128801.81	-9999	13.41		DOM	-9999	1867	27/07/2002	0.5	27/07/2002	15	27/07/2002	27/07/2002	29	29
662813957	276222.73	6132162.31	-9999	8.87			6.5	1955	23/09/1968	-9999	<Null>	-9999	<Null>	<Null>	7.32	7.32
662813965	276306.84	6132128.41	-9999	9.05		DOM	7.2	1872	10/07/1995	-9999	<Null>	-9999	<Null>	10/07/1995	12	12
662814039	272923.75	6130412.3	2	7.9064	OPR	DOM	7.3	12163	19/10/1988	0.5	5/07/1988	3	19/10/1988	5/07/1988	12	12

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662814040	278127.47	6133988	17.59	17.66	OPR	OBS	7.6	1620	22/10/1987	0	22/10/1987	13.08	13/09/2018	22/10/1987	112.6	112.6
662814041	275990.1	6131420	-9999	7.47		DOM	-9999	1614	13/08/2001	-9999	<Null>	4.5	1/07/2001	1/07/2001	8.84	8.84
662814045	272745.75	6130939.23	-9999	5			7.9	2290	5/03/1984	-9999	<Null>	2.25	7/03/1984	7/03/1984	4.2	4.2
662814057	276886.85	6132978.07	-9999	12.85		DOM	7.1	2103	9/01/1996	-9999	<Null>	-9999	<Null>	9/01/1996	18	18
662814098	278450.71	6132291.24	-9999	17.64		STK	7.3	2019	9/05/1988	0.98	4/12/1987	8.5	9/05/1988	4/12/1987	20.1	20.1
662814099	273669.69	6132719.31	6	11.469927	OPR	DOM	7.4	1133	20/10/1989	1.2	<Null>	4.1	20/10/1989	<Null>	11.2	11.2
662814100	277876.8	6132348.33	-9999	14.02		DOM	7.1	1726	15/07/1994	-9999	<Null>	-9999	<Null>	7/06/1994	15.5	15.5
662814185	276355.71	6131995.3	8	10.327612			7.5	1984	24/03/1986	1.2	28/03/1986	3	16/04/1986	28/03/1986	9.1	9.1
662814192	274971.9	6132418.28	-9999	8.86		DOM	-9999	2301	7/02/1998	0.5	20/12/1997	4.5	20/12/1997	20/12/1997	13	22
662814242	275067.72	6128169.28	-9999	5.81	OPR	DOM	7.5	5946	9/03/1992	-9999	<Null>	3	9/03/1992	22/02/1992	12	12
662814278	278684.7	6130464.27	-9999	24.13			-9999	3446	5/11/1934	-9999	<Null>	2.13	5/11/1934	1/01/1934	13.41	13.41
662814333	277081.89	6130528.26	-9999	14.03		DOM	-9999	1474	1/01/1999	-9999	<Null>	7.5	8/01/1999	8/01/1999	15	15
662814345	277821.69	6133396.23	-9999	17	OPR	DOM	7.5	1934	10/04/1989	-9999	<Null>	10.8	10/04/1989	1/02/1989	12	12
662814350	278155.72	6132152.21	16	20.925894	OPR	DOM	-9999	-9999	<Null>	1.25	<Null>	6.1	15/03/1985	15/03/1985	12.8	12.8
662814355	276304.69	6132895.24	-9999	11.23			-9999	3117	20/07/1934	-9999	<Null>	-9999	<Null>	20/07/1934	12.19	12.19
662814356	272446.76	6130327.27	3	7.992535			7.6	371	17/11/1987	1	25/09/1987	1.8	17/11/1987	25/09/1987	5.1	5.1
662814357	276406.83	6131528.26	-9999	8.57		DOM	-9999	999	11/05/1999	1	11/05/1999	5.4	11/05/1999	11/05/1999	12	12
662814359	274856.9	6132533.32	-9999	7.67		DOM	-9999	2132	30/01/1999	1	30/01/1999	4.5	30/01/1999	30/01/1999	14	14
662814395	274811.66	6133118.39	-9999	10.1			7.1	994	24/09/1993	0.303	24/09/1993	-9999	<Null>	24/09/1993	8	8
662814396	274591.77	6132856.23	8	11.831243			-9999	2575	16/01/1952	0.61	16/01/1952	5.18	16/01/1952	<Null>	-9999	7.62
662814409	273541.87	6132498.25	-9999	5		DOM	-9999	1423	19/12/1997	-9999	<Null>	3.3	19/12/1997	19/12/1997	12	12
662814411	275861.15	6132897.98	-9999	10.43		DOM	-9999	2177	23/12/2000	1	23/12/2000	5.4	23/12/2000	<Null>	12	15
662814432	274896.84	6128158.29	-9999	5.37		DOM	-9999	6925	14/01/1999	1	15/01/1999	2	15/01/1999	15/01/1999	12	12
662814502	277138.77	6129872.21	-9999	15.58	OPR	DOM	7.5	547	25/10/1982	4	25/10/1982	6	25/10/1982	25/10/1982	18.2	18.2
662814503	276324.73	6128021.27	-9999	10.71	OPR	DOM	7.2	5298	22/11/1991	-9999	<Null>	4.5	22/11/1991	22/11/1991	20	20
662814508	273439.71	6131741.25	4	9.30954	OPR	DOM	6.9	1117	4/04/1985	1	4/04/1985	2.1	4/04/1985	4/04/1985	5.18	5.18
662814635	277382.76	6131390.28	-9999	11.91			7.6	1586	10/09/1974	-9999	<Null>	4.57	10/09/1974	<Null>	6.1	6.1

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662814769	278421.89	6133053.3	-9999	18.56		DOM	-9999	1839	9/03/1999	1	9/03/1999	14.4	9/03/1999	9/03/1999	24	24
662814965	278573.7	6134322.32	20	25.864159			7.24	2499	28/09/2016	3.79	1/01/1914	-9999	<Null>	1/01/1914	18.29	18.29
662814970	276859.69	6132705.25	11	14.596527			-9999	3031	4/10/1949	1.26	4/10/1949	3.96	4/10/1949	<Null>	7.32	7.32
662814971	274390.74	6132748.26	-9999	8.13			-9999	2845	23/10/1941	-9999	<Null>	3.66	23/10/1941	<Null>	17.37	17.37
662815112	274066.69	6132314.19	8	13.378232	OPR	DOM	7.3	1845	15/11/1982	1	15/11/1982	3.6	15/11/1982	15/11/1982	8.2	8.2
662815120	273156.37	6132463.58	-9999	4.99	BKF	IRR	-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	30/09/2002	0	20
662815121	278116.91	6132278.25	-9999	15	ABD	DOM	7.1	1105	27/05/1995	-9999	<Null>	9.9	27/05/1995	27/05/1995	0	18
662815141	276239.73	6130816.22	7	13.065165	OPR	DOM	-9999	-9999	<Null>	1.5	21/11/1983	2	21/11/1983	21/11/1983	13	13
662815193	277227.7	6133040.23	13	16.857136	OPR	DOM	7.4	1832	5/09/1983	0.5	18/08/1983	6.5	18/08/1983	18/08/1983	10	10
662815198	278081.87	6132268.18	-9999	14.86		DOM	6.9	1440	26/05/1995	-9999	<Null>	11	26/05/1995	26/05/1995	18	18
662815200	273072.18	6130804.06	-9999	4.81		DOM	-9999	3597	8/06/2000	-9999	<Null>	3	8/06/2000	8/06/2000	5	5
662815204	276101.88	6129208.25	-9999	10.34		DOM	-9999	3246	25/01/1999	1	25/01/1999	4.5	25/01/1999	25/01/1999	18	18
662815235	275726.75	6129208.25	-9999	6.13			8	1928	19/03/1986	-9999	<Null>	3.24	16/06/1986	1/12/1985	-9999	8
662815262	273671.36	6133017.09	-9999	5.25			-9999	1923	22/02/2008	1	22/02/2008	5.7	22/02/2008	22/02/2008	27	27
662815384	275772.72	6129717.31	-9999	6.32			7.8	991	17/11/1987	1.2	3/10/1987	2.7	17/11/1987	3/10/1987	9	9
662815386	277106.66	6128628.37	-9999	16.11		DOM	6.6	13623	30/03/1994	-9999	<Null>	-9999	<Null>	15/03/1994	24	24
662815392	274002	6131551	4	8.664378	OPR	IRR	7.6	2216	16/01/1985	0.25	16/01/1985	3	16/01/1985	16/01/1985	9.1	9.1
662815401	276581.63	6129843.27	-9999	12.45		DOM	7.3	1429	7/01/1995	-9999	<Null>	-9999	<Null>	7/01/1995	23.5	23.5
662815402	276276.71	6129968.1	-9999	10.78		DOM	7.3	1362	17/10/1994	-9999	<Null>	-9999	<Null>	17/10/1994	16.5	16.5
662815416	278745.69	6130406.34	-9999	28.340454			-9999	-9999	<Null>	-9999	<Null>	14.6	17/02/2016	17/02/2016	19	19
662815440	273142.69	6130510.32	3	7.472436	OPR	DOM	7.3	13099	15/11/1978	0.75	15/11/1978	3	15/11/1978	15/11/1978	9.5	9.5
662815503	275731.55	6128888.13	-9999	6.54		DOM	-9999	4280	28/05/2003	1.3	28/05/2003	4	28/05/2003	28/05/2003	15	15
662815506	275786.18	6132614.98	-9999	9.77		DOM	-9999	2454	29/01/2000	0.5	29/01/2000	10	29/01/2000	29/01/2000	30	30
662815510	277521.63	6131888.26	-9999	12.43		DOM	8.3	1440	2/01/1995	-9999	<Null>	-9999	<Null>	2/01/1995	14	14
662815525	273721.85	6132783.43	-9999	5.32		DOM	7.4	1396	17/11/1996	-9999	<Null>	4.1	17/11/1996	17/11/1996	8.3	8.3
662815605	278091.72	6132333.13	-9999	14.99		DOM	7.4	1440	3/10/1995	-9999	<Null>	10.2	3/10/1995	3/10/1995	18	18
662815608	272911.72	6130936.25	-9999	4.95	OPR	DOM	7.4	4783	20/09/1991	1	7/09/1991	2.1	20/09/1991	7/09/1991	5.8	5.8

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662815609	277547.72	6133151.26	15	19.98858			-9999	2126	26/06/1983	0.25	1/06/1983	9.1	1/06/1983	1/06/1983	11.6	11.6
662815610	276932.12	6132342.01	-9999	11.33		DOM	-9999	1726	27/12/2000	1	27/12/2000	6	27/12/2000	27/12/2000	16	18
662815631	276566.84	6131373.23	-9999	9.31		DOM	-9999	2329	3/12/1998	-9999	<Null>	5	3/12/1998	3/12/1998	13.5	13.5
662815632	277801.74	6132803.36	-9999	15.69		DOM	7.4	2177	28/03/1995	-9999	<Null>	-9999	<Null>	28/03/1995	18	18
662815633	276191.8	6129383.28	-9999	10.83		DOM	7.1	1804	23/01/1996	-9999	<Null>	-9999	<Null>	23/01/1996	20	20
662815714	278115.75	6133432.24	-9999	18.17			7.2	2443	15/01/1985	-9999	<Null>	3	15/01/1985	15/01/1985	14	14
662815715	276991.83	6132153.27	-9999	11.01		DOM	-9999	1698	10/06/1997	0.8	10/06/1997	5	10/06/1997	10/06/1997	12	12
662815731	272371.96	6132278.35	-9999	5		DOM	6.6	4980	7/02/1996	1	7/02/1996	-9999	<Null>	7/02/1996	12	12
662815733	273902.74	6131563.25	4	9.475567	OPR	DOM	7.6	1697	8/05/1989	1.2	5/04/1989	2.1	8/05/1989	5/04/1989	12	12
662815734	274791.91	6127638.22	-9999	6.92		DOM	-9999	4031	20/11/1999	-9999	<Null>	3	15/09/1999	15/09/1999	12	12
662815738	278679.69	6130561.27	-9999	23.01	BKF		-9999	-9999	<Null>	-9999	<Null>	10.8	24/01/1984	24/01/1984	16.5	16.5
662815794	276054.73	6129312.21	-9999	10.23			7.8	1284	10/12/1985	1.25	10/12/1985	4.12	16/06/1986	10/12/1985	-9999	12.2
662815796	272562.76	6131665.28	3	10.74724	OPR	DOM	7.3	1149	3/09/1982	1	3/09/1982	2	3/09/1982	3/09/1982	6	6
662815803	277791.66	6132778.14	-9999	15.53		DOM	7	1984	6/02/1995	-9999	<Null>	-9999	<Null>	6/02/1995	15	15
662815826	277429.14	6131857.98	-9999	11.97		DOM	-9999	1642	15/04/1998	0.4	15/04/1998	7.5	15/04/1998	15/04/1998	18	18
662815857	272800.72	6132568.31	23.62	23.68	BKF		7.5	2482	3/07/1983	-9999	<Null>	-9999	<Null>	<Null>	0	5
662815859	277253.77	6130683.3	-9999	14.36	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	19/08/1986	0	-9999
662815862	276171.75	6133608.47	-9999	10.51		DOM	6.7	1222	29/11/1994	-9999	<Null>	-9999	<Null>	29/11/1994	20.5	20.5
662815873	278865	6130940	-9999	24.26		IRR	-9999	-9999	<Null>	0.375	17/06/2004	22.5	17/06/2004	17/06/2004	44	44
662815890	275074.7	6131678.23	5	9.862651	OPR	DOM	7.8	2426	28/11/1989	2.1	15/11/1989	2.3	28/11/1989	15/11/1989	12	12
662815901	273012.76	6131747.29	4	11.497067	OPR	DOM	-9999	6692	25/01/1990	0.2	4/12/1989	3	25/01/1990	4/12/1989	6	6
662815916	277200.7	6130109.26	16	20	OPR	DOM	7.3	1067	9/01/1985	0.5	9/01/1985	6	9/01/1985	9/01/1985	20	20
662815918	277927.73	6129099.27	-9999	21.26			-9999	3945	17/07/1945	-9999	<Null>	6.4	17/07/1945	<Null>	10.67	10.67
662815924	276750.7	6129369.23	-9999	13.67	OPR	DOM	7.5	4309	14/05/1992	1.2	7/05/1992	5	14/05/1992	7/05/1992	15.4	15.4
662815926	277806.84	6130228.16	-9999	19.26		DOM	7.2	1266	23/02/1993	-9999	<Null>	-9999	<Null>	10/02/1993	24	24
662815928	277817.72	6130438.32	18	23.338431	OPR	DOM	7.4	1832	12/08/1988	0.2	1/07/1988	5.3	12/08/1988	1/07/1988	12	12
662815941	275732.71	6131989.23	7	13			6.7	3250	5/10/1965	1.26	5/10/1965	2.44	5/10/1965	<Null>	9.14	9.14

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662815943	277395.72	6128327.31	-9999	18.61	OPR	DOM	7.2	5422	24/10/1992	0.75	24/10/1992	3.2	24/10/1992	24/10/1992	13.1	13.1
662815944	278151.86	6132168.1	-9999	15.28		DOM	7.2	1278	27/05/1995	0.3157	27/05/1995	11.1	27/05/1995	27/05/1995	18	18
662815955	278422.69	6130749.27	-9999	19.41			-9999	3003	30/10/1931	-9999	<Null>	8.53	30/10/1931	1/10/1931	-9999	20.42
662815956	274934.69	6133149.28	-9999	10.05			8	2966	17/08/1970	-9999	<Null>	-9999	<Null>	<Null>	-9999	9.14
662815994	275103.77	6132550.28	8	14.741646			7	408	23/12/1971	2.53	23/12/1971	6.1	23/12/1971	<Null>	7.62	7.62
662816008	275317.68	6132279.28	-9999	9.5			7.3	1804	7/02/1985	-9999	<Null>	-9999	<Null>	<Null>	6.1	6.1
662816017	276546.76	6129308.18	-9999	12.59		DOM	7	1945	5/04/1994	-9999	<Null>	4.6	12/04/1994	12/04/1994	20	20
662816050	273608.7	6132922.26	-9999	5.3	OPR	DOM	7.1	2493	29/10/1992	1	23/10/1992	4	29/10/1992	23/10/1992	12	12
662816051	274855.73	6127721.27	-9999	6.69	OPR	DOM	7.8	5994	6/02/1989	1.2	21/01/1988	2.2	6/02/1989	21/01/1988	9.1	9.1
662816079	276624.66	6130977.88	-9999	9.84		DOM	-9999	1423	13/12/2001	-9999	<Null>	9	13/12/2000	13/12/2000	29	29
662816080	275275.74	6132308.21	7	12			-9999	2598	13/08/1934	12.63	1/01/1934	-9999	<Null>	<Null>	10.67	10.67
662816149	274751.32	6127354.32	-9999	6.44			-9999	-9999	<Null>	0.3	24/02/2008	5.6	24/02/2008	24/02/2008	10	12
662816169	277786.71	6129580.23	-9999	20.6	OPR	DOM	-9999	-9999	<Null>	-9999	<Null>	9	1/06/1991	1/06/1991	11	11
662816170	273771.91	6132903.33	-9999	6.05		DOM	7.2	2075	28/06/1995	2.5	28/06/1995	-9999	<Null>	28/06/1995	14	14
662816176	277260.77	6132063.27	11	15.62219			7.9	1889	1/11/1983	0.1	1/08/1983	4.6	1/08/1983	1/08/1983	12.5	12.5
662816177	277163.74	6132293.22	-9999	12.13			-9999	2330	7/10/1914	-9999	<Null>	-9999	<Null>	<Null>	9.14	9.14
662816178	274322.76	6132817.28	-9999	7.78	OPR	DOM	7.3	2008	10/12/1991	1.2	10/12/1991	4	10/12/1991	10/12/1991	12	12
662816180	273190.77	6131584.22	4	8.86087	OPR	DOM	7.2	1687	24/09/1982	0.8	24/09/1982	1.9	24/09/1982	24/09/1982	6	6
662816187	275968.98	6131467.09	-9999	7.32			-9999	1895	24/02/1997	-9999	<Null>	-9999	<Null>	<Null>	8	8
662816239	277036.85	6128258.27	-9999	16.21		DOM	-9999	5880	15/11/1997	0.5	15/11/1997	9	15/11/1997	15/11/1997	30	30
662816330	272769.14	6132476.95	-9999	5		DOM	-9999	3098	12/09/2000	-9999	<Null>	2.7	12/09/2000	12/09/2000	12	12
662816331	274835.72	6131809.31	6	10.984117			-9999	1601	26/10/1959	2.53	26/10/1959	3.05	26/10/1959	<Null>	12.8	12.8
662816332	279005	6130791	-9999	26.61	ABD	IRR	-9999	1939	17/06/2004	-9999	<Null>	-9999	<Null>	15/06/2004	0	50
662816335	273798.76	6133122.22	-9999	5.27			7	770	2/11/1967	-9999	<Null>	3.35	8/11/1967	<Null>	7.62	7.62
662816336	273694.23	6132656.99	-9999	5.09		DOM	-9999	1519	8/04/2002	1	8/04/2002	4	8/04/2002	8/04/2002	13.5	13.5
662816337	276081.72	6131523.17	-9999	7.55		DOM	7.3	927	3/08/1994	4	3/08/1994	-9999	<Null>	3/08/1994	12	12
662816338	277178	6131028	-9999	12.79		DOM	7.3	807	30/04/2012	-9999	<Null>	-9999	<Null>	21/12/1992	15	15

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662816339	277551.9	6133013.28	-9999	15.41		DOM	-9999	1962	22/04/1997	-9999	<Null>	10.5	22/04/1997	22/04/1997	15	18
662816340	275659.74	6131867.23	-9999	7.17			-9999	4012	22/10/1946	-9999	<Null>	3.05	22/10/1946	<Null>	15.24	15.24
662816341	275208.16	6132732.97	-9999	10.14		DOM	-9999	1995	27/02/2000	1	27/02/2000	7.8	27/02/2000	27/02/2000	15	15
662816342	272617.73	6131719.26	-9999	4.05	OPR	DOM	7.9	1484	24/03/1992	-9999	<Null>	1.8	24/03/1992	6/03/1992	6.8	6.8
662816344	278359.58	6133570.3	-9999	18.87		IND	-9999	1535	14/04/2002	2.5	14/04/2002	14	14/04/2002	14/04/2002	28.5	30
662816345	273746.92	6132273.45	-9999	5.2		DOM	-9999	2613	<Null>	2	2/01/1997	4.9	2/01/1997	2/01/1997	18	18
662816383	277188.18	6130341.01	-9999	15.19		DOM	-9999	1883	1/11/2000	-9999	<Null>	9	1/11/2000	1/11/2000	20	20
662816451	275728.74	6132139.31	-9999	8.17			7.4	2301	5/03/1985	-9999	<Null>	3.5	4/03/1985	4/03/1985	5.6	5.6
662816477	276429.7	6133222.3	-9999	12.33			-9999	-9999	<Null>	-9999	<Null>	5.33	29/11/1955	<Null>	10.06	10.06
662816509	273591.91	6131498.16	-9999	4.93		DOM	7.2	2132	17/01/1996	2	17/01/1996	-9999	<Null>	17/01/1996	12	12
662816524	276619.72	6131259.3	8	14.999713			-9999	-9999	<Null>	0.63	20/01/1987	0	20/01/1987	1/01/1987	10	10
662816540	275486.62	6132108.28	-9999	8.17		DOM	7.1	2267	30/03/1994	-9999	<Null>	-9999	<Null>	11/03/1994	15	15
662816554	274624.76	6132360.32	-9999	6.68			-9999	2387	7/06/1949	-9999	<Null>	3.05	7/06/1949	<Null>	-9999	12.19
662816598	274041.72	6133113.25	8	12.616527			-9999	2199	16/03/1936	6.32	16/03/1936	4.57	16/03/1936	<Null>	8.23	8.23
662816599	273362.43	6132533.55	-9999	4.98			-9999	1878	18/01/2007	1.5	18/01/2007	4.1	18/01/2007	18/01/2007	10	10
662816600	277348.97	6129955.74	-9999	16.92		IRR	-9999	816	7/02/2002	0.8	7/02/2002	7	7/02/2002	7/02/2002	21	24
662816616	272774.73	6130645.24	3	8.398243			7.3	2273	31/07/1985	1	<Null>	1.8	31/07/1985	31/07/1985	5	5
662816620	276502.72	6133111.31	-9999	12.52			-9999	1656	1/08/1940	8.84	1/01/1940	-9999	<Null>	1/09/1934	39.32	39.32
662816634	272547.76	6131636.26	3	11	UKN		7.5	1105	3/09/1982	0.5	1/09/1982	2	1/09/1982	1/09/1982	6	6
662816675	273645.76	6131608.28	-9999	4.93			-9999	747	1/01/1979	-9999	<Null>	1.5	1/01/1979	1/01/1979	3.5	3.5
662816676	277726.68	6128548.27	-9999	20.55		DOM	7.3	3770	9/06/1994	0.75	24/10/1992	-9999	<Null>	24/10/1992	13.1	13.1
662816686	274440.74	6128269.99	-9999	4.8			-9999	5081	14/02/2007	-9999	<Null>	3	14/02/2007	14/02/2007	5	5
662816701	275887.74	6129730.24	-9999	7.44			7.4	1362	5/02/1987	0.1	8/12/1986	4	5/02/1987	8/12/1986	8	8
662816722	272682.74	6132199.29	-9999	5	BKF		7.3	4530	13/03/1983	-9999	<Null>	3.2	27/02/1983	27/02/1983	40	40
662816723	277041.89	6132248.28	-9999	11.52		DOM	-9999	1826	10/04/1997	1	10/04/1997	9.5	10/04/1997	10/04/1997	20	20
662816729	273206.69	6132124.3	5	10.199482	OPR	DOM	7.6	849	25/07/1982	1	25/07/1982	2	25/07/1982	25/07/1982	20	20
662816748	275199.75	6132090.23	-9999	8.51			-9999	2144	18/08/1934	-9999	<Null>	7.32	18/08/1934	<Null>	9.45	9.45

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662816778	276631.75	6133648.36	-9999	10.71		DOM	7.3	1782	18/09/1995	1.5	18/09/1995	-9999	<Null>	18/09/1995	24	24
662816783	275547.7	6133186.24	11	9.489946	OPR	DOM	7.4	1906	21/09/1984	1.51	27/07/1984	5.48	27/07/1984	27/07/1984	10.97	10.97
662816808	274694.76	6132498.24	-9999	7.83			-9999	3603	16/03/1951	-9999	<Null>	3.05	16/03/1951	<Null>	-9999	3.66
662816811	277772.02	6131658.16	-9999	13.3		DOM	7.2	1541	25/09/1995	0.5	25/09/1995	-9999	<Null>	25/09/1995	30	30
662816815	274189.57	6132065.57	-9999	5.86		DOM	-9999	2889	11/12/2003	1.875	11/12/2003	5	11/12/2003	11/12/2003	13.5	13.5
662816828	277511.84	6129133.31	-9999	19.12	ABD	DOM	-9999	5954	18/04/1997	-9999	<Null>	-9999	26/06/2018	18/04/1997	0	24
662816830	276571.75	6129388.27	-9999	12.75		DOM	6.7	2284	8/06/1994	-9999	<Null>	-9999	<Null>	29/05/1994	24	24
662816880	277693.15	6129226.05	-9999	19.55		DOM	-9999	3706	24/05/2001	0.25	24/05/2001	8	24/05/2001	24/05/2001	16	16
662816881	276320.75	6129439.28	-9999	11.47			-9999	-9999	<Null>	0.75	24/07/1986	4	25/08/1986	24/07/1986	20	20
662816882	276171.75	6129910.25	8	15.118951			-9999	2387	23/11/1953	3.79	23/11/1953	2.44	23/11/1953	1/01/1935	10.67	10.67
662816883	277830.73	6129202.24	-9999	20.35	OPR	DOM	7.8	1720	1/01/1985	0.4	1/01/1985	7	1/01/1985	1/01/1985	20	20
662816885	276826.68	6130133.31	-9999	13.22			6.89	814	25/01/2016	-9999	<Null>	-9999	<Null>	<Null>	7.62	7.62
662816896	276613.69	6132667.27	-9999	10.58			-9999	2830	24/10/1961	-9999	<Null>	2.74	24/10/1961	<Null>	4.57	4.57
662816903	277548.75	6132024.23	-9999	12.5			-9999	2627	11/09/1934	-9999	<Null>	5.49	11/09/1934	<Null>	7.62	7.62
662816904	276540.7	6131384.24	8	13.590852			6.9	2194	22/01/1987	1.25	19/01/1987	2.1	22/01/1987	19/01/1987	11	11
662816906	276231.83	6129998.19	-9999	10.5		DOM	7	1116	8/11/1994	0.5	8/11/1994	-9999	<Null>	8/11/1994	16.5	16.5
662816907	273751.68	6132428.31	-9999	5.2		DOM	7.2	2397	28/02/1995	-9999	<Null>	-9999	<Null>	28/02/1995	16	16
662816921	278023.74	6129423.28	-9999	21.71			-9999	5469	3/12/1945	0.63	3/12/1945	24.38	3/12/1945	<Null>	27.43	27.43
662816922	278110.72	6129950.29	-9999	22.51			-9999	842	21/10/1914	-9999	<Null>	-9999	<Null>	<Null>	26.2	26.2
662816924	276262.13	6129693	-9999	10.7			-9999	2375	9/10/2001	0.25	3/09/2001	4.9	3/09/2001	3/09/2001	12	12
662816934	277086.96	6128933.13	-9999	15.79		DOM	7.1	6504	15/06/1995	1	15/06/1995	-9999	<Null>	15/06/1995	18.5	18.5
662816937	277636.81	6132308.19	-9999	13.23		DOM	7.5	1614	17/03/1995	1.1	17/03/1995	-9999	<Null>	17/03/1995	15.5	15.5
662816956	273341.74	6131604.29	-9999	5	OPR	DOM	7.2	1177	3/02/1986	1	3/02/1986	1.5	13/03/1986	3/02/1986	4	4
662816958	272615.74	6131065.3	-9999	4.99	OPR	DOM	7.7	600	27/09/1991	1	27/09/1991	1.8	27/09/1991	27/09/1991	5.7	5.7
662816962	278233.15	6131547	-9999	15.76		IND	7.5	2103	21/02/2005	1.2	11/05/2001	10.5	11/05/2001	11/05/2001	16	20.5
662816966	275355.72	6127576.32	-9999	8.1	BKF		7.6	5951	14/05/1992	2	14/04/1992	6	14/05/1992	14/04/1992	15	15
662816967	278687	6133106.9	-9999	20.22			-9999	1541	20/12/2005	0.5	21/12/2005	15.7	21/12/2005	21/12/2005	20	20

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662816977	276031.71	6130086.3	8	14.485374			-9999	2101	14/03/1934	5.05	24/02/1934	4.57	24/02/1934	1/01/1934	9.14	9.14
662817079	273846.86	6131708.28	-9999	4.97		DOM	-9999	1877	<Null>	1.5	17/04/1997	4.8	17/04/1997	17/04/1997	17	17
662817080	276893.85	6129527.28	-9999	13.86		DOM	7	4053	17/05/1995	2	17/05/1995	-9999	<Null>	17/05/1995	16	16
662817088	276140.7	6131921.21	-9999	8.36	OPR	DOM	7.2	1799	1/11/1991	2.5	1/11/1991	4	1/11/1991	1/11/1991	12	12
662817089	275965.69	6131979.3	8	12.595957			-9999	742	1/01/1951	22.73	1/01/1945	-9999	<Null>	1/01/1914	9.14	9.14
662817102	276198.17	6132317.95	-9999	8.87		DOM	-9999	1861	30/01/2001	1	30/01/2001	4.5	30/01/2001	30/01/2001	7.5	7.5
662817106	274821.85	6132008.32	-9999	7.25		DOM	-9999	2448	9/12/1997	1.5	9/12/1997	5	9/12/1997	9/12/1997	13.5	14
662817107	277136.91	6131153.29	-9999	11.63		DOM	-9999	1995	3/01/1998	0.5	3/01/1998	7	3/01/1998	3/01/1998	30	30
662817109	276082.73	6129533.21	-9999	10.23	BKF		8.2	1144	24/03/1992	0.2	9/03/1992	9	24/03/1992	9/03/1992	12	12
662817142	275656.81	6132693.31	-9999	9.97		DOM	7.4	2323	23/10/1996	1.5	23/10/1996	-9999	<Null>	23/10/1996	12	12
662817160	272538.49	6132267.32	-9999	8.163816	BKF		-9999	-9999	<Null>	-9999	<Null>	3	31/07/2014	<Null>	0	5.2
662817174	275864.75	6127754.23	-9999	9.13	ABD		7.7	9941	14/02/1992	-9999	<Null>	15	14/02/1992	9/02/1992	15	15
662817185	274653.7	6132443.29	-9999	7.45			-9999	5777	14/04/1949	-9999	<Null>	3.05	14/04/1949	<Null>	-9999	3.35
662817186	277011.7	6129623.25	-9999	15.05		DOM	7.3	1306	4/04/1995	1	4/04/1995	-9999	<Null>	4/04/1995	22	22
662817187	274366.99	6132860.13	-9999	8.04			-9999	2482	17/01/2007	1	17/01/2007	5.1	17/01/2007	17/01/2007	15.1	15.1
662817188	273717.56	6132098.48	-9999	5.04		DOM	-9999	3161	7/07/2004	1	7/07/2004	4.3	7/07/2004	7/07/2004	10.5	10.5
662817238	278020	6132801	-9999	15.82		DOM	6.9	2295	21/01/1996	0.5	21/01/1996	-9999	<Null>	21/01/1996	24	24
662817239	274336.72	6133103.23	9	13.472131			-9999	1713	3/01/1946	6.32	3/01/1946	5.18	3/01/1946	<Null>	9.14	9.14
662817264	276197.74	6132074.23	-9999	8.71	OPR	IRR	7.6	1923	3/01/1985	1	28/12/1984	6	28/12/1984	28/12/1984	30	30
662817273	274927	6133198	-9999	10.01		DOM	-9999	2058	29/10/2001	0.44	29/10/2001	6	29/10/2001	29/10/2001	30	30
662817274	276900.72	6131688.3	-9999	9.69			-9999	3860	2/01/1958	-9999	<Null>	4.88	2/01/1958	<Null>	-9999	4.88
662817317	275838.77	6129138.3	-9999	7.94			8.2	1687	29/11/1982	1	29/11/1982	2.1	29/11/1982	29/11/1982	10.9	10.9
662817321	272958.46	6132535.58	-9999	5			-9999	1328	5/11/2007	1	5/11/2007	5.4	5/11/2007	5/11/2007	13	13
662817322	276911.81	6132278.18	-9999	11.06		DOM	7.3	1810	9/11/1995	1.5	9/11/1995	-9999	<Null>	9/11/1995	17	17
662817324	276630.76	6132986.24	11	14.848449			-9999	3412	18/09/1934	0.16	18/09/1934	4.57	18/09/1934	<Null>	8.23	8.23
662817325	273497.73	6132516.25	5	11.368794			7	2155	8/11/1967	0.44	8/11/1967	2.74	8/11/1967	<Null>	4.27	4.27
662817326	276284.71	6130808.22	-9999	9.04			6.5	2485	6/01/1969	-9999	<Null>	2.13	6/01/1969	<Null>	6.1	6.1

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662817327	276321.83	6128538.23	-9999	11.2		DOM	-9999	3846	2/03/1998	0.25	26/02/1998	3	26/02/1998	26/02/1998	12	12
662817328	274687.7	6132362.32	-9999	6.36			-9999	4215	14/04/1949	-9999	<Null>	2.29	14/04/1949	<Null>	-9999	4.27
662817329	272315.13	6132693.97	-9999	4.99		DOM	-9999	2432	31/03/2000	-9999	<Null>	5	31/03/2000	31/03/2000	12	12
662817331	276559	6133390	-9999	17.956471	BKF		-9999	-9999	<Null>	-9999	<Null>	8.5	3/03/2016	<Null>	0	-9999
662817332	274038.03	6132299.73	6	15.126875			7.9	1620	12/09/1985	5	<Null>	4.5	12/09/1985	12/09/1985	13	13
662817333	278536.76	6130538.15	-9999	21.75		DOM	7.3	661	25/07/1995	0.5	25/07/1995	-9999	<Null>	25/07/1995	30	30
662817334	272866.71	6130317.3	3	8.123617			-9999	2974	3/12/1959	1.01	3/12/1959	1.22	3/12/1959	<Null>	4.88	4.88
662817335	278403.76	6132286.21	-9999	17.28			7.5	1714	16/06/1993	-9999	<Null>	0	18/12/1986	4/11/1986	20	20
662817363	276316.73	6133217.31	11	14.072164	OPR	DOM	-9999	-9999	<Null>	1.5	22/11/1983	4.2	22/11/1983	22/11/1983	12.8	12.8
662817392	276606.84	6129478.26	-9999	12.7		DOM	7.2	1698	21/12/1993	-9999	<Null>	-9999	<Null>	21/12/1993	21	21
662817410	275933.72	6131516.32	-9999	7.08	OPR	DOM	-9999	-9999	<Null>	-9999	<Null>	4	20/04/1991	20/04/1991	10.3	10.3
662817411	277164.03	6131412.94	-9999	17.078276			-9999	1850	2/01/2009	0.33	2/01/2009	7	2/01/2009	2/01/2009	20	20
662817412	276731.73	6130058.17	-9999	13.04		DOM	7	1110	4/03/1996	1	4/03/1996	-9999	<Null>	4/03/1996	12	12
662817413	273523.71	6131723.24	3	9.968552			6.8	4085	15/10/1984	0.25	15/10/1984	2	15/10/1984	15/10/1984	5	5
662817469	278191.67	6132395.85	-9999	15.76		DOM	-9999	1306	12/03/2002	0.8	12/03/2002	11	12/03/2002	12/03/2002	19	19
662817472	277059.76	6130147.22	-9999	14.3			-9999	799	27/11/1940	-9999	<Null>	7.01	27/11/1940	<Null>	9.75	9.75
662817477	275729.73	6129068.24	8	12.805848	ABD	DOM	8	1664	19/04/1991	1.5	4/04/1991	4.3	4/04/1991	4/04/1991	0	10.2
662817478	275174.74	6132690.22	10	14.893037			7.1	2227	24/09/1978	0.82	20/09/1978	6	20/09/1978	20/09/1978	15	15
662817479	272701.99	6131667.87	-9999	4.7		DOM	-9999	702	17/11/2004	0.5	17/11/2004	3	17/11/2004	17/11/2004	6	6
662817504	273079.85	6132440.2	-9999	4.99		DOM	-9999	3563	17/01/2004	1.33	17/01/2004	4.2	17/01/2004	17/01/2004	10.5	10.5
662817533	273848.74	6133053.31	7	13			7.3	1754	13/03/1987	1.25	4/02/1987	3	13/03/1987	4/02/1987	11	11
662817546	277027.76	6131079.26	-9999	11.85	OPR	DOM	7.4	1979	19/07/1989	-9999	<Null>	0	19/07/1989	22/05/1989	12	12
662817549	277406.78	6132808.28	-9999	14.41		DOM	8.2	1714	29/12/1994	-9999	<Null>	-9999	<Null>	29/12/1994	15	15
662817555	273968.72	6131811.31	8	14.903238			7.5	2284	23/01/1979	1.5	23/01/1979	5.48	23/01/1979	23/01/1979	14.32	14.32
662817618	276011.67	6129123.23	-9999	9.71		DOM	6.9	3747	9/02/1995	-9999	<Null>	-9999	<Null>	9/02/1995	20	20
662817620	275381.94	6132688.44	-9999	10.05		DOM	7.2	1979	29/02/1996	1.25	29/02/1996	-9999	<Null>	29/02/1996	10	10
662817621	276150.78	6132113.32	-9999	14.905839			-9999	1901	12/05/2009	3	12/05/2009	6.5	12/05/2009	12/05/2009	15	15

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662817622	275804.72	6133282.23	11	16.104554			-9999	1328	26/08/1914	10.1	1/01/1914	-9999	<Null>	<Null>	12.19	12.19
662817623	273346.77	6132108.35	-9999	5		DOM	7	3937	31/01/1995	1.8	31/01/1995	-9999	<Null>	31/01/1995	10	10
662817644	276129.71	6129798.22	-9999	10.03	OPR	DOM	8	1901	8/05/1989	-9999	<Null>	4	8/05/1989	1/05/1989	10.5	10.5
662817653	274256.76	6133098.14	-9999	8.34		DOM	6.2	2064	1/01/1995	0.8	14/10/1994	-9999	<Null>	14/10/1994	14	14
662817654	273711.76	6133128.17	-9999	4.99		DOM	7.1	2256	20/02/1995	1.5	20/02/1995	-9999	<Null>	20/02/1995	12.5	12.5
662817777	277811.83	6132088.35	-9999	13.67		DOM	7.5	1524	1/06/1995	3	1/06/1995	-9999	<Null>	1/06/1995	24.5	24.5
662817795	277566.81	6131928.21	-9999	12.66		DOM	7.1	512	28/07/1995	0.5	28/07/1995	-9999	<Null>	28/07/1995	30	30
662817796	277595.73	6129474.23	-9999	19.42	OPR	DOM	7.6	1270	10/11/1991	-9999	<Null>	11	10/11/1991	10/11/1991	20	20
662817799	275765.73	6129492.25	-9999	6.13			-9999	-9999	<Null>	0.75	16/05/1979	3	16/06/1986	16/05/1979	14	14
662817810	273726.73	6132664.23	-9999	5.17	OPR	DOM	7.9	1878	23/09/1991	1.5	21/08/1991	3.6	23/09/1991	21/08/1991	10.5	10.5
662817818	275427.01	6127208.34	-9999	9.29	ABD	DOM	-9999	-9999	<Null>	0.35	4/04/1996	-9999	<Null>	4/04/1996	0	19
662817830	277315.74	6130874.28	13.19	17.179439	OPR	DOM	7.4	1973	16/11/1978	1.01	12/11/1978	-9999	12/09/2014	12/11/1978	15	15
662817831	276648.72	6133070.26	11	17.989255			7.3	2295	6/05/1986	0.76	6/05/1986	4	6/05/1986	1/01/1986	11	11
662817833	272866.89	6131713.25	-9999	4.78		DOM	-9999	5234	22/12/1998	1	22/12/1998	3	22/12/1998	22/12/1998	12	12
662817834	275996.76	6131521.31	-9999	7.27			-9999	2541	11/12/1945	-9999	<Null>	4.27	11/12/1945	<Null>	9.75	9.75
662817835	275632.75	6132065.25	-9999	7.84			-9999	2560	14/11/1934	-9999	<Null>	4.88	4/09/1934	1/01/1934	30.48	30.48
662817852	276549.77	6133718.28	-9999	10.18			-9999	1784	13/12/1933	10.1	13/12/1933	3.05	13/12/1933	<Null>	31.39	31.39
662817880	277718.71	6129884.25	-9999	20.09			7.1	783	4/02/1982	-9999	<Null>	7	4/02/1982	4/02/1982	13	13
662817947	276041.73	6132777.24	9	14.974508			7.5	2482	18/09/1981	1.5	18/09/1981	3	18/09/1981	18/09/1981	9	9
662817948	276416.73	6129054.25	-9999	11.42			6.7	2143	1/01/1983	0.5	12/02/1983	4	12/02/1983	12/02/1983	11.5	11.5
662817949	278001.86	6132318.29	-9999	14.52		DOM	-9999	1457	23/01/1999	0.5	23/01/1999	10	23/01/1999	23/01/1999	30	30
662817969	274930.76	6131936.31	7	11.917237	OPR	DOM	-9999	2199	31/01/1984	1.5	31/01/1984	4	31/01/1984	31/01/1984	11	11
662818003	277411.88	6131358.35	-9999	12.04		DOM	7.1	2092	19/07/1996	1.5	19/07/1996	10	19/07/1996	19/07/1996	24	24
662818041	277411.88	6129623.26	-9999	17.87		DOM	-9999	650	27/03/1997	-9999	<Null>	8.2	27/03/1997	27/03/1997	18	18
662818079	278111.71	6130443.25	-9999	20.05			-9999	929	11/08/1934	22.1	15/06/1934	10.06	15/06/1934	4/08/1934	65.23	65.23
662818081	278041.89	6132743.27	-9999	15.76		DOM	7	2216	21/01/1996	0.5	21/01/1996	-9999	<Null>	21/01/1996	24	24
662818093	276203.73	6128800.28	10	14.091143	OPR	DOM	7.8	3023	12/11/1990	1.5	15/09/1990	2.1	12/11/1990	15/09/1990	12	12

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662818106	278023.75	6130238.21	20	26.504994			7.5	2103	1/01/1983	1	1/02/1983	6	1/02/1983	1/02/1983	18.28	18.28
662818107	277216.66	6133178.26	-9999	14.63		DOM	7.2	2443	14/03/1995	1.2	14/03/1995	-9999	<Null>	14/03/1995	15	15
662818108	273126.69	6132268.28	5	11.12298			7.3	3367	17/11/1987	1	22/09/1987	2.4	17/11/1987	22/09/1987	9	9
662818109	278456.74	6130363.28	-9999	22.78		DOM	-9999	-9999	<Null>	0.25	10/12/1992	15	<Null>	10/12/1992	21	21
662818141	278131.81	6129778.21	-9999	23.21		DOM	6.8	1289	16/08/1994	-9999	<Null>	-9999	<Null>	16/08/1994	21	21
662818155	272699.74	6131043.31	-9999	5	OPR	DOM	7.9	750	3/07/1992	-9999	<Null>	3	3/07/1992	27/02/1992	5	5
662818157	276178.76	6129650.25	-9999	10.26	OPR	DOM	7.5	821	10/12/1991	-9999	<Null>	7.5	10/12/1991	10/12/1991	14	14
662818225	275788.77	6132751.27	-9999	10.02			-9999	1999	4/07/1930	-9999	<Null>	-9999	<Null>	<Null>	8.53	8.53
662818233	275516.72	6132981.24	-9999	10.08	OPR	DOM	7.1	2306	24/06/1992	2	24/06/1992	7	24/06/1992	24/06/1992	14.2	14.2
662818236	277375.08	6130984.4	-9999	12.97		DOM	-9999	1810	9/12/2002	2	9/12/2002	6.1	9/12/2002	9/12/2002	18	18
662818284	276726.71	6130151.29	12	18.027526	OPR	DOM	7.7	902	10/04/1985	1	10/04/1985	3	10/04/1985	10/04/1985	22	22
662818364	276346.76	6130913.3	-9999	8.89		DOM	-9999	-9999	<Null>	0.3	14/02/1990	9.14	14/02/1990	14/02/1990	10.66	10.66
662818393	277441.89	6129453.27	-9999	18.05		DOM	-9999	3230	23/05/1996	0.5	23/05/1996	11	23/05/1996	23/05/1996	30	30
662818434	275714.67	6131313.14	-9999	6.68		DOM	7.1	2204	3/05/1993	-9999	<Null>	-9999	<Null>	21/04/1993	15	18
662818447	277941.9	6131878.29	-9999	14.47		DOM	-9999	1856	16/12/1997	-9999	<Null>	9	16/12/1997	16/12/1997	18	18
662818448	273018.69	6132196.22	-9999	5			8	2848	20/03/1972	-9999	<Null>	3.35	20/03/1972	<Null>	6.71	6.71
662818463	273917.72	6131973.32	-9999	5.82			-9999	2909	2/06/1983	1	2/06/1983	1.5	2/06/1983	<Null>	7.3	7.3
662818467	275908.76	6132738.24	9	13.135025	OPR	DOM	-9999	-9999	<Null>	1.25	29/11/1984	2	29/11/1984	29/11/1984	11	11
662818478	277851.29	6132369.74	-9999	13.94			-9999	1692	24/10/2007	1	24/10/2007	9.4	24/10/2007	24/10/2007	17	18
662818479	277251.78	6131053.2	-9999	12.37		DOM	7.4	2194	24/11/1992	1	7/11/1992	-9999	<Null>	7/11/1992	13.5	13.5
662818491	273735.69	6131668.23	4	9.902577	OPR	DOM	7.3	929	14/09/1984	1	14/09/1984	1.8	14/09/1984	14/09/1984	4.3	4.3
662818494	273784.74	6133031.3	7	13.118002	OPR	DOM	7.8	1826	24/10/1985	1.25	24/10/1985	3.7	5/12/1985	24/10/1985	11	11
662818509	276788.73	6130631.31	11	16.19283			-9999	2584	18/09/1934	0.63	18/09/1934	7.62	18/09/1934	<Null>	11.28	11.28
662818553	275801.71	6128233.31	-9999	8.03			6.9	13701	23/03/1983	0.9	23/03/1983	6	23/03/1983	23/03/1983	18.5	18.5
662818598	276507.16	6130652.02	-9999	9.83		DOM	-9999	1474	17/11/1999	0.5	17/11/1999	7	17/11/1999	17/11/1999	25	25
662818651	276063.71	6129233.29	-9999	10.22			7.4	1340	7/04/1983	0.5	17/06/1983	5	17/06/1983	<Null>	-9999	7
662818699	275106.73	6132764.25	10	14			-9999	2230	19/03/1952	1.26	19/03/1952	8.23	19/03/1952	1/01/1951	10.97	10.97

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662818746	274596.88	6132808.4	-9999	9.13		DOM	6.9	2154	15/12/1993	1.2	20/10/1993	-9999	<Null>	20/10/1993	12	12
662818748	276216.12	6132358.02	-9999	8.98		DOM	-9999	1670	30/01/2001	1	30/01/2001	4.5	30/01/2001	30/01/2001	7.5	7.5
662818749	278046.85	6134123.29	-9999	14.99	ABD		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	0	11.5
662818753	274244.34	6132042.23	-9999	5.61			-9999	1378	4/07/2007	1	3/07/2007	3.3	3/07/2007	3/07/2007	6	7
662818754	276082.73	6129533.21	-9999	10.23	BKF		7.3	1144	24/03/1992	0.4	6/02/1992	6	24/03/1992	6/02/1992	18	18
662818755	276756.87	6130958.31	-9999	10.67		DOM	-9999	1815	2/07/1997	0.25	2/07/1997	4.5	2/07/1997	2/07/1997	13	13
662818757	276766.87	6132463.34	-9999	11.29		DOM	-9999	1094	9/08/1995	0.5	9/08/1995	-9999	<Null>	9/08/1995	30	30
662818773	276170.74	6129236.25	-9999	10.7	OPR	DOM	7	3885	6/02/1989	1.2	21/01/1989	3.5	6/02/1989	21/01/1989	10.6	10.6
662818790	276007.77	6133353.26	11	14.652657			7.5	1664	1/12/1972	12.63	1/12/1972	7.62	1/12/1972	<Null>	12.19	12.19
662818791	272454.05	6130335.81	-9999	5.04			-9999	868	10/11/2007	-9999	<Null>	3	10/11/2007	10/11/2007	5.5	5.5
662818792	275656.68	6127235.3	10	13.956917			-9999	-9999	<Null>	0.4	1/02/1988	5	1/02/1988	1/02/1988	10.5	10.5
662818793	274640.71	6128347.21	-9999	4.98			7.2	816	5/02/1975	-9999	<Null>	0.61	5/02/1975	<Null>	2.44	2.44
662818825	277802.74	6129751.22	-9999	20.73			7.7	882	9/11/1987	1.25	7/11/1987	6.2	9/11/1987	7/11/1987	16.5	16.5
662818854	277492.76	6129582.27	18	20.848563			-9999	428	3/12/1945	1.26	3/12/1945	7.01	3/12/1945	<Null>	11.58	11.58
662818867	277131.74	6129838.3	-9999	15.63	OPR	DOM	7.5	1021	29/10/1992	1	22/10/1992	5.5	29/10/1992	22/10/1992	20	20
662818869	276835.75	6133621.27	-9999	12.26			7.3	2380	1/12/1983	-9999	<Null>	6	1/12/1983	1/12/1983	10.6	10.6
662818927	273069.69	6131564.23	-9999	5			-9999	1670	16/03/1936	-9999	<Null>	-9999	<Null>	<Null>	4.88	4.88
662819173	276516.71	6131647.27	8	15.090697			-9999	1716	22/01/1951	0.44	22/01/1951	3.05	22/01/1951	1/01/1949	5.49	5.49
662819206	272720.7	6131097.22	3	8.652444			7.1	1038	24/04/1986	0.88	19/04/1986	2.7	4/05/1986	19/04/1986	4.8	4.8
662819212	277576.73	6130936.26	-9999	13.38	OPR	DOM	-9999	-9999	<Null>	-9999	<Null>	5	18/05/1989	<Null>	8	8
662819217	278121.72	6130125.27	-9999	21.58			-9999	842	20/10/1914	-9999	<Null>	-9999	<Null>	<Null>	36.4	36.4
662819316	273700.76	6131672.25	4	8.520851			8.1	1216	19/10/1988	40	3/03/1988	2	19/10/1988	3/03/1988	8.5	8.5
662819318	273828.69	6131578.29	4	9.971781	OPR	DOM	7.6	1479	8/05/1989	1.2	5/04/1989	2.1	8/05/1989	5/04/1989	11.1	11.1
662819320	276412.73	6132665.4	-9999	10.2		DOM	-9999	1541	13/02/2002	0.8	13/02/2002	5.4	13/02/2002	13/02/2002	16	16
662819321	276316.93	6132638.25	-9999	10.04		DOM	7.1	2369	25/03/1995	3	25/03/1995	-9999	<Null>	25/03/1995	24	24
662819334	277578.7	6133230.26	15	19.284838	OPR	DOM	7.6	1788	17/03/1983	0.6	21/02/1983	10	21/02/1983	21/02/1983	13	13
662819336	276319.74	6131102.22	7	12.27019	OPR	DOM	7.4	1867	1/03/1984	0.5	1/03/1984	-9999	<Null>	1/03/1984	14	14

