Flood Impact Assessment Report

YERONGA PRECINCT

29 January 2024

J8862 v1.0

STORM WATER CONSULTING

Job No: J8862 v 1.0

Job Name: Yeronga Precinct

Report Name	Date	Report No.
Flood Impact Assessment Report	29 January 2024	J8862 v1.0

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1.0 INTRODUCTION

Storm Water Consulting Pty Ltd was commissioned to prepare a Flood Impact Assessment Report for the Yeronga Precinct.

This report refers to an area which has been titled as the "Yeronga Precinct". The Yeronga Precinct covers an area to the west of 133 Hyde Road as shown in Figure 1.1 below.

Figure 1.1 – Yeronga Precinct

The Yeronga Precinct includes several residential and commercial properties as well as the Orient Road Park. The Yeronga Precinct is subject to overland flow with travels through a waterway in the parklands before passing through 133 Hyde Road and discharging into the Brisbane River.

Between 2002 and 2003, the waterway that passes through 133 Hyde Road was filled and a set of culverts were installed (across 133 Hyde Road) to allow the overland flow to drain out to the Brisbane River. This report has been prepared to assess the hydraulic impacts of the culverts and fill.

2.0 ASSESSMENT AREA CONDITIONS

2.1 Existing Condition

The existing condition refers to the state of 133 Hyde Road prior to the filling of the waterway. A Google Earth image of 133 Hyde Road from 2001 is presented in Figure 2.1 below. Figure 2.1 shows that the northern end of 133 Hyde Road is still in the natural state.