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662819337	274378.7	6132466.24	8	12.753917	OPR	DOM	7.5	1463	14/12/1982	1.5	14/12/1982	2.1	14/12/1982	14/12/1982	7.3	7.3
662819427	274101.04	6132300.78	-9999	7.08		DOM	6.4	1681	25/02/1993	2.5	24/01/1993	4	25/02/1993	<Null>	-9999	12
662819429	272751.85	6132558.33	-9999	5		DOM	-9999	1519	6/01/1998	1.75	6/01/1998	4.5	6/01/1998	6/01/1998	14.5	14.5
662819430	277091.93	6130218.38	-9999	14.55		DOM	7.6	1110	5/03/1996	1	5/03/1996	-9999	<Null>	5/03/1996	13	13
662819487	278061.78	6133106.27	17	20.992331			-9999	-9999	<Null>	0.3	1/01/1983	10.7	1/01/1983	1/01/1983	13.7	13.7
662819488	275730.74	6133018.24	-9999	10.45			-9999	-9999	<Null>	10.1	1/01/1950	4.57	1/01/1950	<Null>	42.67	42.67
662819491	277161.9	6130253.28	-9999	15.01		DOM	-9999	1328	21/01/1999	0.5	25/04/1999	13	25/04/1999	25/04/1999	30	30
662819526	276209.74	6130004.31	-9999	10.36			-9999	842	1/07/1939	-9999	<Null>	-9999	<Null>	1/07/1939	68.58	68.58
662819527	276211.64	6129383.22	-9999	10.93		DOM	7.1	2323	27/02/1995	-9999	<Null>	-9999	<Null>	27/02/1995	20.5	20.5
662819575	273112.68	6132312.25	-9999	5	BKF	IRR	-9999	2761	2/09/2002	0.66	2/09/2002	4.14	2/09/2002	<Null>	0	9.5
662819590	277426.86	6133068.39	-9999	14.88		DOM	7.3	2121	13/08/1996	1	13/08/1996	-9999	<Null>	13/08/1996	15	15
662819659	275180.71	6127848.28	-9999	7.03			9.2	2312	10/02/1980	0.3	16/02/1980	4	16/02/1980	16/02/1980	10.05	10.05
662819699	276267.7	6129925.26	-9999	10.67	OPR	DOM	7.4	1519	29/11/1992	1	29/11/1991	4	21/01/1992	29/11/1991	15	15
662819710	274092.7	6132582.27	-9999	6.63			7.38	4590	25/02/2019	-9999	<Null>	3.66	23/08/1934	1/08/1934	20.12	20.12
662819715	273821.75	6128363.12	-9999	4.53	ABD	DOM	-9999	-9999	<Null>	-9999	<Null>	3.3	9/01/1995	9/01/1995	0	6.5
662819976	275201.74	6131879.27	-9999	7.18	OPR	DOM	-9999	-9999	<Null>	-9999	<Null>	2.2	1/01/1984	1/01/1984	4.7	4.7
662820101	273735.75	6131669.23	4	9.894606			7.3	761	19/03/1982	1	4/01/1979	3.66	4/01/1979	4/01/1979	7.32	7.32
662820116	278421.73	6132423.17	-9999	17.48		DOM	6.9	1866	15/03/1993	-9999	<Null>	11	26/02/1993	26/02/1993	18	18
662820117	276111.23	6133698.47	-9999	10.24			-9999	1826	1/09/2008	1	1/09/2008	7	1/09/2008	1/09/2008	20	20
662820122	277065.72	6131826.3	10	16.00728	BKF		-9999	2845	1/04/1940	0.57	1/04/1940	4.57	1/04/1940	1/01/1940	0	12.19
662820123	277558.77	6129442.25	-9999	19.06	OPR	DOM	-9999	-9999	<Null>	-9999	<Null>	5	8/01/1992	8/01/1992	9	9
662820124	276198.71	6131930.29	-9999	8.5	OPR	DOM	-9999	-9999	<Null>	-9999	<Null>	4	19/12/1990	19/12/1990	9	9
662820125	277420.77	6132474.3	12	16.592005			7.6	1653	5/05/1988	0.3	1/11/1987	11	3/05/1988	1/11/1987	15	15
662820134	276817.7	6131431.31	-9999	9.77	BKF		7.4	2199	1/04/1983	-9999	<Null>	-9999	<Null>	1/06/1983	9.14	9.14
662820135	273396.76	6131560.25	3	9.843057			7.3	1384	27/02/1979	0.75	27/02/1979	3.65	27/02/1979	27/02/1979	12.8	12.8
662820144	276338.69	6131955.26	39.82	11.297371	BKF		7.5	1951	6/01/1982	-9999	<Null>	-9999	<Null>	<Null>	-9999	4
662820150	275031.89	6132343.28	-9999	9.56		DOM	-9999	2194	12/03/1999	1.2	12/03/1999	6	12/03/1999	12/03/1999	12	12

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662820191	277439.72	6133216.22	-9999	15.32	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	0	10.7
662820200	275865.15	6127556.99	-9999	9.82	ABD		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	3/03/2000	0	20
662820201	273697.76	6132715.24	-9999	5.14	OPR	DOM	7.9	1351	12/11/1990	-9999	<Null>	4	12/11/1990	17/10/1990	11	11
662820238	275731.76	6133401.32	-9999	10			-9999	1370	1/01/1950	15.16	1/01/1950	10.97	1/01/1950	<Null>	36.58	36.58
662820266	277055.76	6133200.31	-9999	14.2	OPR	DOM	7.2	2199	9/04/1992	0.8	20/03/1992	8	9/04/1992	20/03/1992	9	9
662820336	275186.95	6132428.35	-9999	10.05		DOM	7.3	2835	27/10/1995	0.5	27/10/1995	-9999	<Null>	27/10/1995	18	18
662820344	277141.77	6133186.31	14	17.1505	OPR	DOM	-9999	-9999	<Null>	0.38	1/04/1984	7.5	1/04/1984	1/04/1984	10	10
662820400	274265.13	6132515.03	-9999	7.69		REC	-9999	2477	27/10/2000	2.5	27/10/2000	3.5	27/10/2000	27/10/2000	12	12.5
662820406	277266.85	6133163.17	-9999	14.71		DOM	6.8	1748	5/02/1996	1	5/02/1996	-9999	<Null>	5/02/1996	20	20
662820407	277516.9	6131853.29	-9999	12.38		DOM	7.3	1541	22/02/1996	0.5	22/02/1996	-9999	<Null>	22/02/1996	24	30
662820422	274891.86	6133188.3	-9999	10.01		DOM	7.19	2290	16/02/2018	0.5	26/09/1998	9	26/09/1998	26/09/1998	30	30
662820450	272834.75	6130808.24	-9999	4.97	ABD		-9999	-9999	<Null>	-9999	<Null>	2	15/05/1983	15/05/1983	6	6
662820451	276138.73	6130205.25	8	16			-9999	1570	6/04/1934	5.05	6/04/1934	4.12	6/04/1934	<Null>	9.75	9.75
662820452	276129.16	6130468.05	507.9	507.68		REC	-9999	2143	12/12/2000	1	12/12/2000	2.79	12/12/2000	12/12/2000	18	18
662820453	275613.7	6127433.27	-9999	9.33			7.6	2909	16/12/1981	0.75	16/12/1981	2.4	16/12/1981	16/12/1981	20.1	20.1
662820454	274318.75	6132994.23	-9999	8			-9999	1230	26/10/1949	2.27	26/10/1949	9.75	26/10/1949	<Null>	31.09	31.09
662820503	277280.09	6130687.01	-9999	14.38		DOM	-9999	2517	13/11/1999	0.5	13/11/1999	10	13/11/1999	13/11/1999	39	39
662820504	275697.1	6131711.68	-9999	6.76		DOM	-9999	1687	11/01/2006	0.5	10/04/2004	11	12/02/2004	12/02/2004	11	30
662820505	276438.69	6130854.28	-9999	9.21	OPR	DOM	-9999	-9999	<Null>	-9999	<Null>	4	26/08/1991	26/08/1991	9.8	9.8
662820506	272951.75	6132153.15	-9999	5		DOM	7.6	1496	11/11/1995	1	11/11/1995	-9999	<Null>	11/11/1995	14	14
662820507	277706.71	6128644.24	-9999	20.31	BKF		-9999	-9999	<Null>	-9999	<Null>	2.5	1/09/1983	1/09/1983	16.4	16.4
662820557	276062.77	6132758.22	-9999	10.14			-9999	2585	30/01/1962	-9999	<Null>	-9999	<Null>	1/01/1962	7.01	7.01
662820578	275751.85	6132568.33	-9999	9.62		DOM	6.9	1546	23/12/1994	1	23/12/1994	-9999	<Null>	23/12/1994	18	18
662820584	274448.76	6132557.22	-9999	8.46			-9999	3146	22/03/1951	-9999	<Null>	3.66	22/03/1951	<Null>	-9999	12.19
662820590	275028.15	6132354.04	-9999	9.5		DOM	-9999	2307	8/06/2000	1.5	8/06/2000	5.5	8/06/2000	8/06/2000	19.5	19.5
662820605	276071.68	6129098.18	-9999	10.03	OPR	DOM	-9999	-9999	<Null>	1	<Null>	2.1	28/03/1985	28/03/1985	8.5	8.5
662820645	275747.12	6132400.02	-9999	9.05		DOM	-9999	1720	22/10/1994	-9999	<Null>	3.9	22/10/1994	22/10/1994	16.5	16.5

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662820646	275843.71	6129450.22	-9999	7.17	BKF		8.7	938	23/12/1980	0.25	22/12/1980	3	22/12/1980	22/12/1980	-9999	14.4
662820651	276296.99	6129733.4	-9999	10.9		DOM	7.4	1968	29/03/1995	2	29/03/1995	-9999	<Null>	29/03/1995	18.5	18.5
662820652	276331.71	6130968.1	7	14.052671			7.2	1995	8/04/1988	0.5	8/04/1988	4	29/04/1988	29/04/1988	14	14
662820682	278476.86	6132943.19	-9999	18.53	ABD	DOM	-9999	1996	<Null>	0.5	31/10/1996	11	2/11/1996	2/11/1996	30	30
662820687	276225.72	6128980.31	10	14.023332			7	2285	7/12/1967	0.24	7/12/1967	2.44	7/12/1967	<Null>	6.71	6.71
662820766	274615.7	6127429.29	6	14			7.4	3236	10/12/1975	1.3	10/12/1975	3.66	10/12/1975	<Null>	14.02	14.02
662820775	276513.73	6132456.26	9	16.276766			-9999	871	11/02/1945	0.25	11/02/1945	1.52	11/02/1945	<Null>	4.57	4.57
662820846	276116.66	6129693.12	-9999	9.88		DOM	7.7	2364	4/11/1994	-9999	<Null>	6	4/11/1994	4/11/1994	12	12
662820963	277391.69	6132396.23	12	20.522706			7.6	1479	25/03/1987	0.4	1/03/1987	8	25/03/1987	1/03/1987	10	10
662820969	277701.76	6132550.3	14	17.931786			7.6	1602	12/11/1980	0.45	3/10/1981	5.48	3/10/1981	3/10/1980	12.49	12.49
662820997	278658.91	6132945.39	-9999	19.77		DOM	-9999	2143	1/02/1997	-9999	<Null>	15	1/02/1997	1/02/1997	22	28
662821013	277634.76	6130775.28	-9999	14.33			-9999	1200	2/01/1958	-9999	<Null>	3.66	2/01/1958	<Null>	-9999	6.4
662821014	275781.74	6131470.3	-9999	6.67	OPR	DOM	7.6	1968	6/02/1990	-9999	<Null>	6	6/02/1990	28/01/1990	10	10
662821036	275973	6129798	-9999	13.250293			-9999	1776	20/09/2010	0.25	20/09/2010	6	20/09/2010	20/09/2010	15	15
662821043	276688.25	6128753.28	-9999	13.43		DOM	-9999	1485	9/08/2002	0.5	9/08/2002	11	9/08/2002	9/08/2002	36	36
662821044	277161.96	6130988.19	-9999	12.6		DOM	7.1	1636	4/10/1996	1	4/10/1996	-9999	<Null>	4/10/1996	15	15
662821120	275441.84	6133208.16	-9999	10.02		DOM	6.8	2121	10/03/1995	-9999	<Null>	-9999	<Null>	10/03/1995	12	12
662821122	275305.71	6127696.29	-9999	7.74			-9999	7839	9/02/1937	-9999	<Null>	-9999	<Null>	<Null>	4.27	4.27
662821127	273558.71	6131738.32	3	9.970506	OPR	IRR	7.9	3539	4/12/1990	1.25	4/12/1990	2.4	4/12/1990	4/12/1990	9.6	9.6
662821132	273438.72	6131641.22	3	8			8.5	1552	13/05/1980	0.75	13/05/1980	2.43	13/05/1980	13/05/1980	10.97	10.97
662821136	275933.73	6127479.21	-9999	10.3			-9999	5140	16/10/1934	-9999	<Null>	2.13	16/10/1934	<Null>	17.98	17.98
662821138	276191.97	6133208.37	-9999	11.87		DOM	6.9	1984	8/09/1995	-9999	<Null>	-9999	<Null>	8/09/1995	15	15
662821140	276801.83	6129498.13	-9999	13.82		DOM	7.6	495	27/09/1995	0.5	27/09/1995	-9999	<Null>	27/09/1995	24	24
662821177	274596.93	6132928.39	-9999	9.17		DOM	7	2262	9/05/1995	5	9/05/1995	-9999	<Null>	9/05/1995	18	18
662821335	275977.7	6132715.29	9	13.368327	OPR	DOM	7.3	2088	3/01/1986	1	3/01/1986	2.4	24/01/1986	3/01/1986	7.9	7.9
662821471	277657.78	6131376.22	13	17			6.7	2685	24/01/1966	0.88	24/01/1966	3.35	24/01/1966	<Null>	7.32	7.32
662821505	276872.76	6129800.22	-9999	14.18			-9999	766	12/05/1987	0.84	12/05/1987	0	12/05/1987	13/04/1987	19	19

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662821536	273075.23	6131736.98	-9999	4.98			-9999	1754	19/04/2007	-9999	<Null>	2.6	19/04/2007	19/04/2007	6.5	6.5
662821539	275250.7	6127507.24	8	10.1205			-9999	4990	6/05/1949	0.25	1/01/1949	-9999	<Null>	<Null>	12.19	12.19
662821541	273503.68	6131506.3	-9999	4.95	OPR	DOM	7.8	1322	17/09/1984	-9999	<Null>	3	10/09/1983	10/09/1983	8	8
662821558	277258.77	6128809.24	-9999	17.25	OPR	DOM	7.3	3241	23/01/1990	-9999	<Null>	7	23/01/1990	3/01/1990	15	15
662821574	276989.75	6131067.23	-9999	11.82	OPR	DOM	7.7	2054	24/03/1992	0.6	19/02/1992	6	24/03/1992	19/02/1992	13.5	13.5
662821612	275961.39	6130325.7	-9999	7.57	BKF		-9999	-9999	<Null>	1	30/07/2006	-9999	<Null>	30/07/2006	0	12.5
662821645	276258.69	6130576.26	-9999	9.34			7.4	2047	28/07/1977	-9999	<Null>	3	1/03/1977	1/03/1977	9	9
662821746	278361.73	6132944.28	-9999	17.82			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	1/12/1914	13.41	13.41
662821772	273884.75	6131732.31	-9999	5	OPR	DOM	7.8	1256	2/03/1992	0.8	4/02/1992	2	2/03/1992	4/02/1992	7	7
662821836	273867.77	6132960.32	7	13.853992			7.3	1804	3/02/1983	1.5	3/02/1983	3.6	3/02/1983	3/02/1983	10.9	10.9
662821846	277022.76	6132290.22	11	16	OPR	DOM	-9999	-9999	<Null>	0.5	8/01/1985	3	8/01/1985	8/01/1985	9.1	9.1
662821872	274181.84	6132848.32	-9999	7.1		DOM	-9999	2216	14/01/1999	1	14/01/1999	4	14/01/1999	14/01/1999	12	12
662821873	273548.73	6131761.27	-9999	4.98			7.5	827	30/04/1970	-9999	<Null>	1.83	30/04/1970	<Null>	2.74	2.74
662821951	278225.71	6134156.27	-9999	15.77			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	18/02/1958	11.58	11.58
662821952	276608.92	6130563.98	-9999	17.945773			-9999	-9999	<Null>	-9999	<Null>	5.8	13/02/2014	13/02/2014	9	9
662821960	277401.15	6129865.5	-9999	17.68	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	0	8
662821961	277382.89	6129857.04	-9999	17.55	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	0	8
662822052	275172.95	6128669.59	-9999	4.91			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	10/11/2004	4.5	4.5
662822053	275155.29	6128661.8	-9999	4.9			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	9/11/2004	4.2	4.2
662822054	275152.97	6128688.12	-9999	4.88			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	9/11/2004	4.5	4.5
662822055	275133.86	6128661.68	-9999	4.88			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	9/11/2004	4.8	4.8
662822056	275107.43	6128648.05	-9999	4.88			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	9/11/2004	4.2	4.2
662822057	275113.21	6128628.56	-9999	4.9			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	9/11/2004	4	4
662822058	275073.76	6128687.77	-9999	4.84			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	9/11/2004	4	4
662822059	275097.36	6128711.78	-9999	4.84			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	8/11/2004	4	4
662822060	274942.85	6128684.28	-9999	4.83			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	8/11/2004	3.8	3.8
662822159	277076.63	6130893.2	-9999	12.81		DOM	7.4	1922	24/03/1993	-9999	<Null>	-9999	<Null>	13/03/1993	18	18

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662822279	276008.72	6131935.29	-9999	8.05			-9999	1000	14/08/1945	7.58	26/07/1945	9.14	26/07/1945	1/01/1945	72.24	72.24
662822313	277501.95	6132988.2	-9999	15.16		DOM	7	1856	11/10/1995	0.4	18/07/1995	-9999	<Null>	18/07/1995	30	30
662822339	277218.76	6128180.24	-9999	17.9			7.7	2125	6/03/1979	0.51	1/03/1979	3.5	1/03/1979	1/03/1979	15	15
662822395	278083.95	6133539.77	-9999	17.89			-9999	-9999	<Null>	0.5	8/09/2007	10	8/09/2007	8/09/2007	24	24
662822610	276794.71	6131485.25	10	11.824526	BKF		7.4	1917	25/03/1987	0.3	1/03/1987	3	25/03/1987	1/03/1987	0	9
662822748	275971.66	6129543.16	-9999	9.22		DOM	7.4	1703	27/11/1994	1	27/11/1994	-9999	<Null>	27/11/1994	20	20
662822749	273608.34	6131566.13	-9999	4.94	BKF	DOM	-9999	1440	15/09/2003	1	15/09/2003	2	15/09/2003	15/09/2003	0	6
662822780	273981.8	6132261.69	5	13.749789	OPR	DOM	7.7	2086	19/04/1979	2.5	18/04/1979	3.65	18/04/1979	18/04/1979	7.31	7.31
662822802	276711.82	6130203.31	-9999	12.33		DOM	-9999	938	14/03/1997	-9999	<Null>	6.6	14/03/1997	14/03/1997	15	15
662822802	275961.39	6130325.7	-9999	7.57	BKF		-9999	-9999	<Null>	1	30/07/2006	-9999	<Null>	30/07/2006	0	12.5
662822922	278263.69	6129340.71	-9999	23.37	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	0	3
662822990	274987.7	6131870.22	-9999	7.15			-9999	3055	27/07/1945	-9999	<Null>	3.66	27/07/1945	<Null>	9.14	9.14
662823068	277866.16	6129905	-9999	20.76		DOM	-9999	666	4/03/2000	-9999	<Null>	11	4/03/2000	4/03/2000	21	21
662823153	277687	6133585	-9999	16.35	EQP	RCL	-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	-9999	-9999
662823176	278097.76	6134090.23	-9999	15.32			-9999	-9999	<Null>	-9999	<Null>	13.72	8/09/1954	<Null>	18.29	18.29
662823258	278275.73	6133892.31	18	23.26335			6.8	326	23/09/1981	1.26	1/01/1954	10.67	17/10/1955	1/01/1952	14.7	14.7
662823306	275789.34	6128806.54	-9999	7.46			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	29/10/2007	6	6
662823307	275770.74	6128763.09	-9999	7.81			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	29/10/2007	5.8	5.8
662823334	277553.77	6128703.22	-9999	19.29			-9999	8937	6/10/1960	-9999	<Null>	2.13	6/10/1960	<Null>	3.05	3.05
662823369	272732.72	6132193.32	-9999	5	OPR	DOM	7.5	3201	3/03/1992	1.1	4/02/1992	3.5	3/03/1992	4/02/1992	11	11
662823398	275861.99	6129863.24	-9999	6.66		DOM	7.2	2103	24/01/1996	0.5	24/01/1996	-9999	<Null>	24/01/1996	12	12
662823451	276567.73	6129586.3	-9999	12.55			6.6	2008	13/03/1987	1	23/02/1987	4.5	13/03/1987	23/02/1987	12	12
662823474	276597.2	6131749.14	-9999	8.93		DOM	-9999	1815	12/05/2003	1	12/05/2003	3.5	12/05/2003	12/05/2003	12	12
662823652	278201.16	6133200.04	-9999	17.97		DOM	-9999	2493	25/11/1999	0.5	25/11/1999	6	25/11/1999	25/11/1999	35	35
662823653	273816.73	6132378.08	-9999	5.55		DOM	7.8	2165	17/03/1993	0.77	14/02/1993	-9999	<Null>	14/02/1993	7.6	7.6
662823658	277647.29	6131163.73	-9999	13.45			-9999	1150	19/03/2007	0.6	20/03/2007	8	20/03/2007	20/03/2007	25	25
662823671	278531.9	6132285.5	-9999	18.29			-9999	1524	16/10/2005	1	16/10/2005	10	16/10/2005	16/10/2005	18	18

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662823751	276220.15	6133089.03	-9999	11.67		DOM	-9999	2561	6/02/2001	0.9	6/02/2001	7.5	6/02/2001	6/02/2001	18	18
662823765	278516.97	6129723.41	-9999	25.7			-9999	-9999	<Null>	-9999	<Null>	5.5	17/02/1997	<Null>	7.8	7.8
662823771	277066.69	6128667.24	-9999	15.86			7.6	4900	28/11/1986	0.13	19/11/1986	6.1	28/11/1986	19/11/1986	12.2	12.2
662824546	276031.67	6130355.1	-9999	7.95			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	6/09/2007	13.5	13.5
662824686	278015.74	6128757.21	-9999	22.74			-9999	1685	11/08/1934	-9999	<Null>	3.05	11/08/1934	<Null>	5.33	5.33
662824689	277861.99	6133303.09	-9999	17.06		DOM	6.8	2064	7/12/1995	-9999	<Null>	-9999	<Null>	7/12/1995	18	18
662824907	276236.96	6129049.4	-9999	15.88689	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	0	6.2
662824947	276221.87	6131358.23	-9999	8.2		DOM	-9999	1289	11/09/1999	1	11/09/1999	4.5	11/09/1999	11/09/1999	11	12
662825154	277187.76	6133834.32	-9999	14.87			-9999	943	28/03/1946	-9999	<Null>	-9999	<Null>	<Null>	21.34	21.34
662825183	273901.67	6132998.12	-9999	6.92	OPR	DOM	7.7	2421	17/01/1992	0.2	16/11/1991	3.6	17/01/1992	16/11/1991	13	13
662825204	277786.76	6132303.29	-9999	13.6		DOM	7.5	1839	9/10/1995	1	9/10/1995	-9999	<Null>	9/10/1995	22	22
662825367	278907.19	6130996.56	-9999	25.930417			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	13/01/2010	17	17
662825566	276610	6130449	-9999	16.674564	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	0	18
662825647	278922.18	6131029.11	-9999	30.479038	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	0	-9999
662825720	276731.31	6130435.94	-9999	17.454702			-9999	-9999	<Null>	-9999	<Null>	5.3	16/01/2015	16/01/2015	9	9
662825816	278061.86	6129618.22	-9999	22.7		DOM	-9999	1043	4/03/1998	-9999	<Null>	11	4/03/1998	4/03/1998	23	23
662825817	275821.67	6129633.15	-9999	6.95		DOM	7.1	1061	31/01/1994	-9999	<Null>	-9999	<Null>	28/01/1994	10	10
662825845	278130.41	6129835.37	-9999	23.04		DOM	-9999	921	29/11/2002	0.8	29/11/2002	10.5	29/11/2002	29/11/2002	19	19
662826092	278986.1	6131044.28	-9999	32.362995	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	14/09/2011	0	5
662826093	279004.36	6131013.11	-9999	34.462619	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	14/09/2011	0	5
662826408	278353.74	6133861.24	-9999	17.92			-9999	-9999	<Null>	-9999	<Null>	10.67	14/09/1954	<Null>	11.28	11.28
662826409	276569	6132587	-9999	12.829693			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	7.38	7.38
662826410	273610.59	6131679.23	-9999	4.95			-9999	-9999	<Null>	-9999	<Null>	4	20/02/2001	20/02/2001	4	4
662826437	278083.7	6130219.24	-9999	20.78			-9999	-9999	<Null>	-9999	<Null>	5.18	1/01/1931	1/01/1931	12.19	12.19
662826796	277381.37	6128357.41	-9999	23			-9999	1328	10/03/2012	3.157	15/03/2012	3	15/03/2012	15/03/2012	42	42
662826904	278604.28	6133230.45	-9999	19.91			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	6/01/2005	20	20
662826959	278213.77	6130647.87	-9999	25.518196	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	10/05/2013	0	11.5

UNIT_NO	EASTING	NORTHING	REF ELEV	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662827093	278486.67	6130949.14	-9999	22.999163			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	26/08/2013	13.5	13.5
662827249	278212.35	6130645.97	-9999	25.569445			-9999	-9999	<Null>	-9999	<Null>	9.8	28/01/2016	28/01/2016	12	12
662827250	276560	6132582	-9999	12.98894			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	7.27	7.27
662827454	273343.76	6132049.23	-9999	5			-9999	1100	1/06/1959	-9999	<Null>	-9999	<Null>	<Null>	27.43	27.43
662827455	273751.72	6133113.17	-9999	5.27		DOM	7.5	1066	16/01/1995	-9999	<Null>	-9999	<Null>	16/01/1995	16.5	16.5
662827596	276581.88	6129788.22	-9999	12.46		DOM	-9999	1143	25/03/1997	-9999	<Null>	5.8	25/03/1997	25/03/1997	15	15
662828116	278481.98	6130924.69	-9999	24.065182			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	23/07/2014	14	14
662828168	277304	6130226	-9999	20.889015			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	11/02/2016	12	12
662828177	272409.81	6130392.87	-9999	5.05			-9999	464	11/02/2008	-9999	<Null>	4	11/02/2008	11/02/2008	6	6
662828206	278752.67	6132388.35	-9999	20			-9999	-9999	<Null>	-9999	<Null>	13.3	16/12/1993	16/12/1993	17.5	18
662828209	277195.75	6133904.22	-9999	14.89			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	1/01/1979	-9999	-9999
662828298	276448.05	6131253.88	-9999	13.123428			-9999	-9999	<Null>	-9999	<Null>	3.5	5/01/2011	5/01/2011	6.5	6.5
662828309	275755.2	6128761.53	-9999	12.016392			-9999	-9999	<Null>	-9999	<Null>	3.4	3/08/2012	3/08/2012	5.5	5.5
662828429	277081.81	6128938.33	-9999	15.75		DOM	7.2	1132	10/02/1995	-9999	<Null>	-9999	<Null>	10/02/1995	20	20
662828897	276744.75	6128051.63	-9999	20.77504			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	18/07/2017	8	8
662829717	278839	6132252	-9999	28.462476	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	0	-9999
662829718	278835	6132260	-9999	28.833626	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	26/07/1996	0	-9999
662829719	278826	6132255	-9999	27.8569	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	0	-9999
662829720	278828	6132251	-9999	27.836	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	0	-9999
662829721	278829	6132244	-9999	27.477021	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	0	-9999
662829722	278851	6132258	-9999	28.384359	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	0	-9999
662829723	278837	6132260	-9999	28.780763	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	0	-9999
662829731	277072	6130318	-9999	19.075333			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	10	10
662829916	278262.16	6134083.67	-9999	22.309662			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	17/11/2015	18	18
662830069	273608	6131556	-9999	10			-9999	1586	15/03/2019	0.6	15/03/2019	1.5	15/03/2019	15/03/2019	4	4

T1 Aquifer Wells

UNIT NO	EASTING	NORTHING	REF ELEV (m AHD)	GRND ELEV (m)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662800719	278620.69	6131117.26	19.45	19.23	OPR	IND	-9999	2684	5/02/1962	12.63	8/02/1962	10.21	14/09/2018	8/02/1962	156.97	156.97
662801435	278644.74	6133628.22	-9999	20.6	BKF		10.6	921	2/08/1977	3.92	2/08/1977	21.2	2/08/1977	15/07/1977	0	184
662804576	278605.72	6133363.21	18.63	18.81			8.2	445	28/11/1988	-9999	<Null>	14.54	21/09/1991	2/11/1977	125	125
662807538	275976.74	6133753.31	14.45	13.45	RHB	OBS	8.3	860	23/04/2013	7.5	4/10/1949	16.76	11/12/2018	3/11/1945	149	149.35
662807541	275966.7	6133648.28	-9999	9.99			7	846	1/12/1972	12.63	1/12/1972	18.29	1/12/1972	<Null>	182.88	182.88
662807546	275900	6133659	-9999	9.98			7.8	888	20/11/1986	6.8	9/01/1974	19.46	9/01/1974	1/01/1974	144	144
662807549	276546.72	6133682.25	-9999	10.43			-9999	671	29/02/1952	5.68	22/02/1934	8.23	22/02/1934	1/01/1934	141.73	141.73
662807552	277132.72	6133969.28	15.9	15.8		OBS	7.4	1054	3/11/1984	11.25	21/09/1949	17.05	4/03/1985	15/11/1945	143.26	143.26
662807553	277168.77	6133893.24	-9999	14.25			-9999	829	9/08/1955	8.84	1/01/1955	13.72	6/12/1951	6/12/1951	176.17	176.17
662807555	277636.76	6134041.28	-9999	15.01			7.8	1027	11/02/1997	-9999	<Null>	-9999	<Null>	<Null>	140.82	140.82
662807558	278093.72	6134117.21	-9999	15.19			-9999	1085	22/10/1954	-9999	<Null>	18.29	14/09/1954	1/01/1946	167.64	167.64
662807561	278458.7	6134253.27	-9999	16.09	BKF		7.3	1759	15/03/1986	8.84	4/05/1946	0	15/03/1986	2/05/1946	0	169.16
662807570	278053.76	6133707.22	-9999	17.13	BKF		7.4	991	24/09/1981	15.16	7/07/1965	22.25	28/02/1969	7/07/1965	-9999	122.22
662807576	272970.73	6131893.33	-9999	5.03			7.7	849	26/11/1986	2.65	23/02/1970	13.72	23/02/1970	23/02/1970	131.67	131.67
662807579	273062.7	6132095.3	-9999	5			-9999	-9999	<Null>	6.32	14/04/1934	3.05	14/04/1934	14/04/1934	122.53	122.53
662807580	273172.68	6132275.3	-9999	5			7	827	2/02/1970	10.1	2/02/1970	11.28	2/02/1970	1/01/1929	135.64	135.64
662807583	273286.72	6131692.28	-9999	5			-9999	786	29/06/1932	10.1	11/06/1932	0.46	11/06/1932	11/06/1932	140.82	140.82
662807584	273297.7	6132067.28	-9999	5			-9999	800	26/02/1952	-9999	<Null>	-9999	<Null>	<Null>	143.26	143.26
662807586	272923.72	6132497.22	-9999	5			-9999	856	11/02/1946	3.79	11/02/1946	8.23	11/02/1946	11/02/1946	134.11	134.11
662807588	273141.69	6132426.27	-9999	4.99			-9999	857	15/04/1952	3.79	1/01/1952	-9999	<Null>	<Null>	158.5	158.5
662807591	273386.76	6132508.28	-9999	4.98			-9999	771	26/02/1952	8.84	1/01/1948	12.19	6/11/1945	1/01/1945	128.02	128.02
662807592	273415.69	6132396.22	-9999	4.99			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	128.02	128.02
662807593	273557.71	6132361.23	8.47	8.5	ABD	OBS	7.2	732	13/11/1984	10	18/10/1949	10.51	29/06/1995	29/10/1945	0	145.69
662807596	274019.73	6132871.28	-9999	6.38			-9999	729	26/02/1952	12.63	1/01/1946	6.1	1/01/1931	1/01/1931	198.12	198.12
662807608	274111.74	6131879.23	4	20.221973	BKF	IRR	7.2	972	28/05/1996	7.58	1/01/1972	33.53	18/03/1970	24/10/1952	0	152.4
662807614	273274.7	6130299.26	-9999	4.39	ABD		-9999	914	21/04/1955	12	13/09/1949	12.65	13/09/1949	21/11/1945	140.21	140.21

UNIT NO	EASTING	NORTHING	REF ELEV (m AHD)	GRND ELEV (m)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662807617	272430.72	6130534.22	-9999	5.04			-9999	857	2/05/1956	15.16	2/05/1956	5.49	2/05/1956	1/01/1956	143.26	143.26
662807619	272595.71	6130816.27	-9999	5.02			-9999	800	26/02/1952	15.79	26/02/1952	18.59	26/02/1952	5/02/1946	137.16	137.16
662807625	272515.75	6131088.25	3.78	3.8		OBS	7.7	981	16/02/2006	-9999	<Null>	3.98	11/12/2018	28/06/1968	128	128.02
662807640	274853.73	6133214.22	10	14.18012	ABD		-9999	871	21/04/1955	10.1	25/09/1949	10.66	25/09/1949	16/11/1945	146.3	146.3
662807656	274789.77	6131656.22	-9999	5.89			7.5	931	29/09/1987	12.88	1/01/1972	12.19	17/03/1966	1/01/1948	213.36	213.36
662807657	274364.35	6131907.75	-9999	4.95	BKF		7.8	966	29/09/1987	12.63	16/03/1962	0	18/09/1987	8/03/1962	0	217.02
662807658	274455.8	6132221.49	6	16.960762	BKF	IRR	6.7	2818	23/05/1996	12.63	7/10/1965	6.1	7/10/1965	10/09/1965	0	216.71
662807659	274302	6132021	6	8.565457			-9999	1145	16/06/1953	13.89	26/08/1952	6.4	26/08/1952	9/02/1928	174.35	174.35
662807660	275639.7	6131429.29	6.8	6.04		OBS	8	708	27/07/1983	12.63	5/12/1949	2.61	19/09/2018	5/12/1949	256.5	258
662807661	275267.71	6131190.26	3.92	3.9	RHB	OBS	7	744	1/02/1972	12	12/07/1979	6.55	10/09/1982	29/10/1962	206	213.36
662807662	274908.74	6130961.31	-9999	4.84			-9999	800	19/03/1958	17.68	19/04/1949	5.49	19/04/1949	19/04/1949	147.83	147.83
662807663	274945.76	6130882.28	3.18	4.25	BKF	OBS	7.4	761	21/01/1983	-9999	<Null>	2.06	27/09/2003	17/09/1962	0	213.97
662807664	274672.73	6130617.27	-9999	4.65			-9999	813	1/01/1962	-9999	<Null>	-9999	<Null>	1/10/1962	213.36	213.36
662807665	274928.74	6130328.22	-9999	4.86			-9999	813	13/07/1948	5.05	13/07/1948	0	13/07/1948	1/01/1934	140.21	140.21
662807667	274781.7	6131357.21	-9999	4.98			-9999	742	11/09/1934	3.54	11/09/1934	0	11/09/1934	11/09/1934	161.54	161.54
662807691	276008	6133306	11.66	12.08	BKF	OBS	7.8	810	20/11/1986	9.0909	11/12/1973	13.78	11/09/2005	11/12/1973	204	204
662807692	276001.68	6133381.3	-9999	11.11			6.7	733	20/12/2002	10.1	6/12/1967	48.77	6/12/1967	<Null>	153.62	153.62
662807693	275756.76	6133176.28	-9999	10.38	BKF		7.6	757	12/08/2014	7.58	14/12/1967	11.58	12/08/2014	14/12/1967	0	152.4
662807699	275551.76	6132582.29	-9999	9.54			7	1064	24/11/1967	10.61	26/10/1967	18.29	26/10/1967	1/01/1967	147.83	147.83
662807703	276169.69	6132894.26	-9999	10.85			-9999	700	27/02/1952	12.63	23/10/1934	6.4	23/10/1934	23/10/1934	149.05	149.05
662807704	276305.77	6132959.31	-9999	11.39	BKF		-9999	643	21/12/1951	15.16	17/09/1949	8.84	17/09/1949	16/01/1946	144.02	144.02
662807707	276178.72	6133417.28	-9999	11.17			-9999	729	27/02/1952	-9999	<Null>	-9999	<Null>	1/01/1934	147.83	147.83
662807708	276074.69	6133435.26	-9999	11			-9999	700	27/02/1952	-9999	<Null>	7.62	28/07/1934	28/07/1934	146.3	146.3
662807709	276258.73	6133476.29	-9999	10.86			-9999	771	13/12/1937	7.58	13/12/1937	22.86	13/12/1937	1/01/1937	144.78	144.78
662807711	276630.71	6133369.29	-9999	12.28			-9999	671	27/02/1952	6.32	22/02/1934	8.23	22/02/1934	1/02/1934	138.99	138.99
662807717	277317.71	6133518.26	-9999	14.97	OPR	DRN	6.7	855	18/03/1966	6.32	18/03/1966	20.12	18/03/1966	18/03/1966	143.26	143.26
662807718	277606.76	6133418.31	-9999	16.16			7.7	1049	25/03/1974	16.42	1/01/1967	12.19	1/01/1940	1/07/1934	124.36	124.36

UNIT NO	EASTING	NORTHING	REF ELEV (m AHD)	GRND ELEV (m)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662807719	277655.76	6133580.22	15.19	15.2	BKF	OBS	8.2	921	17/02/1975	11.37	15/10/1934	19.26	7/09/1983	15/10/1934	0	131.37
662807723	278005.76	6132838.29	-9999	16.22			-9999	643	2/11/1934	15.16	13/10/1934	12.8	13/10/1934	23/10/1934	160.02	160.02
662807724	278578.79	6133452.75	17.95	23.143966		OBS	7.2	1272	24/11/1986	15.16	21/11/1969	20.17	29/03/1982	21/11/1969	154	155.45
662807725	278538.36	6133623.31	18.19	22.930189		OBS	7.6	1100	2/10/2003	10.05	31/08/1973	24.45	13/09/2018	31/08/1973	127	127
662807738	276455.7	6131966.23	-9999	9.09			-9999	657	23/03/1955	17.05	12/03/1951	19.81	12/03/1951	12/03/1951	137.16	137.16
662807739	276450.7	6131987.3	7.78	7.78	ABD	OBS	7.9	761	17/02/1975	18.95	15/12/1948	8.41	15/09/1998	13/11/1934	0	204.22
662807746	277080.7	6131793.26	-9999	10.31	UKN		7.6	910	24/02/2005	10.1	14/07/1971	9.14	14/07/1971	1/01/1971	118.87	118.87
662807756	278141.74	6131236.28	16	16	ABD	OBS	7.8	1356	13/11/1984	15.16	5/12/1949	10.23	5/03/2004	27/07/1934	0	104.85
662807764	276063.74	6131086.29	-9999	7.89			-9999	757	27/02/1952	3.79	20/09/1935	0	20/09/1935	1/01/1932	117.35	117.35
662807773	276396.71	6130598.29	-9999	9.85			-9999	729	27/06/1935	15.16	27/06/1935	0	27/06/1935	1/01/1935	112.78	112.78
662807775	277305.74	6130632.3	13.73	13.73		OBS	7.7	772	28/04/1981	22.73	16/12/1948	5.2	14/09/2018	13/11/1934	111.56	113.39
662807778	278107.76	6130816.21	-9999	17.23			-9999	-9999	<Null>	7.58	<Null>	7.01	<Null>	<Null>	41.45	41.45
662807782	275761.7	6130463.28	-9999	7.47			-9999	813	24/10/1949	10.74	24/10/1949	11.58	23/10/1946	23/11/1945	144.78	144.78
662807785	275897.7	6130206.22	6	8.294674	UKN		-9999	800	28/02/1952	11.37	1/01/1952	0	24/08/1935	1/01/1934	174.35	174.35
662807790	275892.75	6129939.26	-9999	6.74			-9999	-9999	<Null>	5.05	<Null>	0	<Null>	<Null>	95.4	95.4
662807791	276024.76	6130466.3	-9999	7.69			7.3	832	25/11/1986	15.16	1/01/1967	-9999	<Null>	<Null>	141.73	141.73
662807799	276937.74	6130495.21	-9999	12.84			-9999	828	1/01/1934	-9999	<Null>	-9999	<Null>	1/01/1914	73.15	73.15
662807843	272731.73	6128112.24	-9999	4.85			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	8/12/1950	124.05	124.05
662807844	272731.71	6128113.24	-9999	4.86			-9999	743	29/02/1960	11.37	12/03/1951	16.76	12/03/1951	12/03/1951	141.73	141.73
662807846	274105.7	6128103.31	-9999	5.07			-9999	743	29/02/1960	6.32	3/04/1951	15.85	3/04/1951	3/04/1951	103.63	103.63
662807847	274148.71	6128499.32	-9999	3.97	PLG		-9999	1070	7/06/1957	5.68	14/02/1927	0	14/02/1927	14/02/1927	92.96	115.82
662807849	274409	6128473	-9999	7.03			-9999	1100	29/02/1960	22.73	7/12/1956	0	7/12/1956	7/12/1956	79	114.6
662807850	274339.76	6127422.24	-9999	6.13			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	1/09/1909	88.7	88.7
662807852	273981.7	6128542.24	3.38	2.61	BKF		8.3	1077	17/12/1986	-9999	<Null>	0.01	21/09/1991	15/01/1968	0	153.31
662808044	274796.76	6128803.28	-9999	4.76			-9999	1145	29/02/1960	6.06	30/04/1951	14.33	30/04/1951	30/04/1951	91.44	91.44
662808046	274675.71	6127378.27	-9999	4.62			-9999	2130	19/11/1914	-9999	<Null>	2.74	19/11/1914	<Null>	86.26	86.26
662808048	275812.7	6129682.22	-9999	6.8			-9999	843	5/03/1952	8.21	6/06/1947	7.92	6/06/1947	30/03/1946	140.51	140.51

UNIT NO	EASTING	NORTHING	REF ELEV (m AHD)	GRND ELEV (m)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662808050	275246.72	6128651.32	6	11.05236			-9999	1013	6/05/1949	1.89	6/05/1949	-9999	<Null>	<Null>	90	90
662808052	275109.74	6128431.3	-9999	5.77	RHB	OBS	8.7	865	25/08/1986	8.84	15/12/1948	0.01	19/09/2018	18/01/1946	94	103.63
662808073	276554.77	6129645.26	-9999	12.44			-9999	885	13/12/1933	-9999	<Null>	3.96	13/12/1933	<Null>	69.19	69.19
662808081	276701.74	6128592.27	13.13	13.18		OBS	7.3	1485	10/11/2005	5	31/10/1985	2.67	19/09/2018	8/09/1914	57	70.7
662808082	275939	6128153	-9999	8.71	BKF		-9999	-9999	<Null>	0.51	<Null>	-9999	<Null>	<Null>	0	76.81
662808084	276150.72	6128216.24	3	13.837881	BKF		7.7	1183	2/06/2015	-9999	<Null>	4.73	2/06/2015	8/08/1968	0	81.38
662808093	277237	6129129	-9999	16.41			7.7	1832	29/08/2006	10.74	1/01/1967	7.32	25/02/1946	1/01/1945	64.01	64.01
662808094	276665	6129471	12.26	12.45	RHB	OBS	7.6	1670	11/11/1985	2	6/11/1985	12.76	13/03/2014	<Null>	69	79.25
662808096	276738.69	6129251.28	-9999	13.45			-9999	786	15/09/1914	-9999	<Null>	-9999	<Null>	1/08/1914	83.82	83.82
662808120	277744.75	6129663.23	20.37	20.09	ABD	OBS	7.9	617	13/10/1977	20.21	11/08/1950	6.93	13/03/1991	11/08/1950	0	60.96
662811161	272370.68	6128691.32	7.39	7.53		OBS	7.8	960	13/12/1984	-9999	<Null>	12.42	27/03/1998	15/11/1979	226	267
662811199	277183.71	6133914.25	-9999	14.91			7.6	832	3/11/1979	-9999	<Null>	15	23/11/1979	23/11/1979	170	170
662811505	275183.75	6127962.24	-9999	6.75			-9999	-9999	<Null>	8.84	1/01/1964	-9999	<Null>	<Null>	103.63	103.63
662811786	277959.76	6133713.3	16.16	21.755524		OBS	7.6	655	24/02/1988	-9999	<Null>	26.39	5/02/1998	16/06/1981	121	121
662811875	277971.8	6133718.37	-9999	16.9		OBS	-9999	-9999	<Null>	-9999	<Null>	24	16/06/1981	16/06/1981	121	121
662811876	277971.8	6133718.37	-9999	16.9		OBS	-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	16/06/1981	121	121
662812446	278524.71	6133684.24	21.86	21.49	OPR	IND	7.9	1005	19/12/2006	12	31/07/1989	31.41	4/09/2007	7/02/1983	200	257.8
662812516	278545.74	6133586.14	-9999	19.91	BKF	IND	7.7	1300	23/11/2004	18.75	29/09/1983	21.2	29/09/1983	29/09/1983	0	210
662813389	277664.76	6134040.3	-9999	15.09			-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	1/12/1949	138.7	138.7
662813504	278447	6134312	-9999	14.99	OPR	IND	7.9	906	19/11/1985	6.25	26/08/1985	20.5	19/11/1985	26/08/1985	191.3	191.3
662813505	278327.75	6134254.31	-9999	14.99	OPR	IND	7.5	927	19/11/1985	8.75	12/07/1985	19.3	19/11/1985	12/07/1985	196	196
662813732	278462.75	6134320.3	-9999	14.98		IND	7.6	972	8/10/1986	5	25/07/1986	19.1	8/10/1986	25/07/1986	186.5	186.5
662813939	278570.71	6134336.23	-9999	14.96	BKF	IND	-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	30/03/1987	0	177.5
662813940	278358.76	6133997.22	-9999	17.69		IND	7.8	1010	18/02/2005	0.14	13/04/1987	29	13/04/1987	13/04/1987	203.6	203.6
662814013	277838.76	6133852.28	-9999	16.13			7.6	714	29/09/1987	25	9/09/1987	24.4	29/09/1987	9/09/1987	215	215
662814214	272255.7	6129076.29	-9999	5.48			8.4	1034	26/02/2009	6	20/05/1988	8.7	21/09/2018	20/05/1988	228	228
662814229	276005.71	6130430.31	-9999	7.45	BKF	IND	-9999	849	6/07/1988	20	5/06/1988	3.6	6/07/1988	5/06/1988	0	138

UNIT NO	EASTING	NORTHING	REF ELEV (m AHD)	GRND ELEV (m)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662814373	277829.7	6131087.27	-9999	14.15	OPR	IND	7.5	1765	26/11/1988	12	26/11/1988	11.2	26/11/1988	26/11/1988	64	64
662814393	278432.72	6133854.28	-9999	18.54		IND	7.7	725	22/05/1989	12.5	13/12/1988	34	22/05/1989	13/12/1988	207.5	207.5
662815323	272198.72	6129349.26	-9999	5.85	OPR	IND	-9999	983	17/07/1990	7	2/07/1990	5.8	2/07/1990	2/07/1990	228	228
662815498	277707.74	6134119.26	-9999	15	OPR	IND	7.9	719	3/04/1991	25	5/02/1991	24	3/04/1991	5/02/1991	216	216
662815556	274046	6128556	-9999	4.59	OPR	OBS	7.9	1050	25/02/2005	10	24/01/1991	6.7	24/01/1991	24/01/1991	211	215
662815991	277806.73	6131092.26	-9999	14.04	OPR	IND	7.2	1440	23/02/2005	12	2/04/1992	11.2	2/04/1992	2/04/1992	65	65
662816261	277971.79	6133728.21	-9999	16.85		OBS	6.9	3471	25/08/1993	5	25/09/1992	-9999	<Null>	25/09/1992	120	121
662818780	274348	6132130	-9999	6.04		IRR	7.7	771	23/02/2005	8.4	6/12/1996	10	6/12/1996	6/12/1996	216	221
662819428	275921.85	6130328.24	-9999	7.18	OPR	IND	8.1	845	2/03/2005	31	20/11/1998	3	20/11/1998	20/11/1998	140	140
662820552	274357.48	6131546.76	-9999	4.74		IRR	-9999	755	17/11/2000	10	17/11/2000	11.3	17/11/2000	17/11/2000	221	221
662820663	278361.17	6133575.98	-9999	18.86		IRR	-9999	1105	3/09/2001	5	7/08/2001	-9999	<Null>	7/08/2001	114	121
662820854	274702	6131817	-9999	5.95		IND	-9999	688	11/01/2002	20	11/01/2002	15	11/01/2002	11/01/2002	224	224
662820911	273694	6129636.65	-9999	3.99	BKF	GTH	-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	28/03/2002	0	104
662820912	273684.71	6129626.21	-9999	3.99	BKF	GTH	-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	0	104
662820913	273674.7	6129616.2	-9999	3.98	BKF	GTH	-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	0	104
662820914	273665.81	6129606.2	-9999	3.98	BKF	GTH	-9999	1328	9/11/2018	-9999	<Null>	-9999	<Null>	<Null>	0	104
662820915	273656.92	6129597.31	-9999	3.98	BKF	GTH	-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	<Null>	0	104
662821320	277553	6130518	-9999	16.19		DRN	-9999	722	12/06/2003	1.2	12/06/2003	12.5	12/06/2003	12/06/2003	84	84
662821949	278199	6131438	17	17	OPR	OBS	-9999	2334	4/06/2015	12	24/02/2005	7.76	14/09/2018	24/02/2005	49.09	49.09
662822322	274246	6128574	-9999	5.91	OPR	MAR	-9999	1039	19/10/2005	10	12/10/2005	7	12/10/2005	12/10/2005	188	196.7
662822597	276537.63	6133389	-9999	11.85	RHB		-9999	831	14/03/2014	5	12/02/2011	18	12/02/2011	4/03/2005	122.5	144
662823335	274441	6128460	-9999	4.88	OPR	MAR	-9999	1083	7/08/2007	15	29/05/2007	0.85	7/08/2007	29/05/2007	119	124
662823525	278530	6133192	-9999	19.55			-9999	1078	31/08/2007	10	3/08/2007	27.3	3/08/2007	3/08/2007	206	206
662823539	272889	6128948	-9999	4.56	NIU	INV	-9999	998	24/07/2007	8	6/06/2007	-9999	<Null>	6/06/2007	215	215
662824910	274670.4	6131664.22	-9999	9.392029			-9999	-9999	<Null>	2.2731	20/11/2008	12	22/11/2008	22/11/2008	220	220
662825428	275410	6129193	-9999	6.23		INV	7.51	1104	23/09/2014	5	28/06/2010	-0.46	20/09/2018	28/06/2010	117	117
662826395	274880.64	6127397.26	-9999	10.655516	OPR	IRR	7.33	1279	11/12/2018	10.1024	27/09/2008	-9999	<Null>	27/09/2008	110	124

UNIT NO	EASTING	NORTHING	REF ELEV (m AHD)	GRND ELEV (m)	STATUS	PURPOSE	PH	TDS (mg/L)	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662827005	274778	6129092	-9999	7	BKF		-9999	-9999	<Null>	-9999	<Null>	-9999	<Null>	29/04/2013	0	180
662827006	274768	6129083	-9999	6.850467	BKF		-9999	1156	13/06/2013	-9999	<Null>	-9999	<Null>	<Null>	0	186
662827008	274834.05	6127412.68	-9999	14.288677	OPR	IRR	-9999	1317	15/08/2013	20	15/08/2013	4	15/08/2013	<Null>	124	124
662827263	277706	6133437	-9999	21.61946			-9999	-9999	<Null>	10	24/05/2014	22	24/05/2014	24/05/2014	124	124
662827792	275719	6133208	-9999	18.158036		IRR	7.67	730	12/08/2018	10	7/05/2015	9.74	29/08/2017	7/05/2015	151	151
662827794	276137	6128201	-9999	10.736216	OPR	IRR	7.35	1158	18/10/2018	10	15/05/2015	2.13	24/10/2017	15/05/2015	70	70
662829437	274772	6126935	-9999	15.673587		TWS	-9999	-9999	<Null>	20	9/04/2018	10	9/04/2018	9/04/2018	107.5	107.5

UNIT_NO	EASTING	NORTHING	REF ELEV (mAHD)	GRND ELEV (m AHD)	STATUS	PURPOSE	PH	TDS	TDS DATE	YIELD (L/s)	YIELD DATE	SWL (m bgl)	SWL DATE	DRILL DATE	LAT DEPTH (m)	MAX DEPTH (m)
662807607	274016	6131583	8	11.621665	UKN		-9999	2115	7/01/1952	5.68	5/02/1951	9.14	5/02/1951	14/05/1928	147.83	147.83
662807630	274468.71	6133189.29	10	15.198174			-9999	3098	31/01/1946	6.32	18/01/1946	15.24	18/01/1946	1/01/1932	264.57	264.57
662807751	277278.74	6131424.26	10.82	10.82	ABD	OBS	8.5	468	13/11/1984	25	29/09/1950	5.9	29/06/1995	22/09/1950	0	132.59
662807759	278634.69	6131316.28	-9999	18.68	OPR	IND	7.2	2942	21/11/1986		<Null>	-9999	<Null>	<Null>	103.02	103.02
662807848	274350.73	6128485.23	-9999	10.41			-9999	1000	29/02/1960	1.26	14/01/1930	0	14/01/1930	14/01/1930	170.69	170.69
662808059	275798.68	6127494.32	-9999	9.78	BKF		-9999	1730	21/04/1955	15.16	1/01/1949	1.68	3/08/1955	1/01/1914	0	111.86
662811501	274771.74	6126916.22	-9999	8.17	ABD	RCL	7.78	1222	31/08/1990	25.2561	22/10/1990	-9999	26/05/2018	25/08/1990	0	109.73
662812452	275638.74	6131431.27	6.45	6.04		OBS	8.1	813	19/03/1986		<Null>	-0.52	19/09/2018	25/08/1983	256.5	258
662813648	277716.7	6133961.31	-9999	15.51			-9999		<Null>		<Null>	-9999	<Null>	24/06/1970	213.4	213.4
662814266	278126.75	6133992.28	17.49	17.52	OPR	OBS	7.99	1093	9/01/2014	2	19/08/1988	13.69	13/09/2018	19/08/1988	246	246
662814292	277381	6130687	-9999	14.49	OPR	IND	7.4	661	15/01/1992		<Null>	6.7	6/03/1987	8/12/1986	91	91
662822321	274426	6128496	-9999	4.97	OPR	MAR	-9999	1197	11/10/2005	12	4/10/2005	-9999	<Null>	4/10/2005	210	221
662825427	275385	6129186	-9999	12.89		INV	7.59	1020	23/09/2014	10	24/06/2010	-4.07	20/09/2018	24/06/2010	191	227
662825717	273921	6128612	-9999	10.722895	NIU	INV	-9999	5580	3/11/2010	15	3/11/2010	3	3/11/2010	3/11/2010	340	340
662825718	274657	6128969	-9999	7.191138	OPR	MAR	-9999	2709	17/10/2010	15	19/10/2010	0	17/10/2010	17/10/2010	280	280
662825719	274990	6129202	-9999	10.54434	OPR	MAR	-9999	1035	20/10/2010	10	8/07/2010	0.81	8/07/2010	8/07/2010	224	240
662827002	275158	6129229	-9999	9.819146	OPR	MAR	-9999	925	26/05/2013	30	22/05/2013	3.5	26/05/2013	26/05/2013	220	220
662827007	274849	6129133	-9999	6.544001	OPR	MAR	-9999	2721	13/06/2013	30	11/06/2013	2.5	13/06/2013	13/06/2013	234	234

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Appendix D

Existing Scenario 2, 3 and 4 Drain Standard Mapping

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Drain Standard]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

Drainage Standard Map
Scenario 2 - Future Development, Existing Infrastructure

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Drain Standard]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

Drainage Standard Map
Scenario 3 - Future Development, Existing Infrastructure, Climate Change RCP 4.5

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Drain Standard]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

Drainage Standard Map
Scenario 4 - Future Development, Existing Infrastructure, Climate Change RCP 8.5

Appendix E

Existing Scenario Flood Plain Mapping

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

- Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;
- Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

- Storms with different Annual Exceedance Probability;
- Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

Disclaimer

This map is provided on the basis that those responsible for its preparation and publication do not accept any responsibility for any loss or damaged alleged to be suffered by anyone as a result of the publication of the map and the notations on it, or as a result of the use or misuse of the information provided herein.