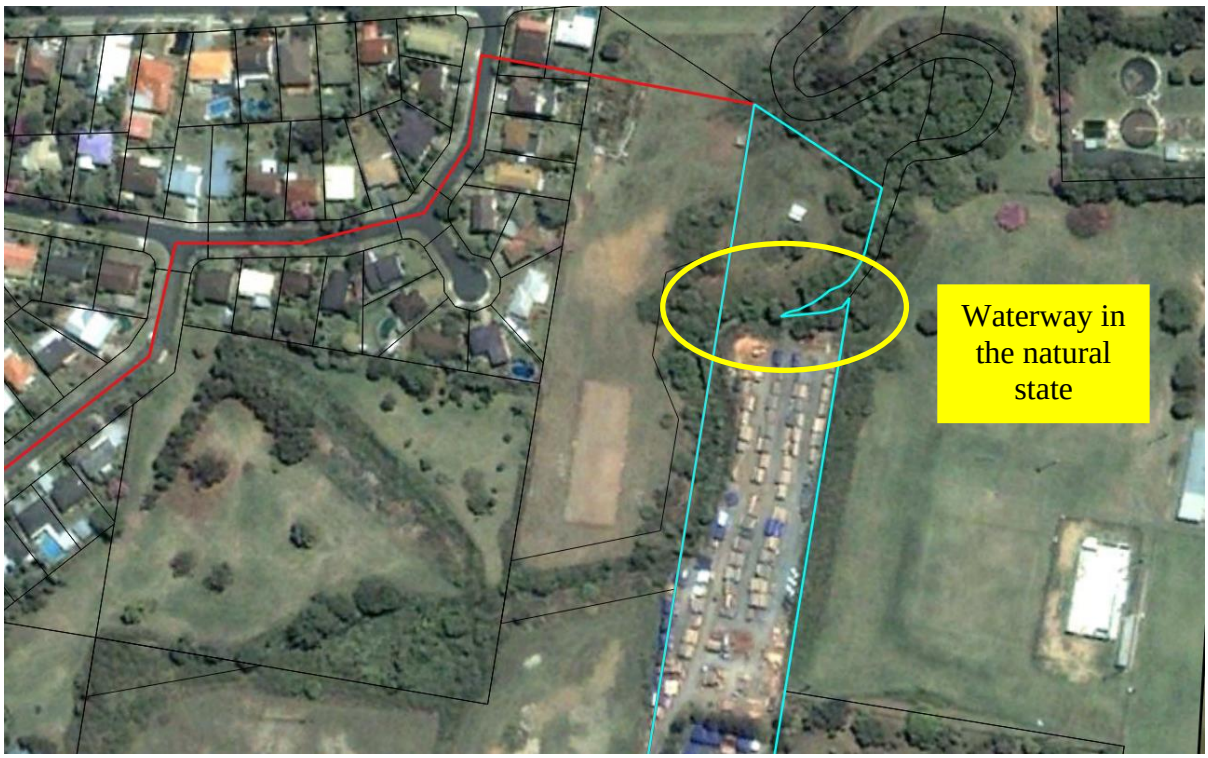

Figure 2.1 – 2001 Google Earth Image

Ground level data (across 133 Hyde Road) for the existing condition was sourced from Brisbane City Council's open data website. The ground level contour information from 2002 shows the natural topography of the waterway through 133 Hyde Road. An extract of the contour information is presented in Figure 2.2 on the following page. The 2002 contour information shows ground levels in the waterway through 133 Hyde Road are approximately 3m AHD. Note, due to the level of accuracy of the ground level data, the true ground level through the waterway may vary.

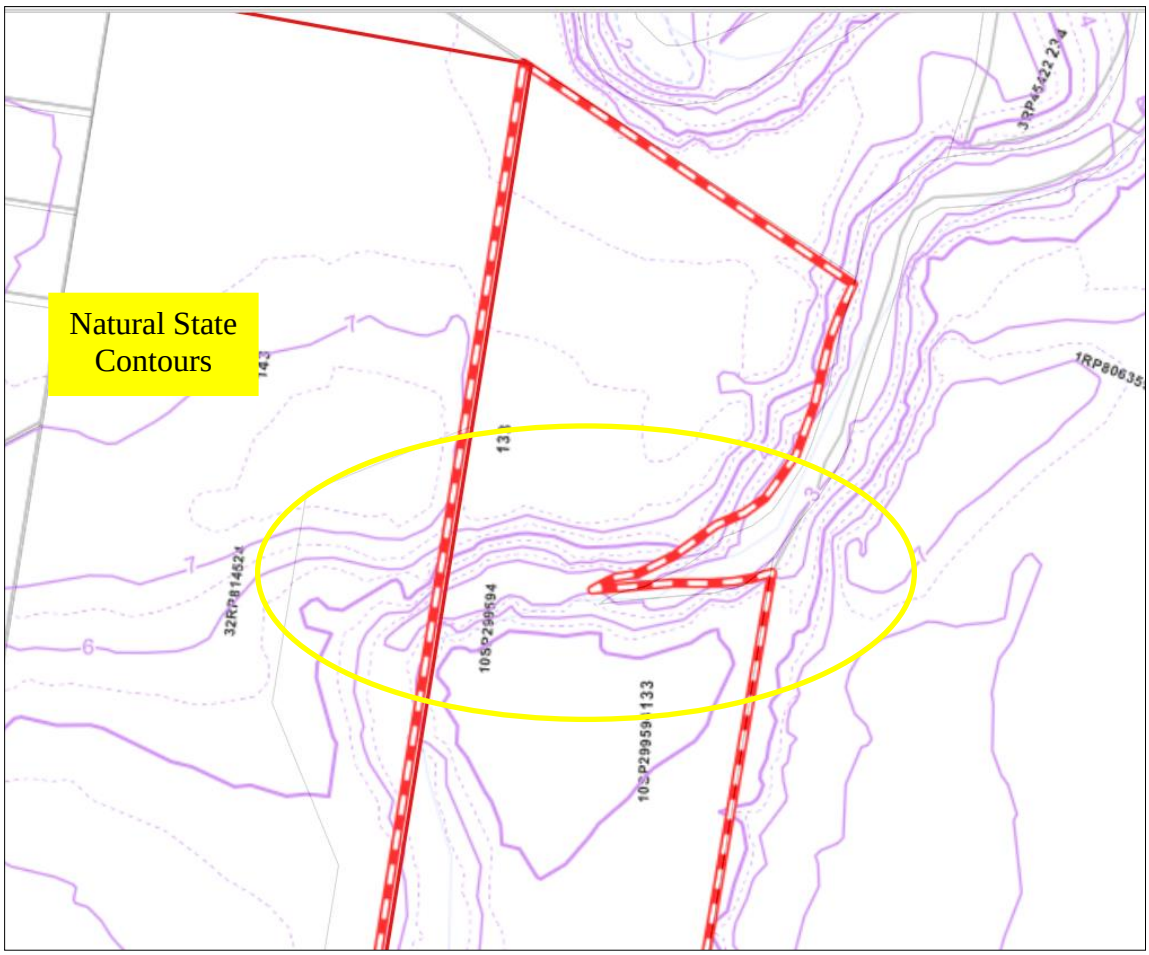

Figure 2.2 – 2002 Ground Level Contour Information – Waterway through 133 Hyde Road