The data contained on this map is based on survey, hydraulic and hydrological modelling to accuracy sufficient for broad scale flood risk management and planning. Further development, earthworks and other changes to the catchment may affect the actual flood extents. The modelling reflects current practice but it may be realised that there are uncertainties and assumptions associated with the data and the processes on which the models are based, and therefore the flood extents shown on this map cannot be regarded as exact predictions.

The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

0.5 EY Floodplain Map
Scenario 1 - Existing Development, Existing Infrastructure

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments

- Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

0.2 EY Floodplain Map
Scenario 1 - Existing Development, Existing Infrastructure

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

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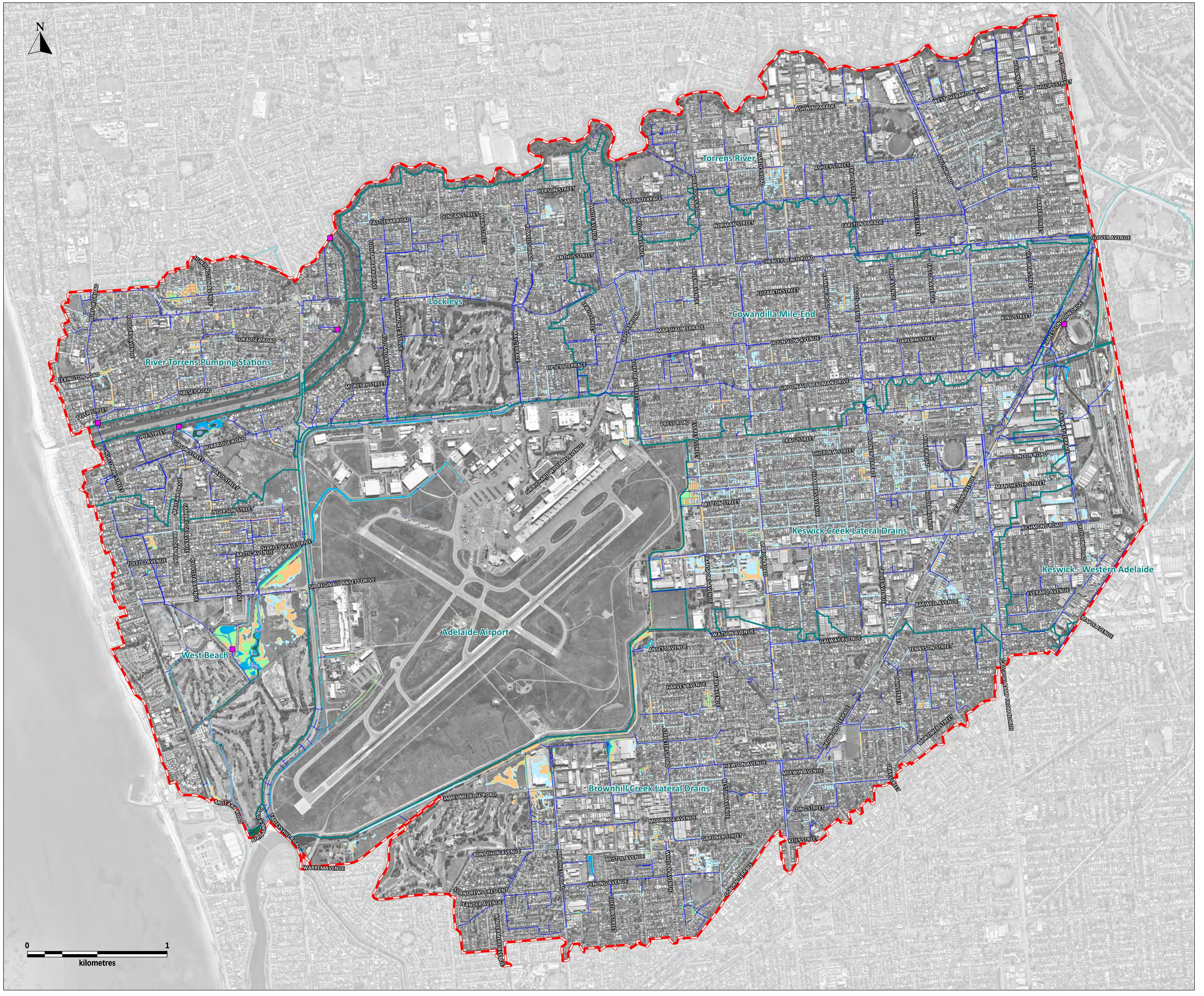
The flood extents are not based on actual historical floods.



Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

10% AEP Floodplain Map
Scenario 1 - Existing Development, Existing Infrastructure

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

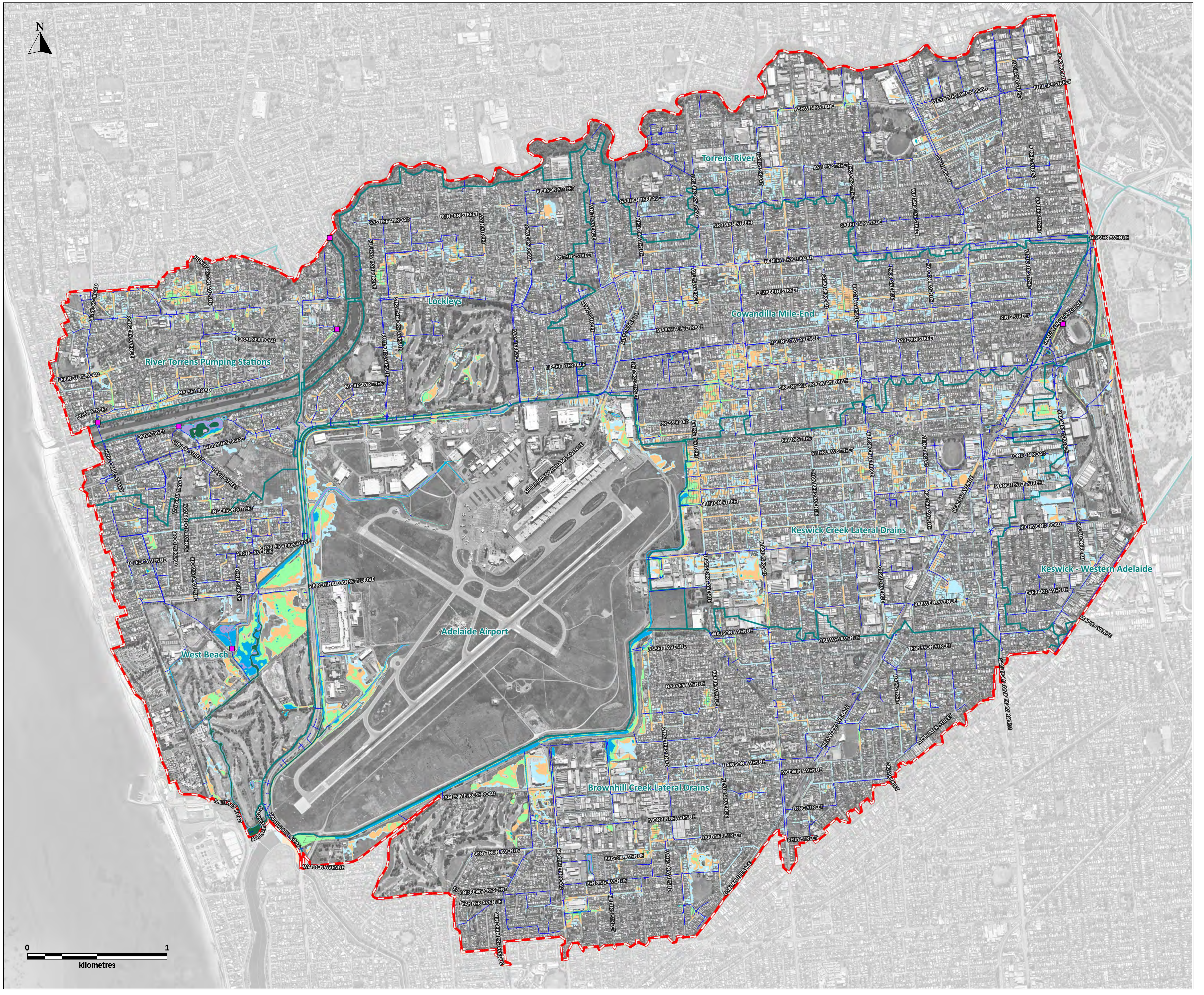
West Torrens
Stormwater Management Plan

5% AEP Floodplain Map
Scenario 1 - Existing Development, Existing Infrastructure

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre



Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

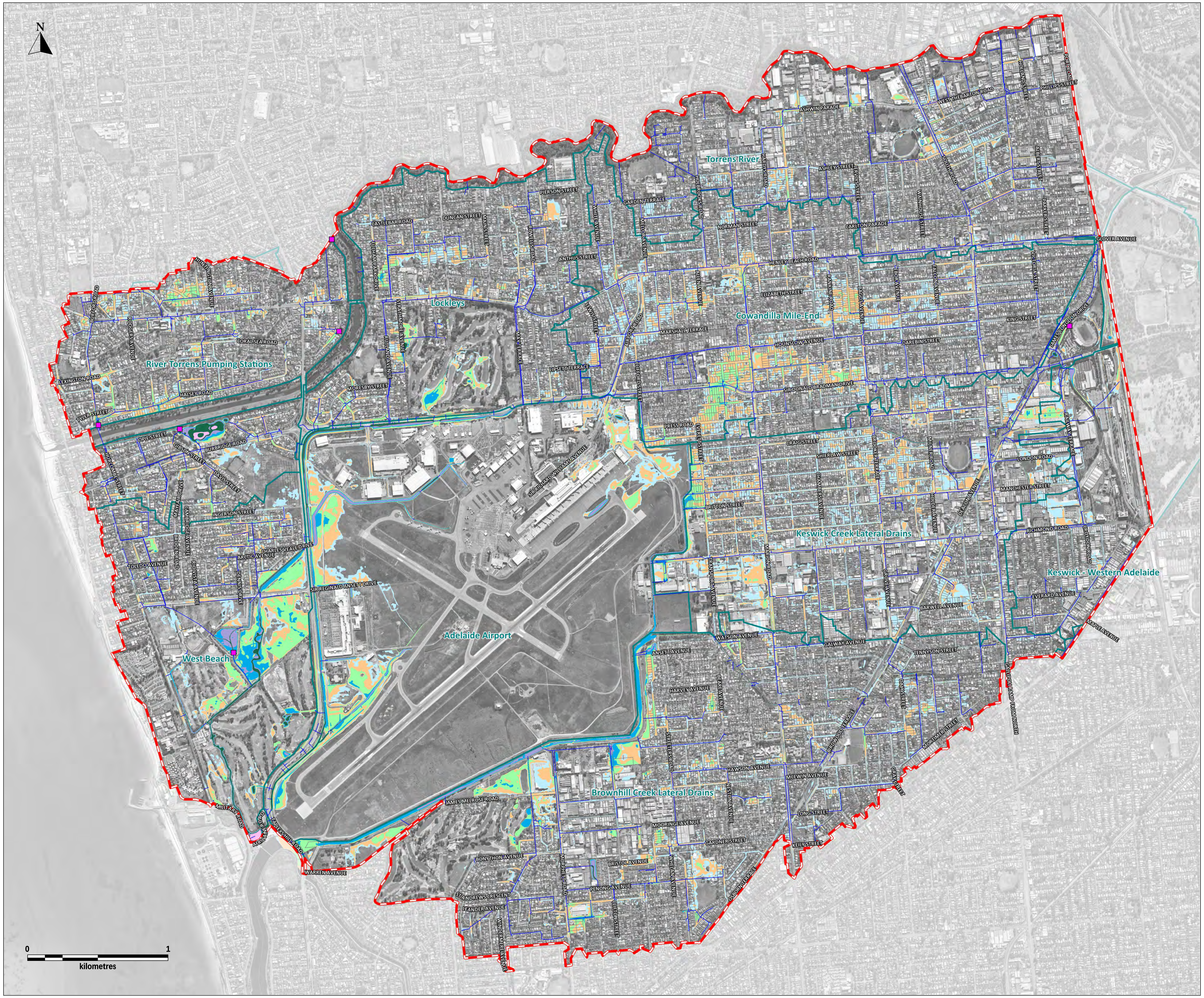
West Torrens
Stormwater Management Plan

2% AEP Floodplain Map
Scenario 1 - Existing Development, Existing Infrastructure

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre



Background

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Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

1% AEP Floodplain Map
Scenario 1 - Existing Development, Existing Infrastructure

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

- Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;
- Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

- Storms with different Annual Exceedance Probability;
- Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

0.5 EY Floodplain Map
Scenario 2 - Future Development, Existing Infrastructure

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments

- Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

0.2 EY Floodplain Map
Scenario 2 - Future Development, Existing Infrastructure

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

Existing Stormwater Drain

Pump Station

Model Boundary

Major Catchments

Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

10% AEP Floodplain Map
Scenario 2 - Future Development, Existing Infrastructure

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

DRAFT 26/11/2021

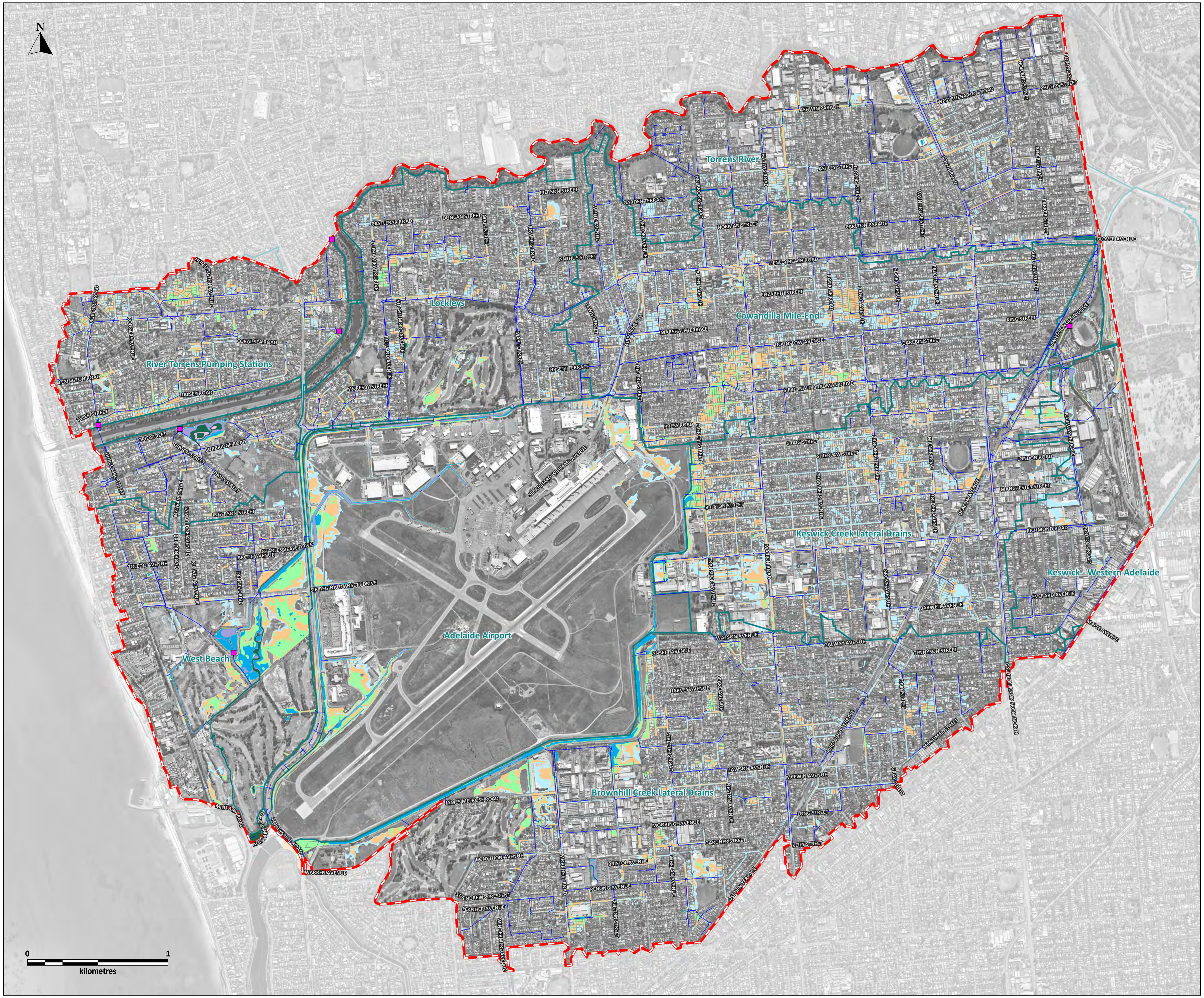
West Torrens
Stormwater Management Plan

5% AEP Floodplain Map
Scenario 2 - Future Development, Existing Infrastructure

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre



Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

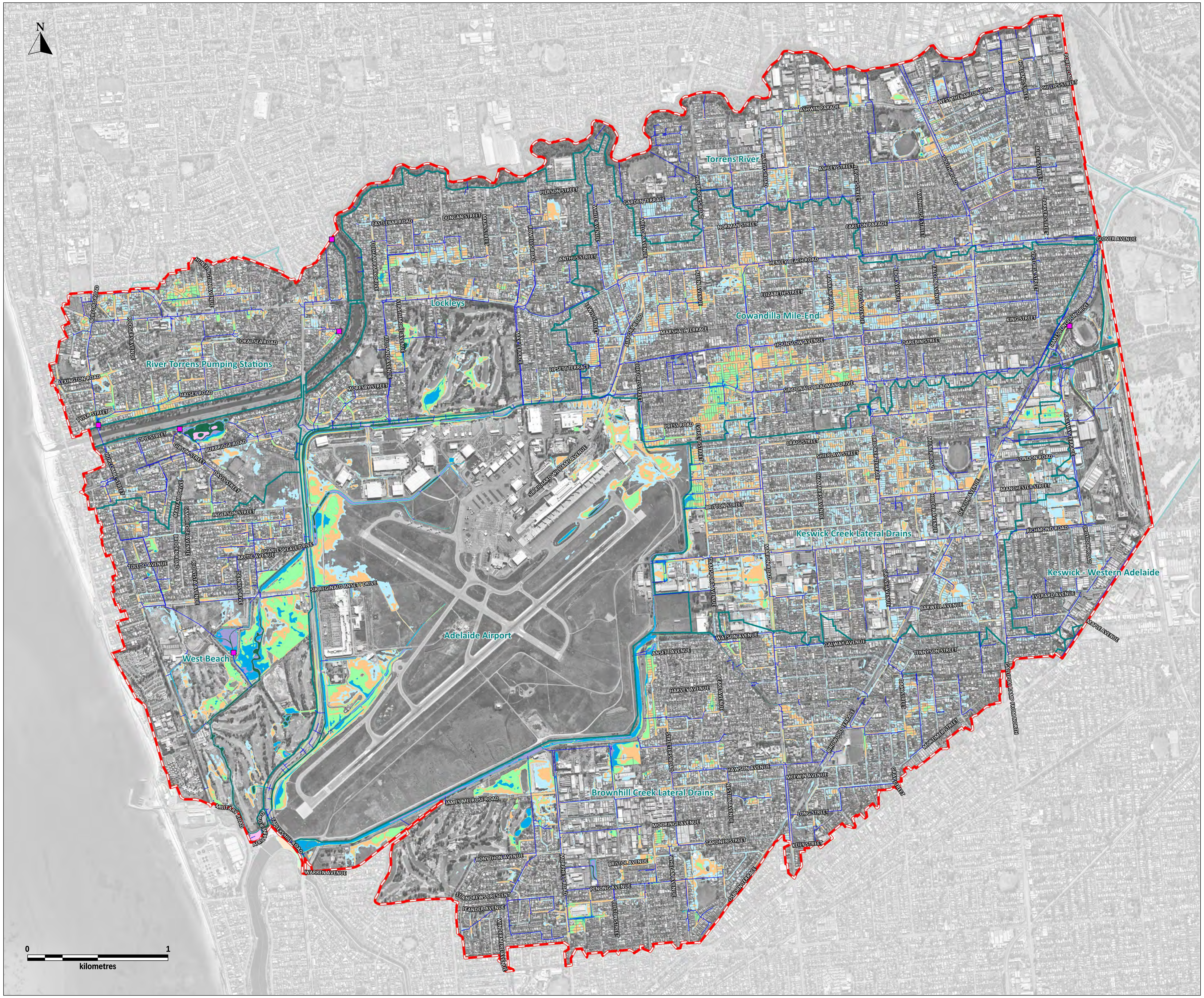
West Torrens
Stormwater Management Plan

2% AEP Floodplain Map
Scenario 2 - Future Development, Existing Infrastructure

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre



Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

1% AEP Floodplain Map
Scenario 2 - Future Development, Existing Infrastructure

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

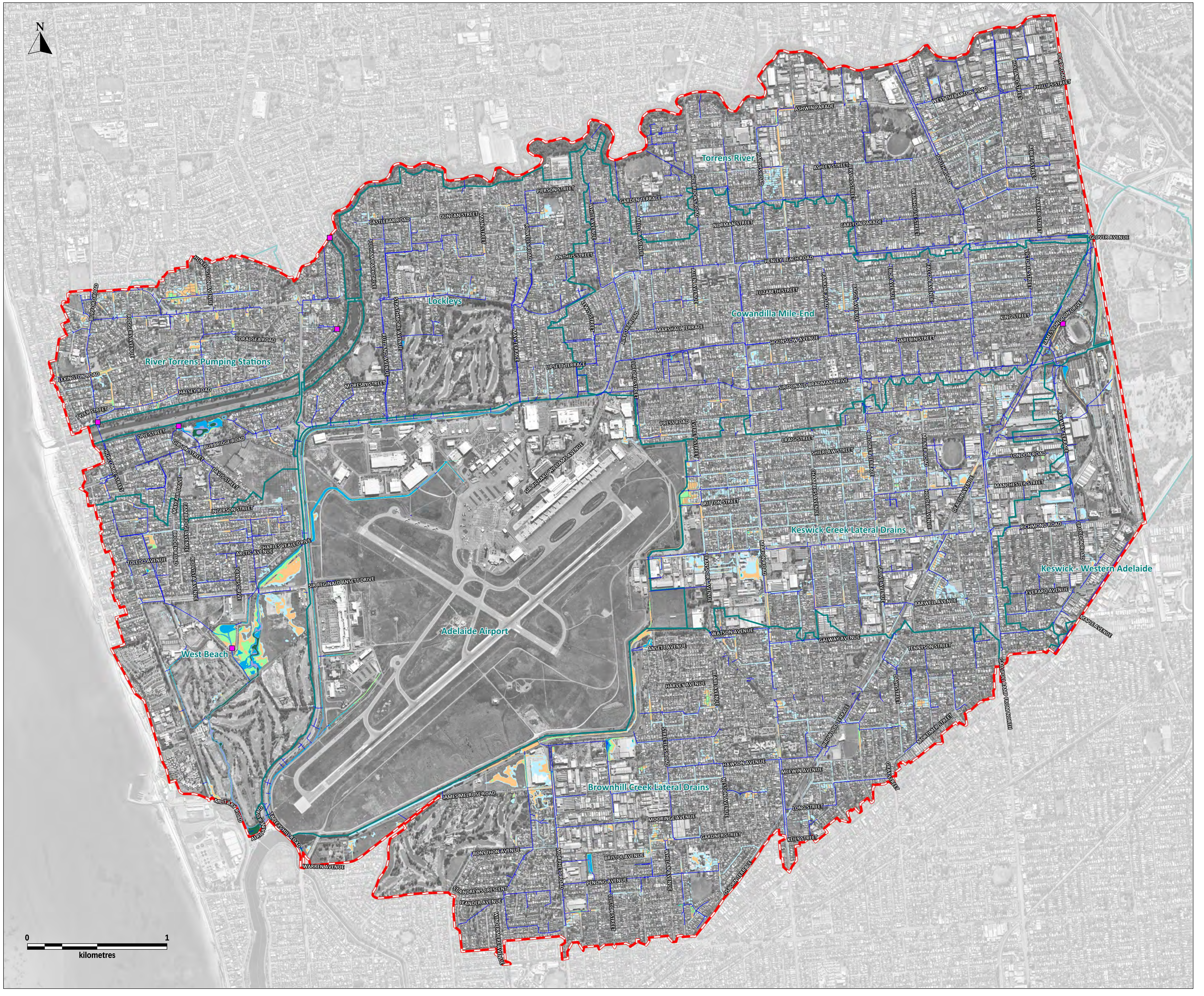
West Torrens
Stormwater Management Plan

0.5 EY Floodplain Map
Scenario 3 - Future Development, Existing Infrastructure, Climate Change RCP 4.5

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre



Background

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Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

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As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

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Effect of debris on flood extent

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

0.2 EY Floodplain Map
Scenario 3 - Future Development, Existing Infrastructure, Climate Change RCP 4.5

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

- Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;
- Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

- Storms with different Annual Exceedance Probability;
- Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

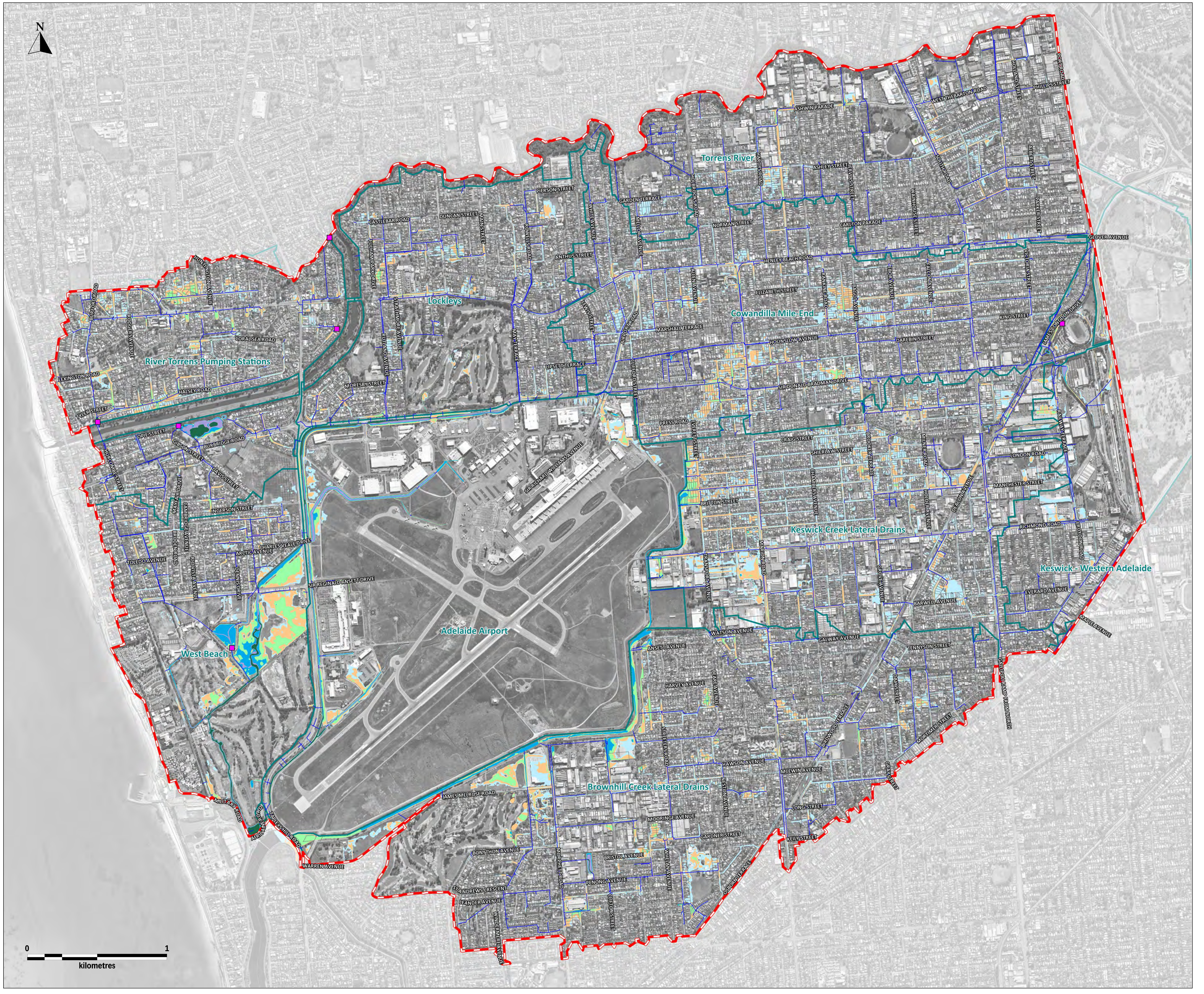
West Torrens
Stormwater Management Plan

10% AEP Floodplain Map
Scenario 3 - Future Development, Existing Infrastructure, Climate Change RCP 4.5

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre



Background

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Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

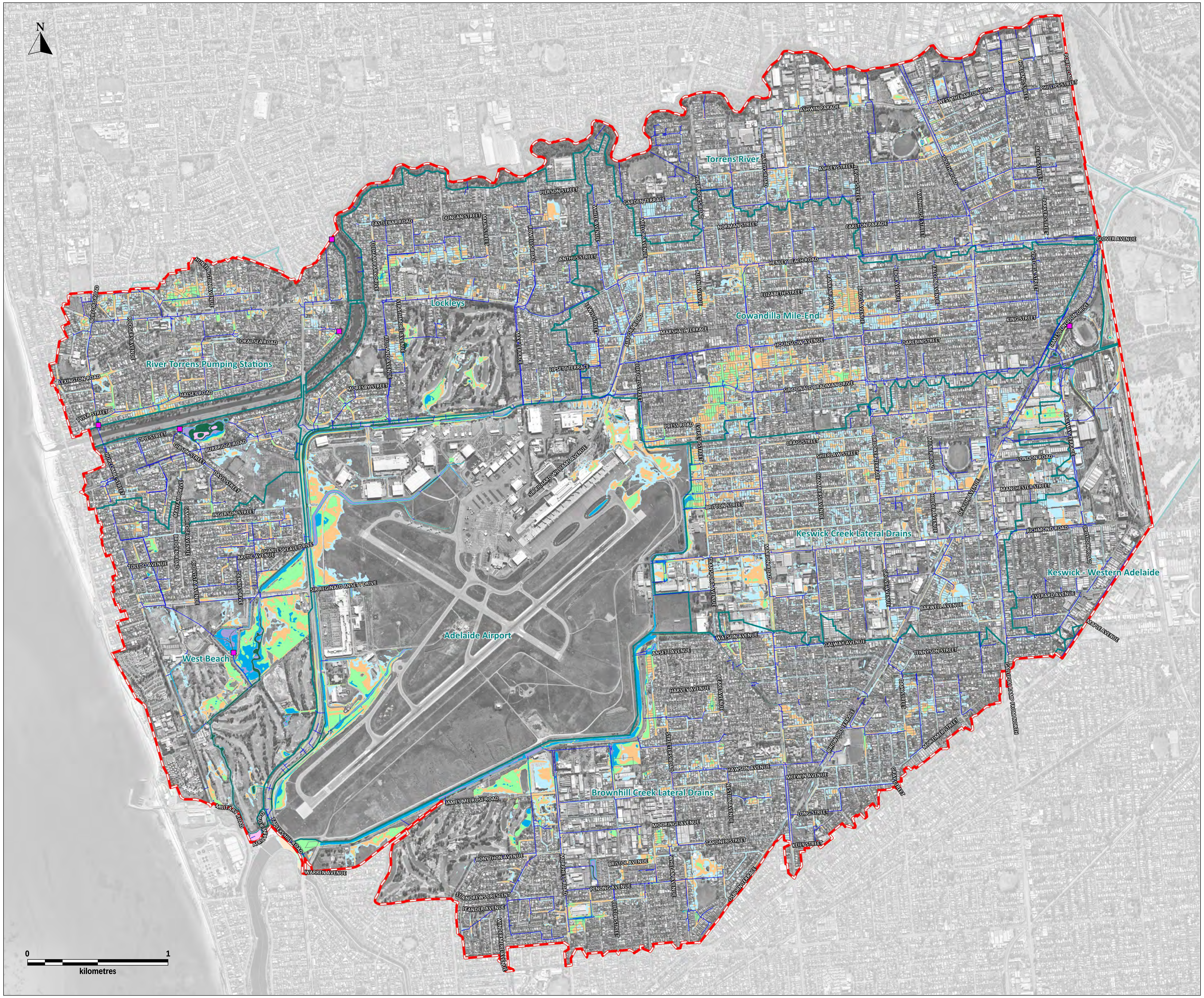
West Torrens
Stormwater Management Plan

5% AEP Floodplain Map
Scenario 3 - Future Development, Existing Infrastructure, Climate Change RCP 4.5

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre



Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

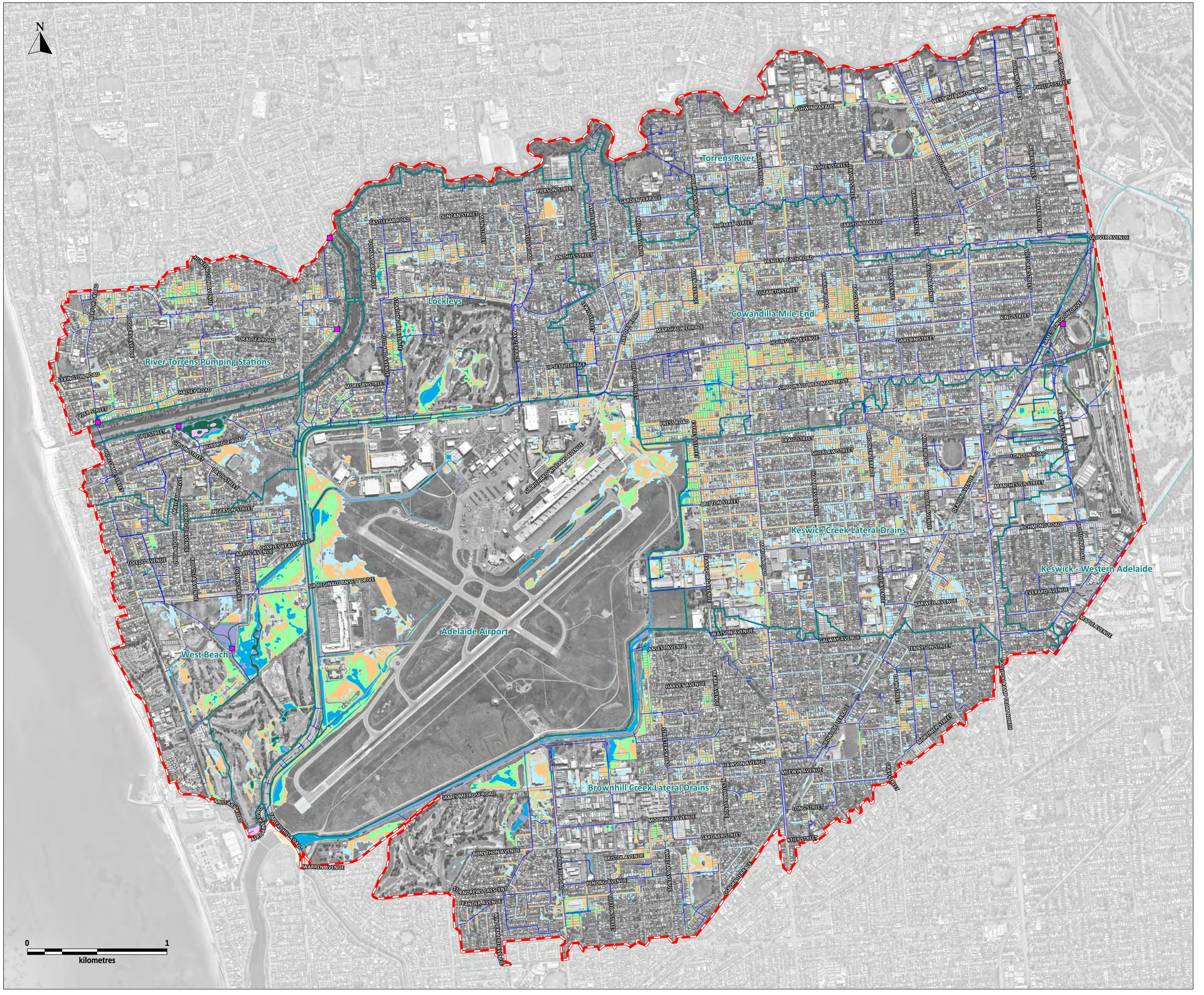
West Torrens
Stormwater Management Plan

2% AEP Floodplain Map
Scenario 3 - Future Development, Existing Infrastructure, Climate Change RCP 4.5

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre



Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

1% AEP Floodplain Map
Scenario 3 - Future Development, Existing Infrastructure, Climate Change RCP 4.5

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

0.5 EY Floodplain Map
Scenario 4 - Future Development, Existing Infrastructure, Climate Change RCP 8.5

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

0.2 EY Floodplain Map
Scenario 4 - Future Development, Existing Infrastructure, Climate Change RCP 8.5

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

10% AEP Floodplain Map
Scenario 4 - Future Development, Existing Infrastructure, Climate Change RCP 8.5

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre

Background

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Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

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Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

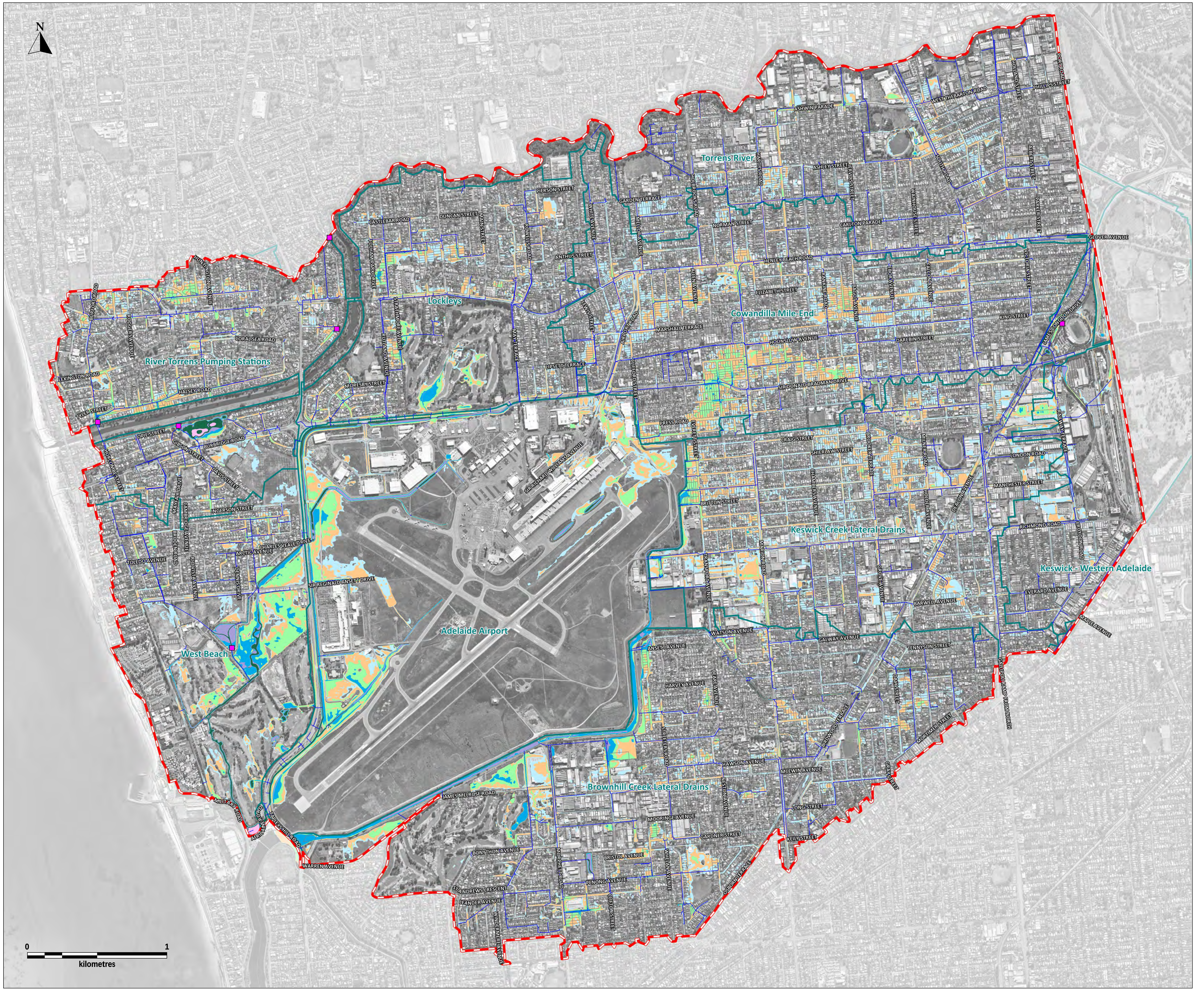
West Torrens
Stormwater Management Plan

5% AEP Floodplain Map
Scenario 4 - Future Development, Existing Infrastructure, Climate Change RCP 8.5

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre



Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

Disclaimer

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

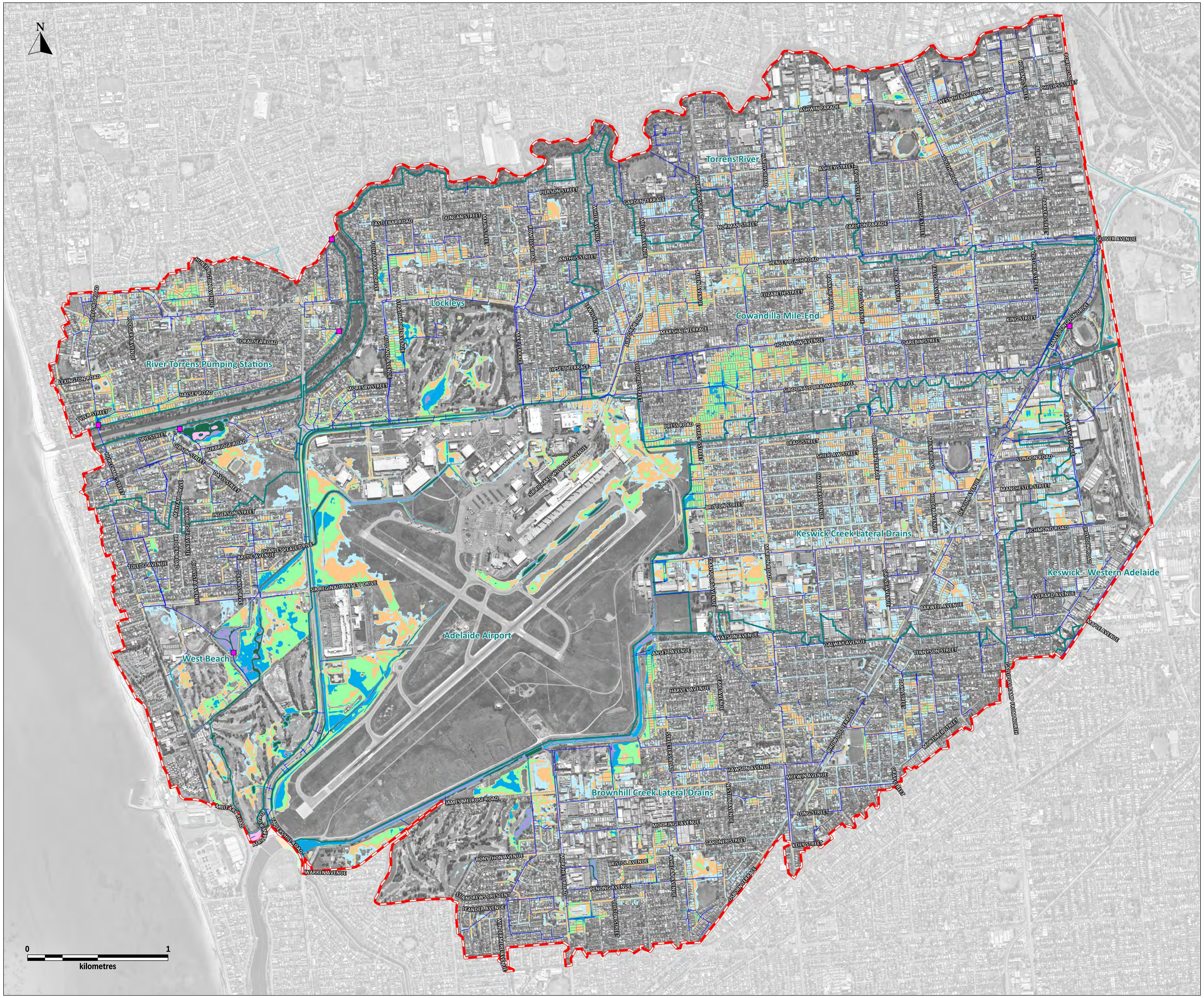
West Torrens
Stormwater Management Plan

2% AEP Floodplain Map
Scenario 4 - Future Development, Existing Infrastructure, Climate Change RCP 8.5

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre



Background

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Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

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The flood extents are not based on actual historical floods.

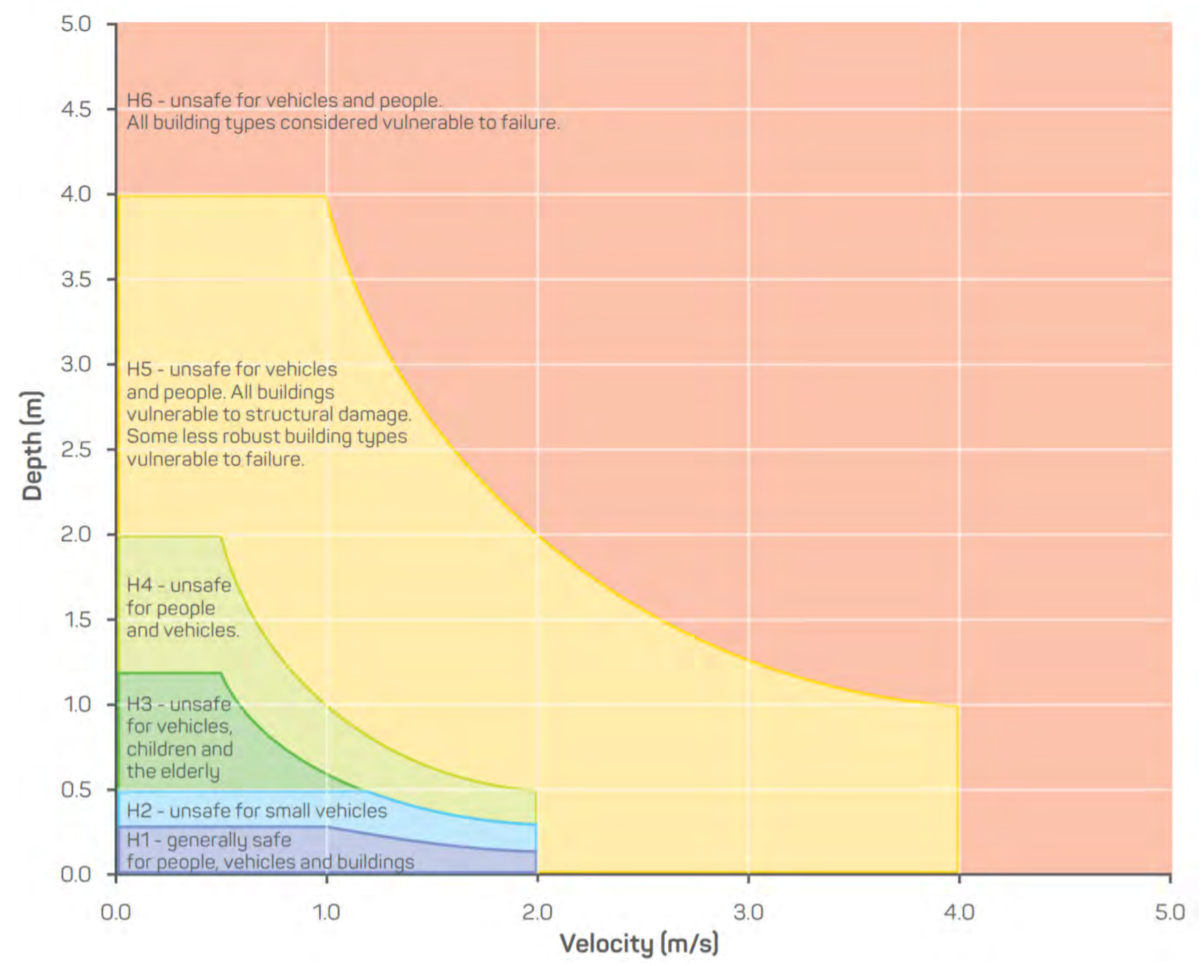
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

1% AEP Floodplain Map
Scenario 4 - Future Development, Existing Infrastructure, Climate Change RCP 8.5



Model Boundary | Pump Station

Existing Stormwater Drain | Cadastre

Background

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Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

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Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

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Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Effect of debris on flood extent

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The flood extents are not based on actual historical floods.

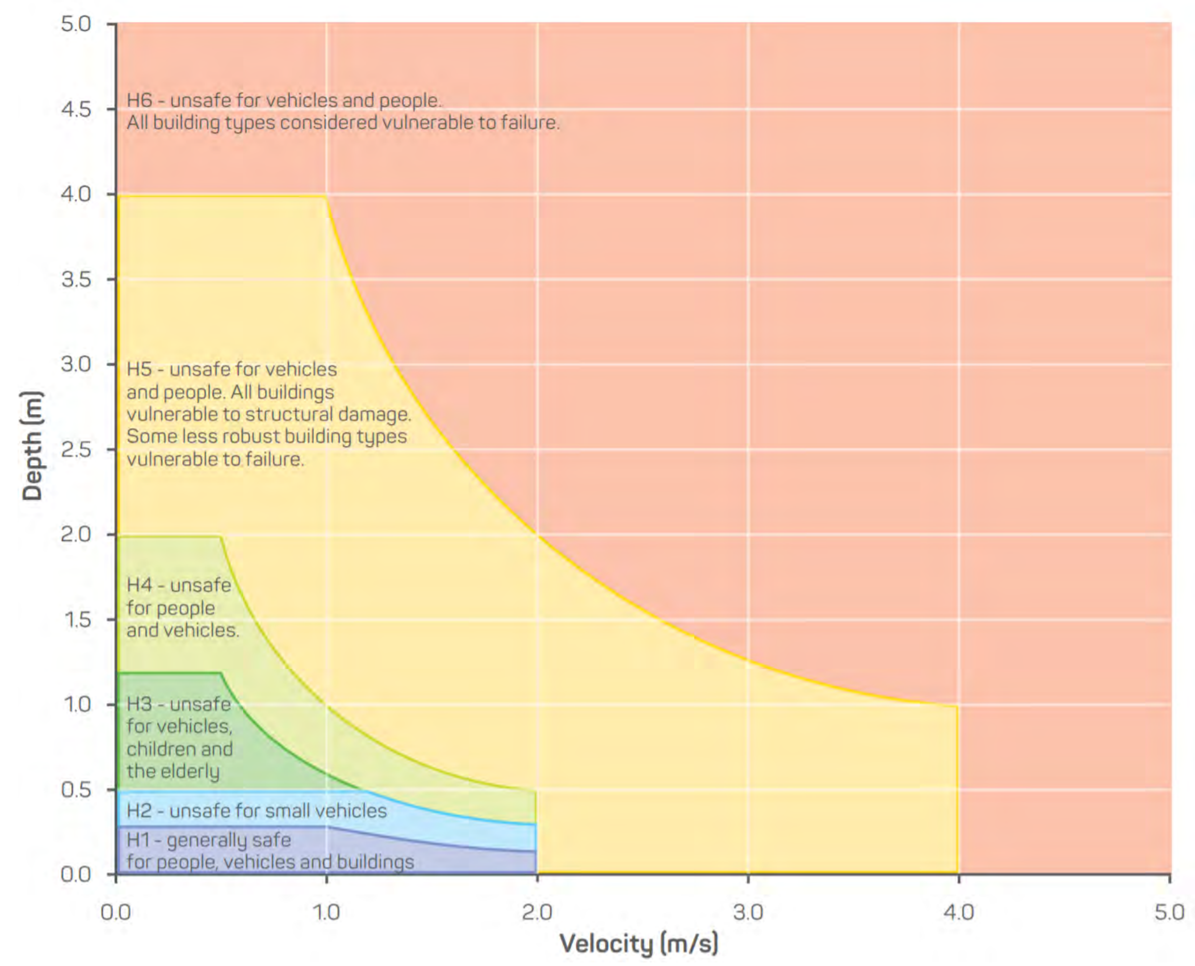
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

0.5 EY Hazard Map
Scenario 1 - Existing Development, Existing Infrastructure



Model Boundary
Pump Station
Existing Stormwater Drain
Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

- Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

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Storm Durations

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Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

- Storms with different Annual Exceedance Probability;

- Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

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Effect of debris on flood extent

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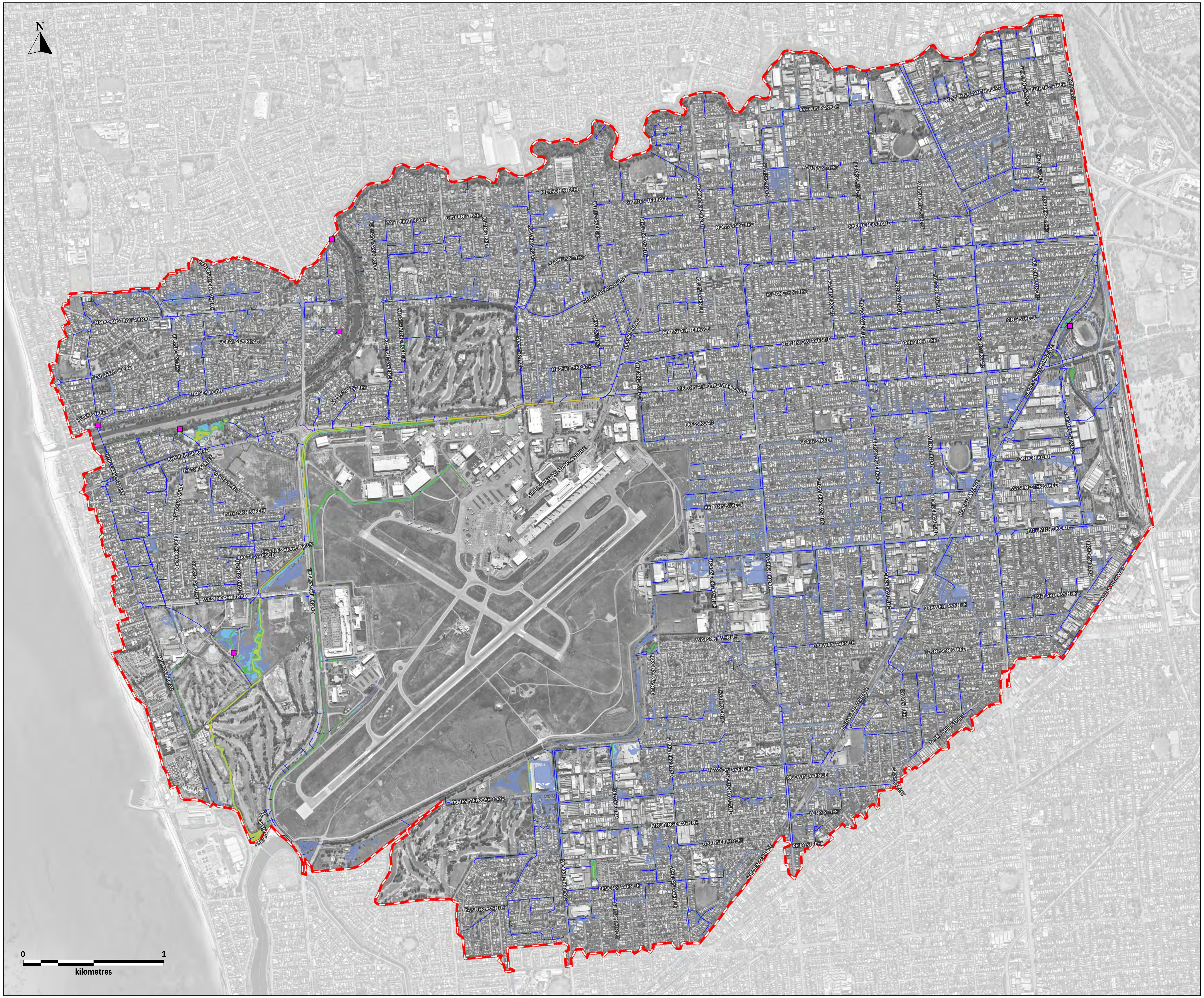
The flood extents are not based on actual historical floods.



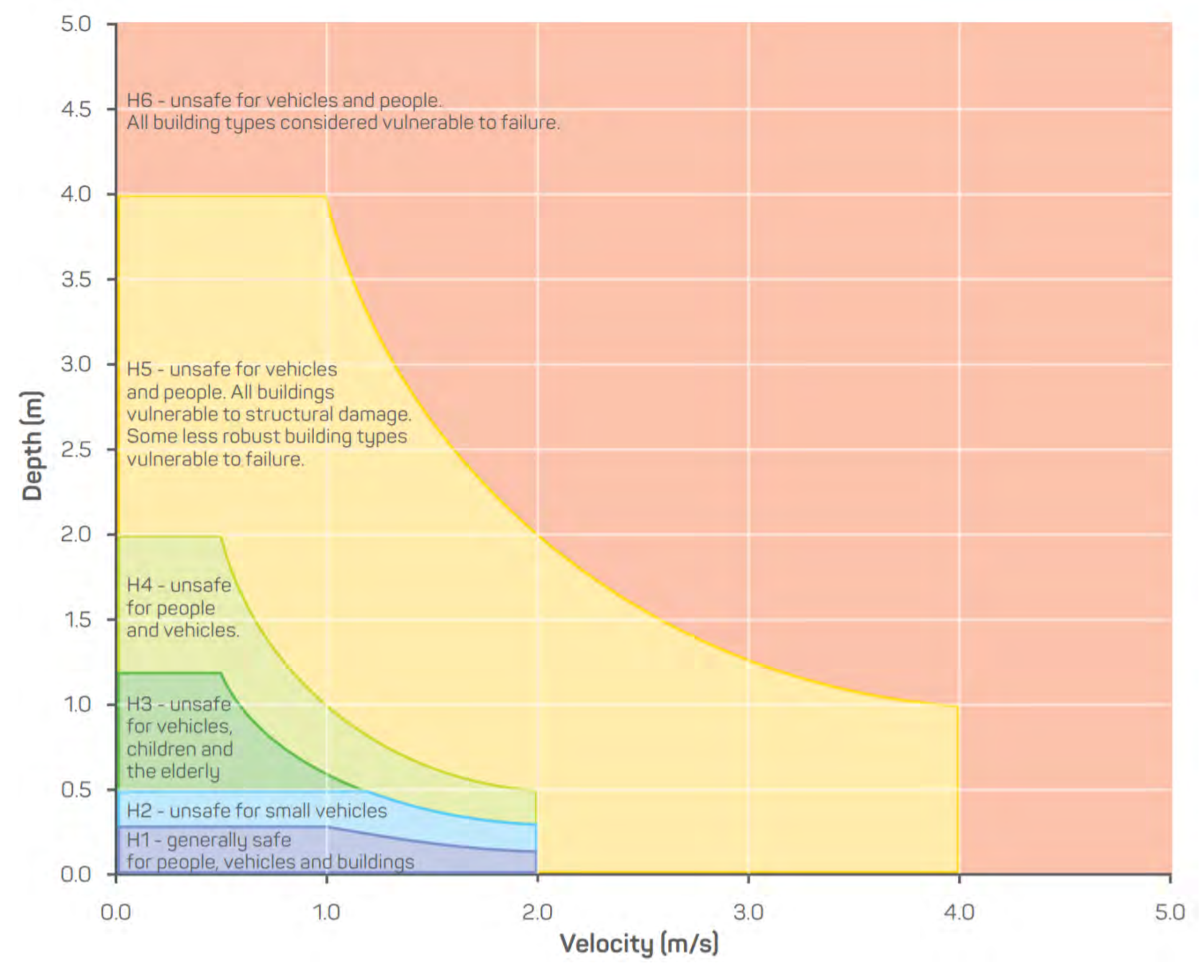
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

0.2 EY Hazard Map
Scenario 1 - Existing Development, Existing Infrastructure



Model Boundary

Pump Station

Existing Stormwater Drain

Cadastre

Background

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Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Effect of debris on flood extent

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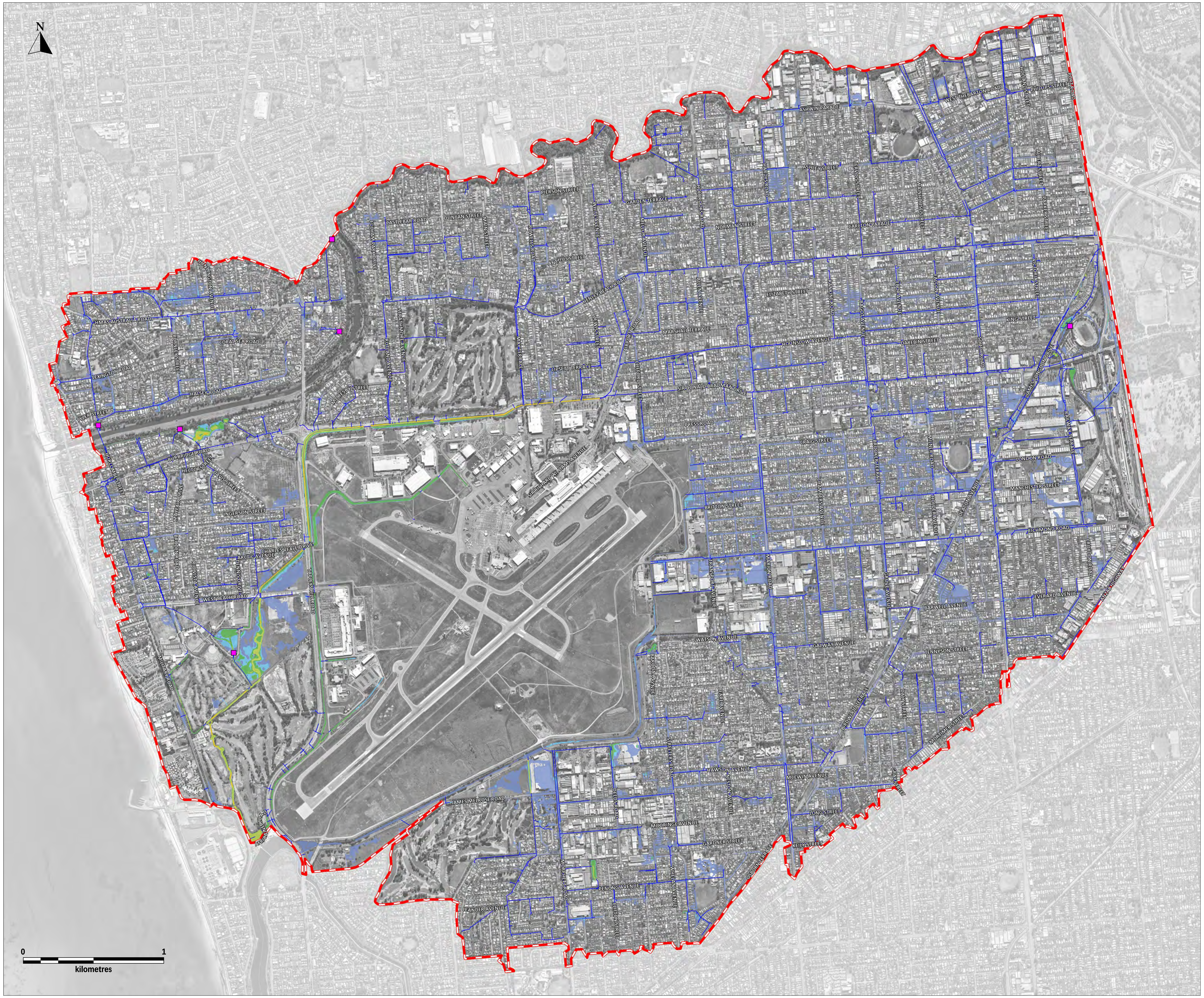
The flood extents are not based on actual historical floods.



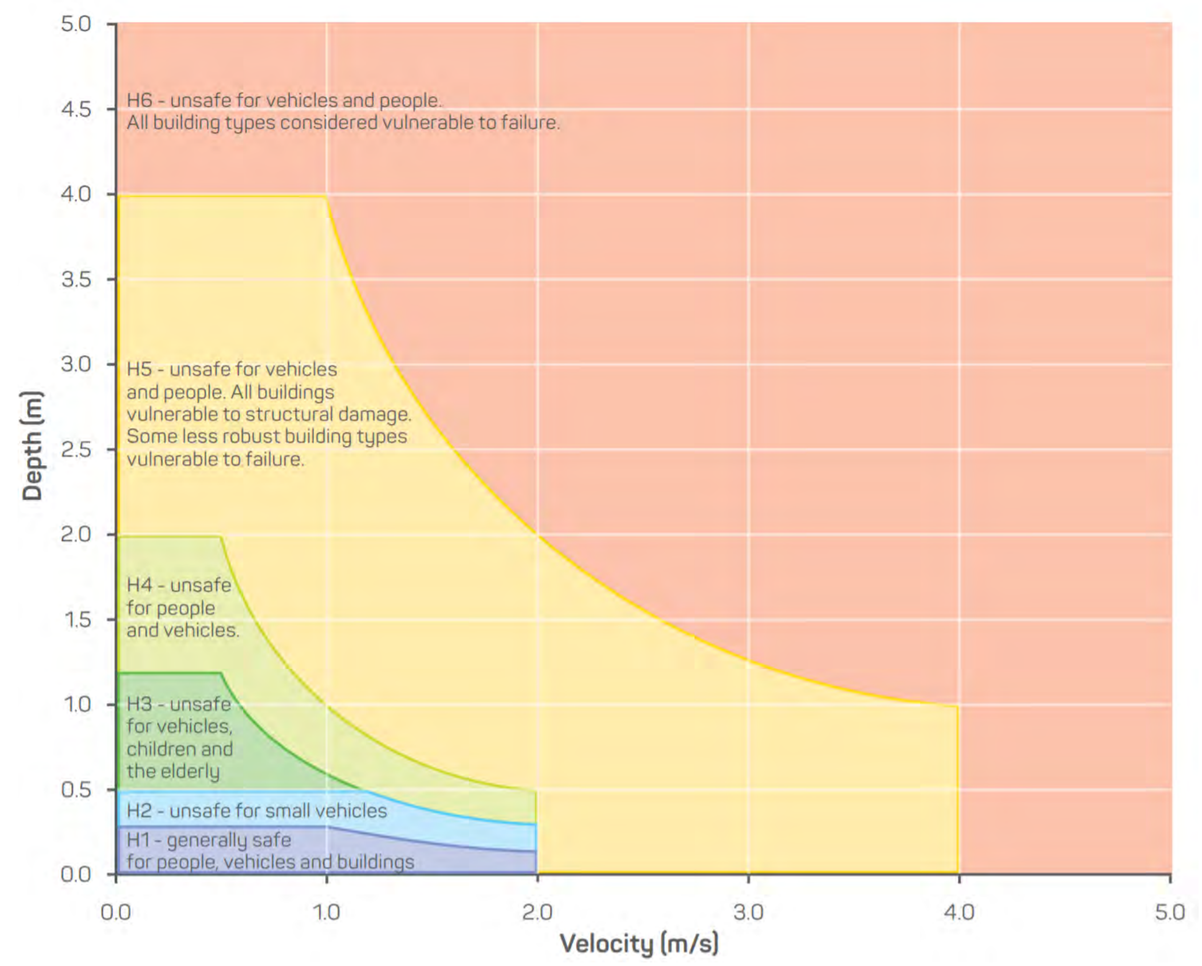
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

10% AEP Hazard Map
Scenario 1 - Existing Development, Existing Infrastructure



Model Boundary
Pump Station
Existing Stormwater Drain
Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

- Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

- Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

- Storms with different Annual Exceedance Probability;

- Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Effect of debris on flood extent

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The flood extents are not based on actual historical floods.

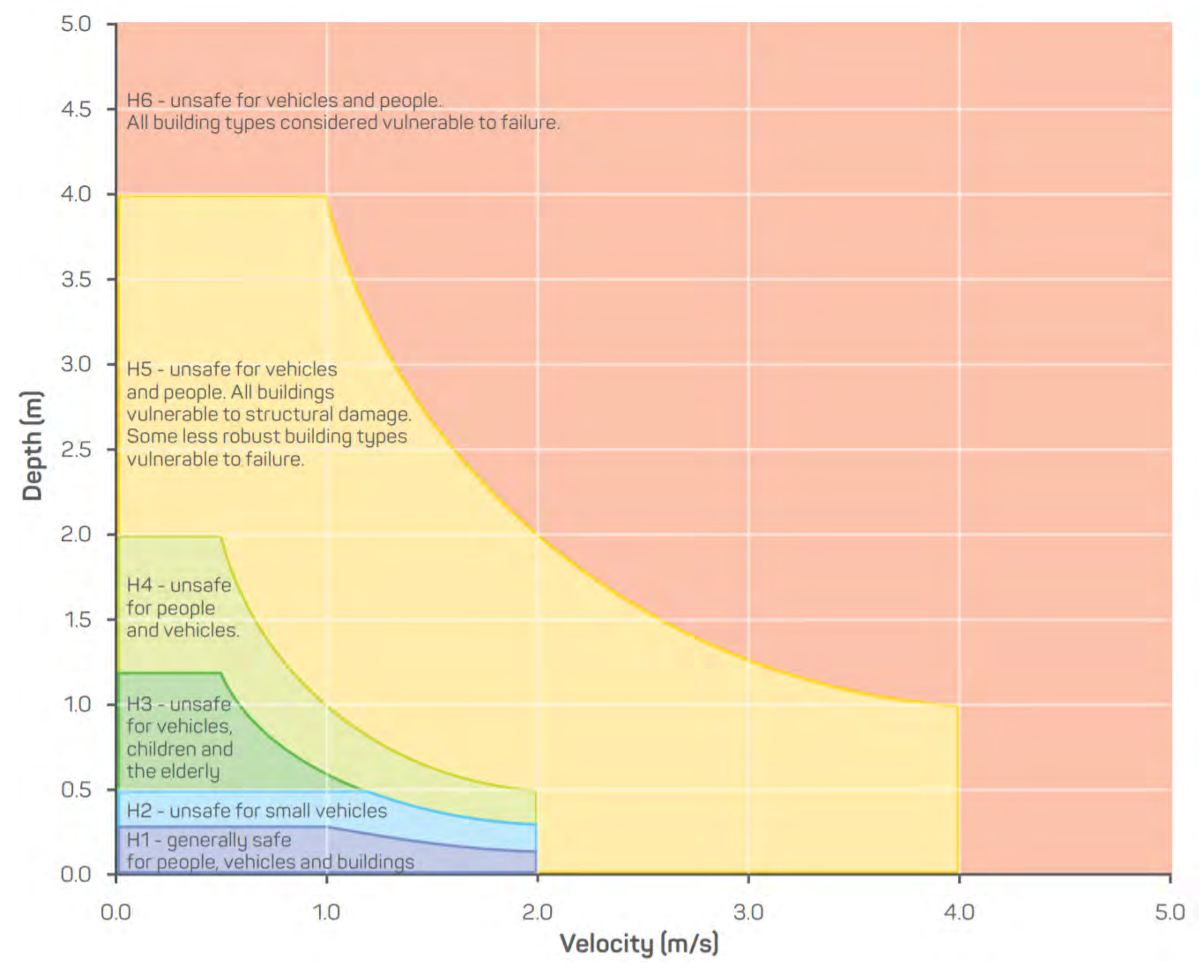
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

5% AEP Hazard Map
Scenario 1 - Existing Development, Existing Infrastructure



Model Boundary
Pump Station
Existing Stormwater Drain
Cadastre

Background

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Flood Risk Probability

Flood risk can be considered in terms of:

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Storm Durations

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Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

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Effect of debris on flood extent

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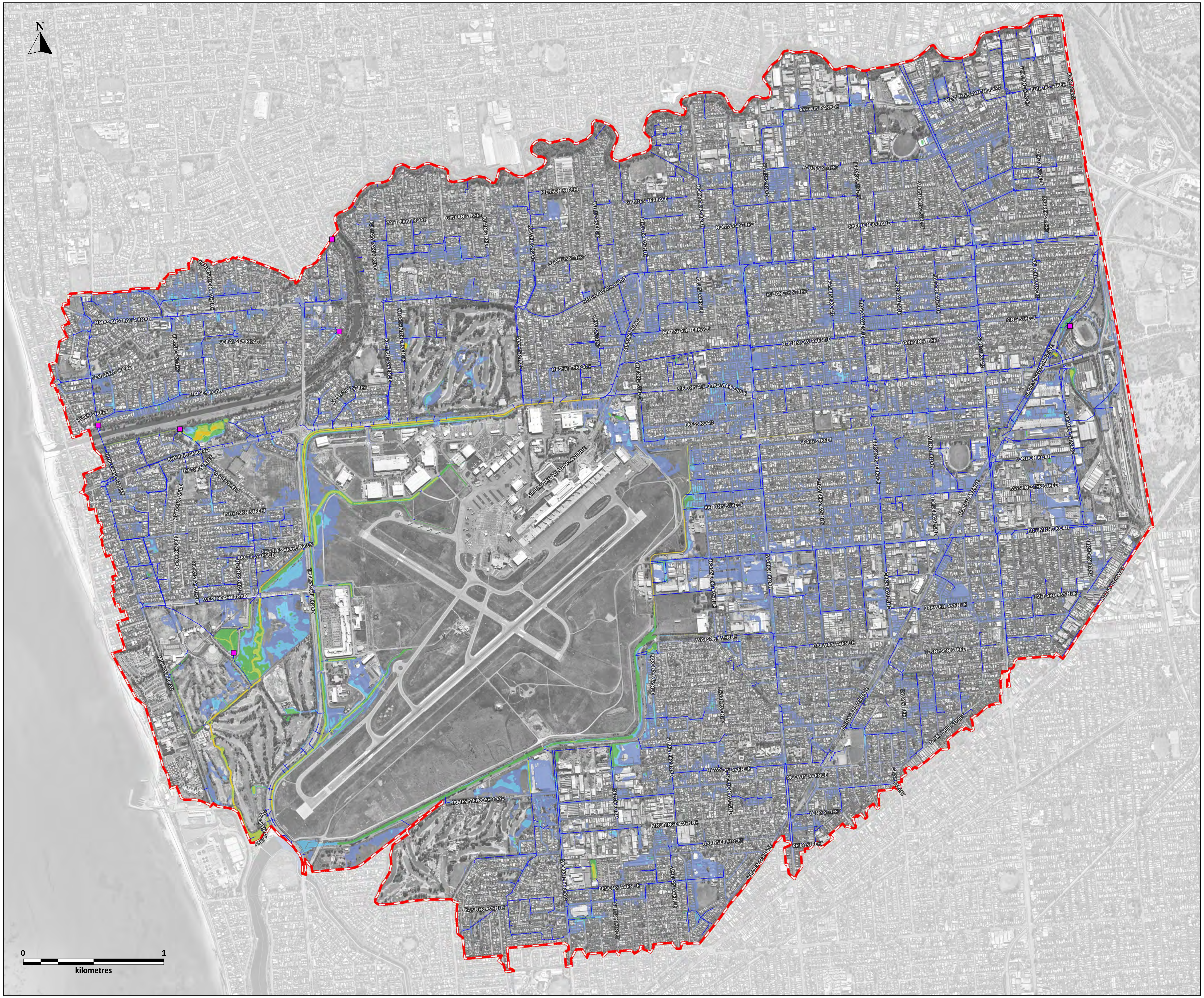


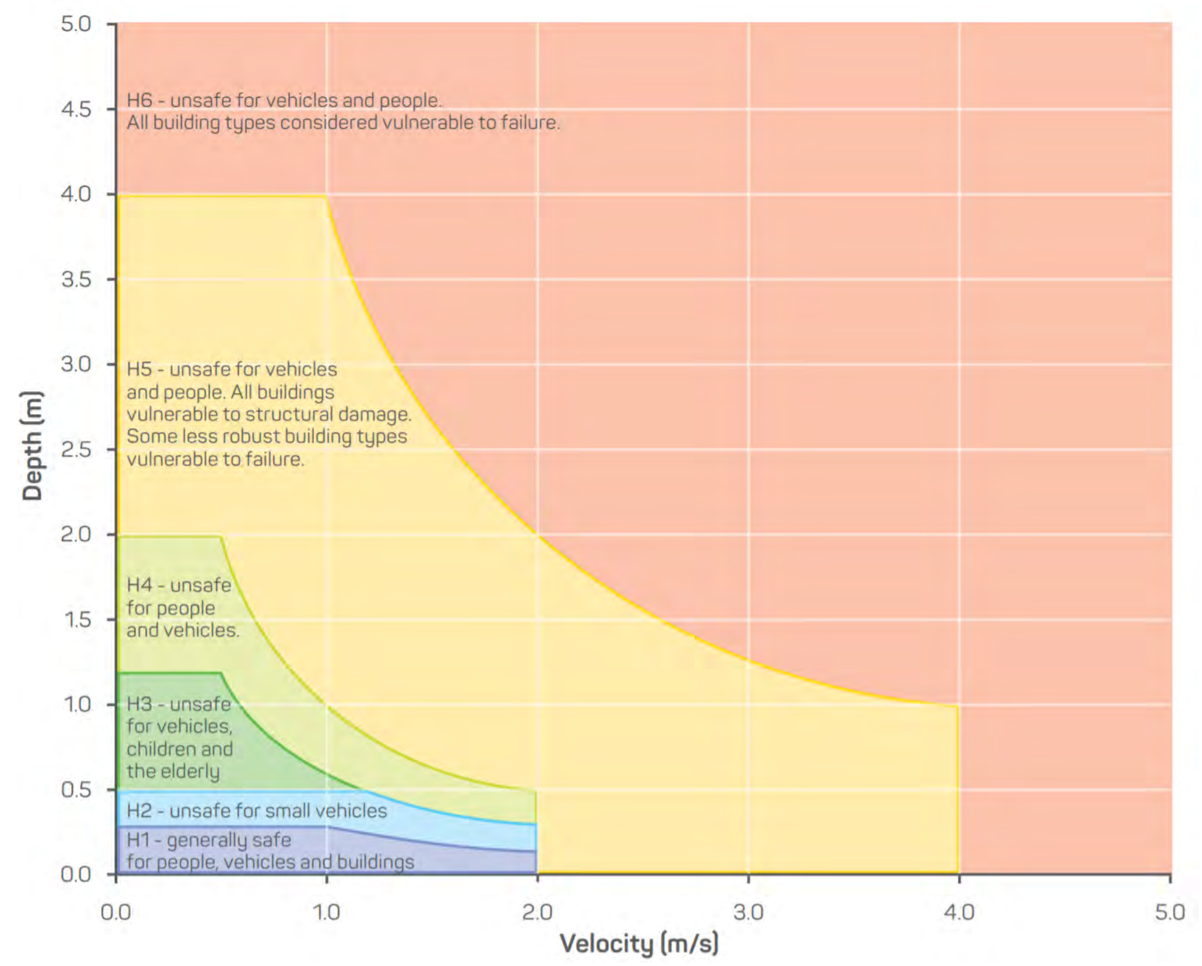
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

2% AEP Hazard Map
Scenario 1 - Existing Development, Existing Infrastructure



Model Boundary

Pump Station

Existing Stormwater Drain

Cadastre

Background

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Storm Durations

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Scope of Mapping

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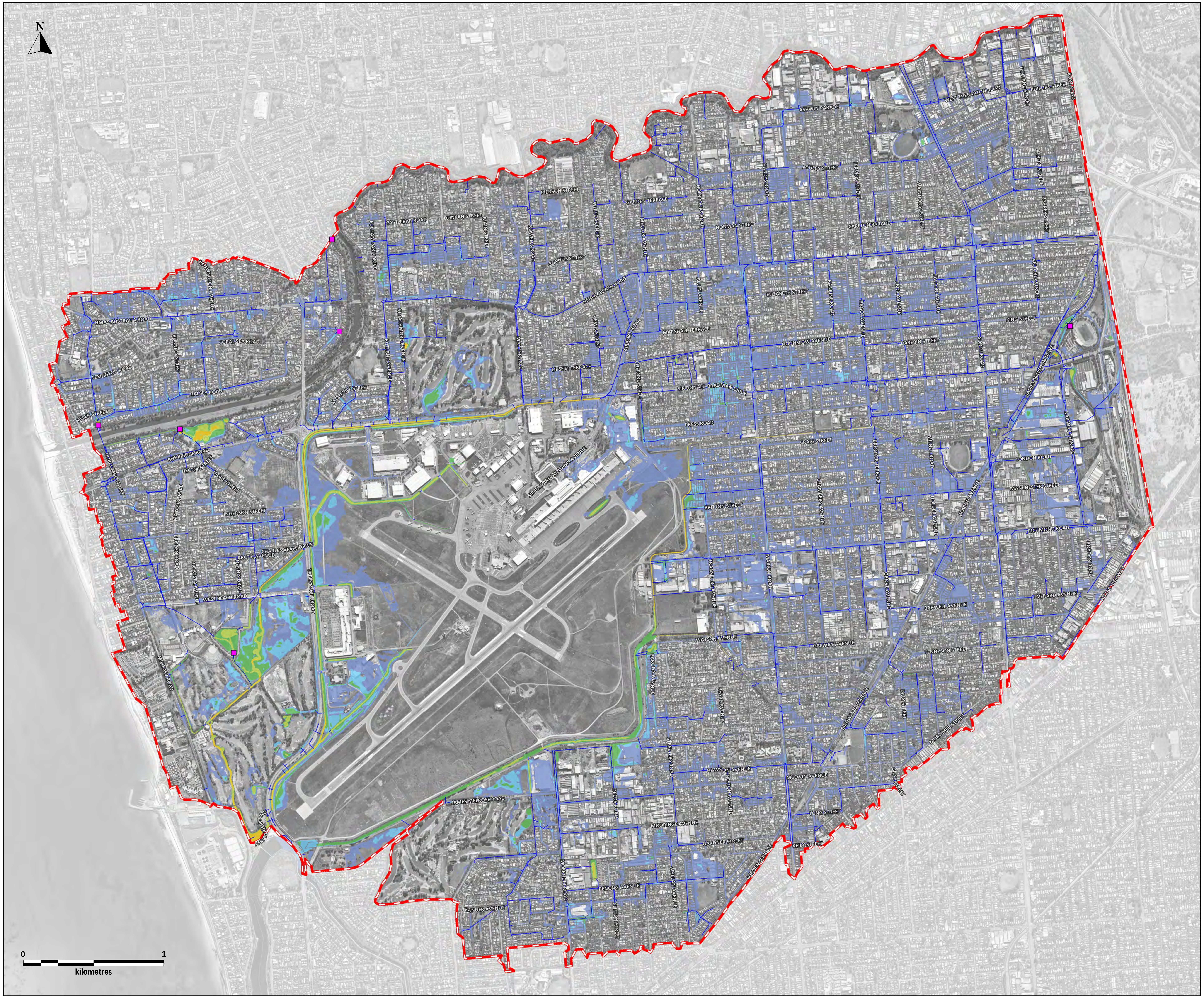
The flood extents are not based on actual historical floods.



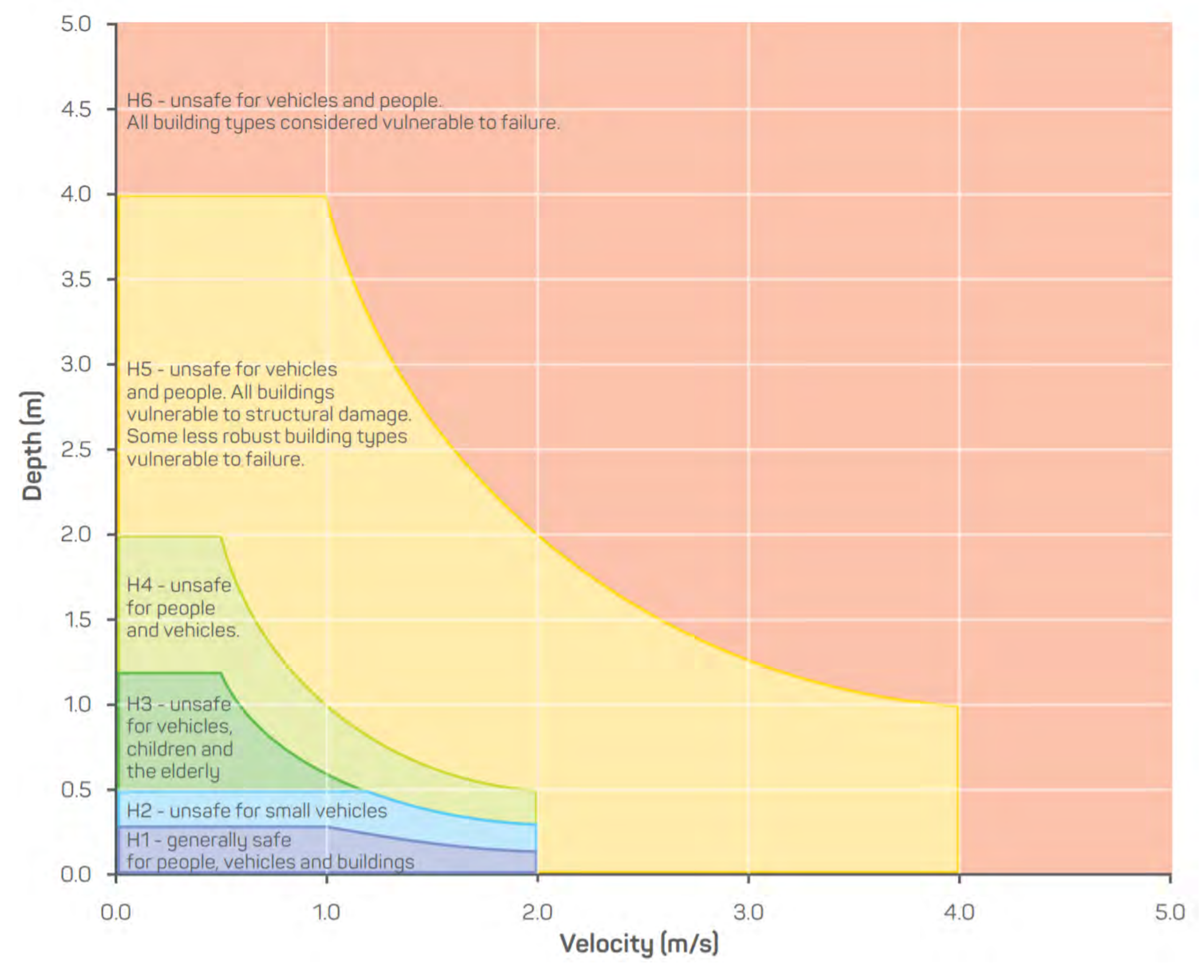
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

1% AEP Hazard Map
Scenario 1 - Existing Development, Existing Infrastructure



Model Boundary

Pump Station

Existing Stormwater Drain

Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

- Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;
- Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

- Storms with different Annual Exceedance Probability;
- Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

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The flood extents are not based on actual historical floods.

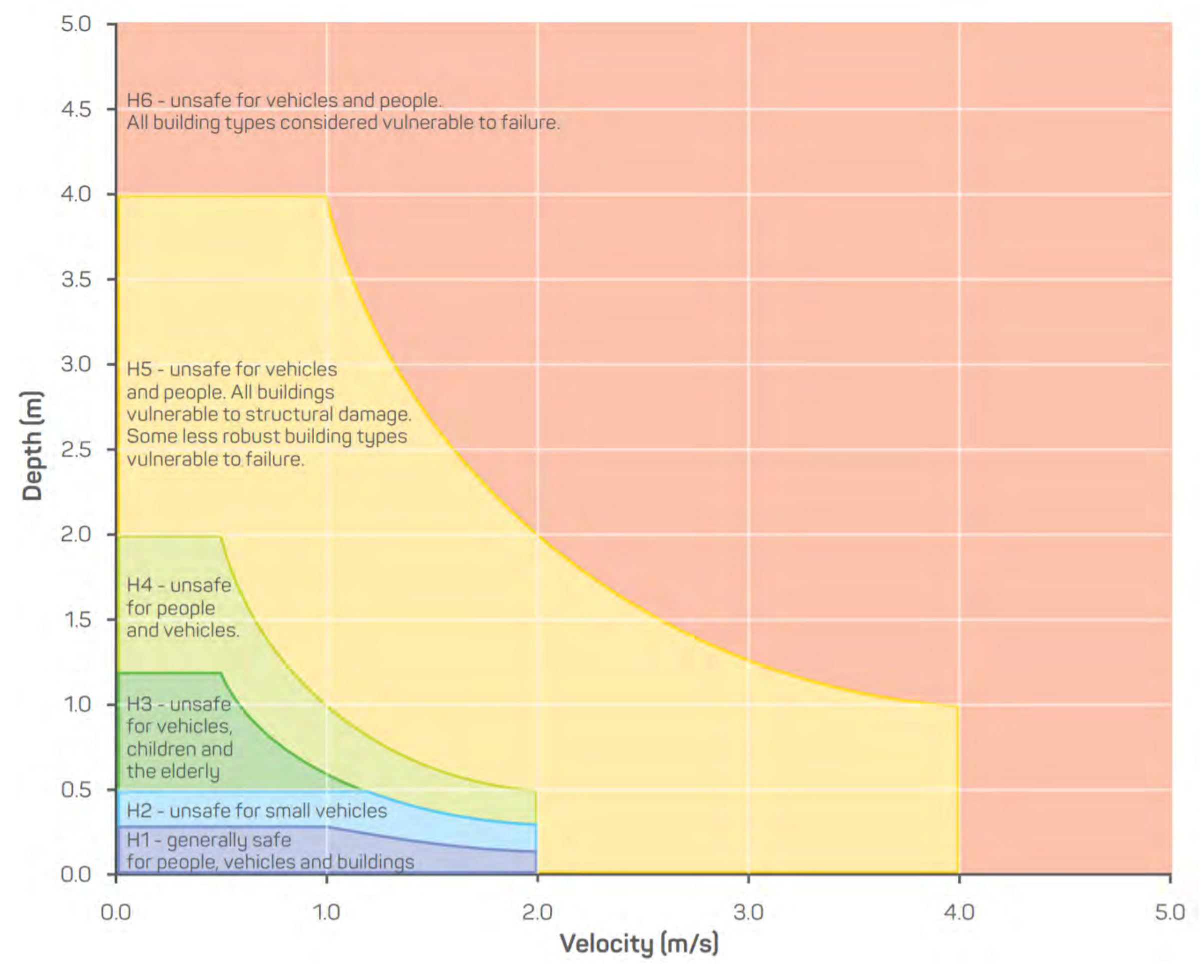
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

0.5 EY Hazard Map
Scenario 2 - Future Development, Existing Infrastructure



Model Boundary

Pump Station

Existing Stormwater Drain

Cadastre

Background

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Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

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Storm Durations

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Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Effect of debris on flood extent

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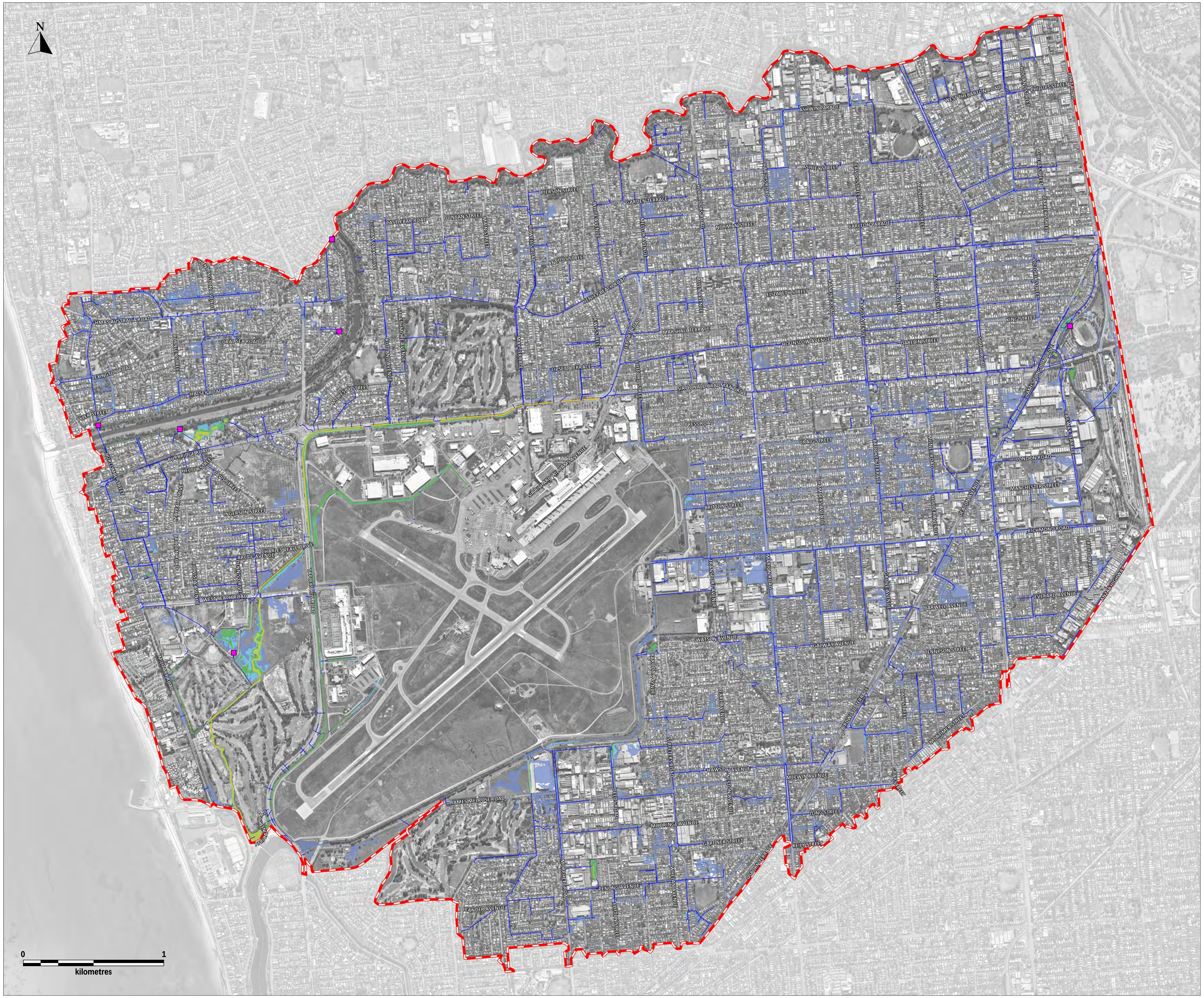
The flood extents are not based on actual historical floods.



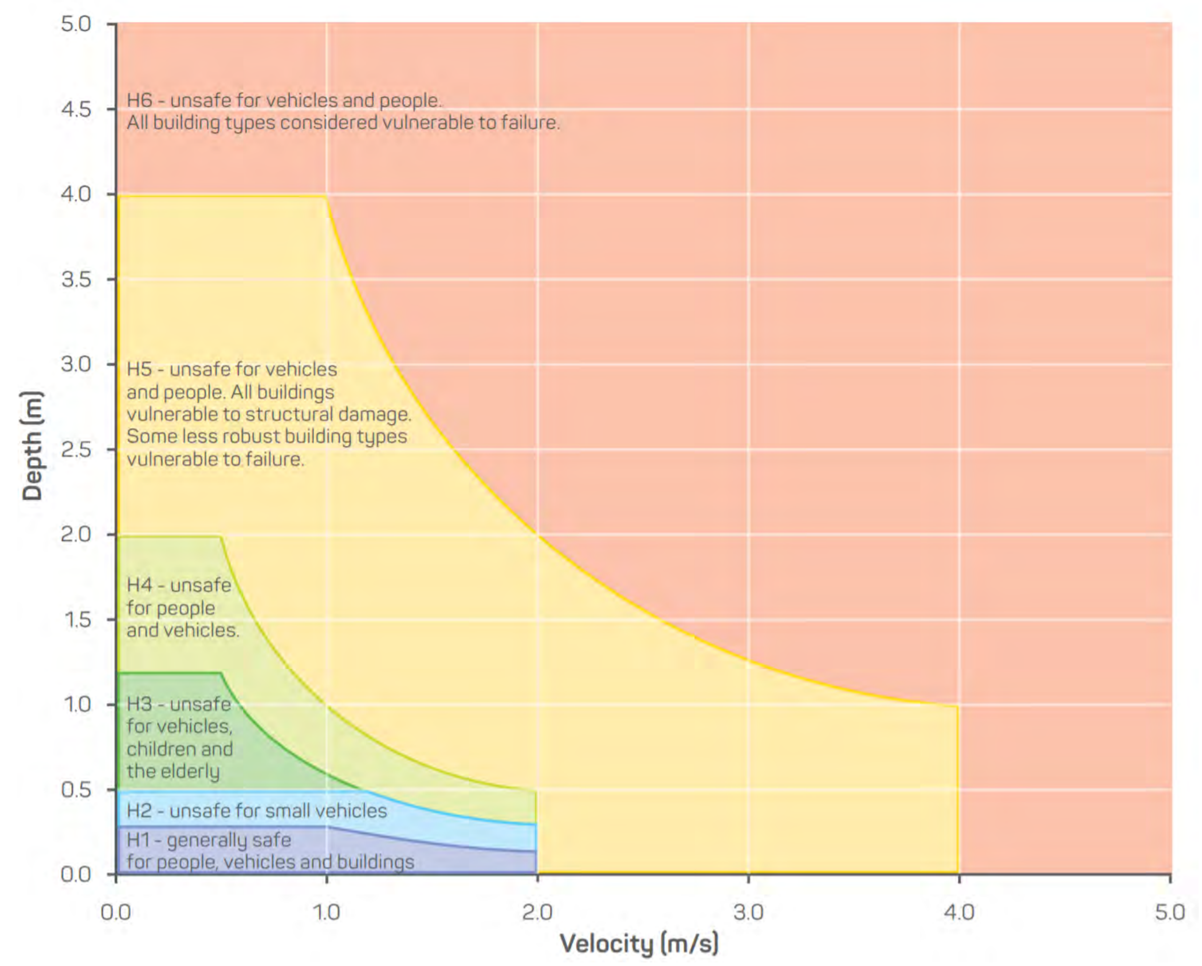
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

0.2 EY Hazard Map
Scenario 2 - Future Development, Existing Infrastructure

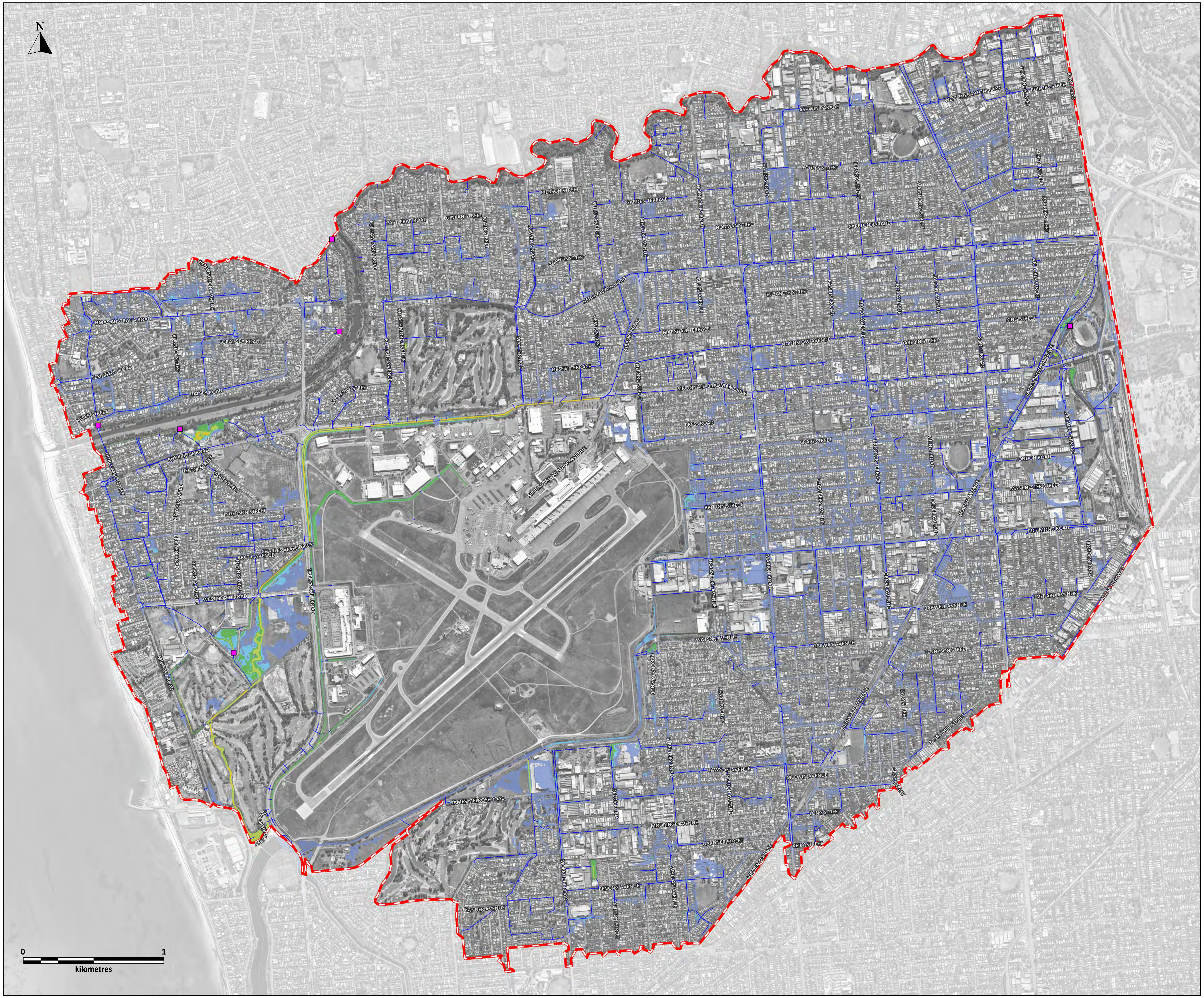


Model Boundary

Pump Station

Existing Stormwater Drain

Cadastre



Background

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Flood Risk Probability

Flood risk can be considered in terms of:

- Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

- Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

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Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

- Storms with different Annual Exceedance Probability;

- Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

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Effect of debris on flood extent

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The flood extents are not based on actual historical floods.