2.2 Developed Condition

The developed condition refers to the state of 133 Hyde Road after filling of the waterway. A current Google Earth image of 133 Hyde Road is presented in Figure 2.3 below. Figure 2.3 shows that the northern end of 133 Hyde Road has been developed and the waterway has been filled.

Figure 2.3 – Current Google Earth Image

Ground level data for the developed condition was sourced from the State Government, which utilises 2019 ALS Lidar Data. An extract of the contour information is presented in Figure 2.4 on the following page. The 2019 ALS data shows that the waterway was filled to approximately 5.5m AHD.

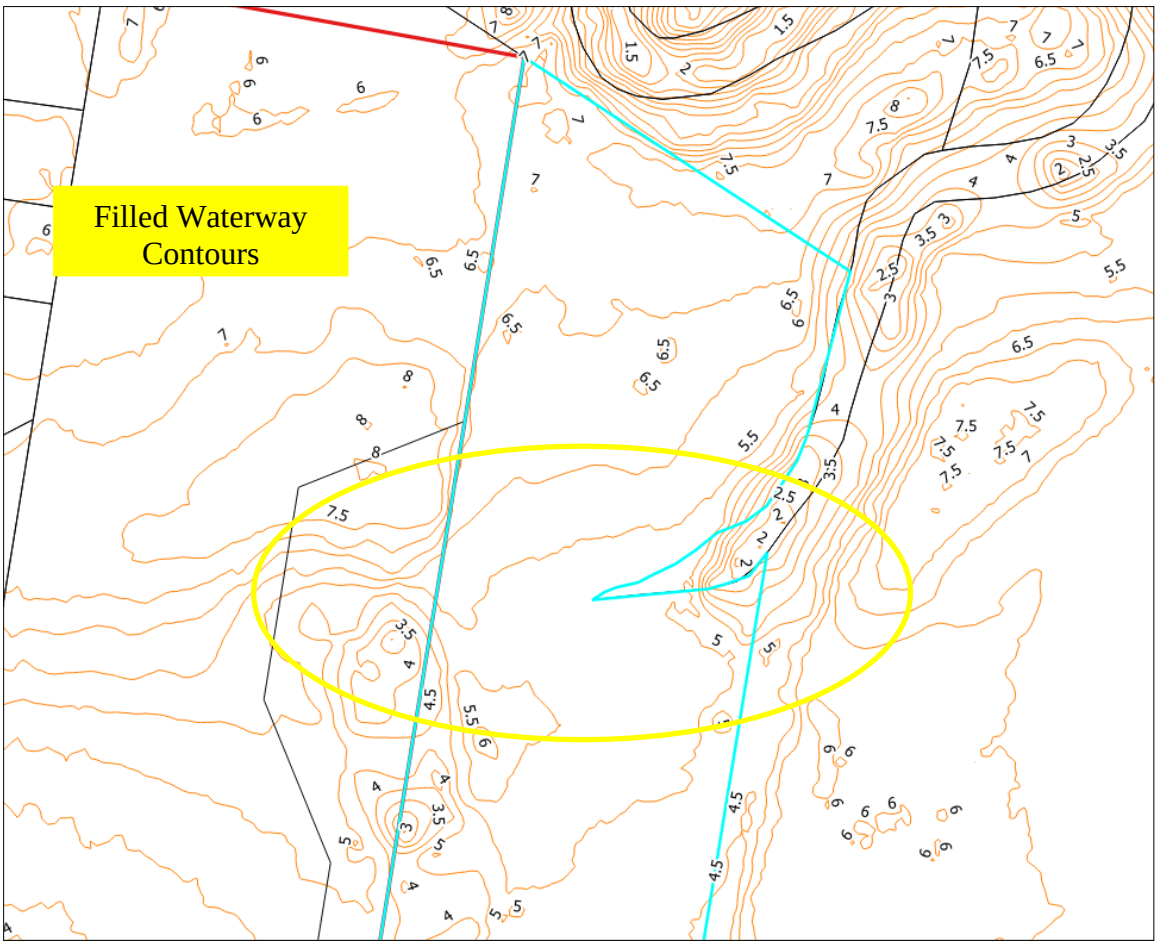

Figure 2.4 – 2019 Ground Level Contour Information – Northern End of 133 Hyde Road

3.0 HYDROLOGIC ANALYSIS

The Yeronga Precinct is affected by runoff from several upstream catchments. A catchment plan showing the areas contributing flows to the Yeronga Precinct is presented in Figure 1, Appendix A.

An URBS model was set up to create inflow boundary conditions for the TUFLOW model (discussed in Section 4.0). The inflow boundary conditions are presented in Figure 3, Appendix A. The URBS model was simulated using a non-linearity index value and beta value of 2.5 and 0.8 respectively. No initial loss and a continuing loss of 2.5mm/hr were used in the model. A schematic of the URBS model layout is presented in Figure 2, Appendix A.

A summary of the 1% AEP URBS flows is presented in Table 3.1 below.

Table 3.1 – URBS Model Results

Inflow Location	1% AEP 60min Peak Discharge m^3/s
Inflow-1	11.6
Inflow-2	9.3
Inflow-3	3.3
Inflow-4	1.9
Inflow-5	9.8
Inflow-6	2.9
Inflow-7	1.3
Inflow-8	1.7

4.0 2D HYDRODYNAMIC MODELLING

A TUFLOW 2D hydrodynamic model was prepared to assess the impacts of the earthworks and culverts located on 133 Hyde Road. The TUFLOW model was based on a 2m grid size.

4.1 Existing Condition Scenario

Ground level data for areas external to 133 Hyde Road was sourced from the State Government and is based on 2019 ALS Lidar data. Ground level data through 133 Hyde Road was sourced from Brisbane City Council and is based on 2002 contour information. Minor ground level modifications have been included in the model to allow the bed of the waterway to drain out to the Brisbane River. Inflows into the model were sourced from the URBS analysis as presented in Table 3.1. Manning's values presented in Table 4.1 below were input into the model to represent appropriate roughness coefficients.

Table 4.1 – Manning's Values

Manning's n	Surface
0.02	Road Areas
0.04	Grassed Areas
0.10	Built Up Areas
0.08	Watercourses

Culverts located under Brisbane Corso were input into the model as 1D elements. A schematic of the existing scenario TUFLOW model setup is presented in Figure 3, Appendix A. An existing 1% AEP inundation plan is presented in Figure 4, Appendix A.

4.2 Developed Condition Scenario

The existing TUFLOW model was modified to include 2019 ALS Lidar data through 133 Hyde Road. Twin 1200mm diameter culverts (located under the filled area on 133 Hyde Road) were input into the model as 1D elements. The upstream and downstream invert levels of the culverts were set at 1.2m AHD and 0.6m AHD respectively. The culvert information was privately surveyed and has been provided to SWC. A developed condition 1% AEP inundation plan is presented in Figure 5, Appendix A.

An afflux impact plot is presented in Figure 6, Appendix A. The impact plot shows that the Yeronga Precinct would potentially experience flood level increases up to 250mm. The residential properties along Orient Road would potentially experience flood level increases up to 150mm.

5.0 CONCLUSIONS

This report has been prepared to assess the hydraulic impacts of the culverts and fill located on the property at 133 Hyde Road.

The hydraulic assessment documented in this report shows that the Yeronga Precinct would potentially experience flood level increases up to 250mm due to the fill and culverts that were constructed on 133 Hyde Road.

It should be noted that the culverts located through 133 Hyde Road appear to be warped and as such, impacts could be higher due to the restricted capacity. The material impact on several of the flood affected properties in the Yeronga Precinct has not been assessed as part of this report.