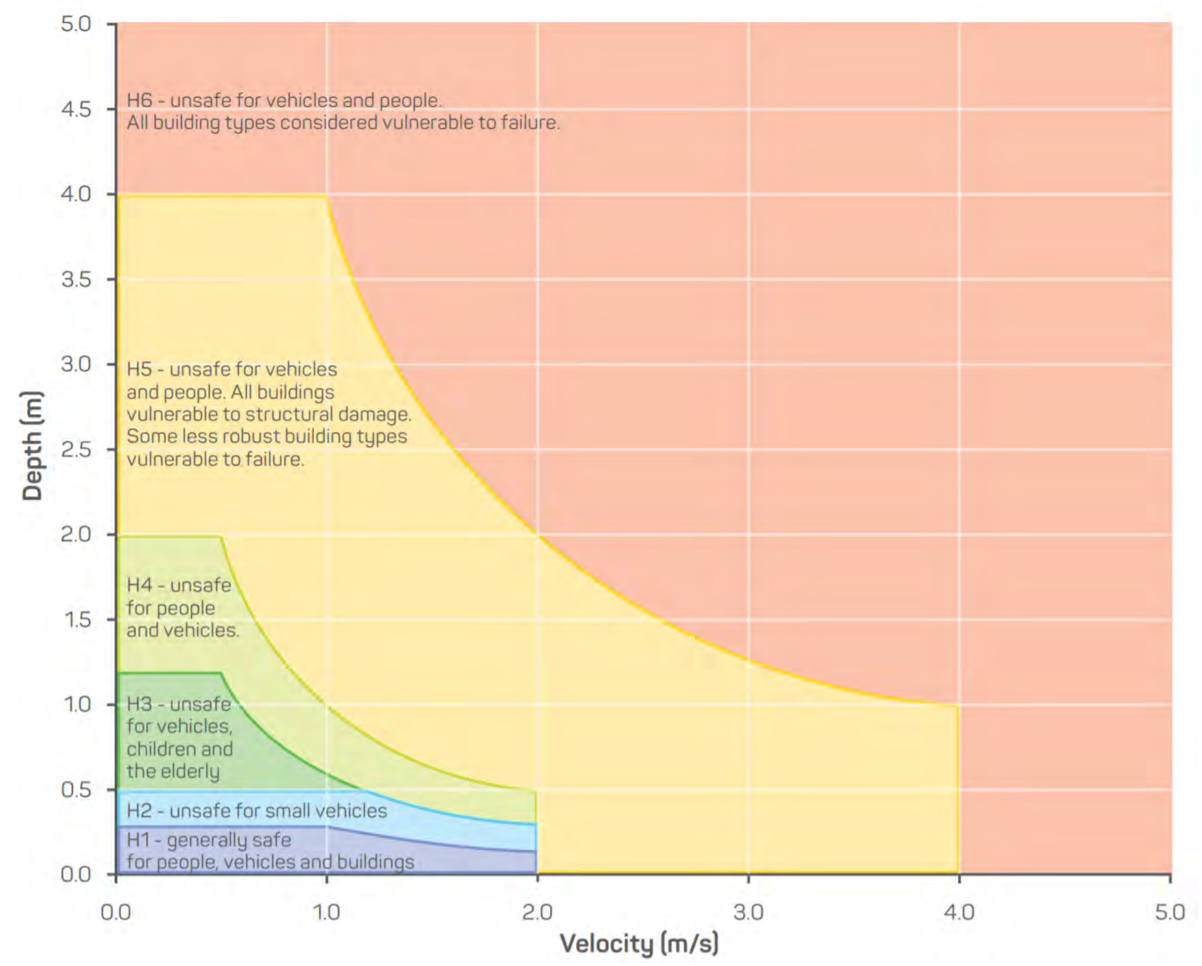
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

10% AEP Hazard Map
Scenario 2 - Future Development, Existing Infrastructure



Model Boundary
Pump Station
Existing Stormwater Drain
Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Effect of debris on flood extent

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The flood extents are not based on actual historical floods.

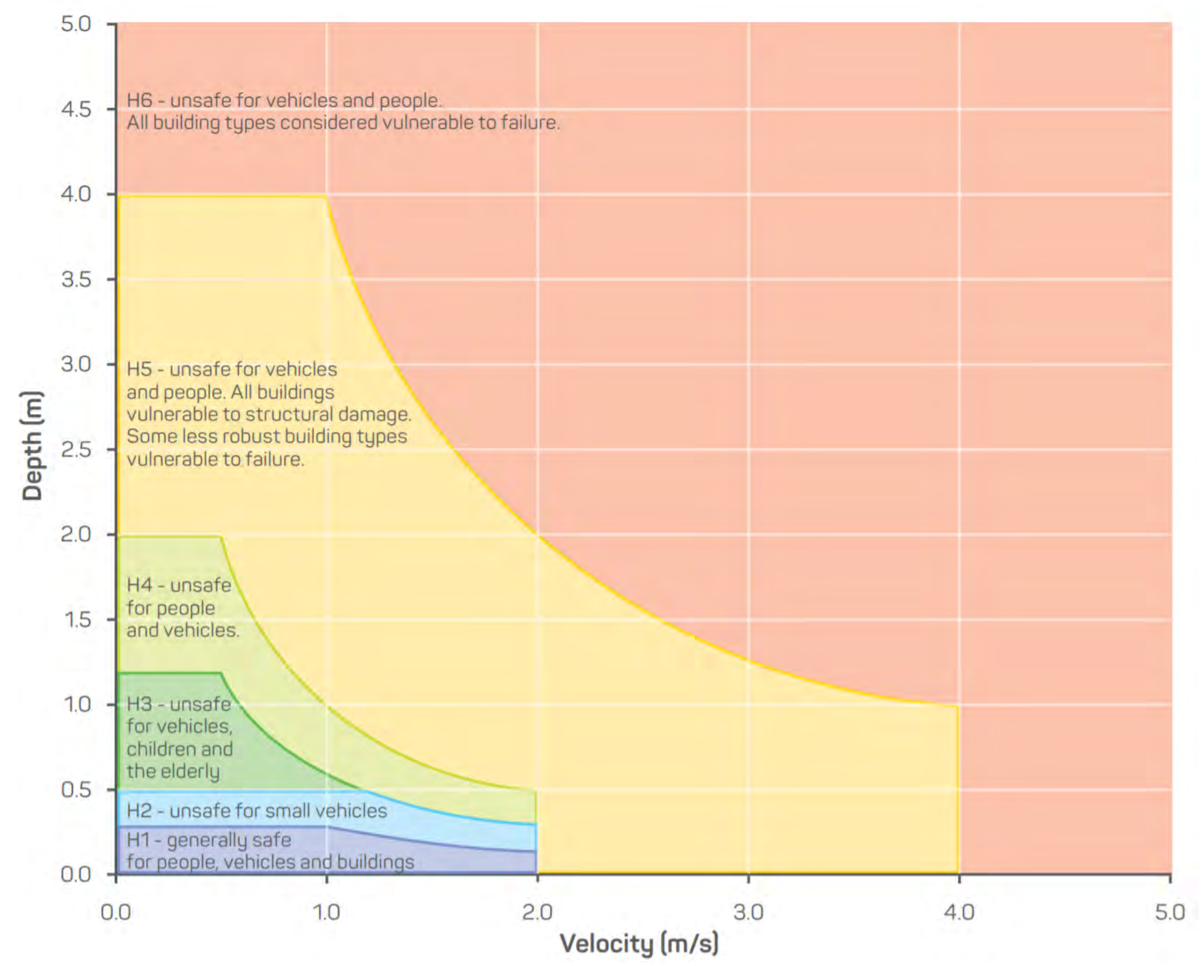
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

5% AEP Hazard Map
Scenario 2 - Future Development, Existing Infrastructure



Model Boundary
Pump Station
Existing Stormwater Drain
Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

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Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

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Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

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Effect of debris on flood extent

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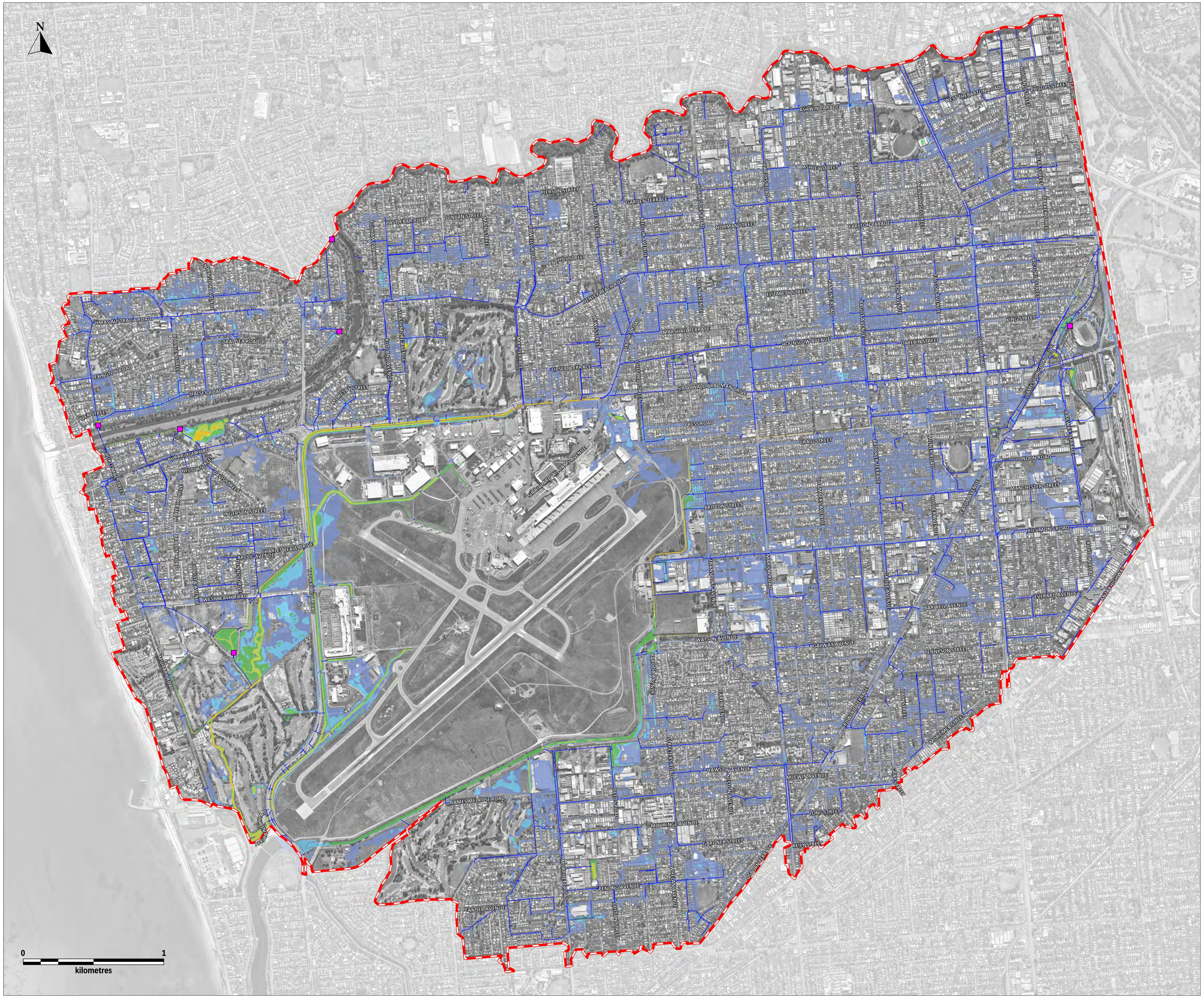
The flood extents are not based on actual historical floods.



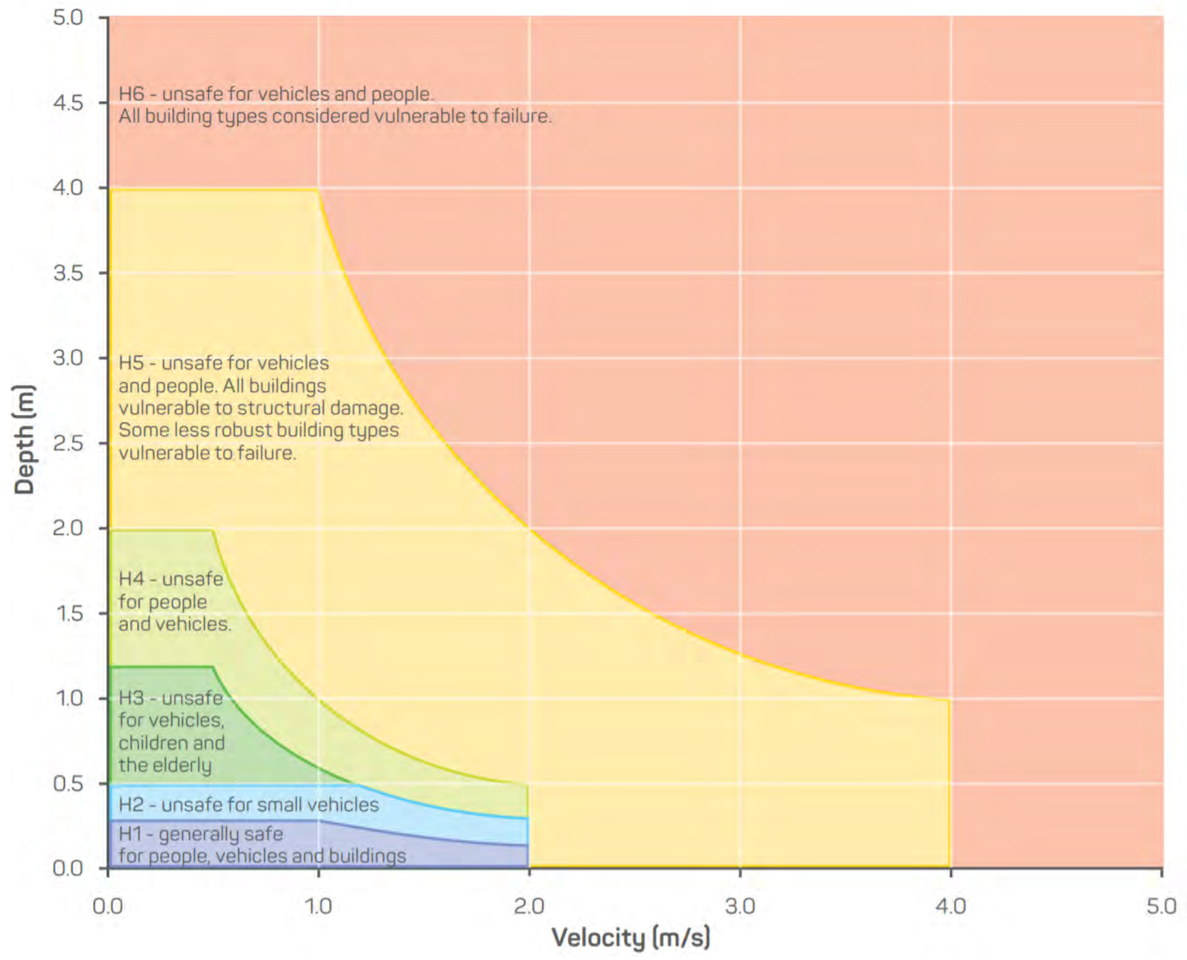
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

2% AEP Hazard Map
Scenario 2 - Future Development, Existing Infrastructure



Model Boundary

Pump Station

Existing Stormwater Drain

Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Effect of debris on flood extent

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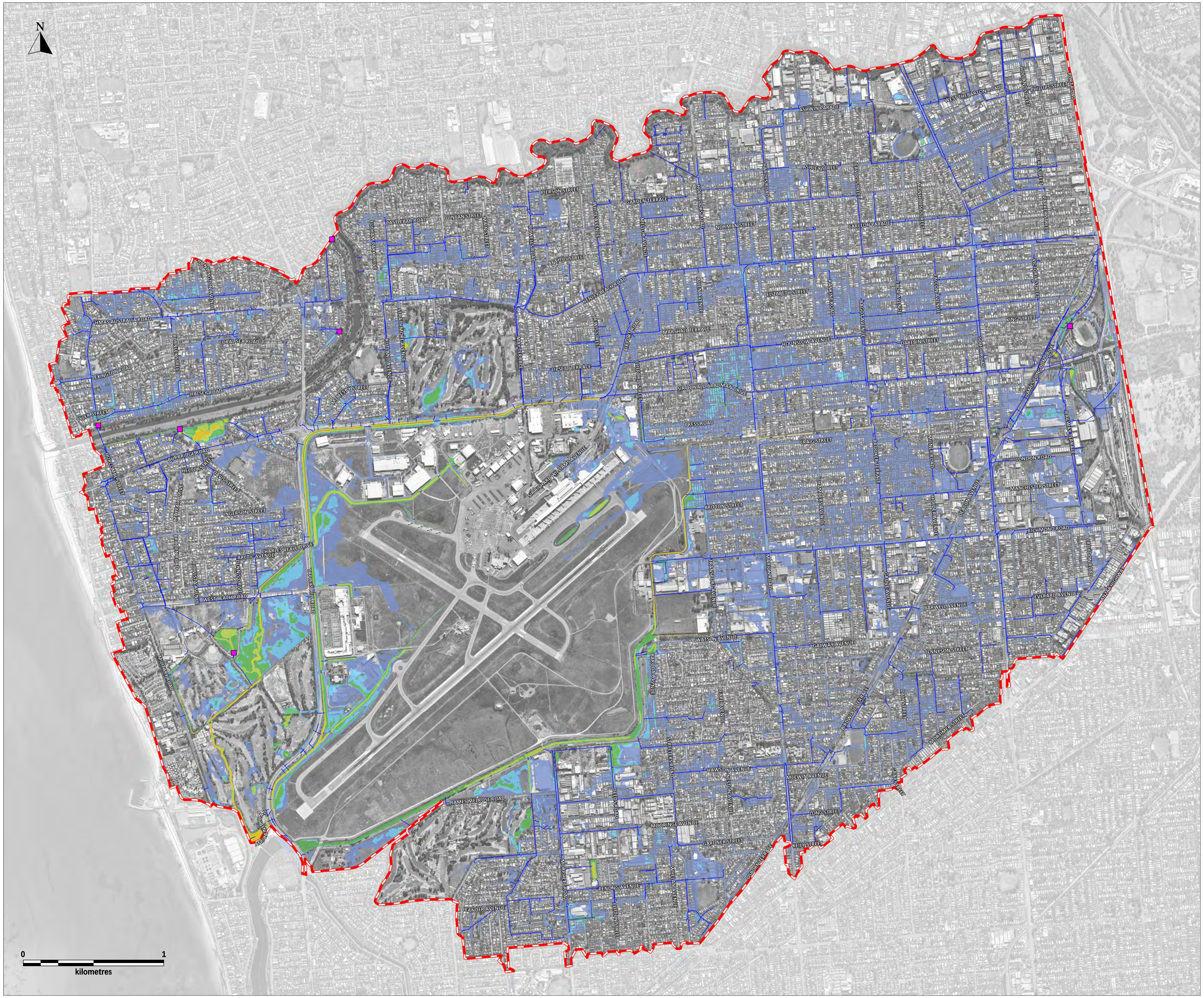
The flood extents are not based on actual historical floods.



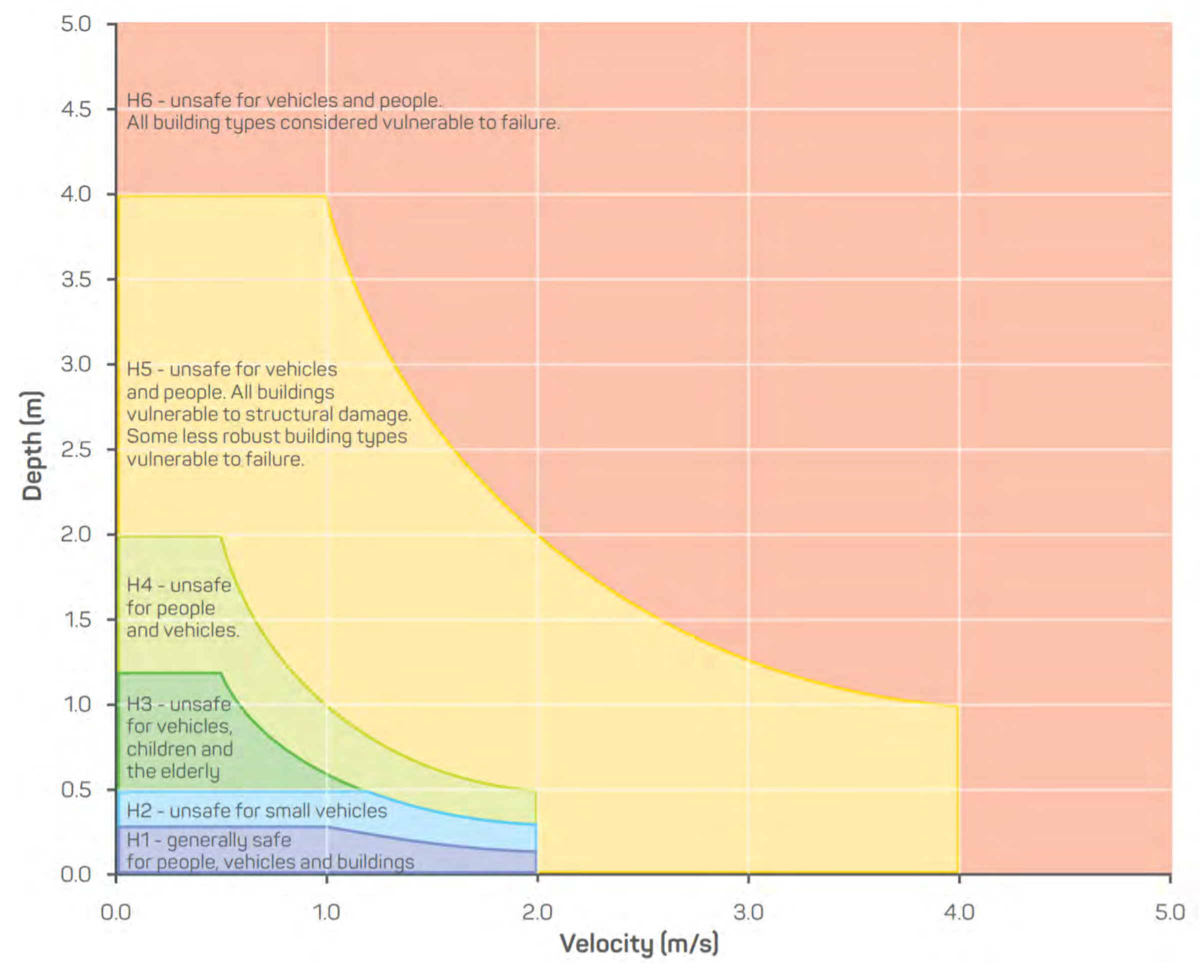
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

1% AEP Hazard Map
Scenario 2 - Future Development, Existing Infrastructure



Model Boundary
Pump Station
Existing Stormwater Drain
Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

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Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

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Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

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Effect of debris on flood extent

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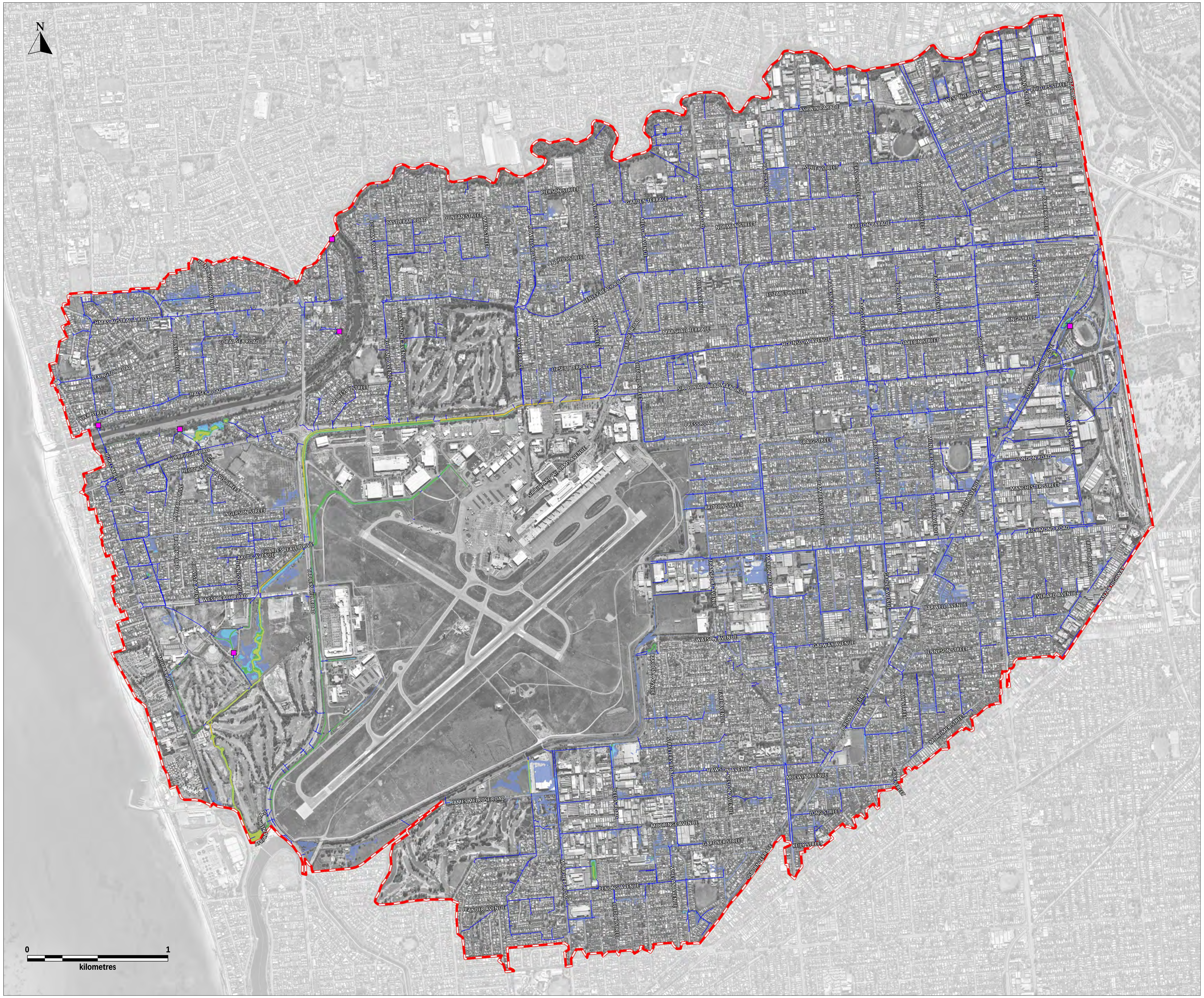
The flood extents are not based on actual historical floods.



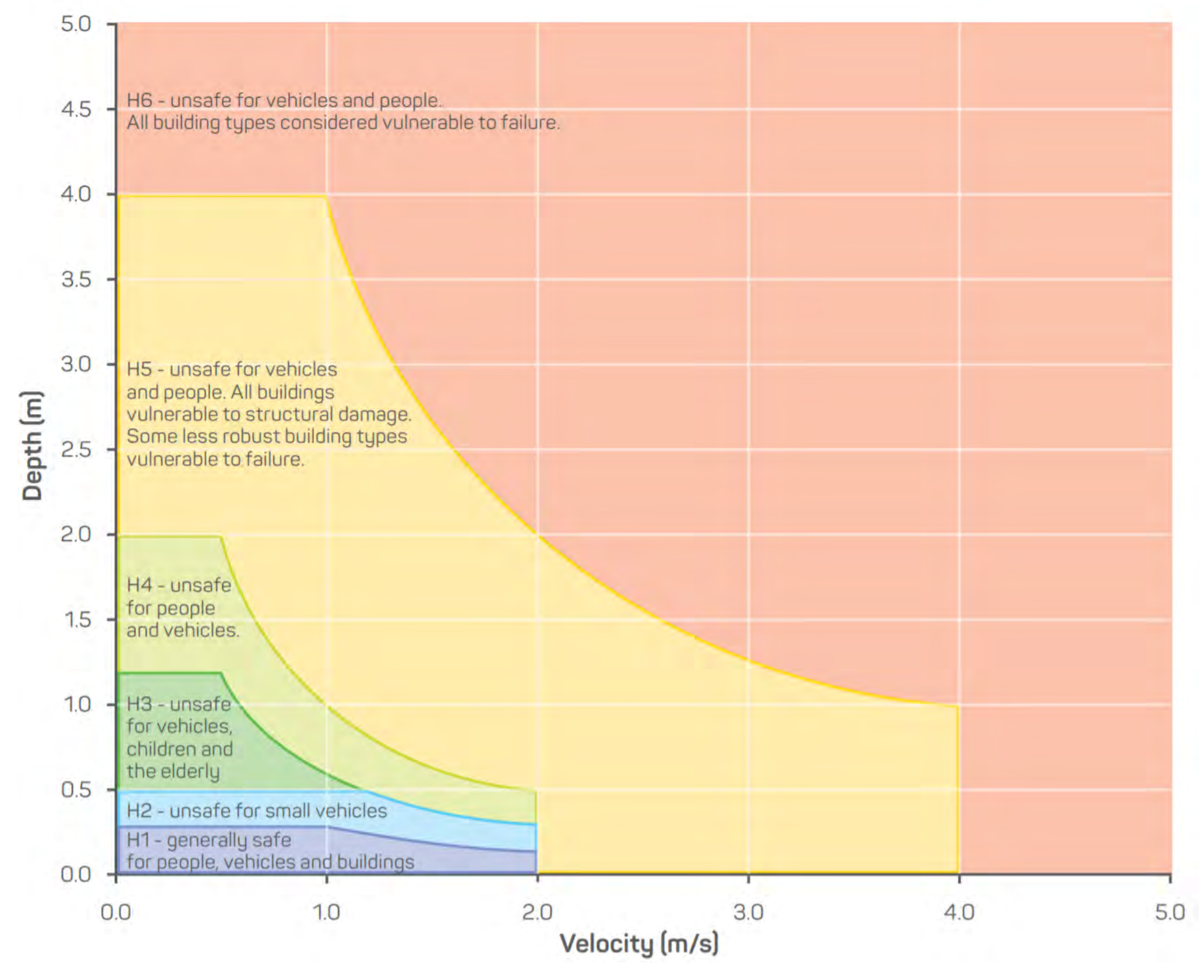
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

0.5 EY Hazard Map
Scenario 3 - Future Development, Existing Infrastructure, Climate Change RCP 4.5



Model Boundary

Pump Station

Existing Stormwater Drain

Cadastre

Background

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Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

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Storm Durations

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Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

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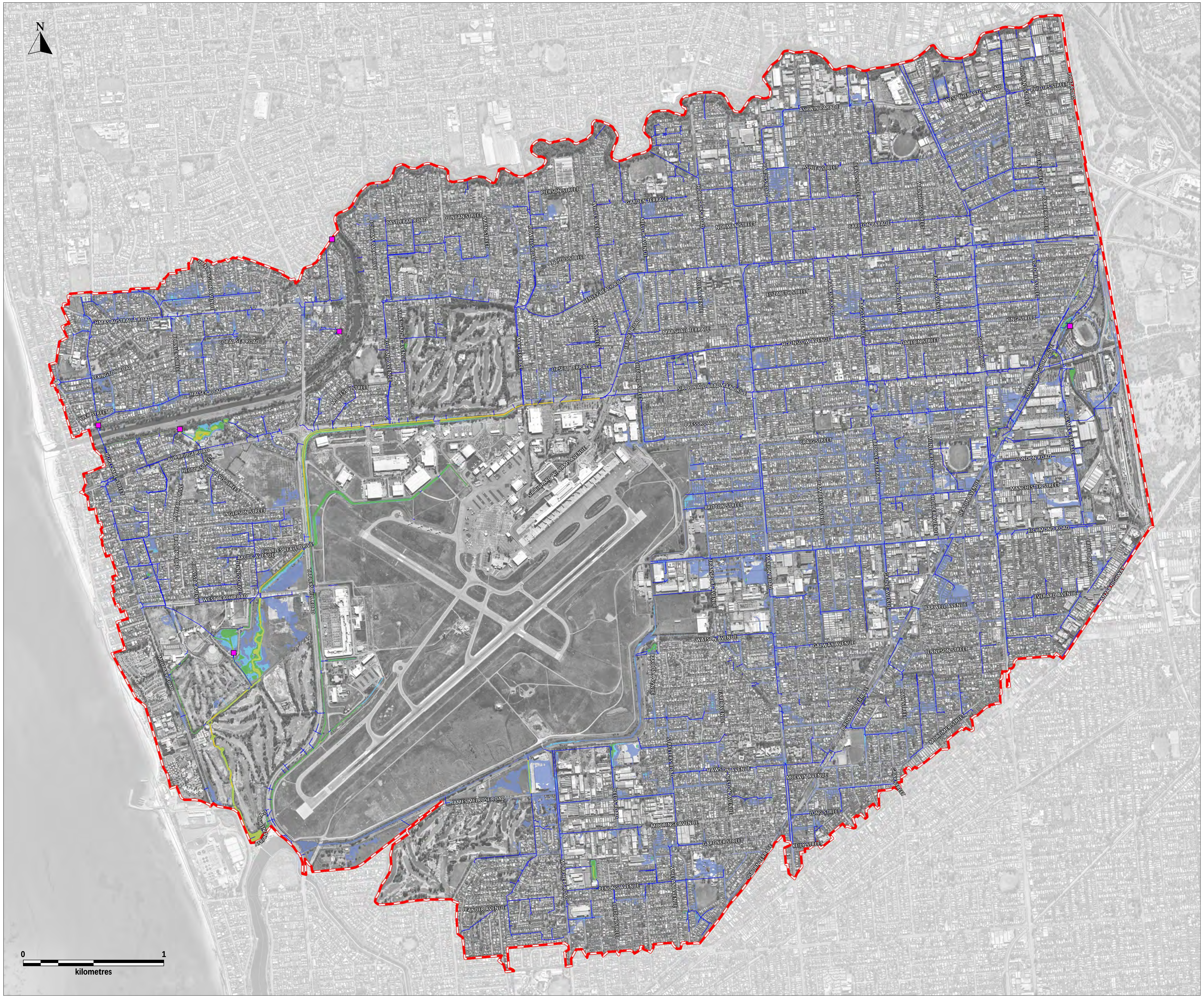
The flood extents are not based on actual historical floods.



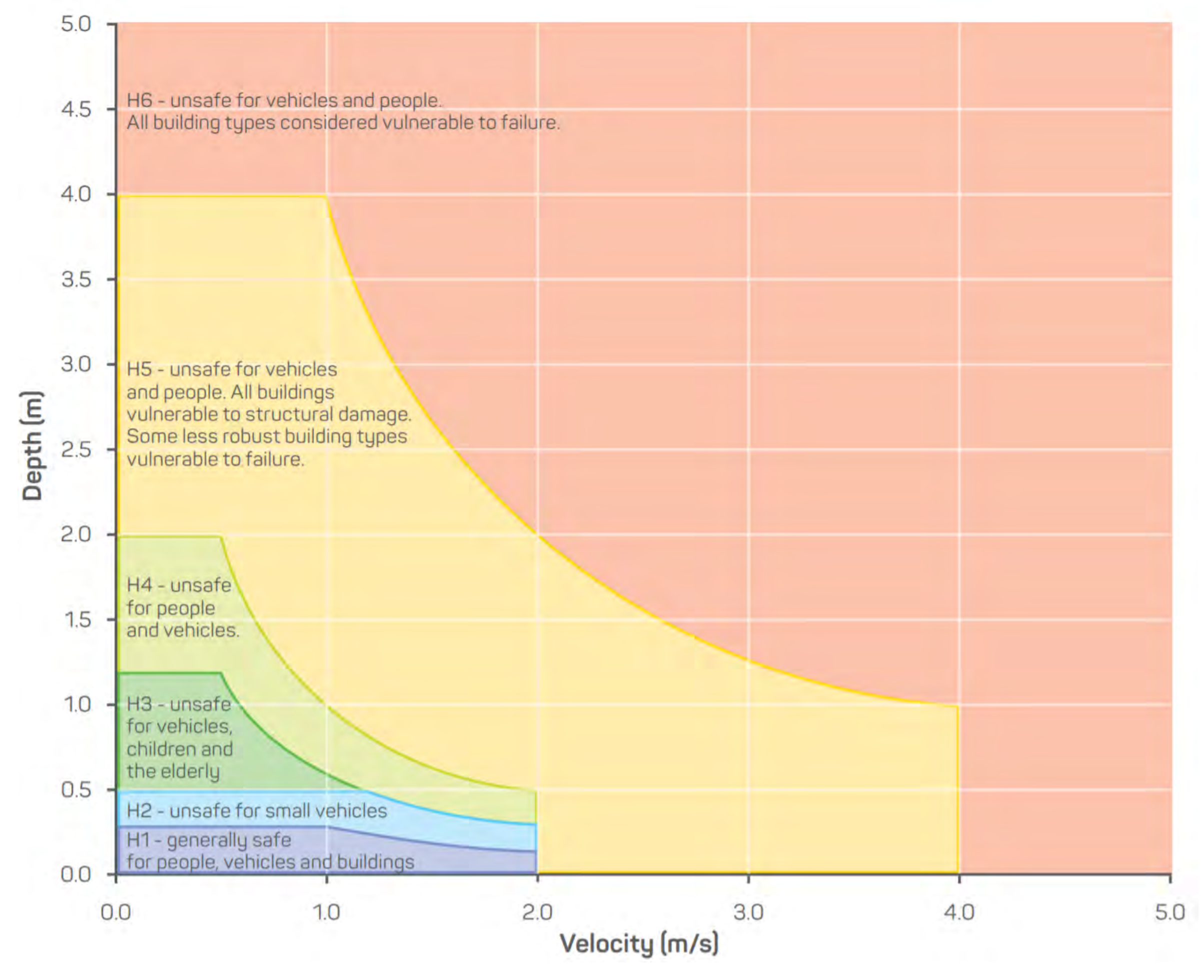
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

0.2 EY Hazard Map
Scenario 3 - Future Development, Existing Infrastructure, Climate Change RCP 4.5



Model Boundary
Pump Station
Existing Stormwater Drain
Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Effect of debris on flood extent

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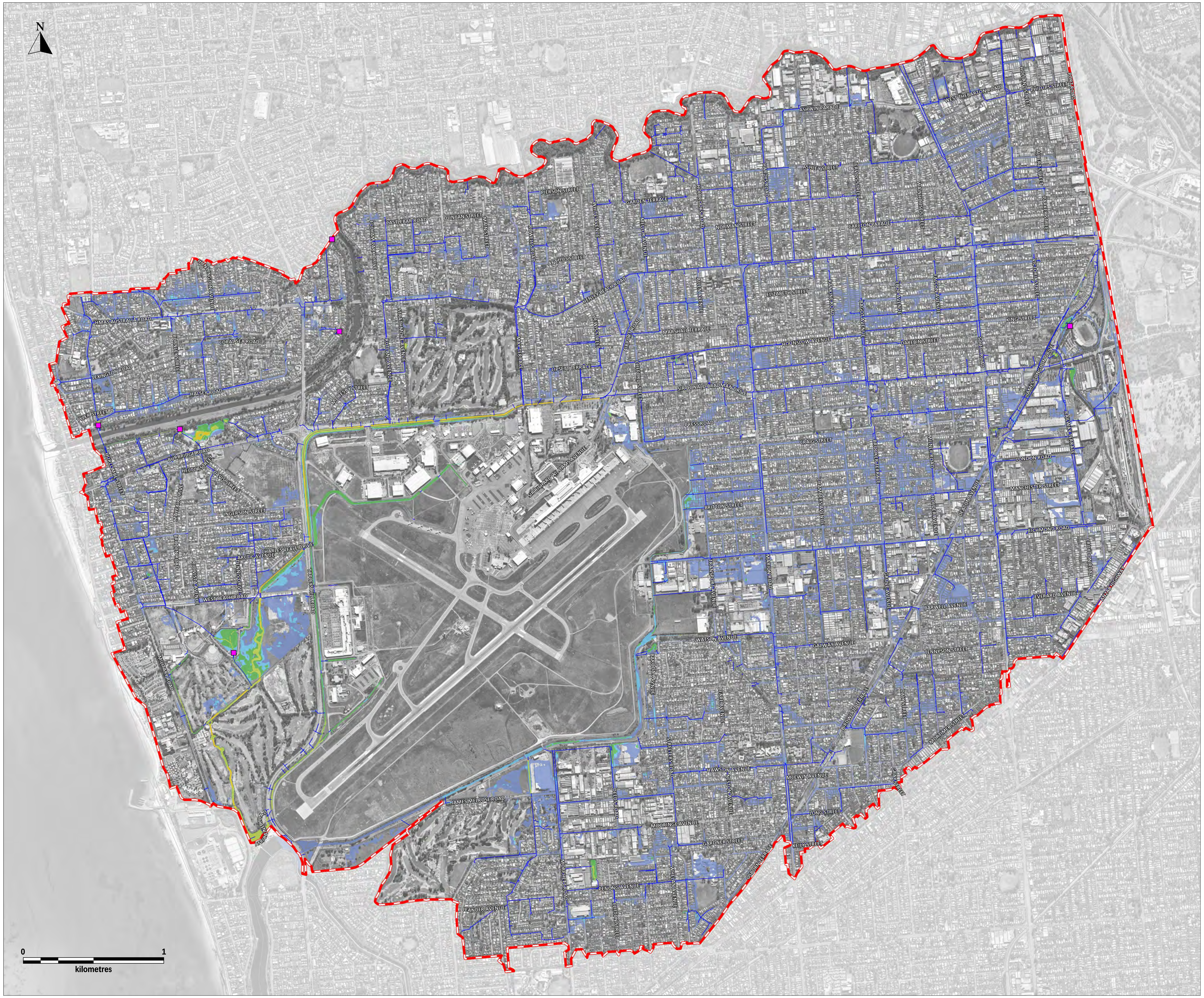
The flood extents are not based on actual historical floods.



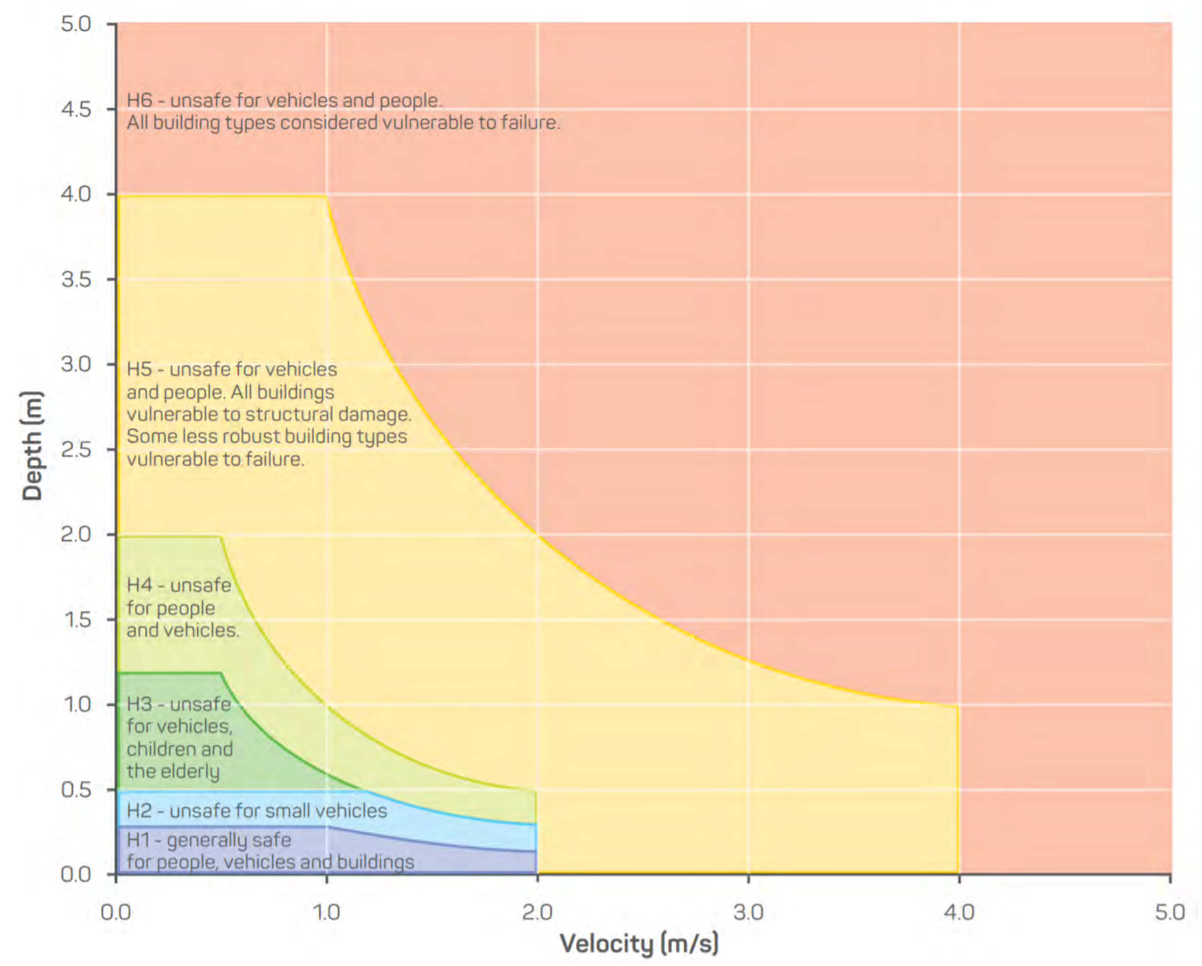
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

10% AEP Hazard Map
Scenario 3 - Future Development, Existing Infrastructure, Climate Change RCP 4.5



Model Boundary

Pump Station

Existing Stormwater Drain

Cadastre

Background

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Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

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• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

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Effect of debris on flood extent

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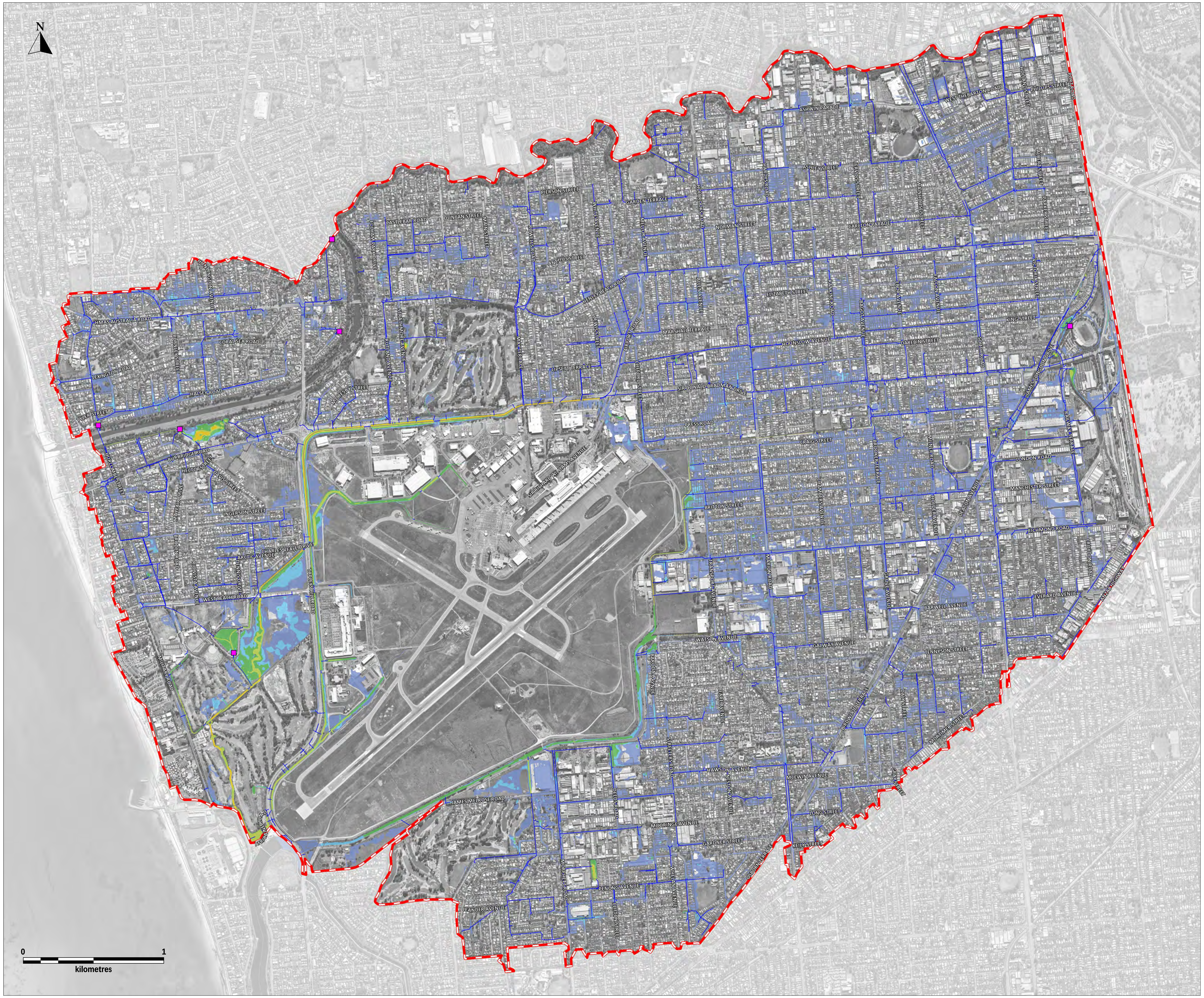
The flood extents are not based on actual historical floods.



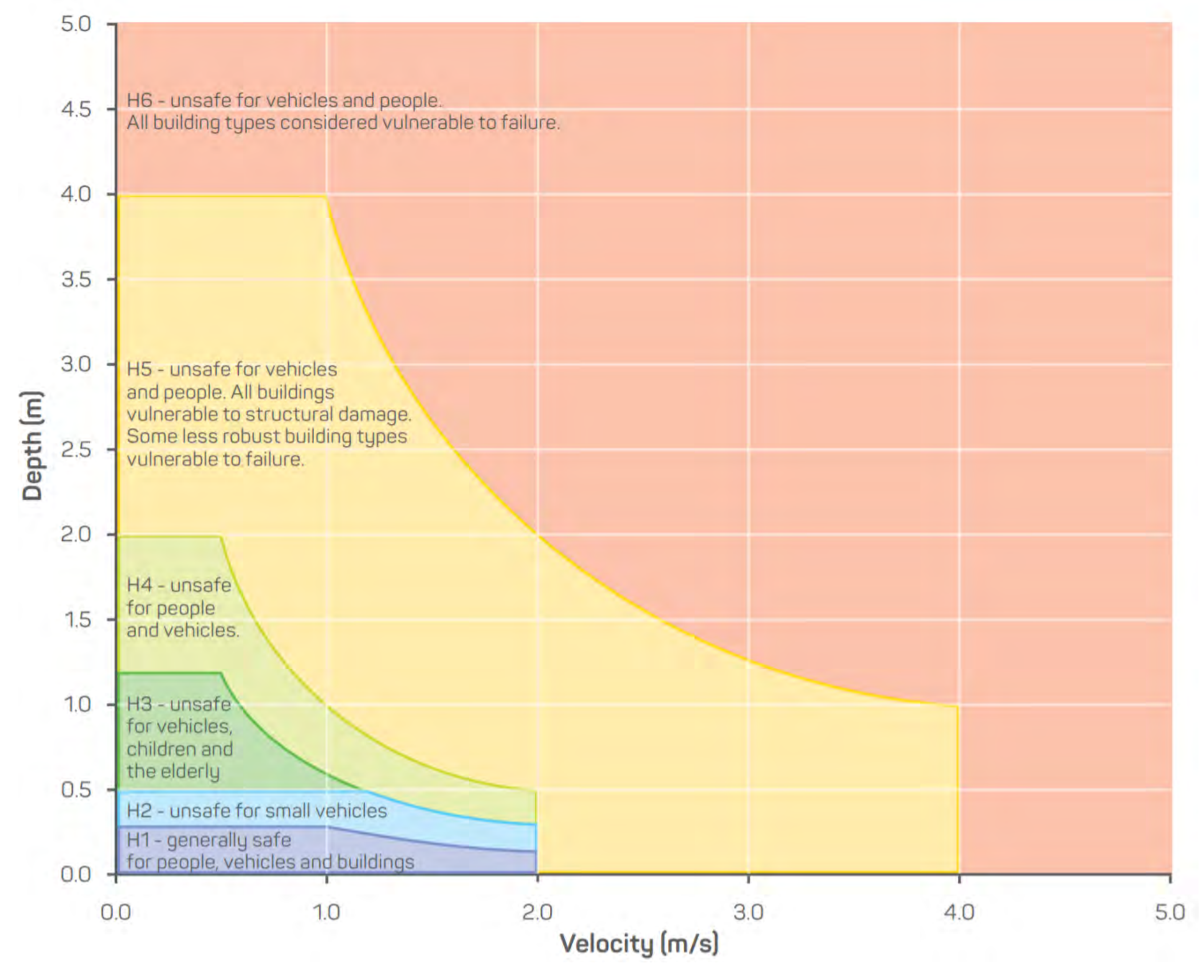
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

5% AEP Hazard Map
Scenario 3 - Future Development, Existing Infrastructure, Climate Change RCP 4.5



Model Boundary

Pump Station

Existing Stormwater Drain

Cadastre

Background

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Flood Risk Probability

Flood risk can be considered in terms of:

- Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;
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Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

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Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

- Storms with different Annual Exceedance Probability;
- Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Effect of debris on flood extent

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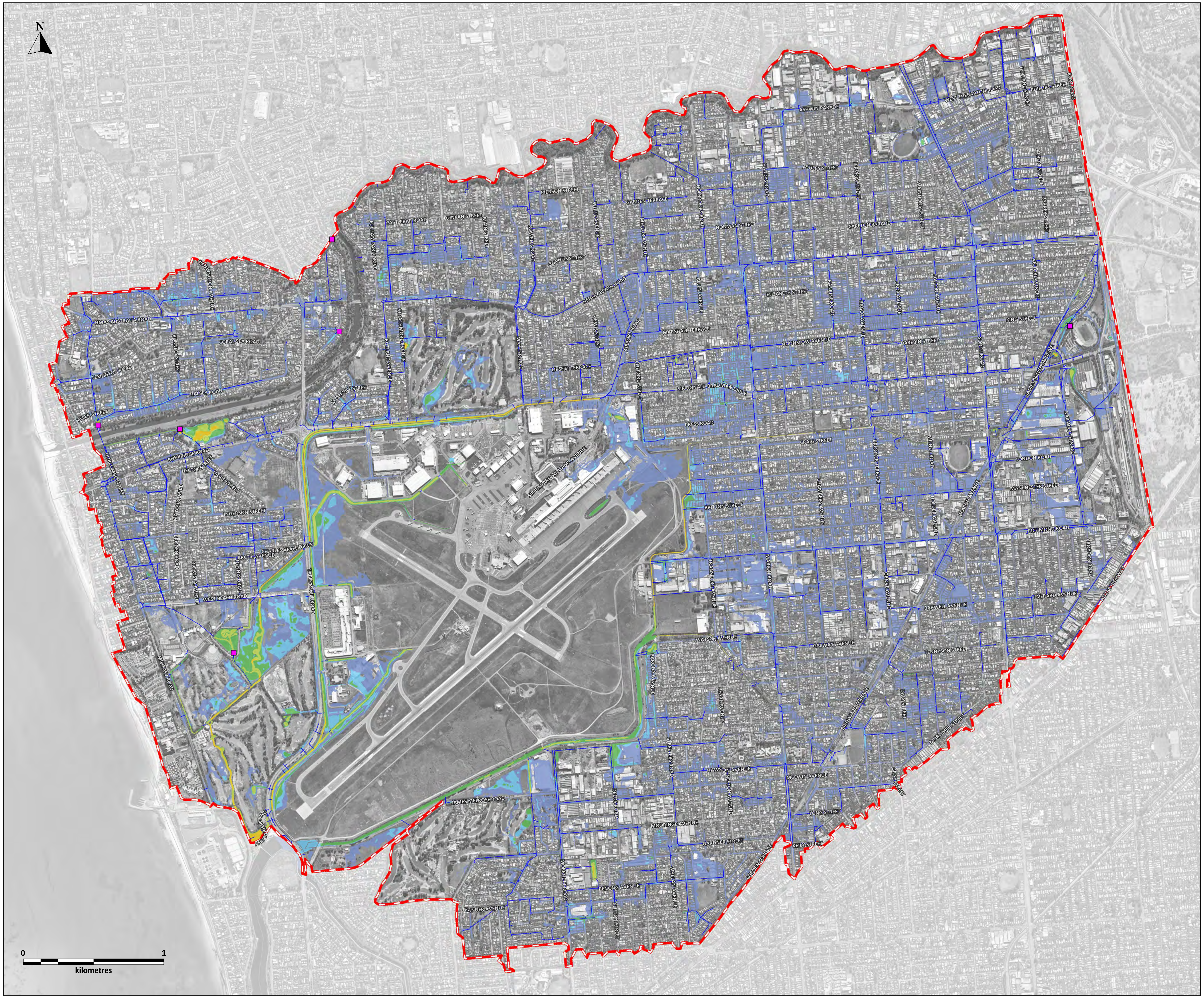
The flood extents are not based on actual historical floods.



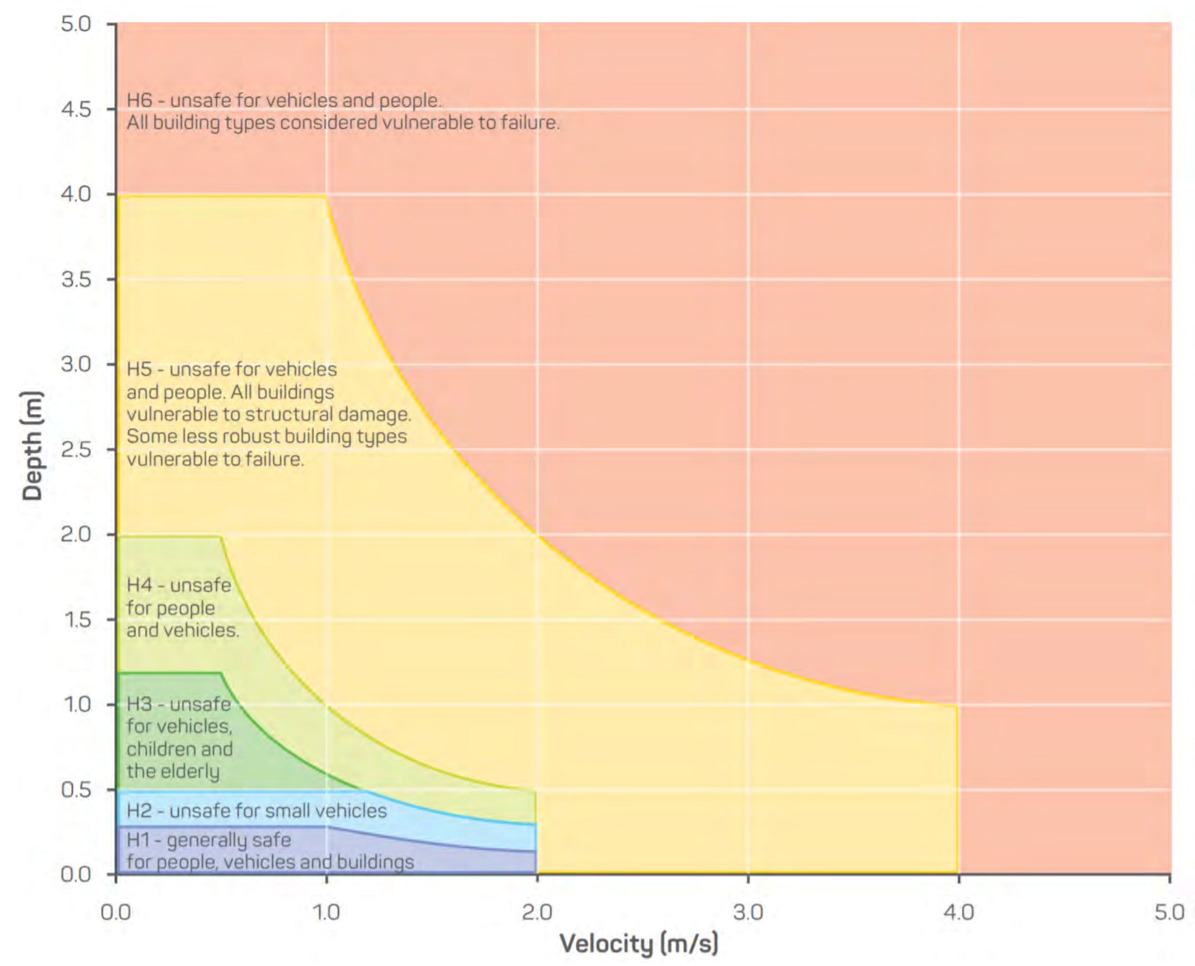
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

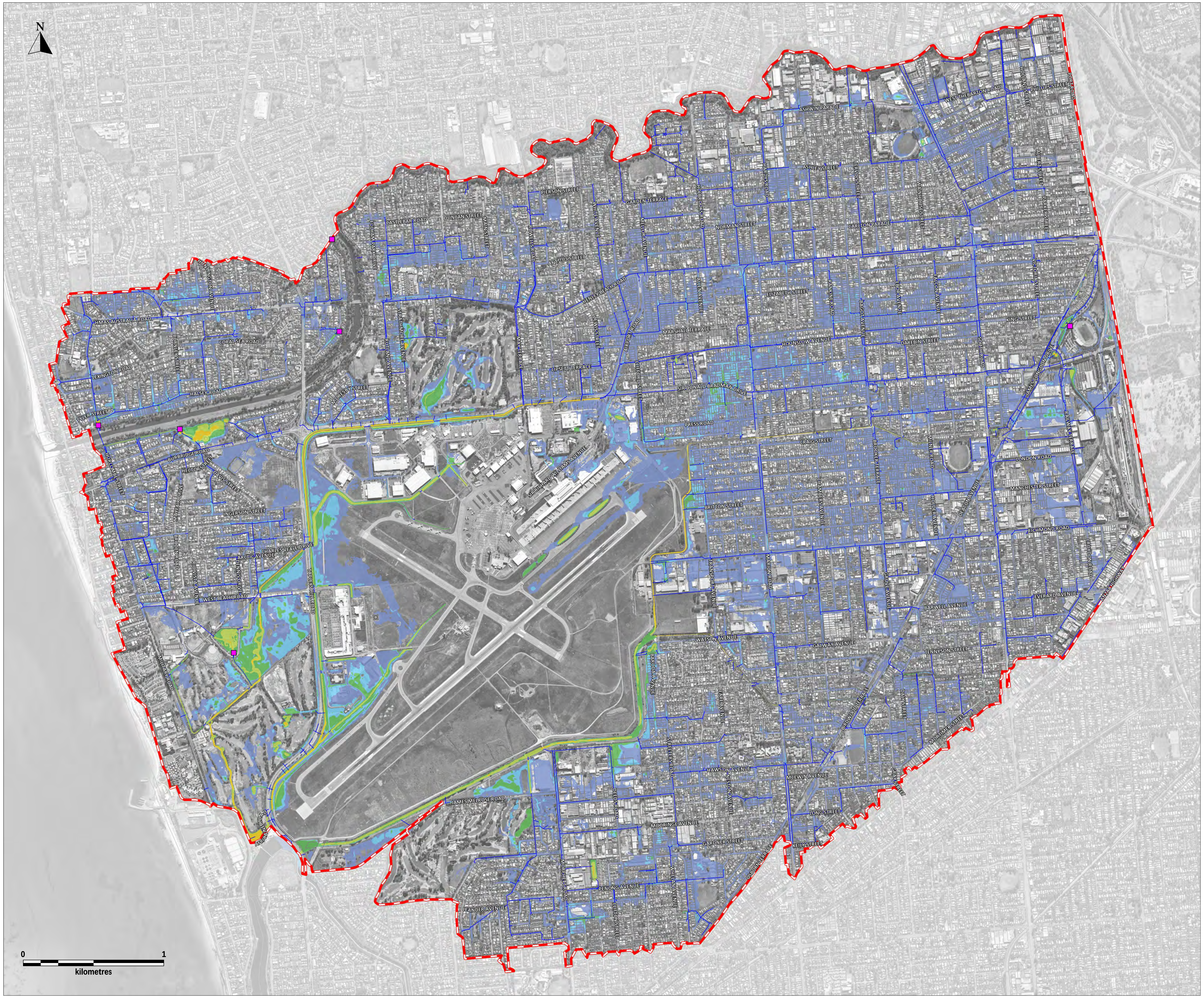
DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

2% AEP Hazard Map
Scenario 3 - Future Development, Existing Infrastructure, Climate Change RCP 4.5



Model Boundary
Pump Station
Existing Stormwater Drain
Cadastre



Background

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Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

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Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

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Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

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• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

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Effect of debris on flood extent

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The flood extents are not based on actual historical floods.

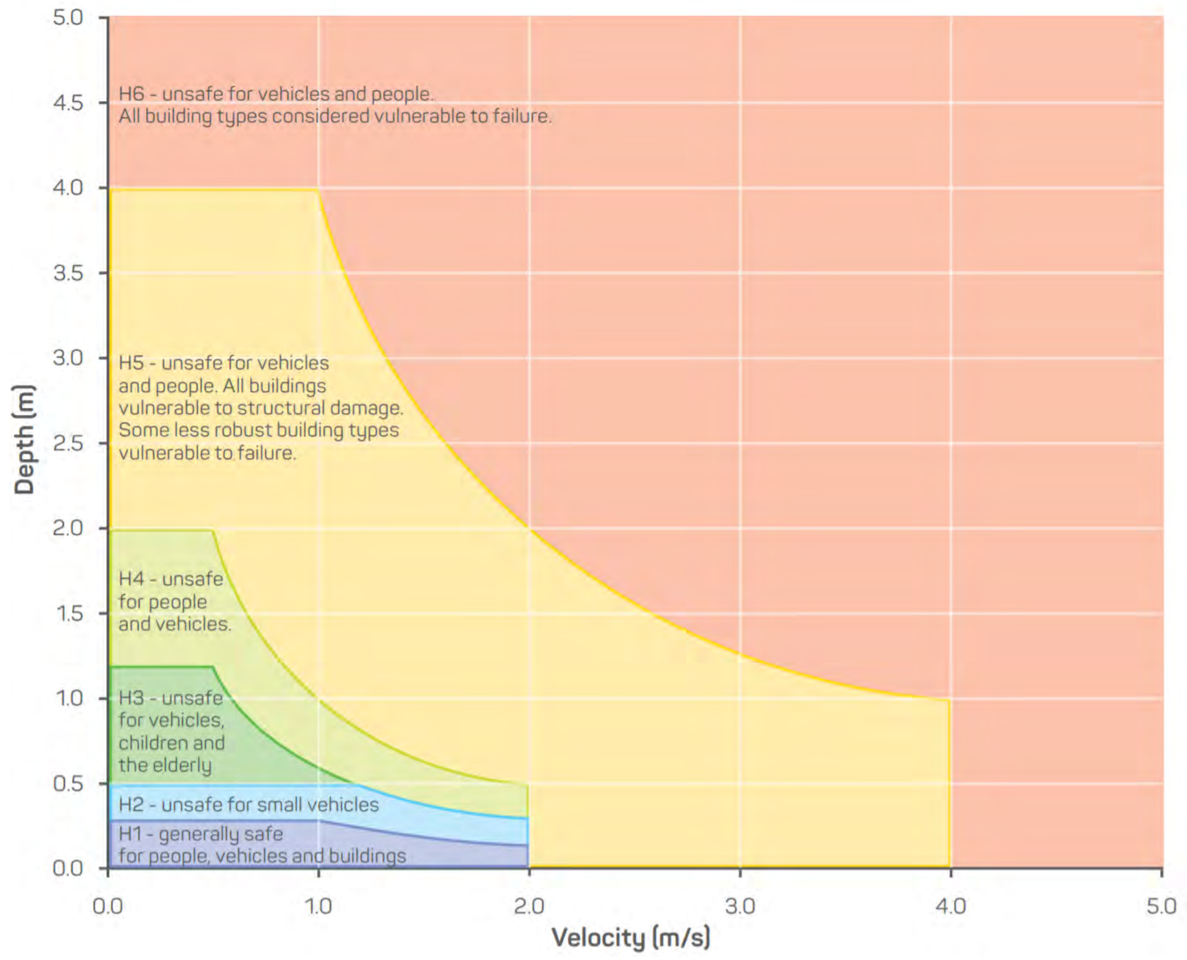
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

1% AEP Hazard Map
Scenario 3 - Future Development, Existing Infrastructure, Climate Change RCP 4.5



Model Boundary

Pump Station

Existing Stormwater Drain

Cadastre

Background

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Flood Risk Probability

Flood risk can be considered in terms of:

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• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

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Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Effect of debris on flood extent

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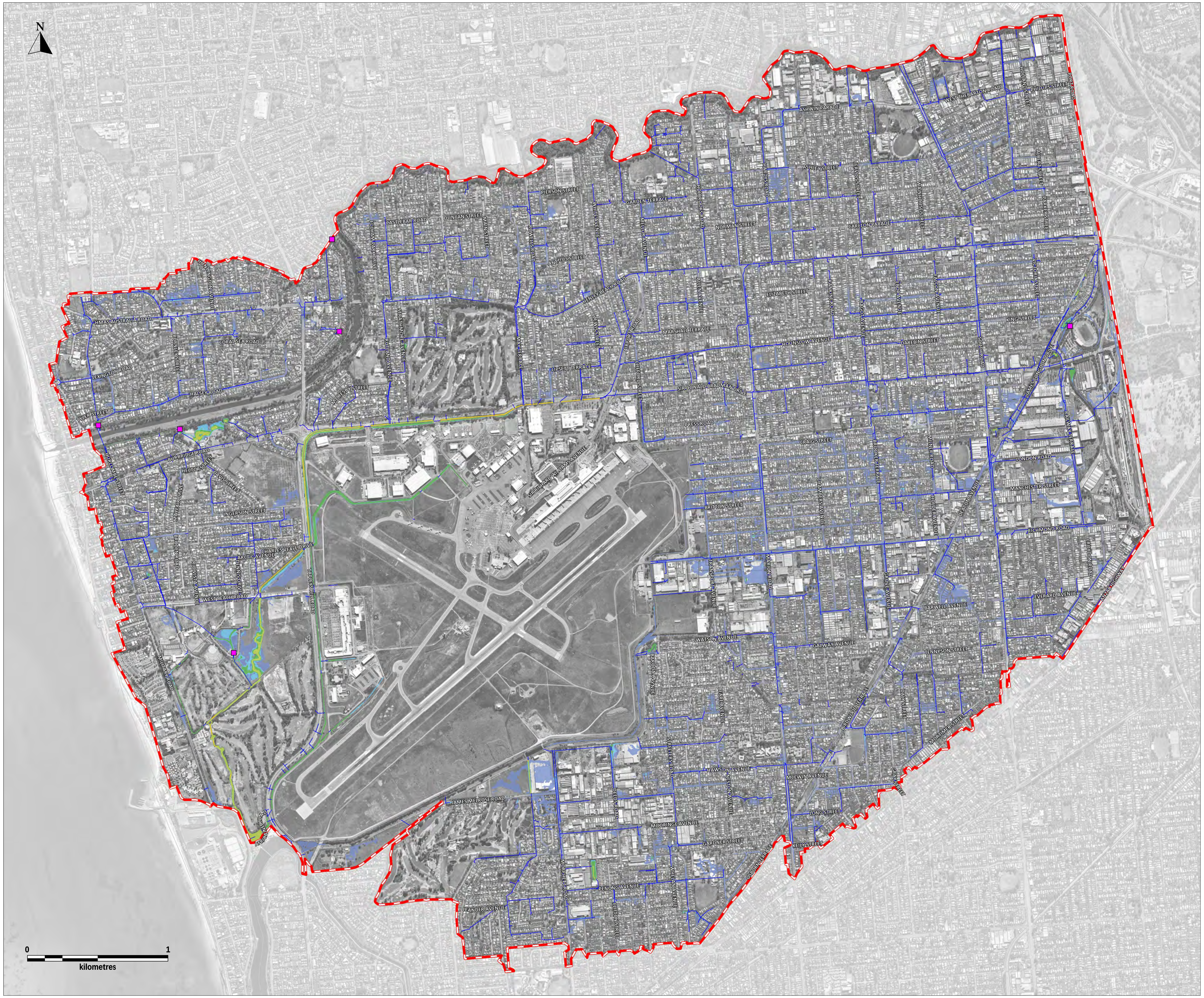
The flood extents are not based on actual historical floods.



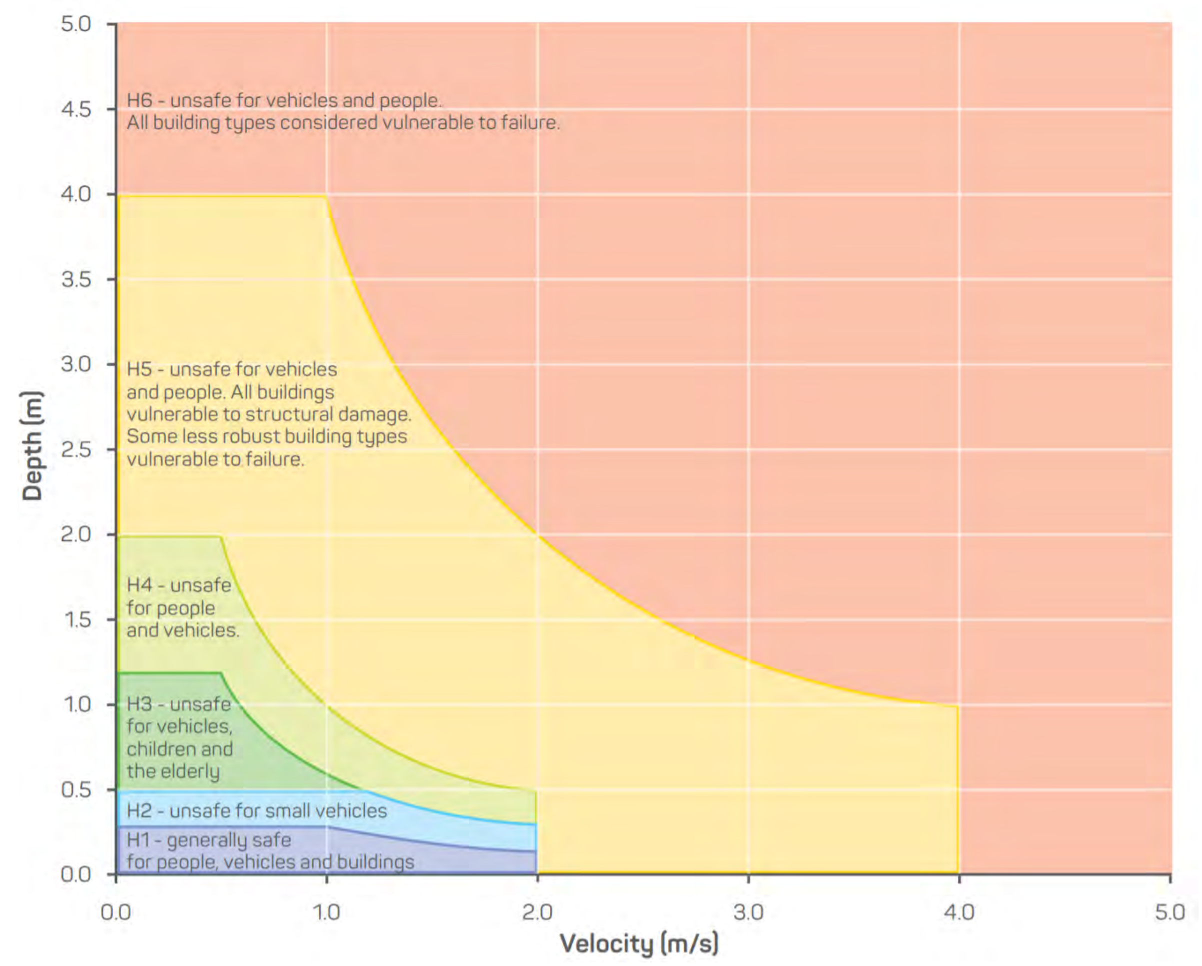
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

0.5 EY Hazard Map
Scenario 4 - Future Development, Existing Infrastructure, Climate Change RCP 8.5



Model Boundary

Pump Station

Existing Stormwater Drain

Cadastre

Background

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Flood Risk Probability

Flood risk can be considered in terms of:

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Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

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Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

- Storms with different Annual Exceedance Probability;
- Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

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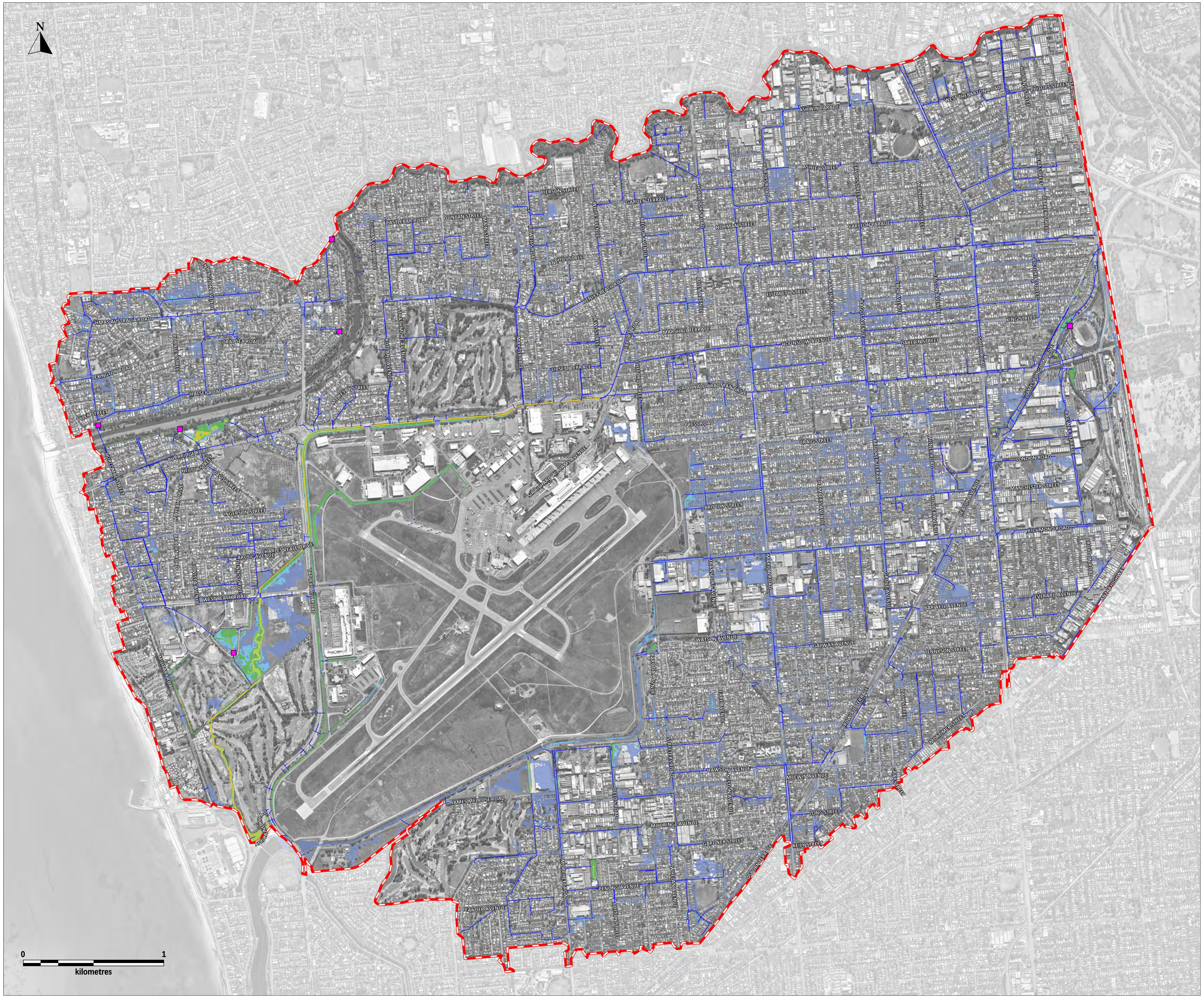
The flood extents are not based on actual historical floods.



Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

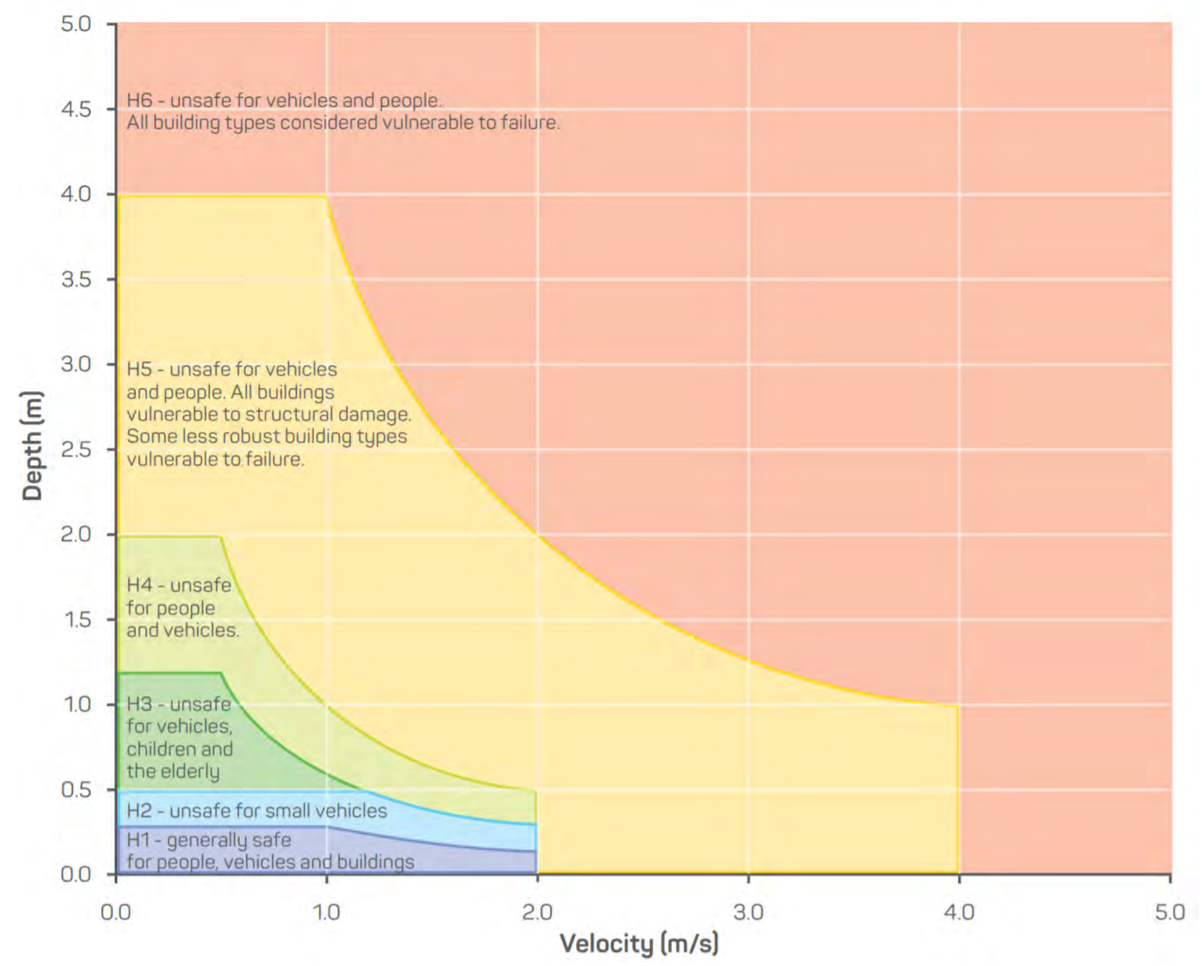
southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

0.2 EY Hazard Map

Scenario 4 - Future Development, Existing Infrastructure, Climate Change RCP 8.5



Model Boundary
Pump Station
Existing Stormwater Drain
Cadastre

Background

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Flood Risk Probability

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Storm Durations

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Scope of Mapping

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The flood extents are not based on actual historical floods.

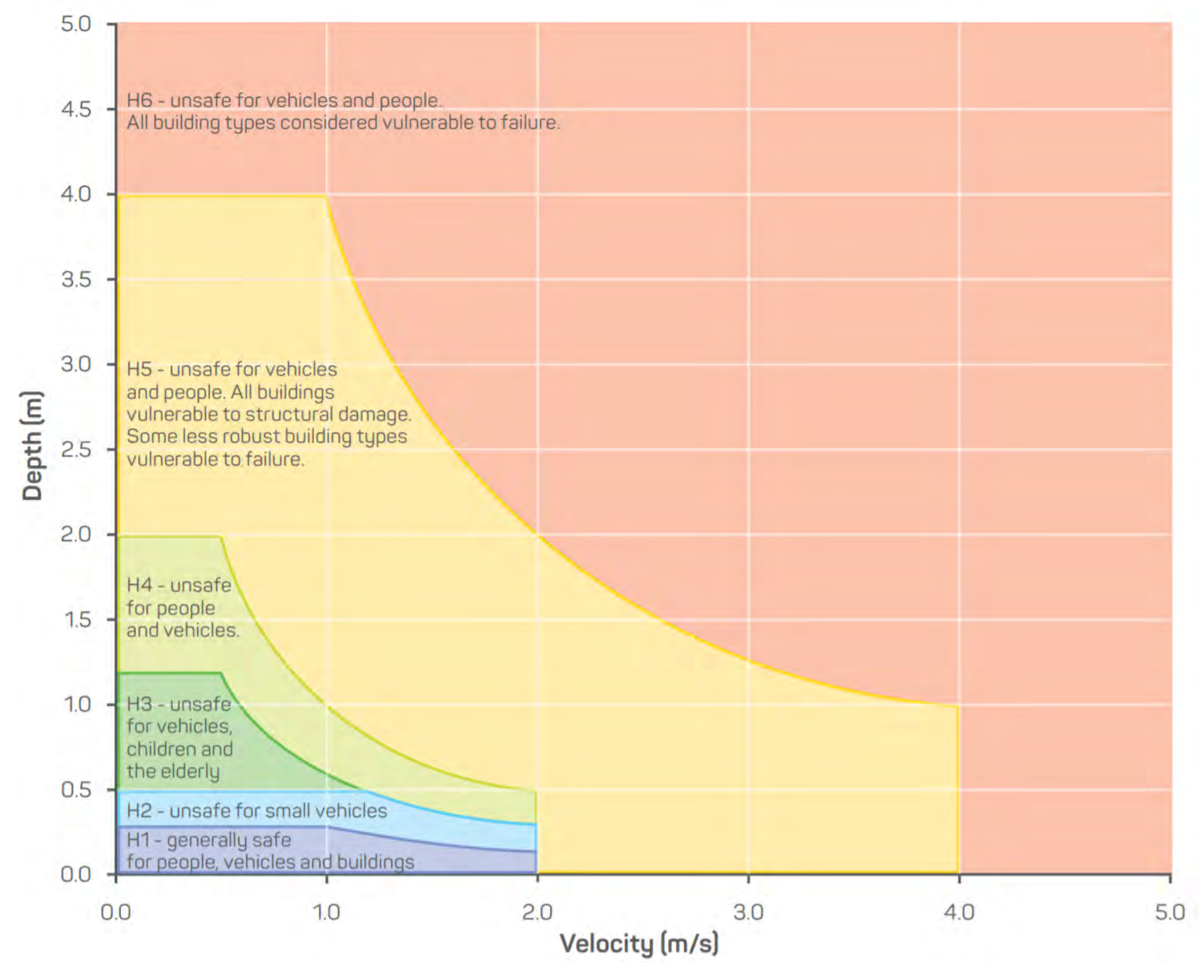
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

10% AEP Hazard Map
Scenario 4 - Future Development, Existing Infrastructure, Climate Change RCP 8.5



Model Boundary

Pump Station

Existing Stormwater Drain

Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

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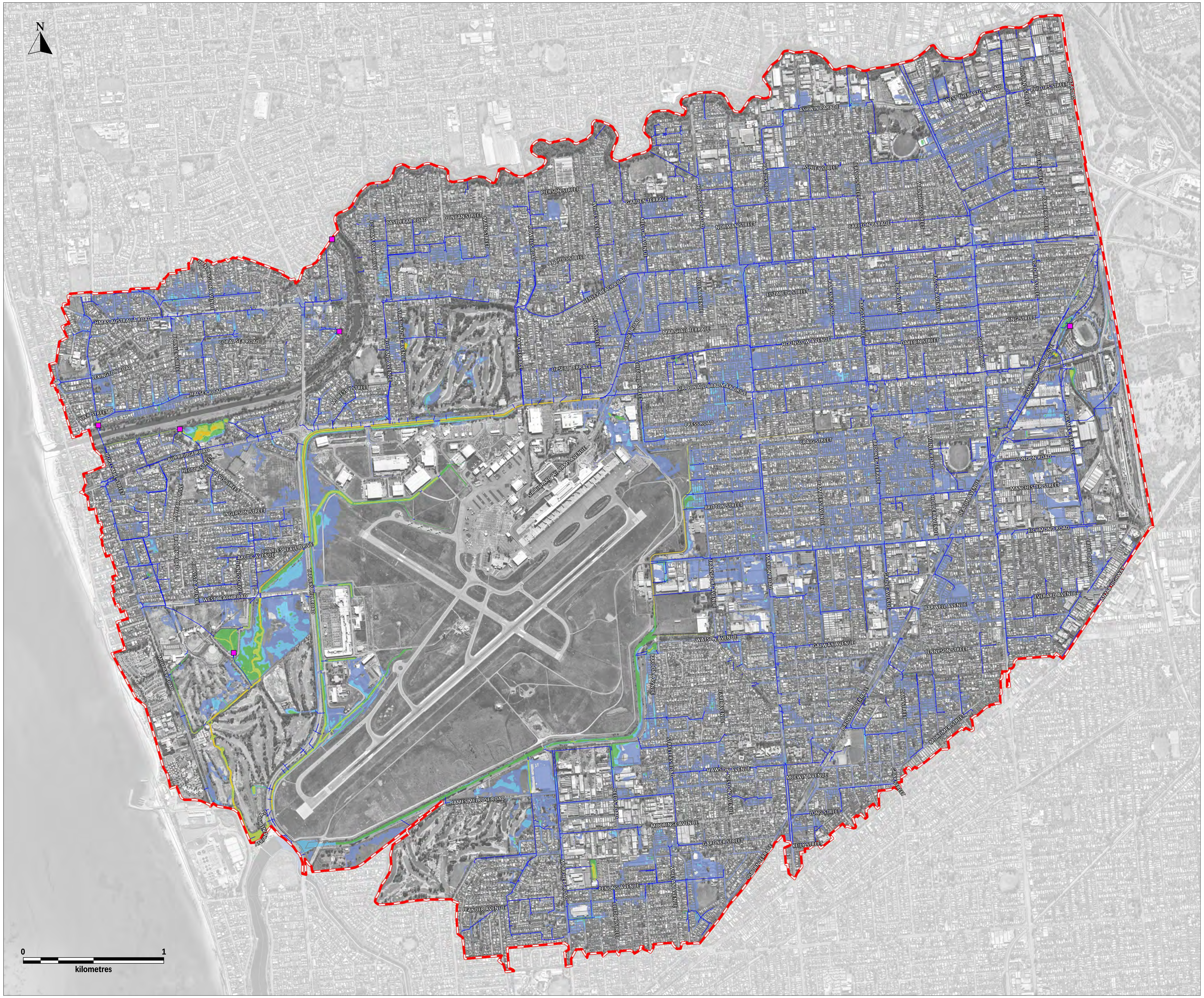
The flood extents are not based on actual historical floods.



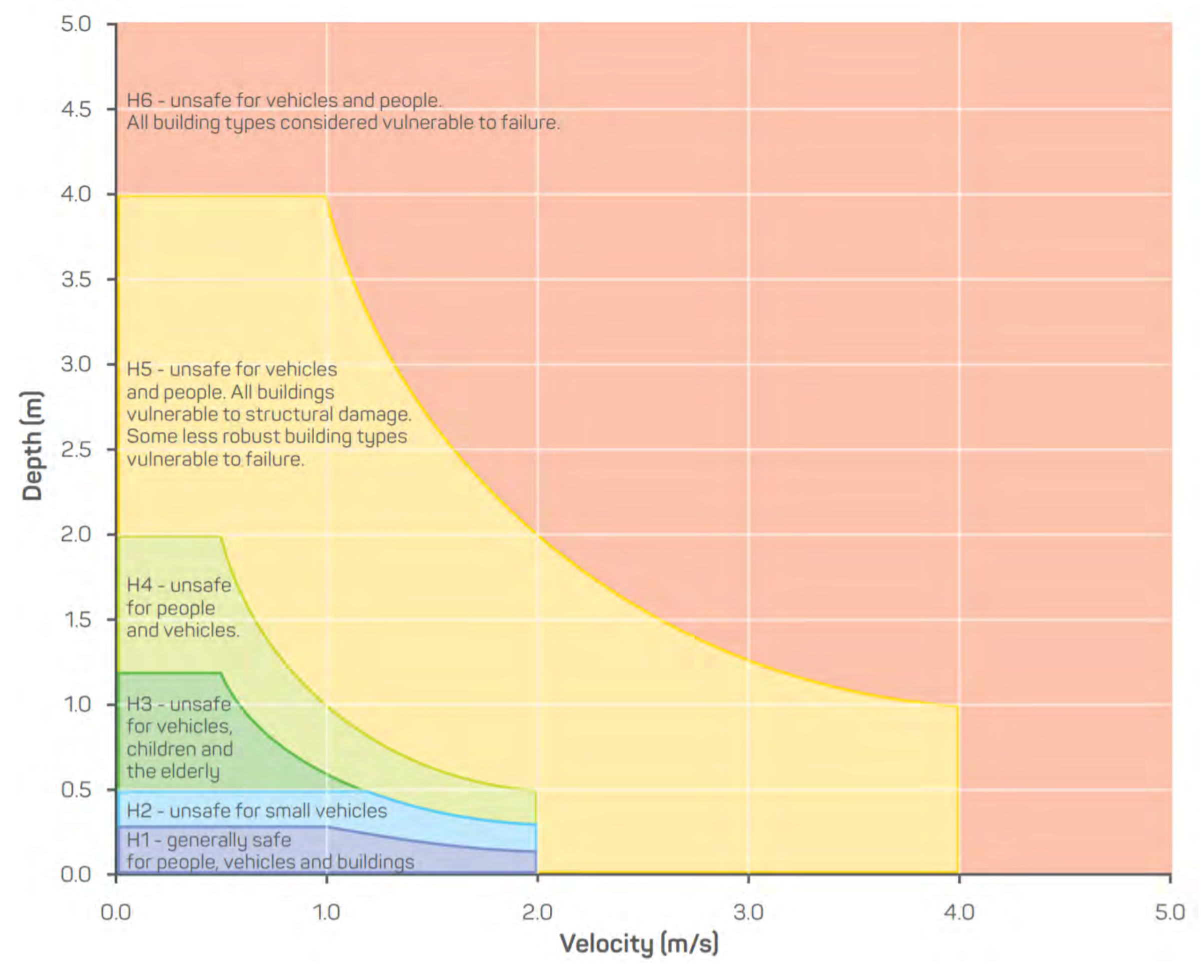
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

5% AEP Hazard Map
Scenario 4 - Future Development, Existing Infrastructure, Climate Change RCP 8.5



Model Boundary

Pump Station

Existing Stormwater Drain

Cadastre

Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

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Storm Durations

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Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

- Storms with different Annual Exceedance Probability;

- Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

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Effect of debris on flood extent

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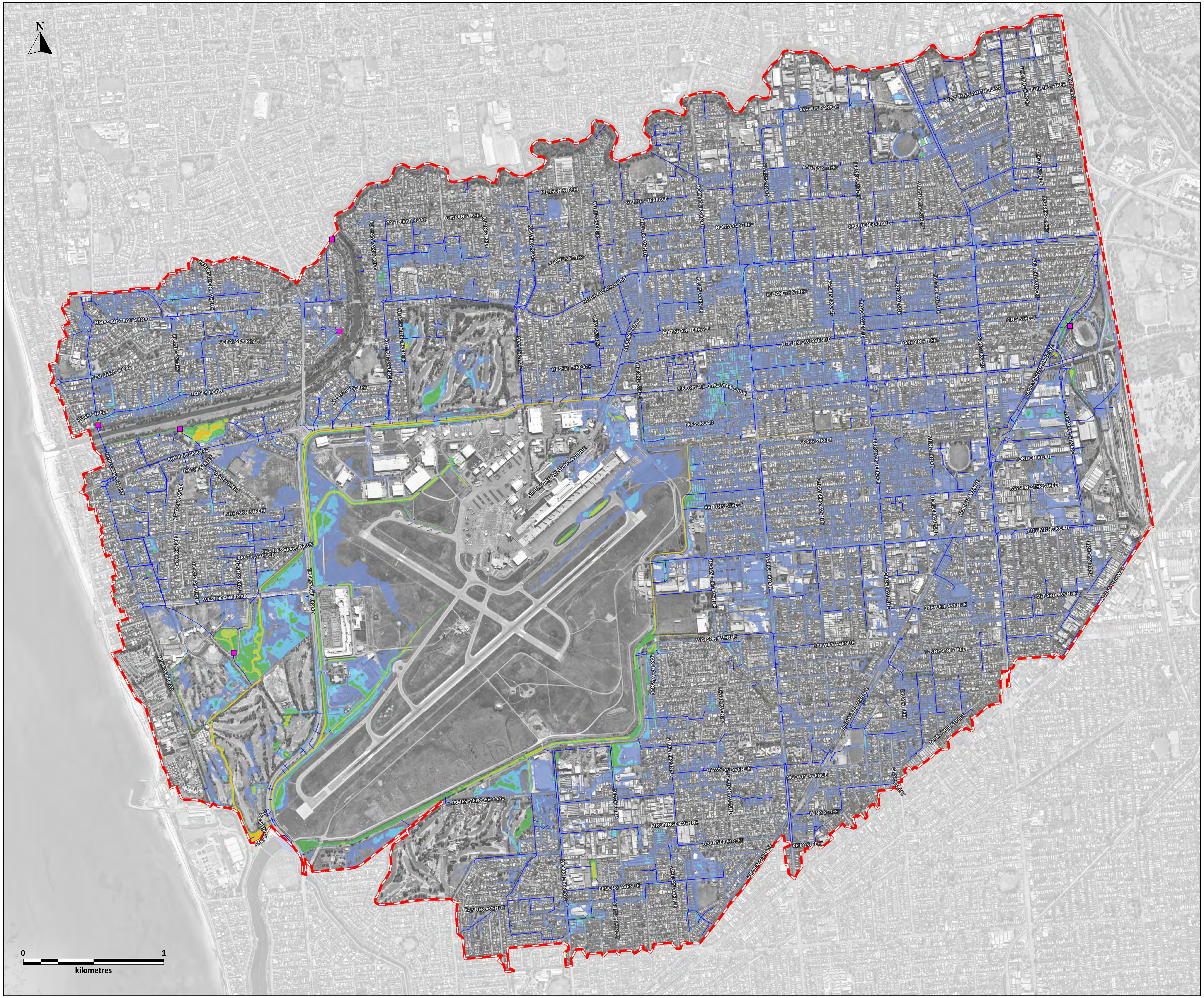
The flood extents are not based on actual historical floods.



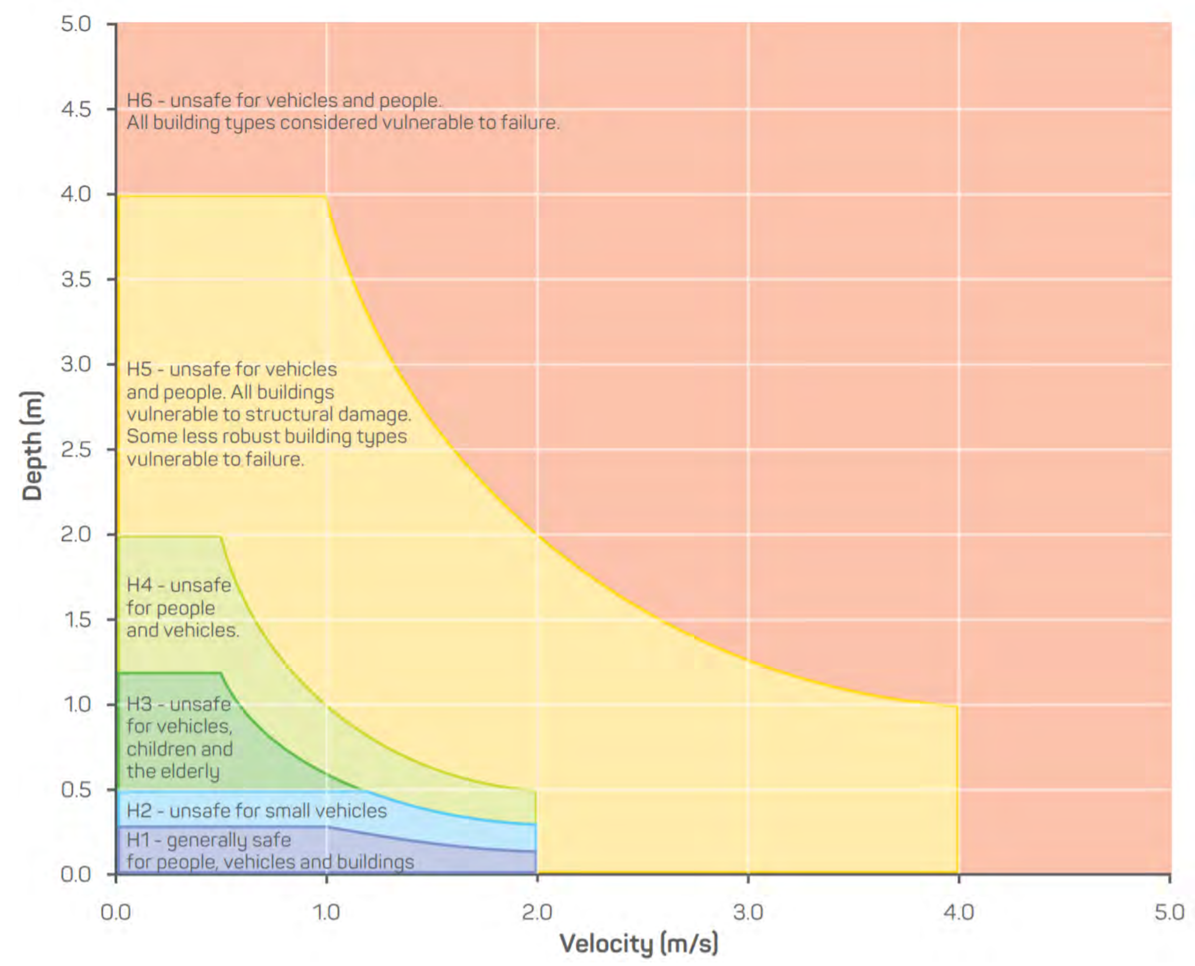
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

2% AEP Hazard Map
Scenario 4 - Future Development, Existing Infrastructure, Climate Change RCP 8.5



Model Boundary

Pump Station

Existing Stormwater Drain

Cadastre

Background

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Flood Risk Probability

Flood risk can be considered in terms of:

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Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

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Scope of Mapping

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• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

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Effect of debris on flood extent

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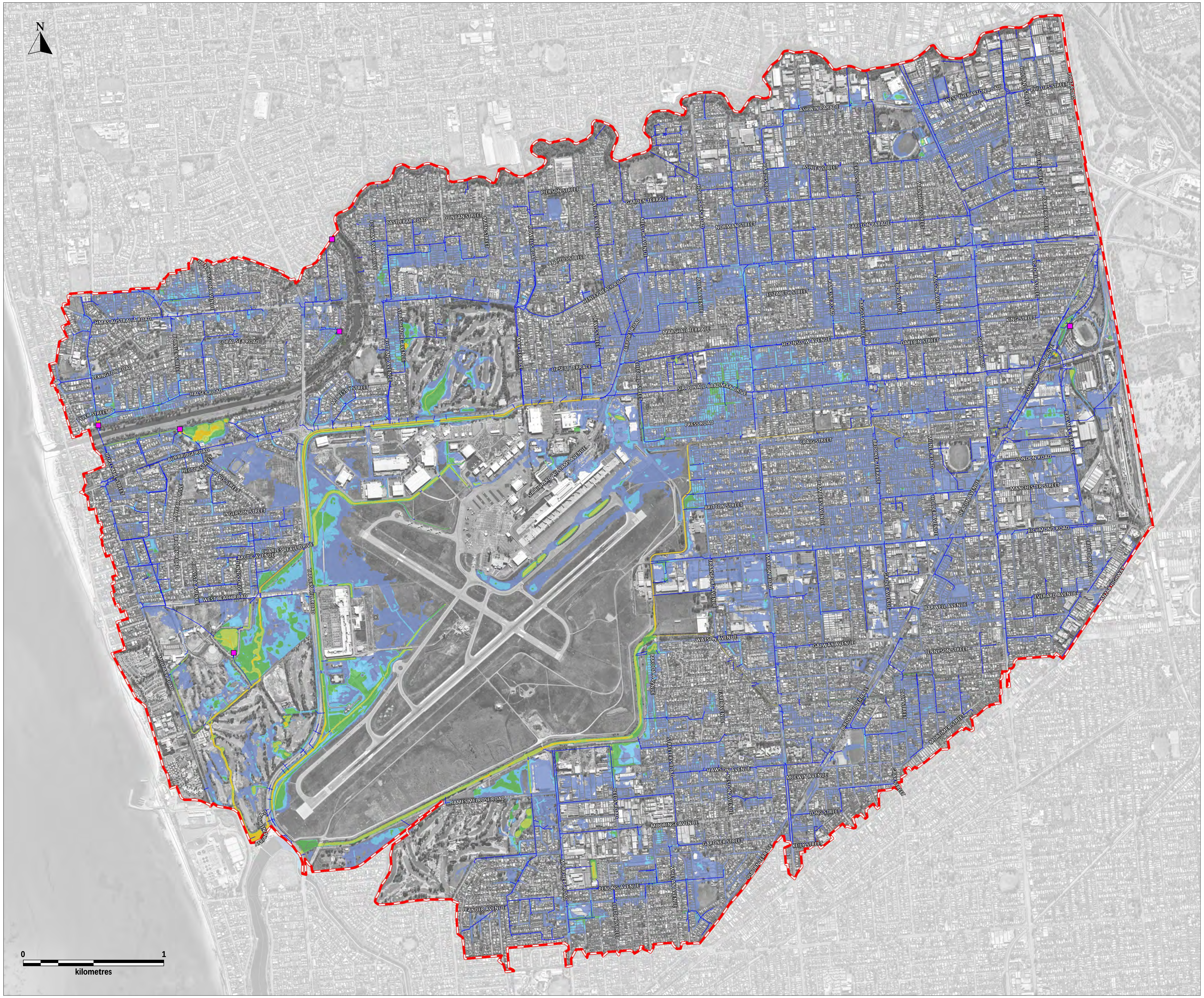
The flood extents are not based on actual historical floods.



Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

1% AEP Hazard Map
Scenario 4 - Future Development, Existing Infrastructure, Climate Change RCP 8.5

Appendix F

Upgrade Scenario Flood Plain Mapping

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Upgrade Stormwater Drain
- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments

- Cadastre

Background

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Storm Durations

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Scope of Mapping

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Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

0.5 EY Floodplain Map
Upgrade - Future Development, Upgrade Infrastructure, Climate Change RCP 8.5

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Upgrade Stormwater Drain
- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre

Background

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Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

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Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

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Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

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• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

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Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

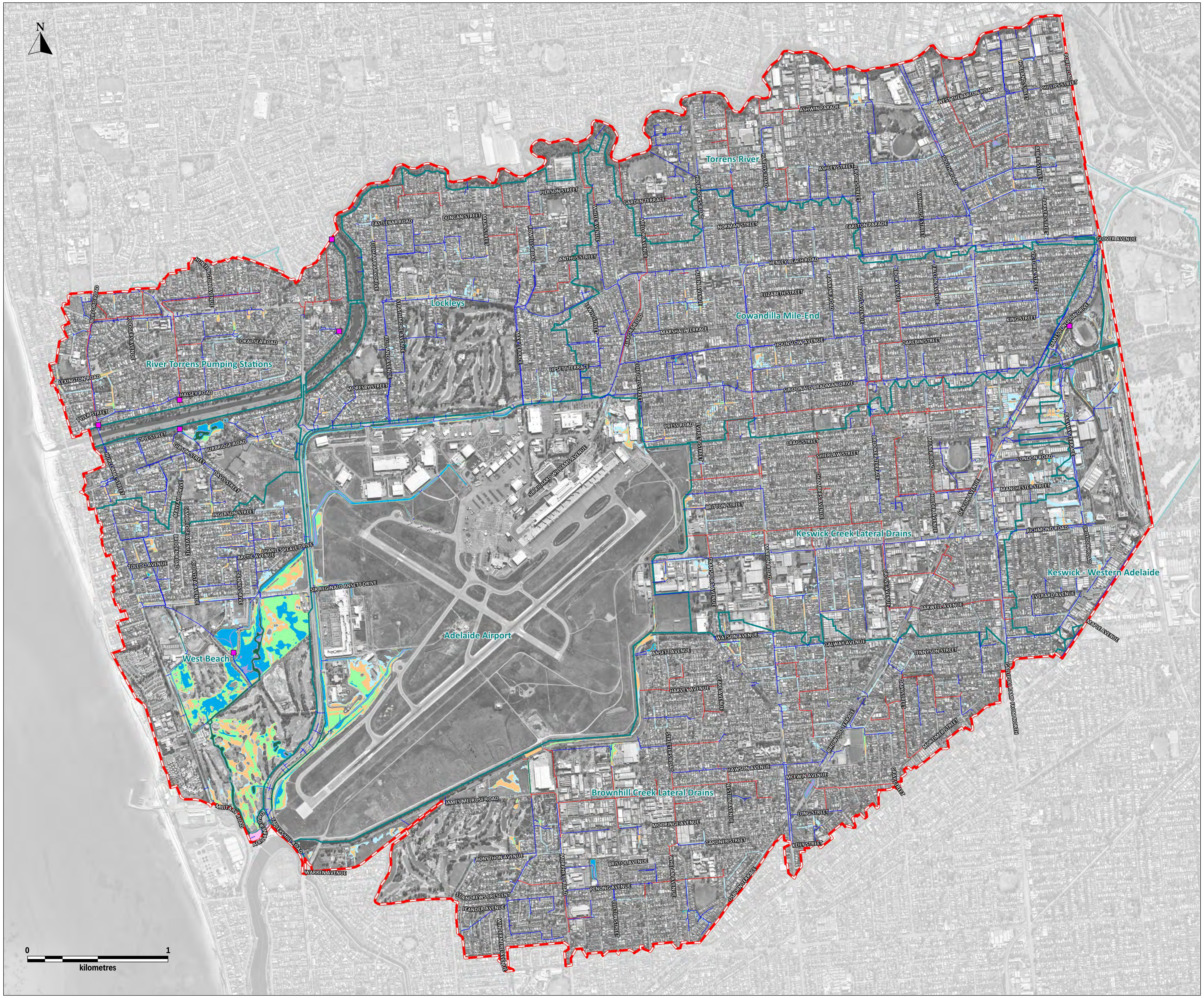
West Torrens
Stormwater Management Plan

0.2 EY Floodplain Map
Upgrade - Future Development, Upgrade Infrastructure, Climate Change RCP 8.5

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Upgrade Stormwater Drain
- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre



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Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

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Storm Durations

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Scope of Mapping

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Effect of debris on flood extent

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Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

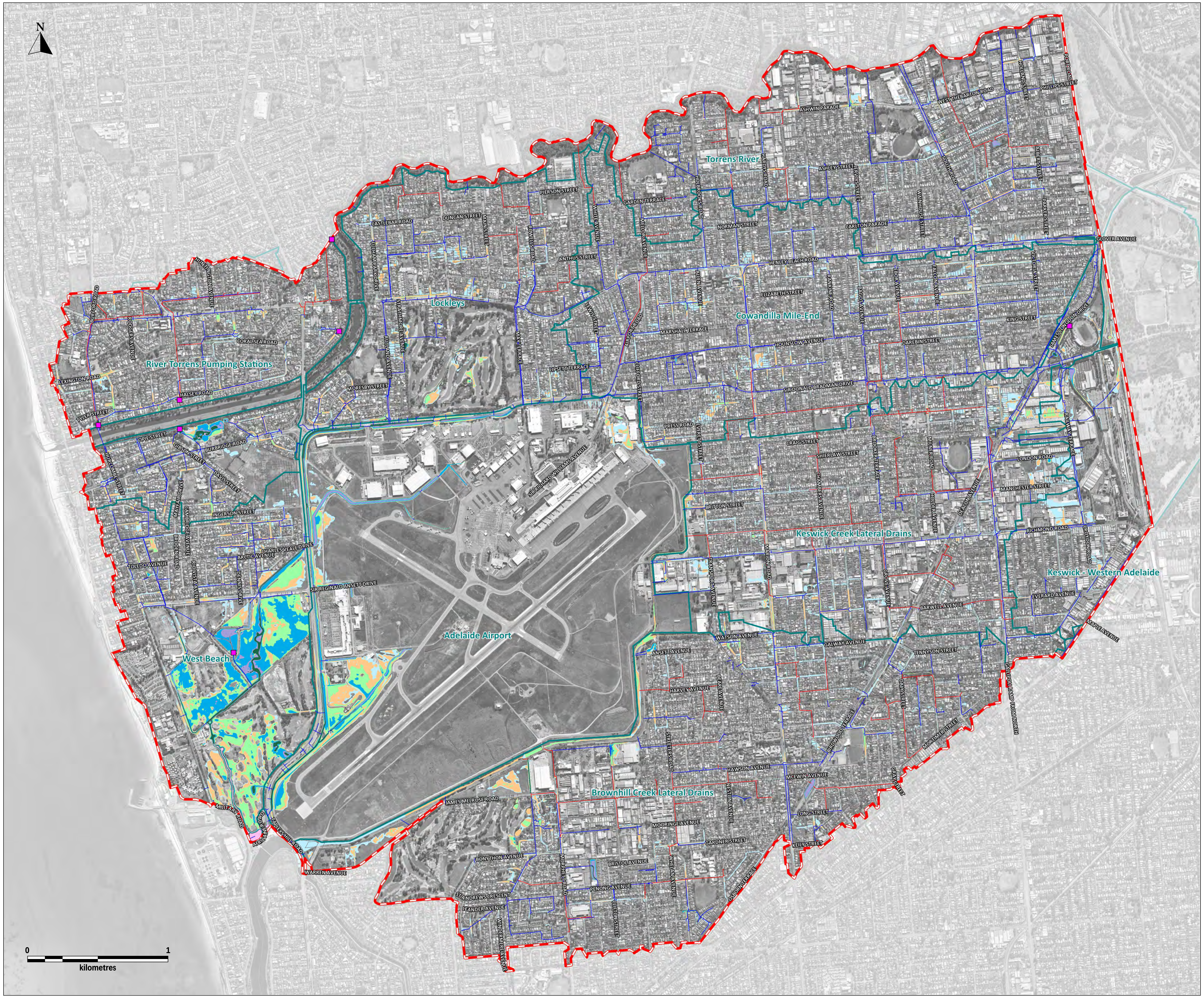
West Torrens
Stormwater Management Plan

10% AEP Floodplain Map
Upgrade - Future Development, Upgrade Infrastructure, Climate Change RCP 8.5

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Upgrade Stormwater Drain
- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre



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Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

5% AEP Floodplain Map
Upgrade - Future Development, Upgrade Infrastructure, Climate Change RCP 8.5

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
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- 2.5 – 5.0 m
- > 5.0 m

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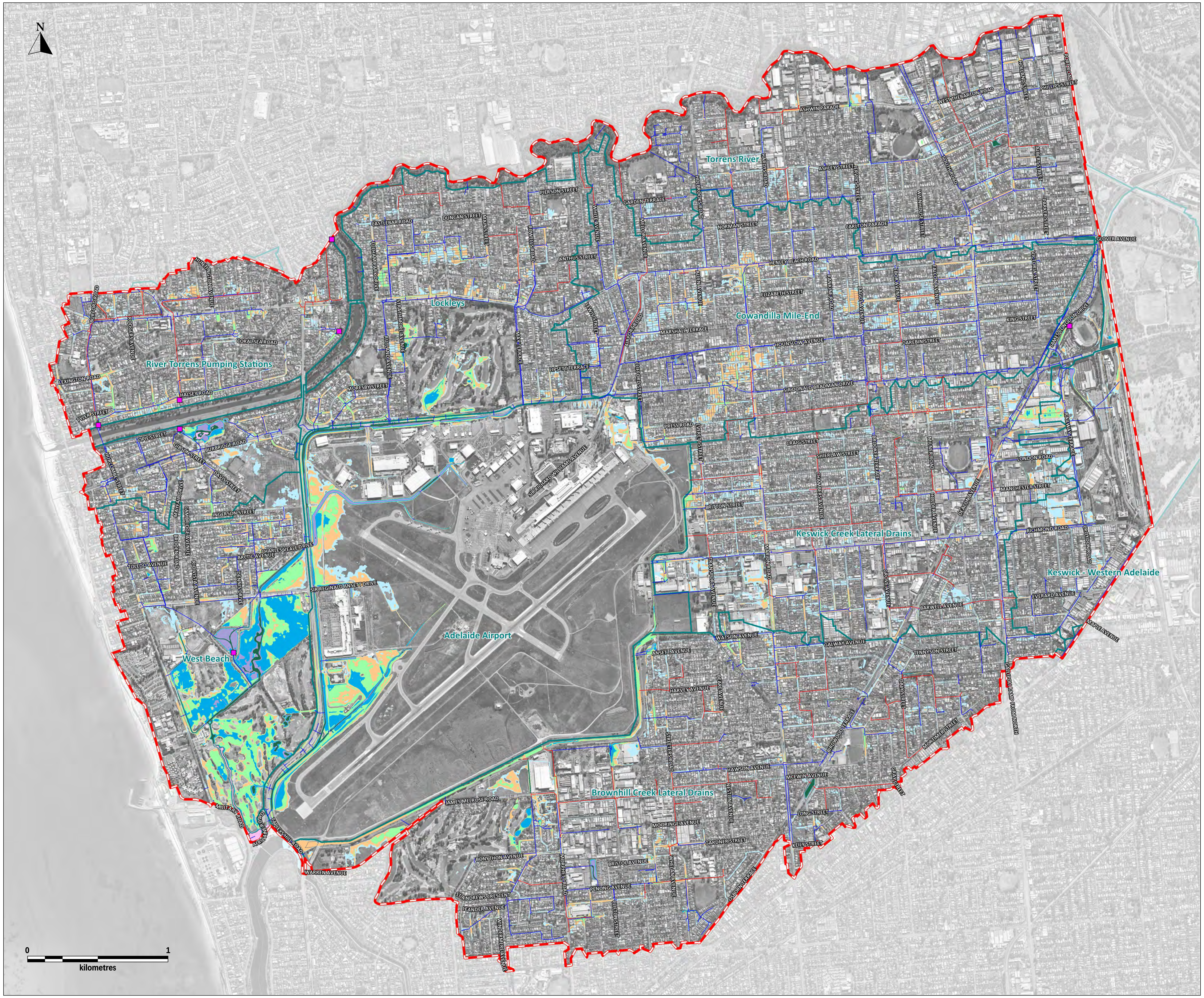
- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre



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The flood extents are not based on actual historical floods.

Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

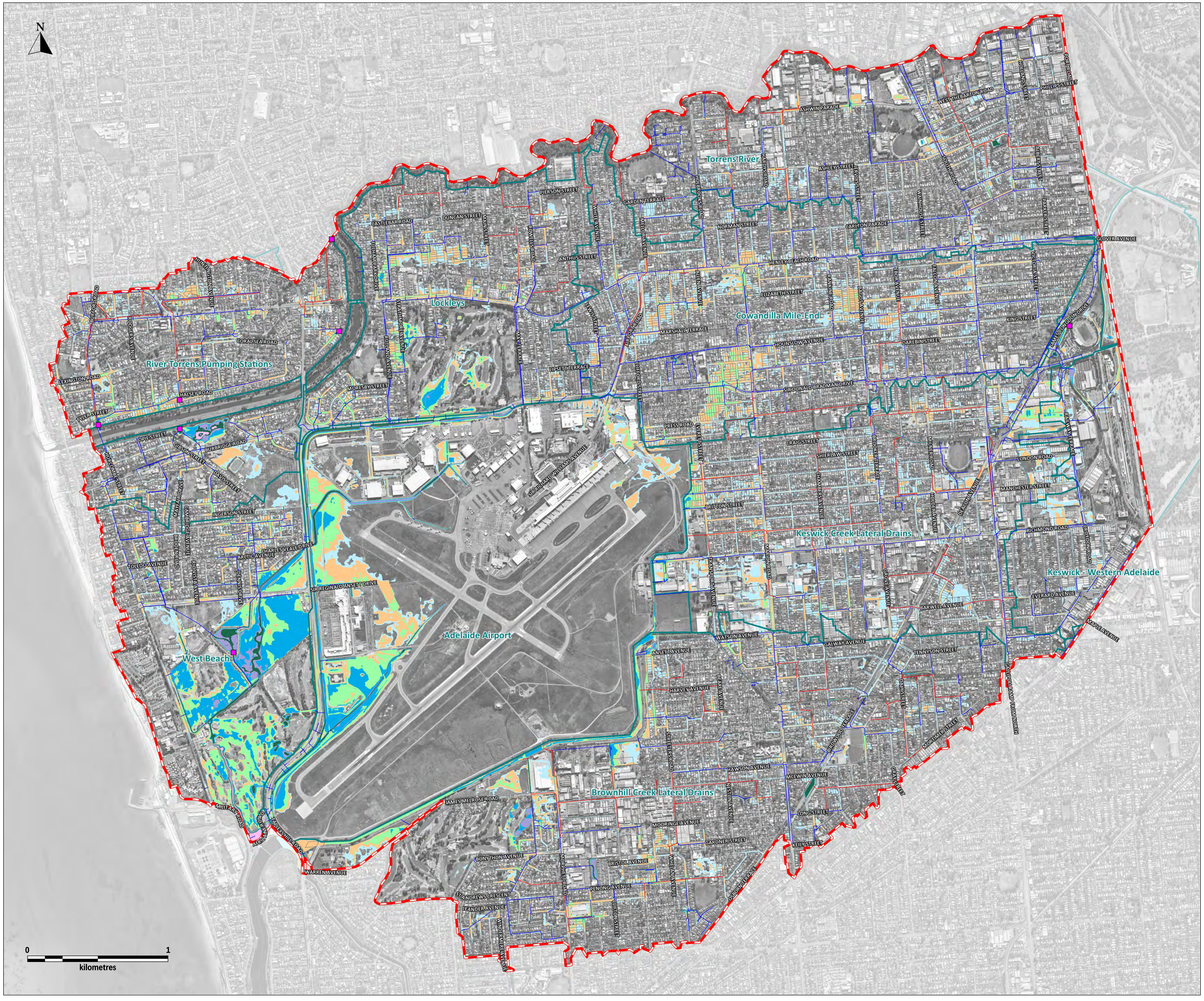
West Torrens
Stormwater Management Plan

2% AEP Floodplain Map
Upgrade - Future Development, Upgrade Infrastructure, Climate Change RCP 8.5

Flood Depth Contour Band

- 0.025 – 0.1 m
- 0.1 – 0.25 m
- 0.25 – 0.5 m
- 0.5 – 1.0 m
- 1.0 – 1.5 m
- 1.5 – 2.5 m
- 2.5 – 5.0 m
- > 5.0 m

- Upgrade Stormwater Drain
- Existing Stormwater Drain
- Pump Station
- Model Boundary
- Major Catchments
- Cadastre



Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Areas of flooding with depth of less than 25mm have been cropped from the flood plain extent.

Effect of debris on flood extent

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The flood extents are not based on actual historical floods.

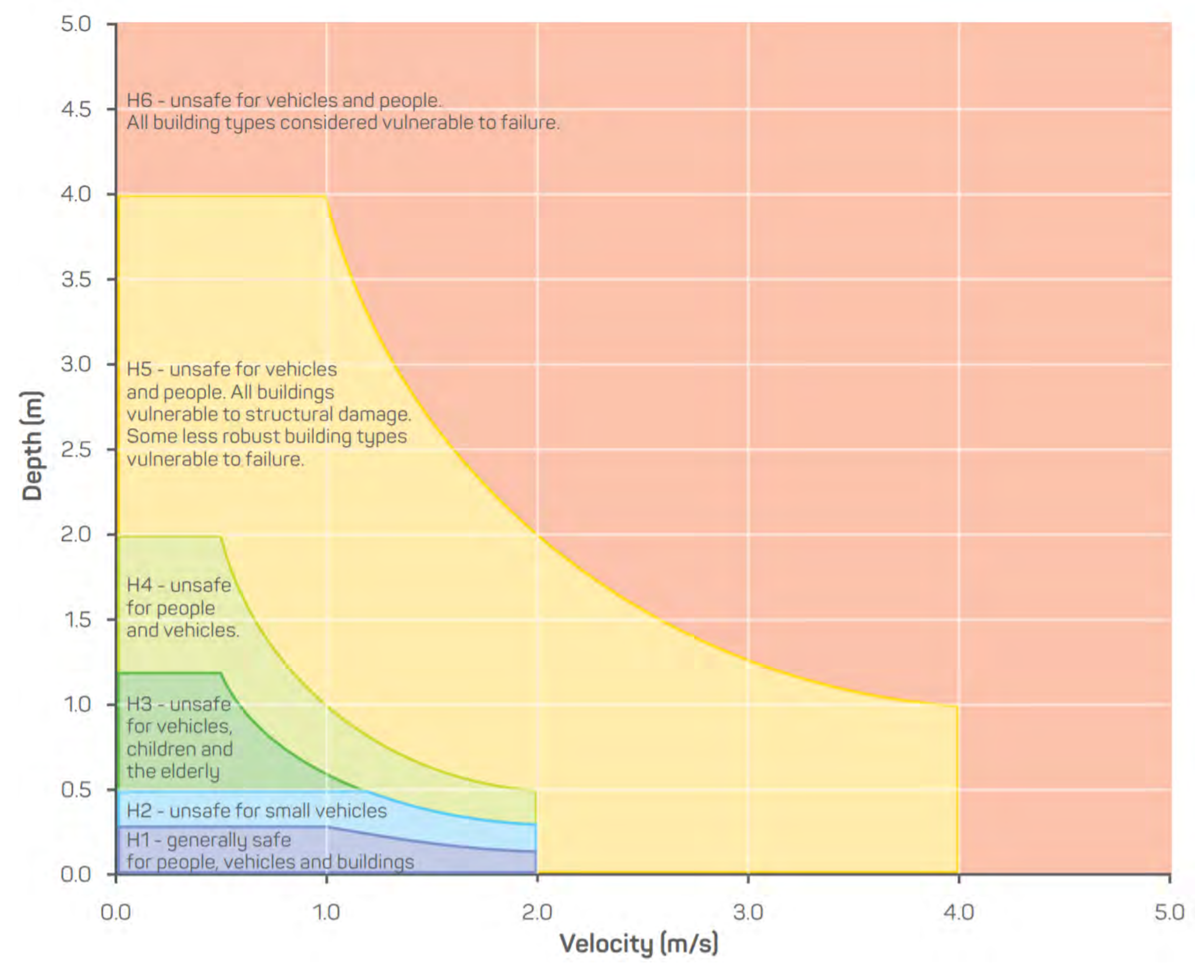
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

1% AEP Floodplain Map
Upgrade - Future Development, Upgrade Infrastructure, Climate Change RCP 8.5



Model Boundary
Pump Station
Existing Stormwater Drain
Cadastre
Upgrade Stormwater Drain

Background

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Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

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Areas of very shallow flooding

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Effect of debris on flood extent

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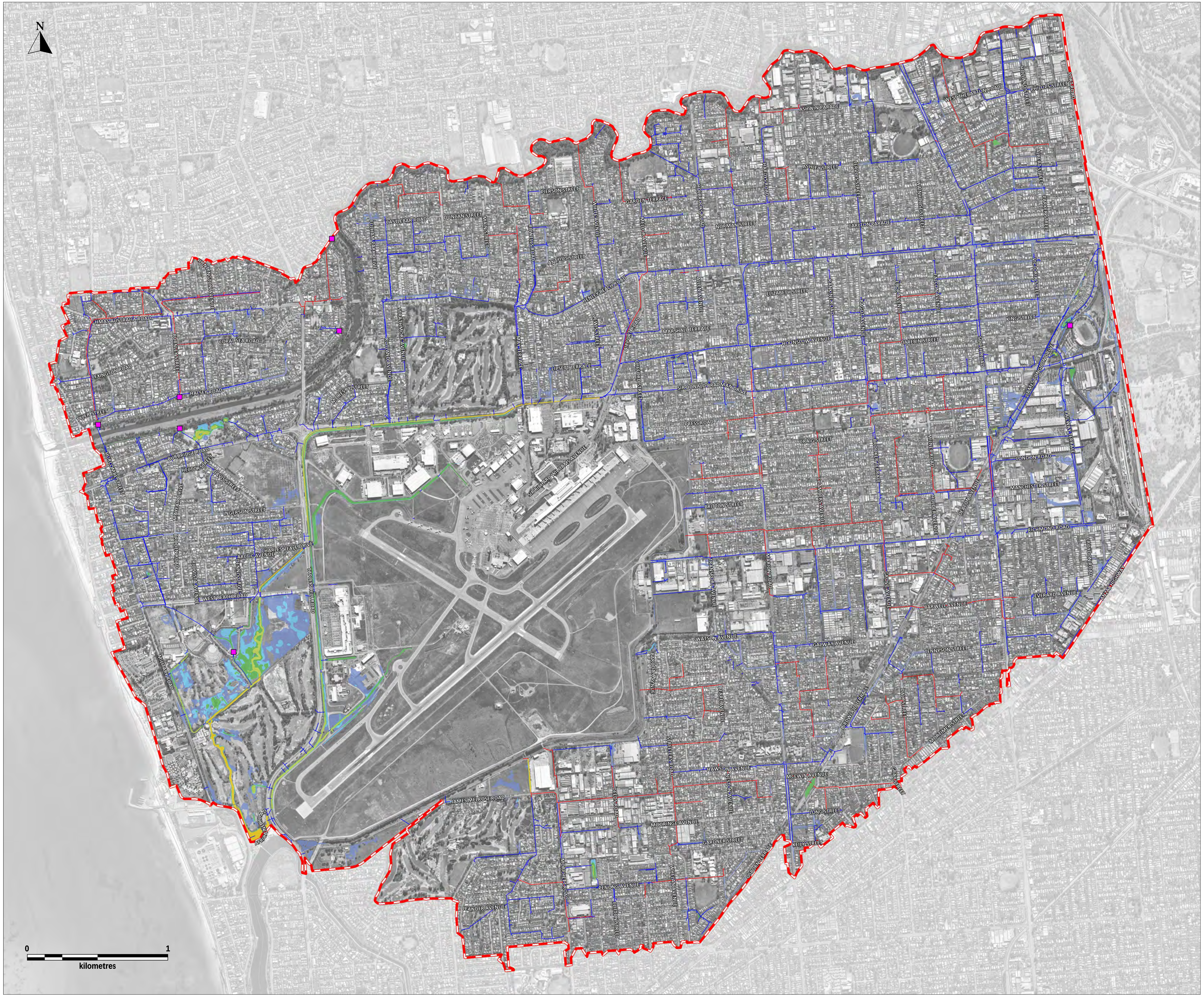
The flood extents are not based on actual historical floods.



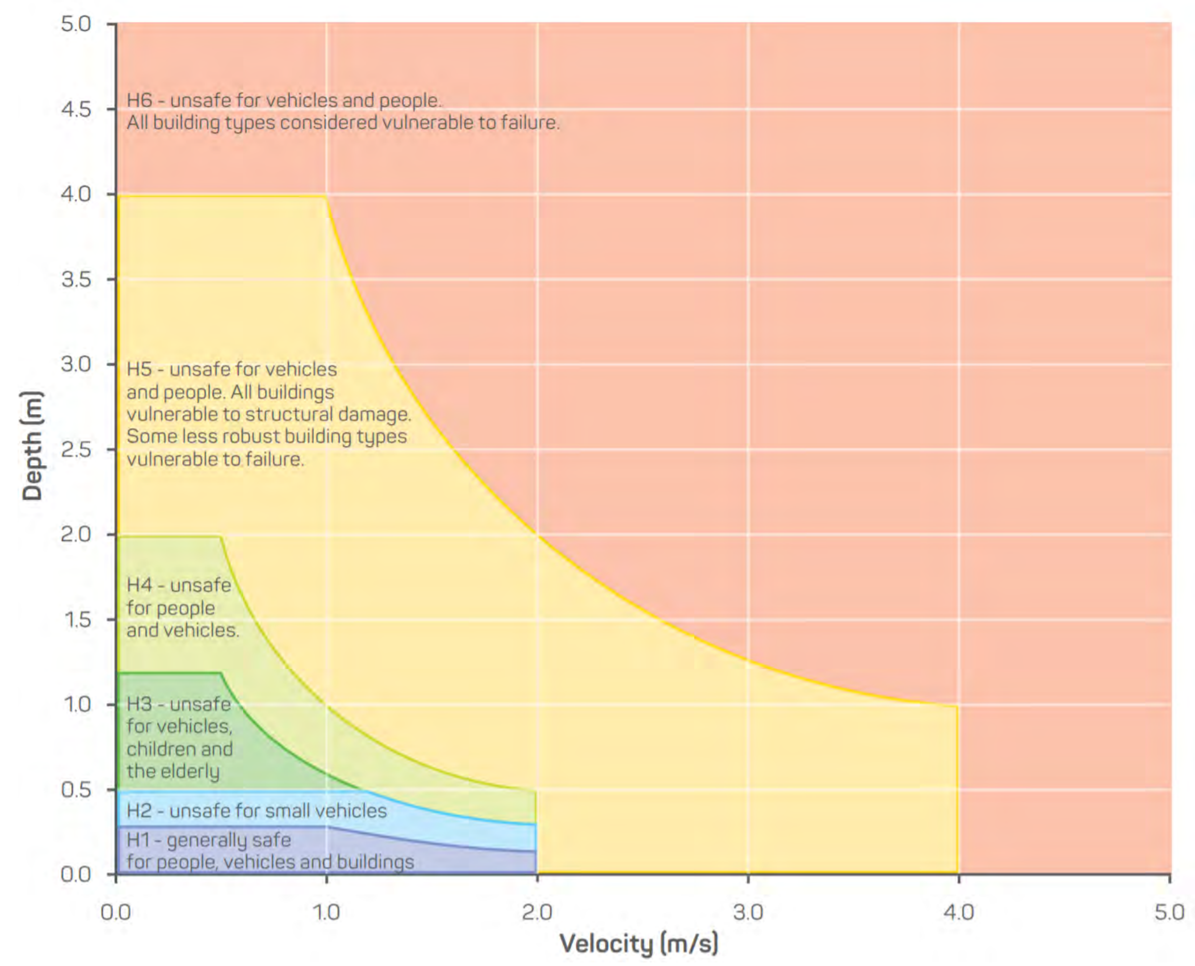
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

0.5 EY Hazard Map
Upgrade - Future Development, Upgrade Infrastructure, Climate Change RCP 8.5



Model Boundary
Pump Station
Existing Stormwater Drain
Cadastre
Upgrade Stormwater Drain

Page 434

Background

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Flood Risk Probability

Flood risk can be considered in terms of:

• Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;

• Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

As a result of this interaction this map combines the outer envelope or flood extent from the various storm events each of which produce the maximum flood extent in different parts of the catchment. Because of this, the extent of flooding shown may not occur across the entire area at the same time or during any one storm event.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Effect of debris on flood extent

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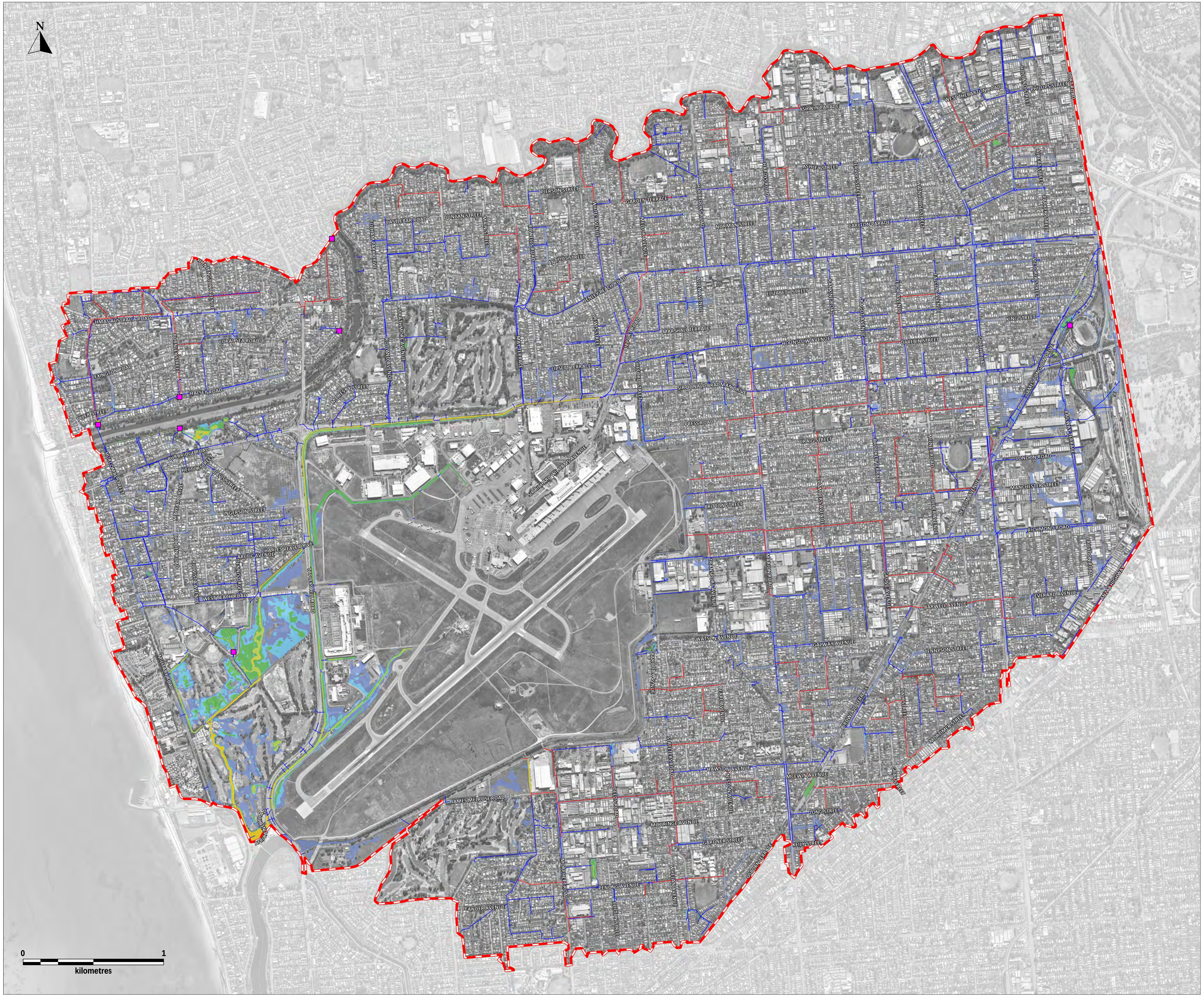
The flood extents are not based on actual historical floods.



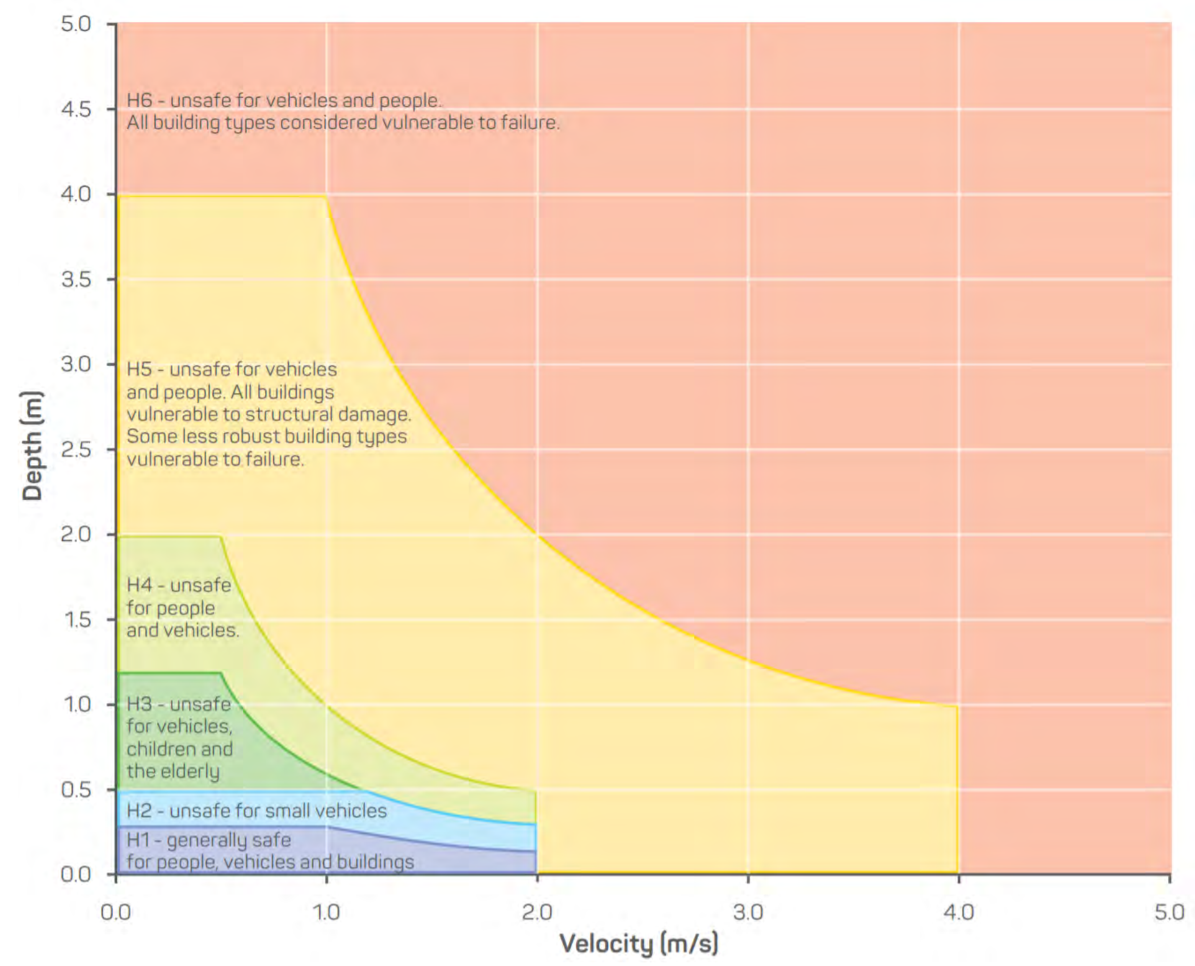
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

0.2 EY Hazard Map
Upgrade - Future Development, Upgrade Infrastructure, Climate Change RCP 8.5



Model Boundary

Pump Station

Existing Stormwater Drain

Cadastre

Upgrade Stormwater Drain

Background

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Flood Risk Probability

Flood risk can be considered in terms of:

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Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

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Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

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• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

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Effect of debris on flood extent

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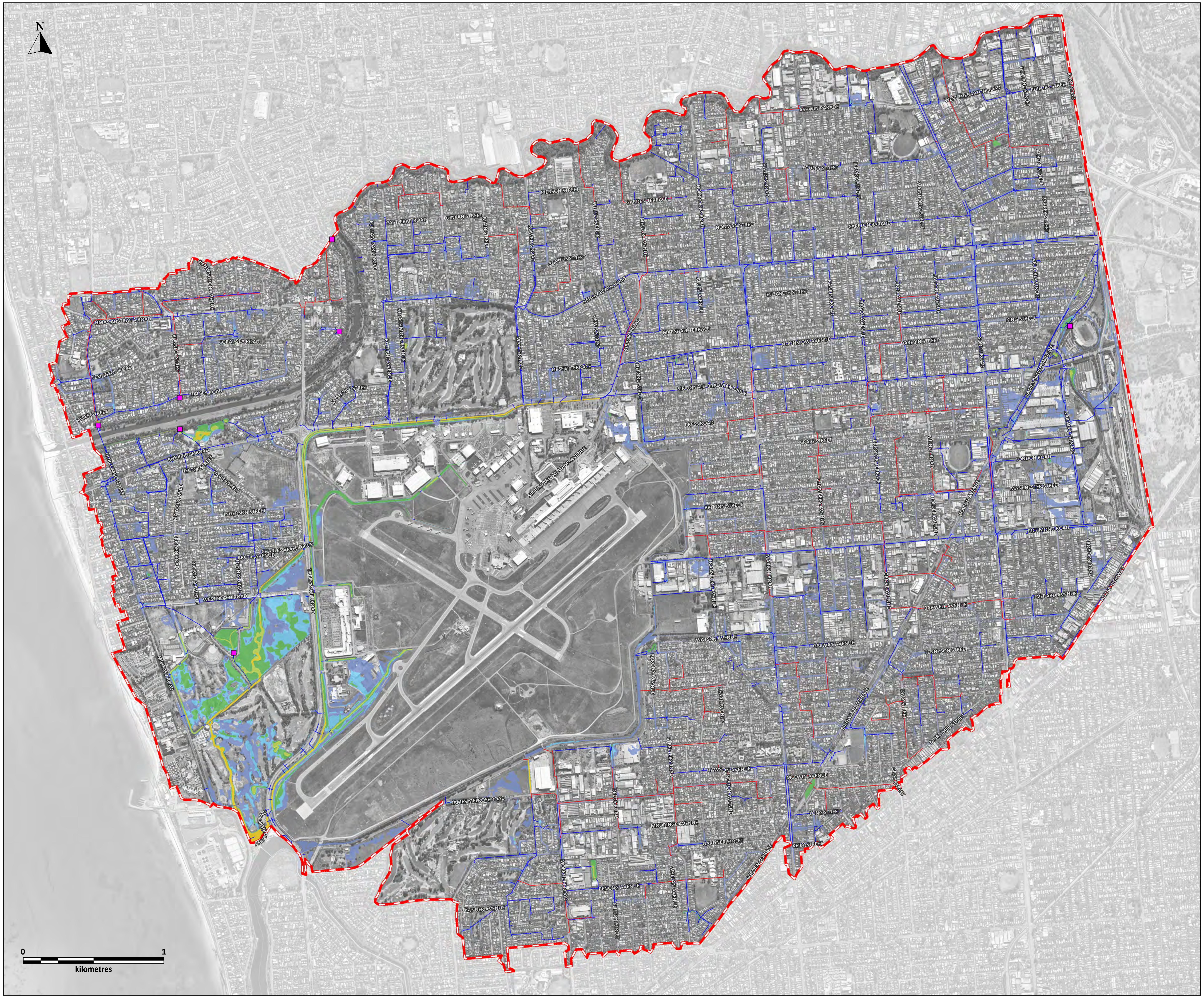
The flood extents are not based on actual historical floods.



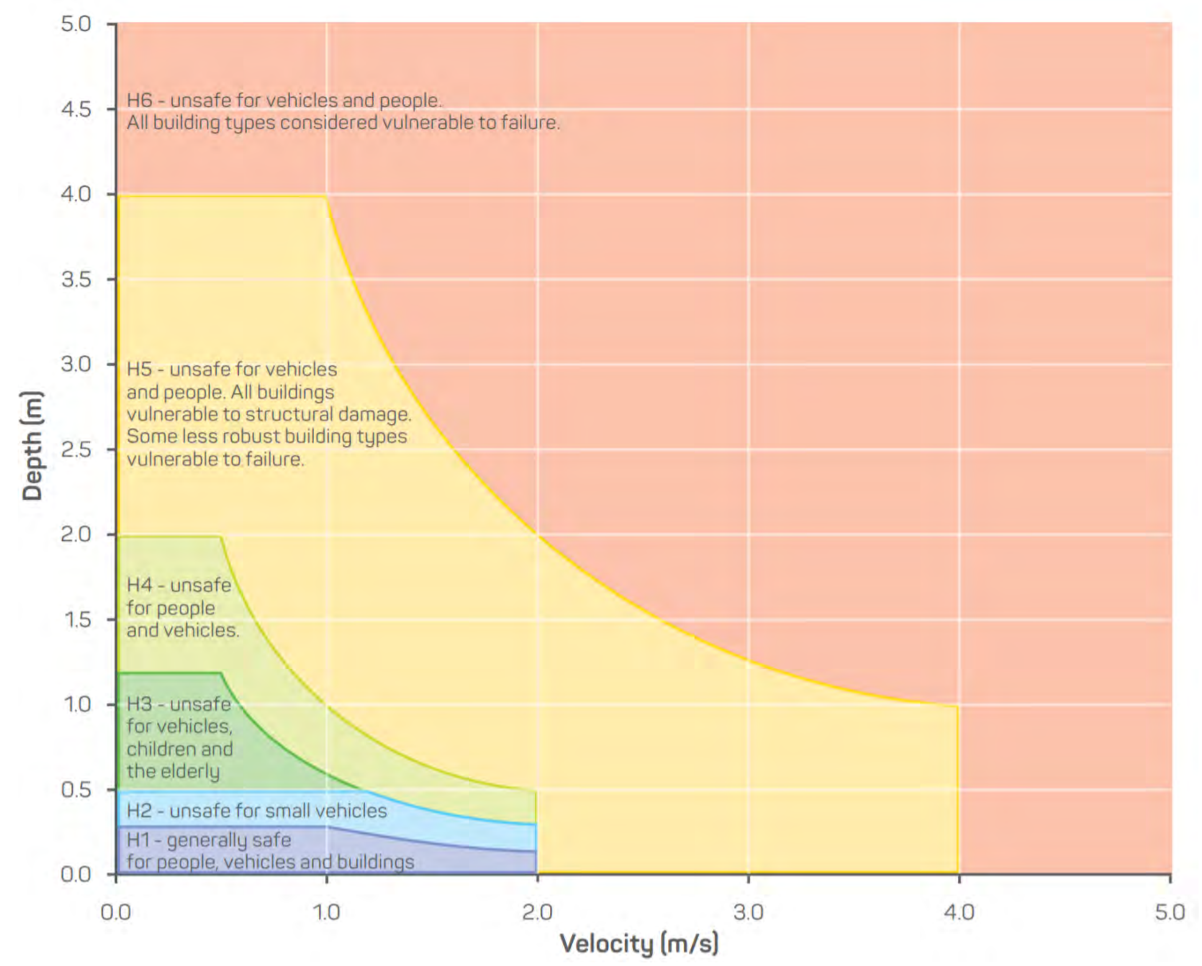
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upgrade Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

10% AEP Hazard Map
Upgrade - Future Development, Upgrade Infrastructure, Climate Change RCP 8.5



Model Boundary
Pump Station
Existing Stormwater Drain
Cadastre
Upgrade Stormwater Drain

Background

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Flood Risk Probability

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Storm Durations

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Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

• Storms with different Annual Exceedance Probability;

• Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

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Effect of debris on flood extent

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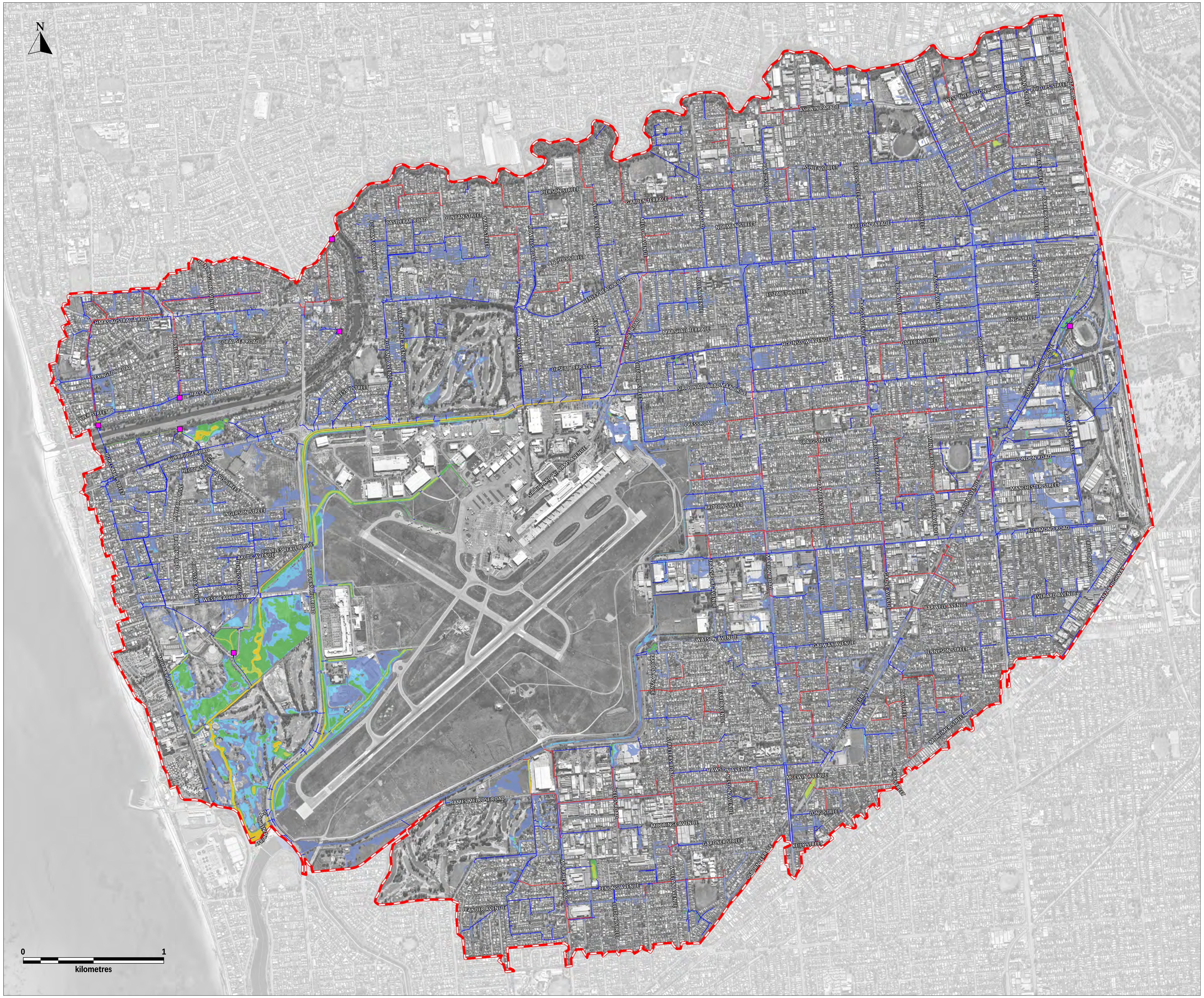
The flood extents are not based on actual historical floods.



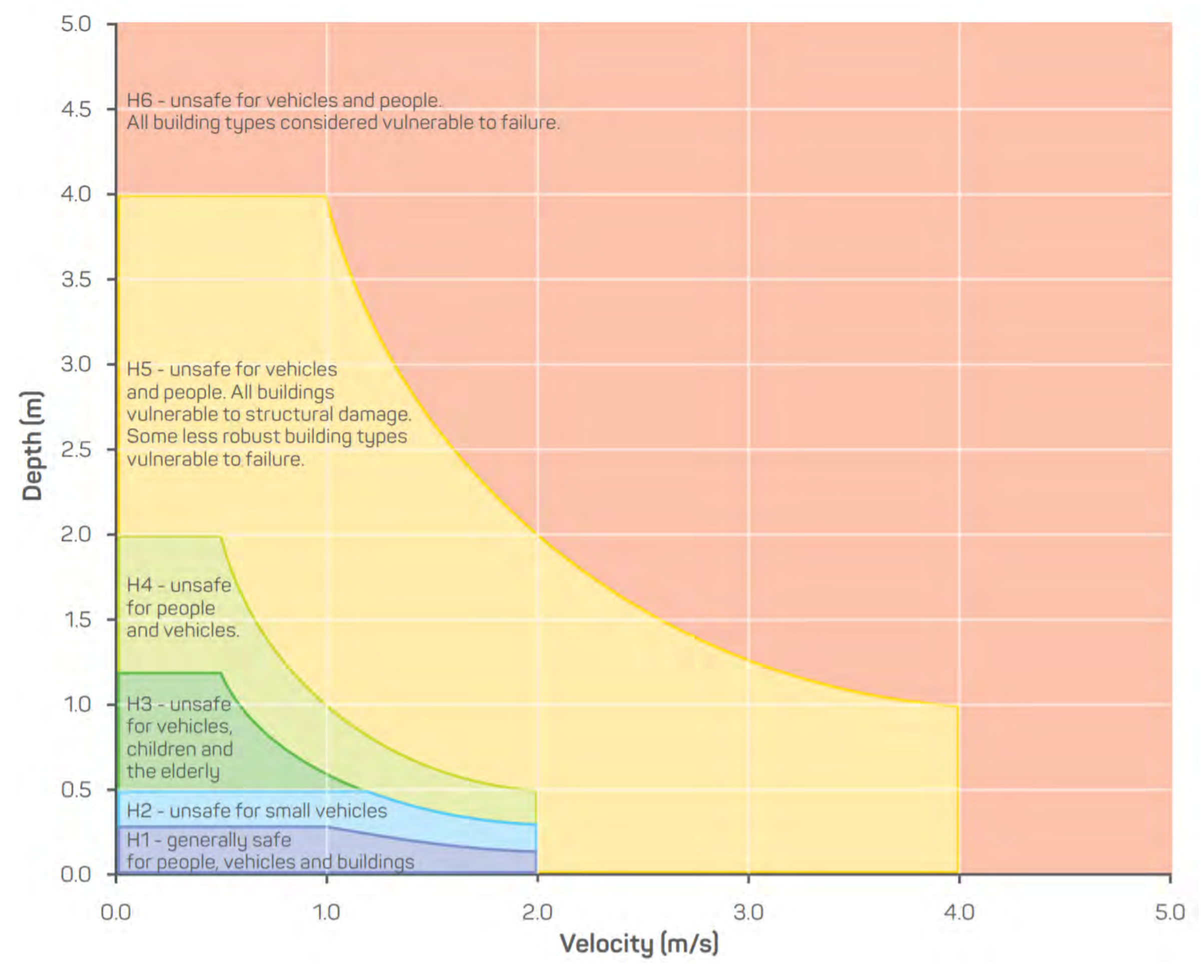
Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

5% AEP Hazard Map
Upgrade - Future Development, Upgrade Infrastructure, Climate Change RCP 8.5



Model Boundary
Pump Station
Existing Stormwater Drain
Cadastre
Upgrade Stormwater Drain

Background

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Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.

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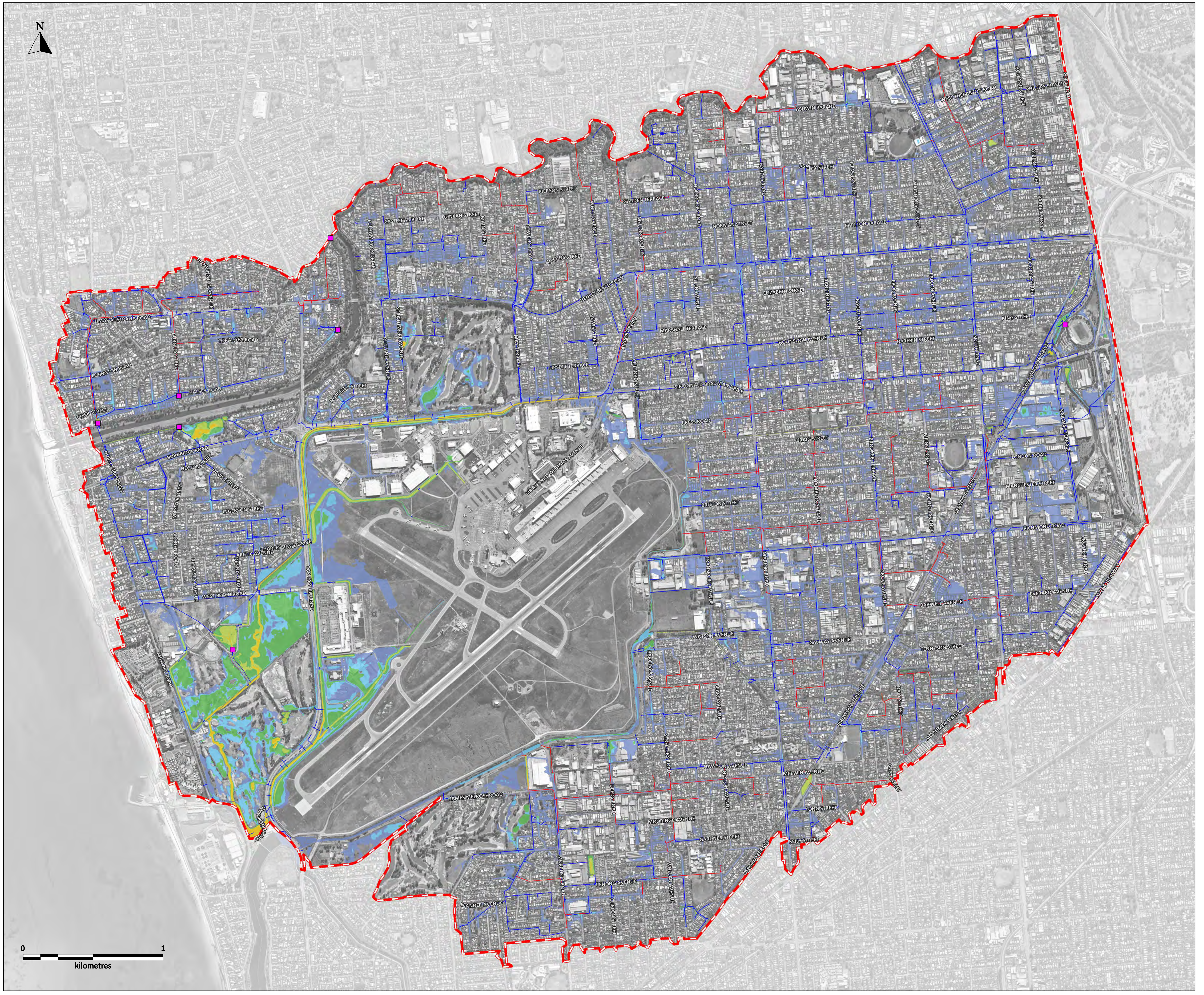

Data Sources:
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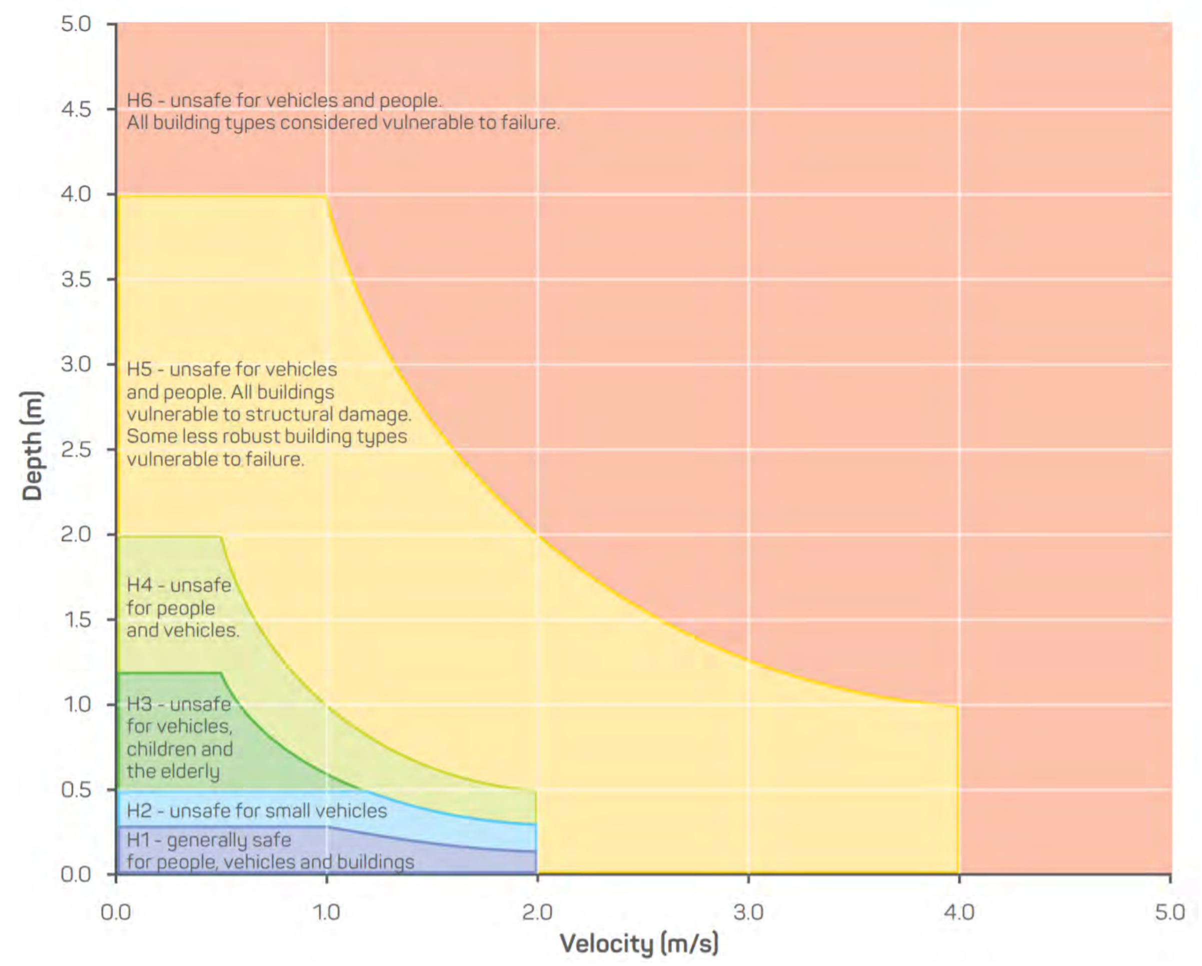
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

2% AEP Hazard Map
Upgrade - Future Development, Upgrade Infrastructure, Climate Change RCP 8.5



Model Boundary
Pump Station
Existing Stormwater Drain
Cadastre
Upgrade Stormwater Drain

Background

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Scope of Mapping

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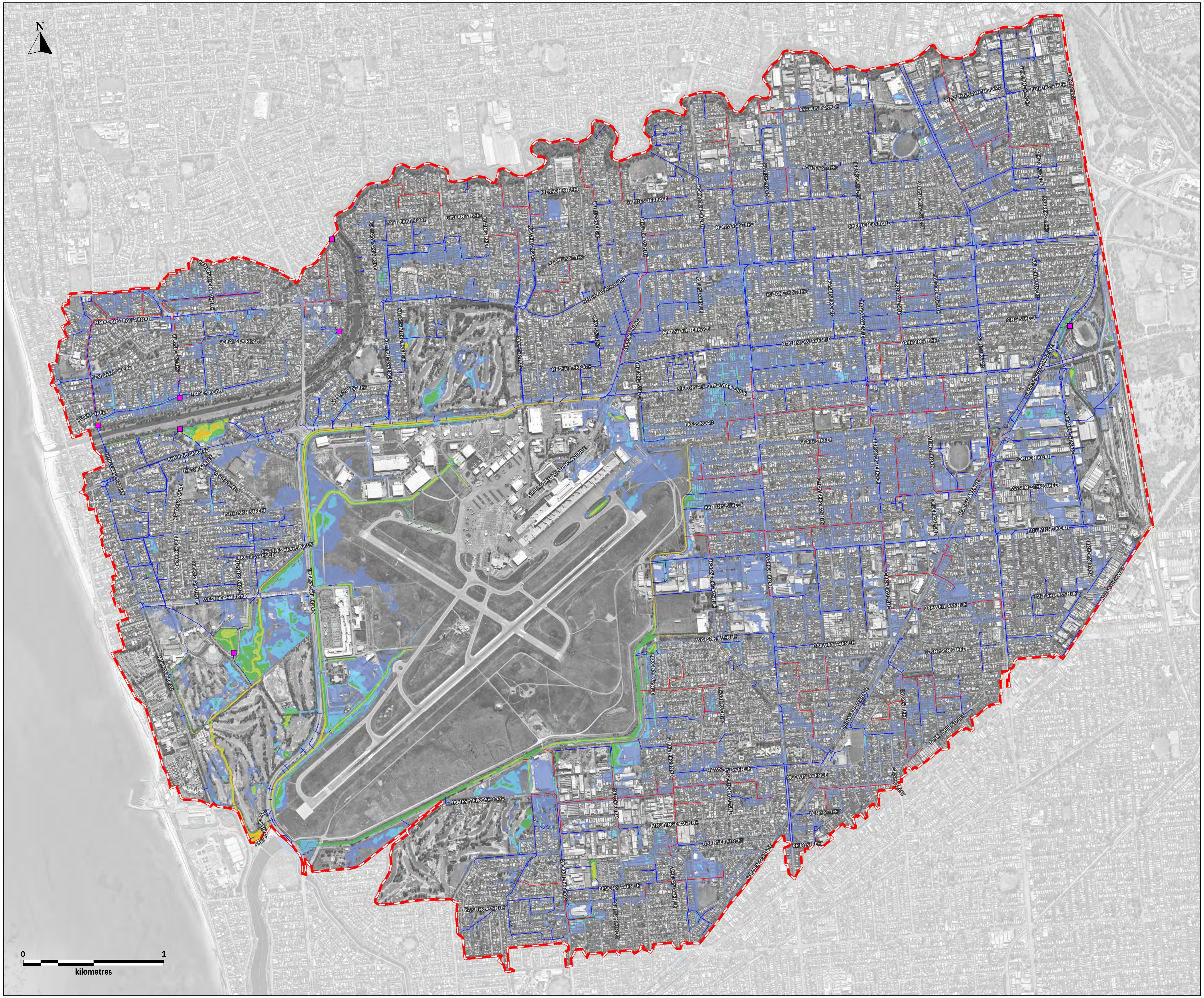
The flood extents are not based on actual historical floods.



Data Sources:
City of West Torrens [Existing Stormwater Network]
Southfront [Floodplain Mapping, Upograde Stormwater Infrastructure]
NearMap [Aerial Photograph]

southfront

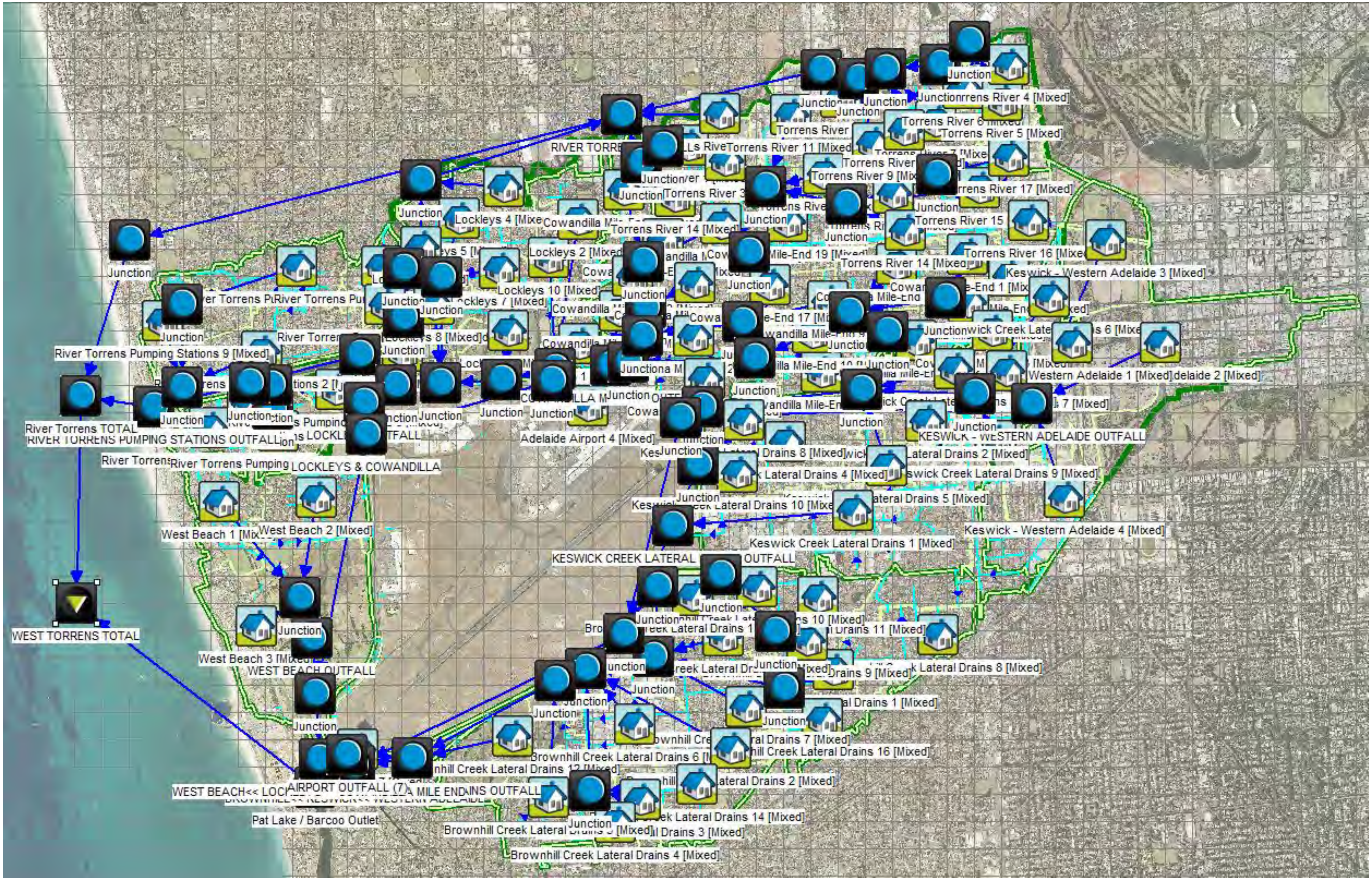
DRAFT 26/11/2021

West Torrens
Stormwater Management Plan

1% AEP Hazard Map
Upgrade - Future Development, Upgrade Infrastructure, Climate Change RCP 8.5

Appendix G

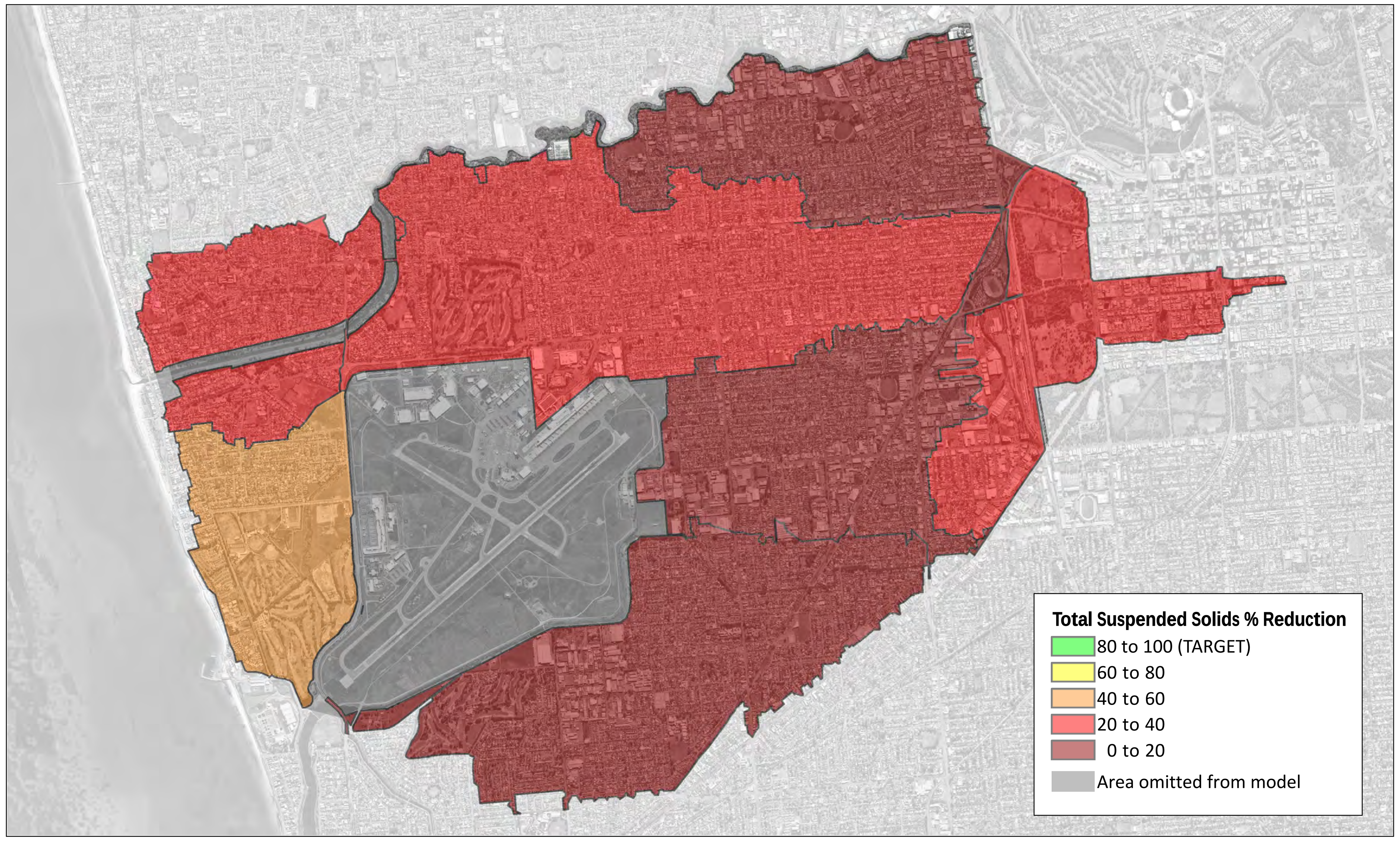
Baseline MUSIC Model Structure

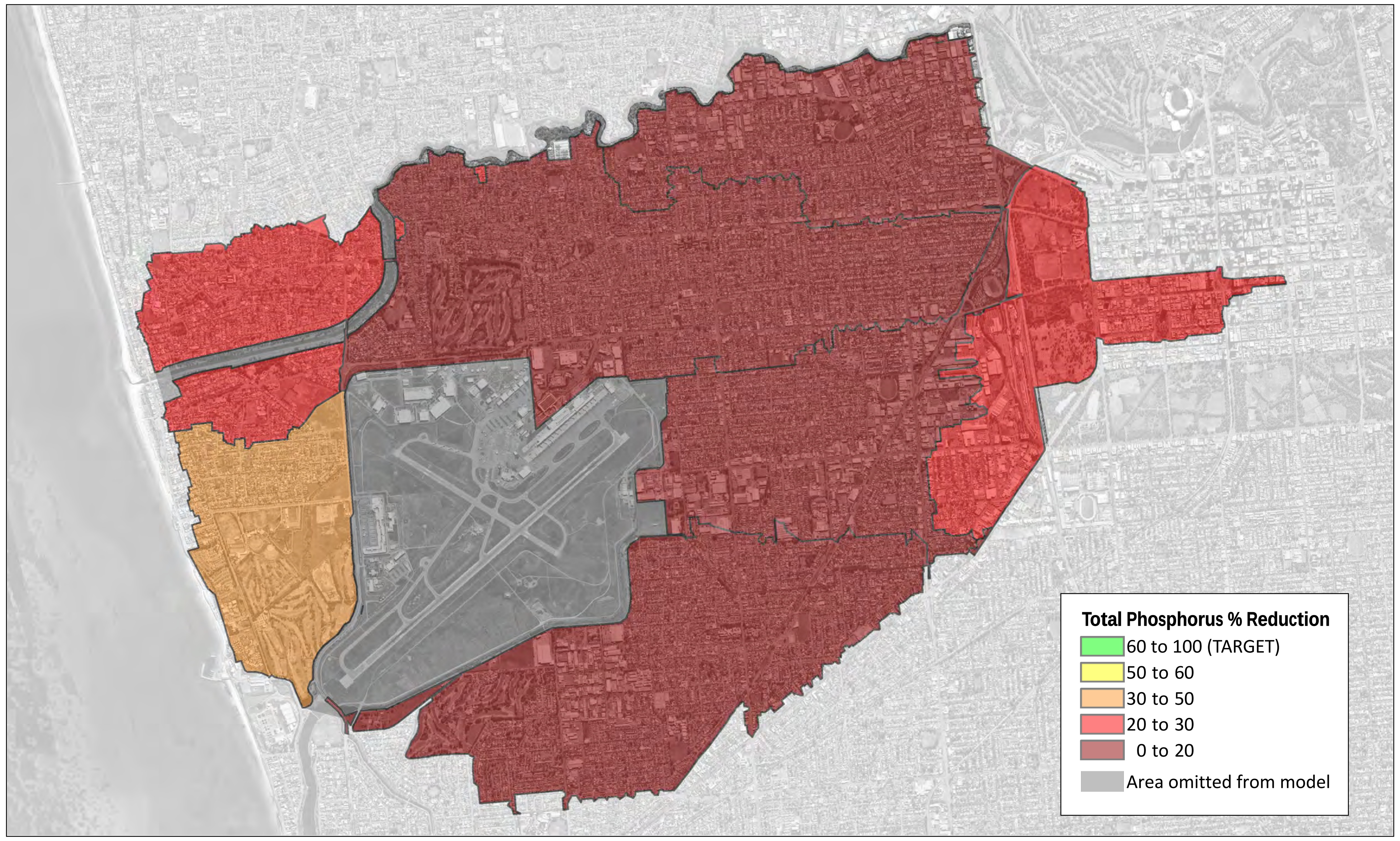


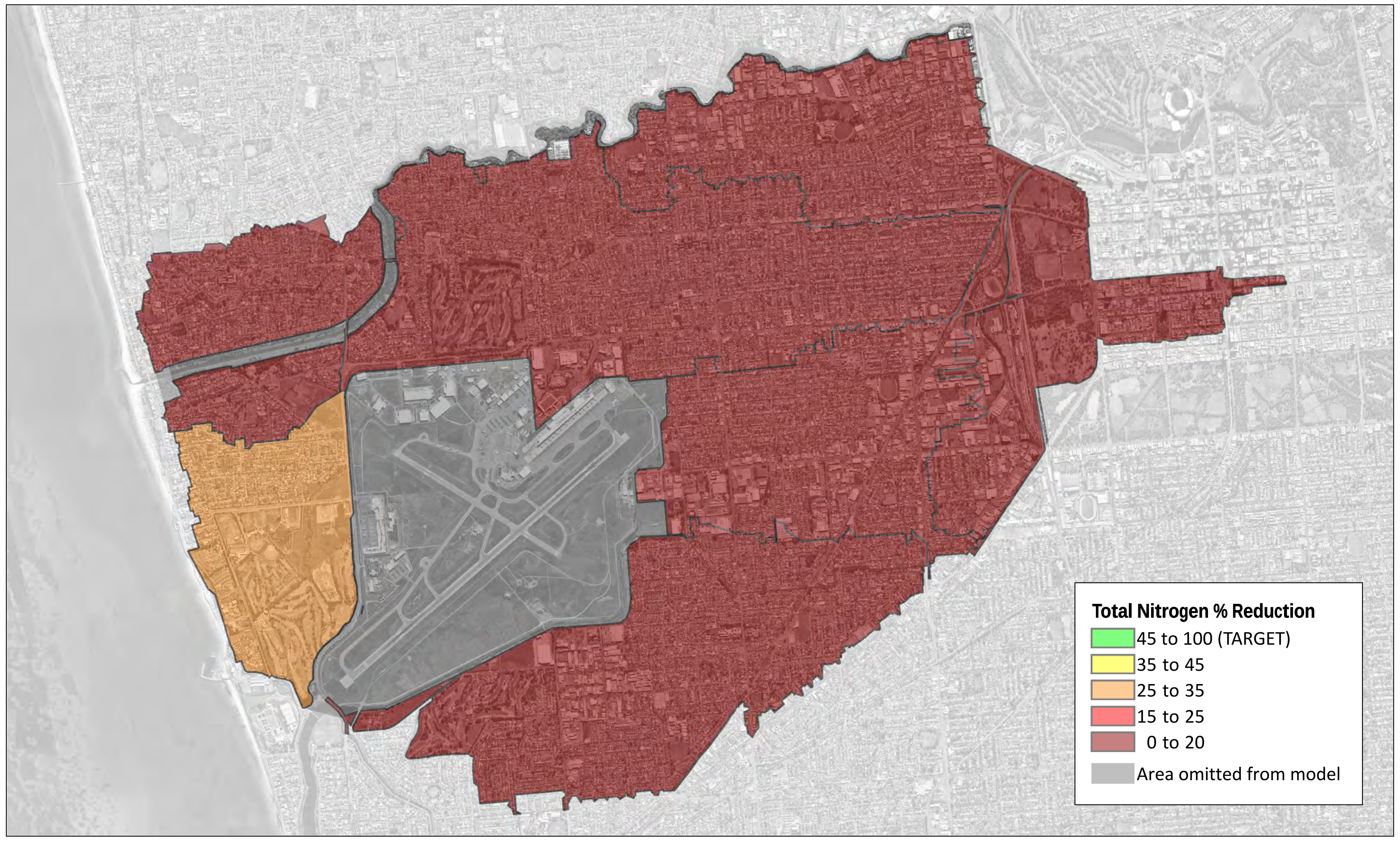
West Torrens SMP – Baseline MUSIC Model Structure

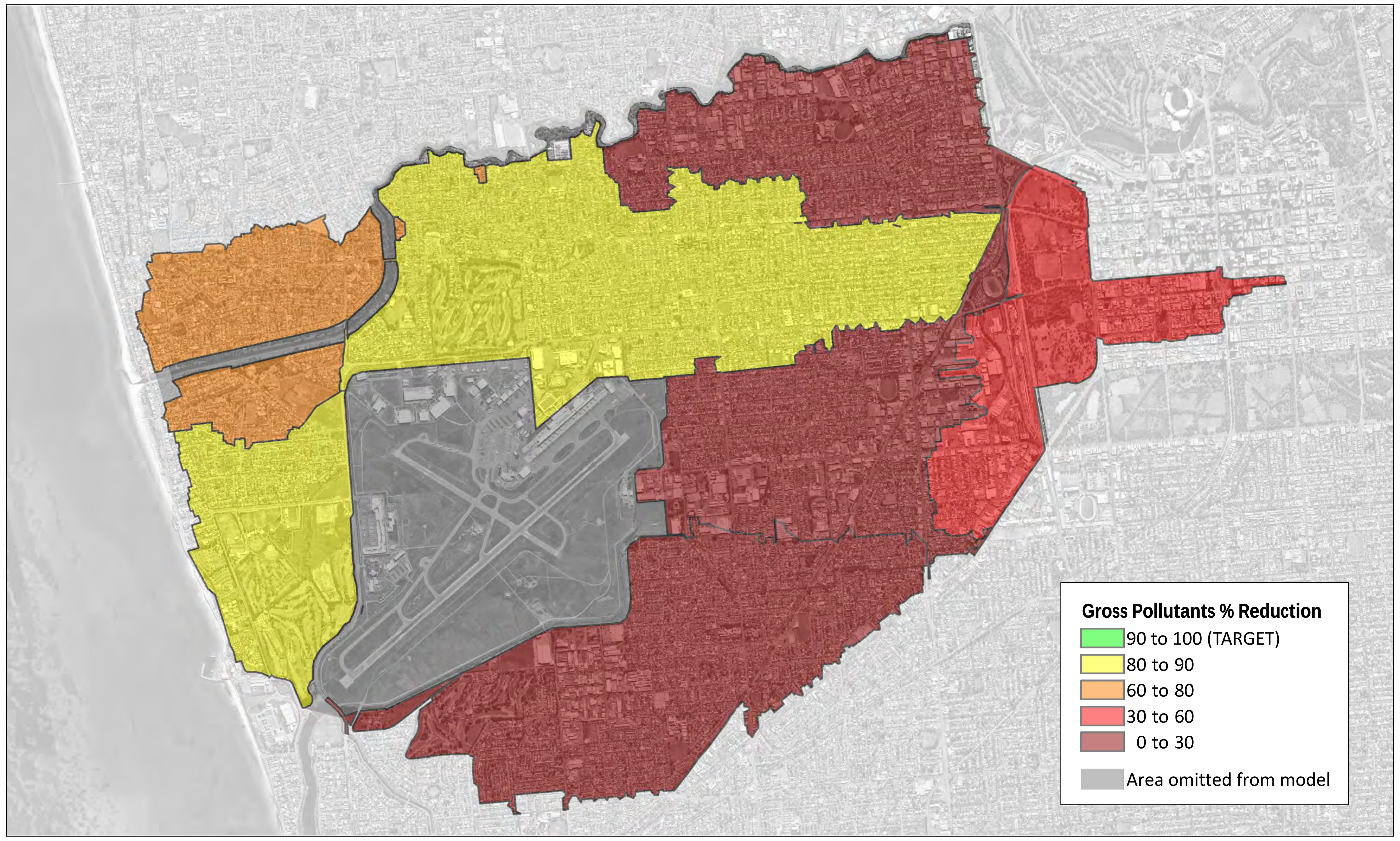
Appendix H

Existing Scenario Water Quality Heat Maps







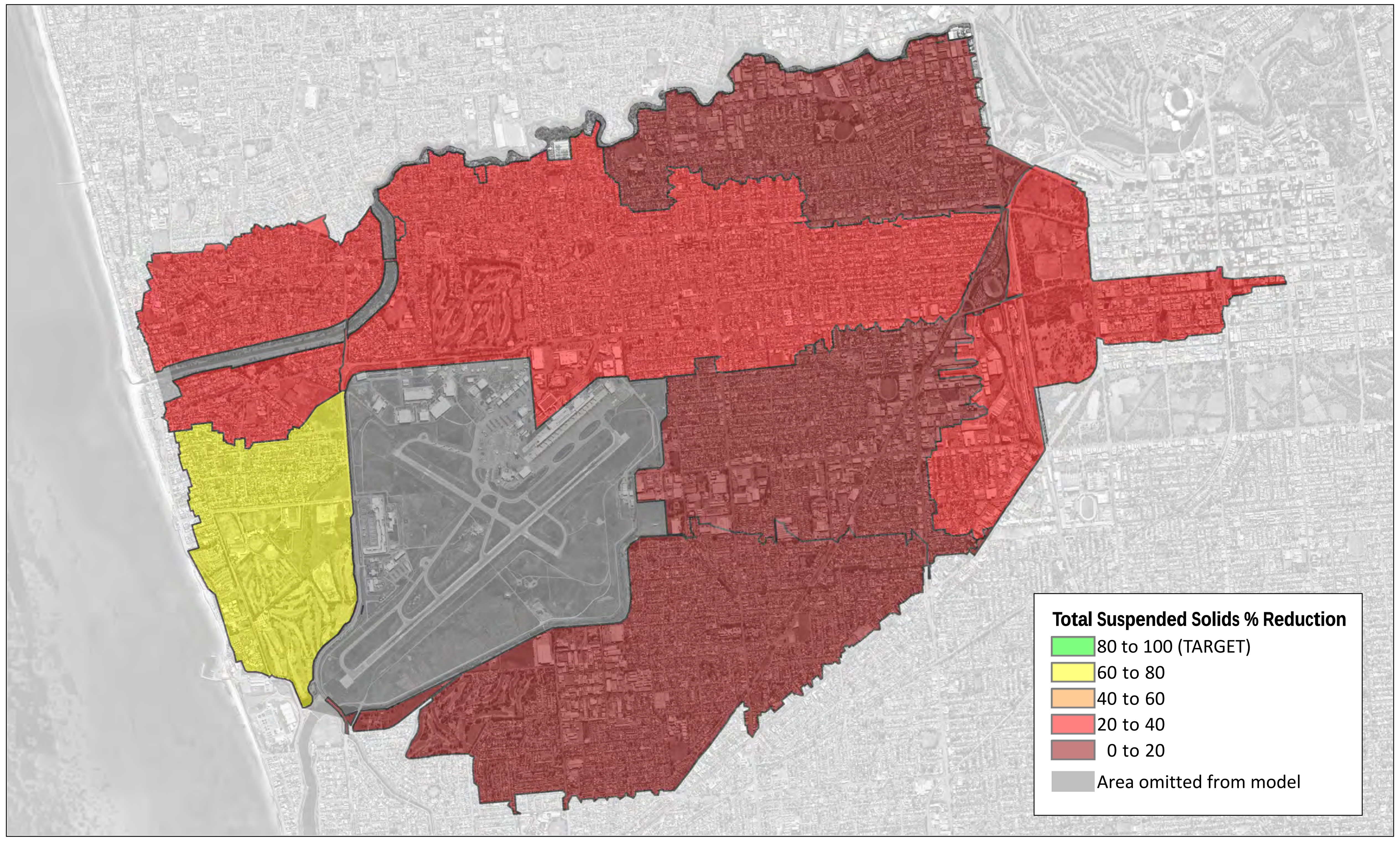


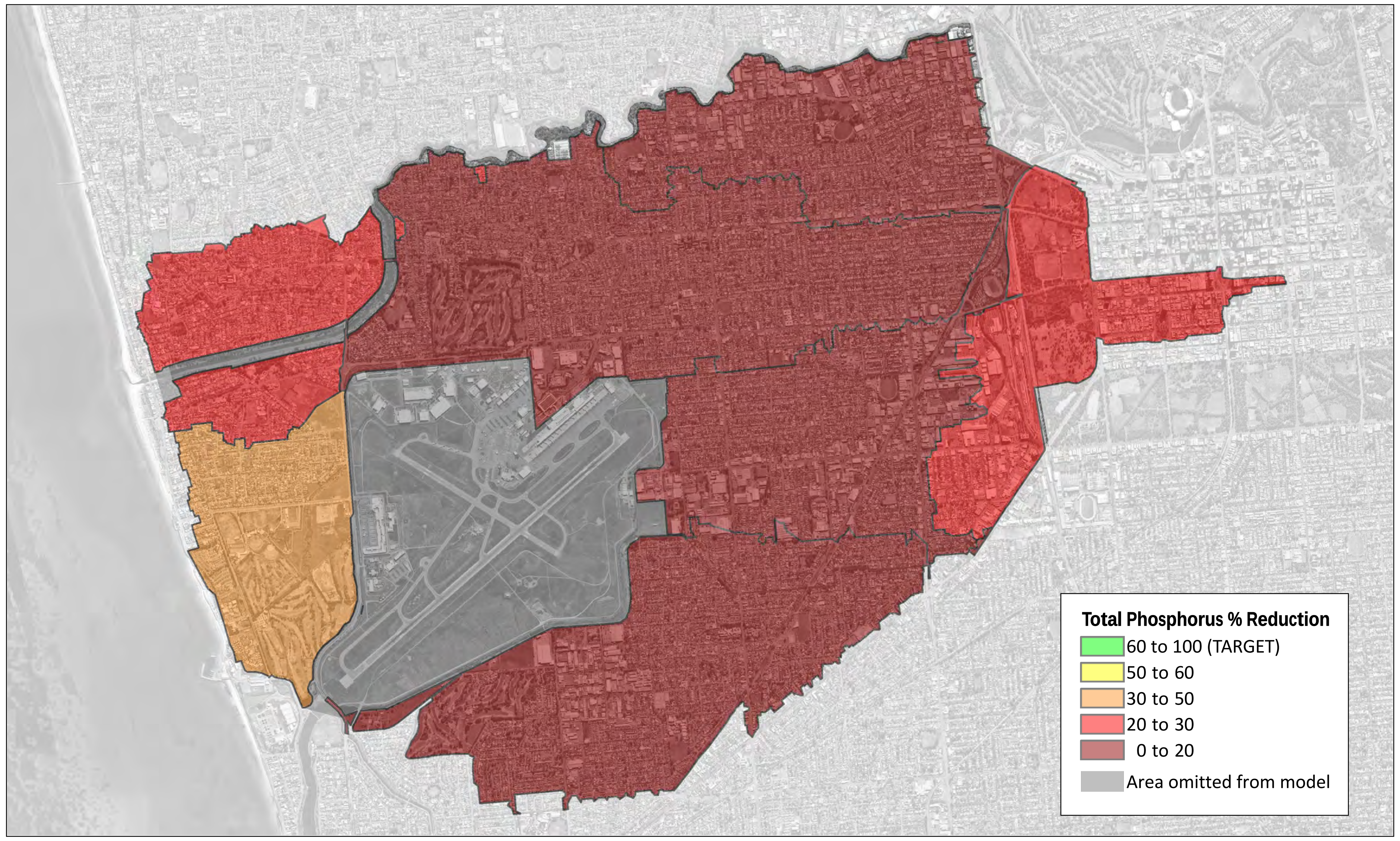
Data Sources:
Southfront [Water Quality Heat Mapping]
NearMap [Aerial Photograph]

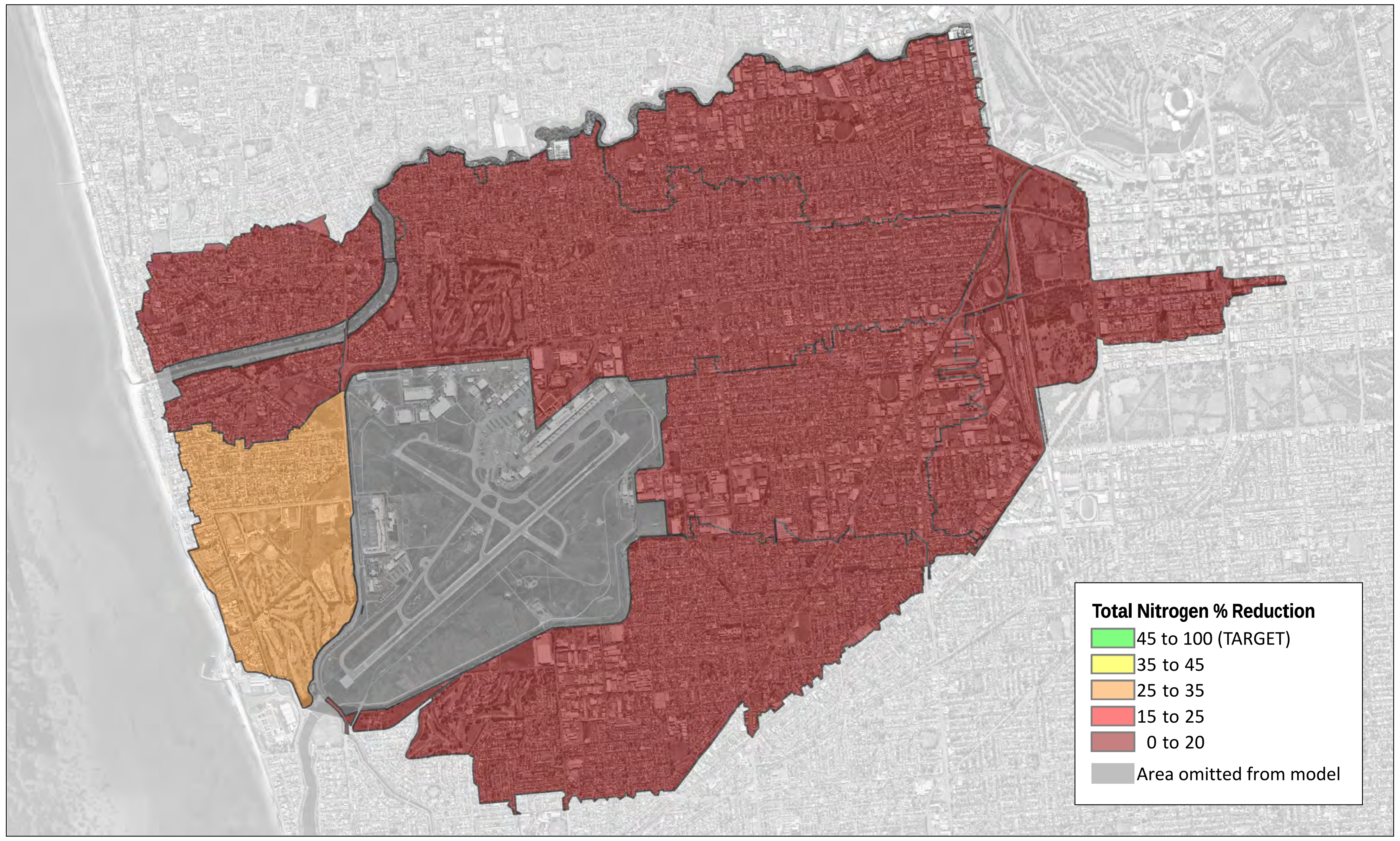
West Torrens
Stormwater Management Plan

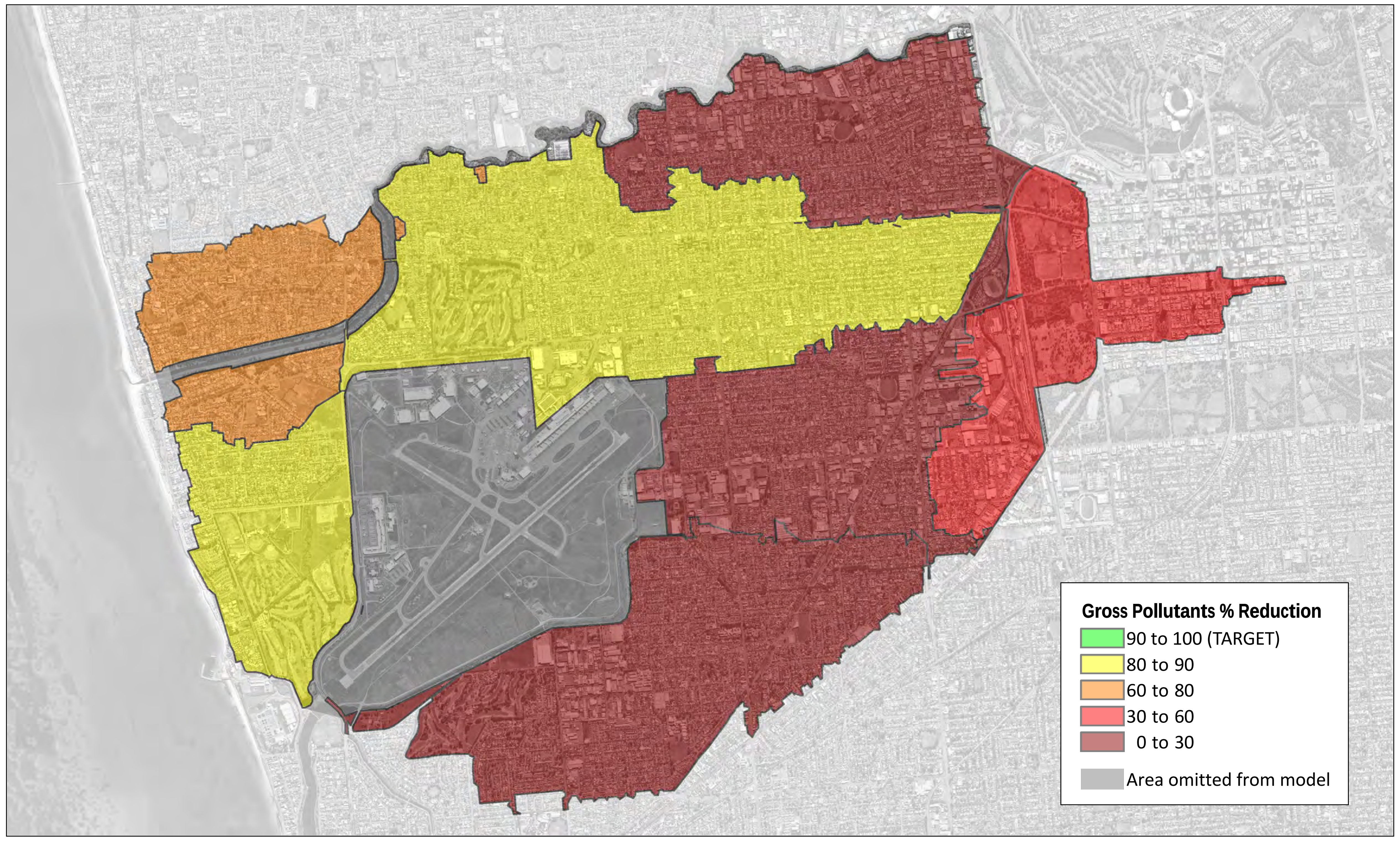
southfront

Future Development, Existing Infrastructure (Scenario 2) Water Quality Heat Map









Data Sources:
Southfront [Water Quality Heat Mapping]
NearMap [Aerial Photograph]

West Torrens
Stormwater Management Plan

Future Development, Existing Infrastructur, Climate Change (Scenario 3 and 4) Water Quality Heat Map

Appendix I

Total Direct Damages: 1:500 year AEP Event and Probable Maximum Flood

1:500 year AEP and PMF Total Direct Tangible Damages, Existing vs Upgrade Drainage Infrastructure

Land Use	Total Damages Estimate ($000)			
	1:500 year AEP		PMF	
	Existing	Upgrade	Existing	Upgrade
Residential	$82,700	$47,300	$1,199,200	$1,179,900
Commercial – Office	$39,400	$33,000	$180,000	$178,100
Commercial – Retail	$34,200	$28,300	$329,500	$323,600
Industrial	$45,600	$37,900	$297,800	$292,500
Total	**$201,900**	**$146,500**	**$2,006,400**	**$1,974,100**

1:500 year AEP and PMF Total Direct Tangible Damages per Catchment, Existing vs Upgrade Drainage Infrastructure

Catchment	Total Damages Estimate per Catchment ($000)			
	1:500 year AEP		PMF	
	Existing	Upgrade	Existing	Upgrade
West Beach	$3,000	$3,000	$91,200	$89,200
River Torrens Pumping Stations	$8,900	$5,600	$144,400	$141,600
Lockleys	$9,500	$7,800	$109,600	$109,100
Torrens River	$28,400	$24,300	$310,400	$308,300
Cowandilla Mile-End	$52,400	$31,500	$563,700	$550,900
Keswick Creek Lateral Drains	$57,700	$42,900	$453,600	$442,500
Keswick - Western Adelaide	$11,800	$12,000	$50,600	$50,500
Brown Hill Creek Lateral Drains	$27,200	$17,600	$265,900	$265,300
Adelaide Airport	$2,800	$1,900	$17,000	$16,600
Total	**$201,900**	**$146,500**	**$2,006,400**	**$1,974,100**