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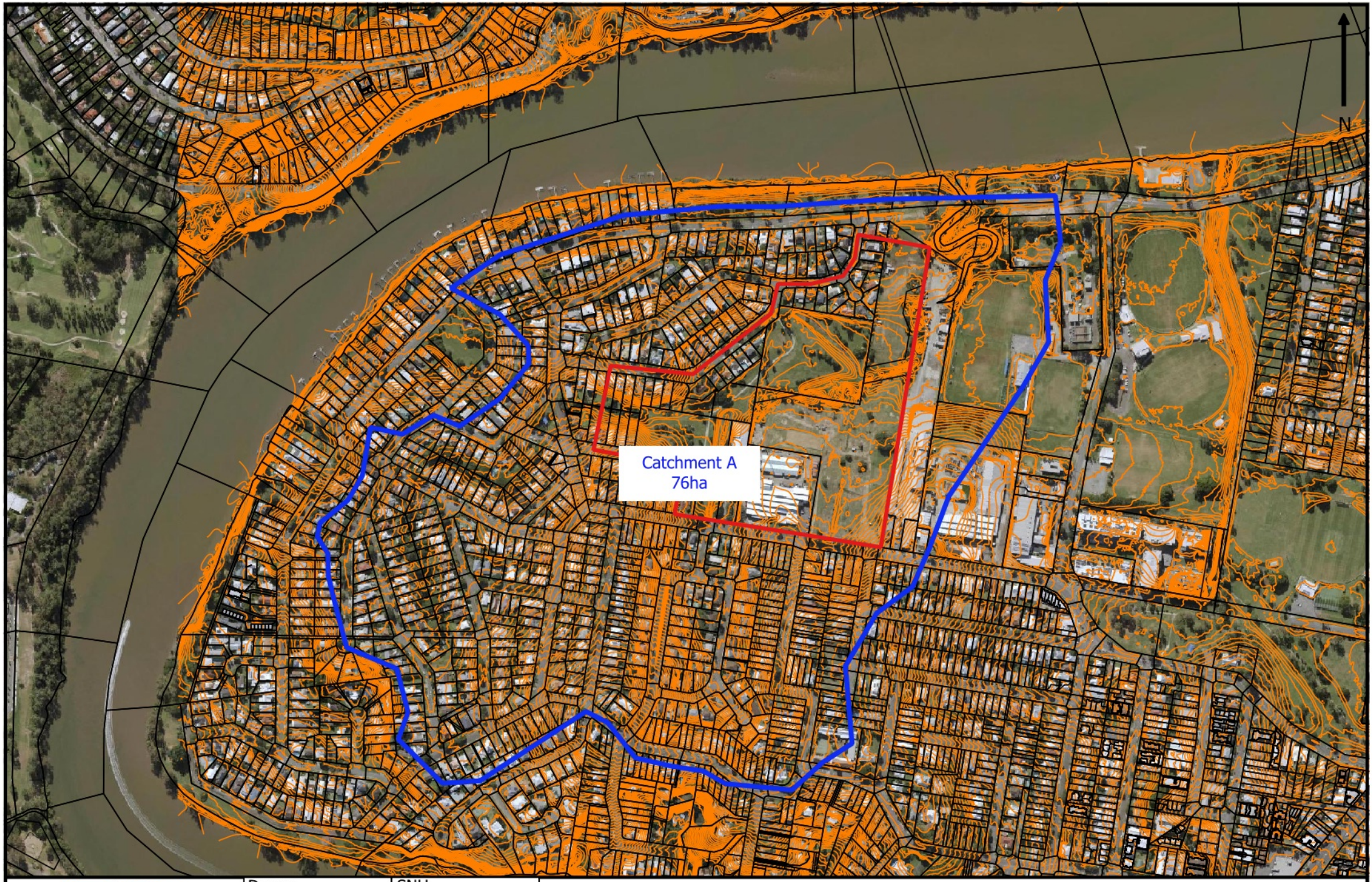
LIST OF APPENDICIES

APPENDIX A

Figures



STORM
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Drawn	SNH
Checked	JH
Date	29/1/24
Scale	1:7,500 (A4)

Yeronga Precinct

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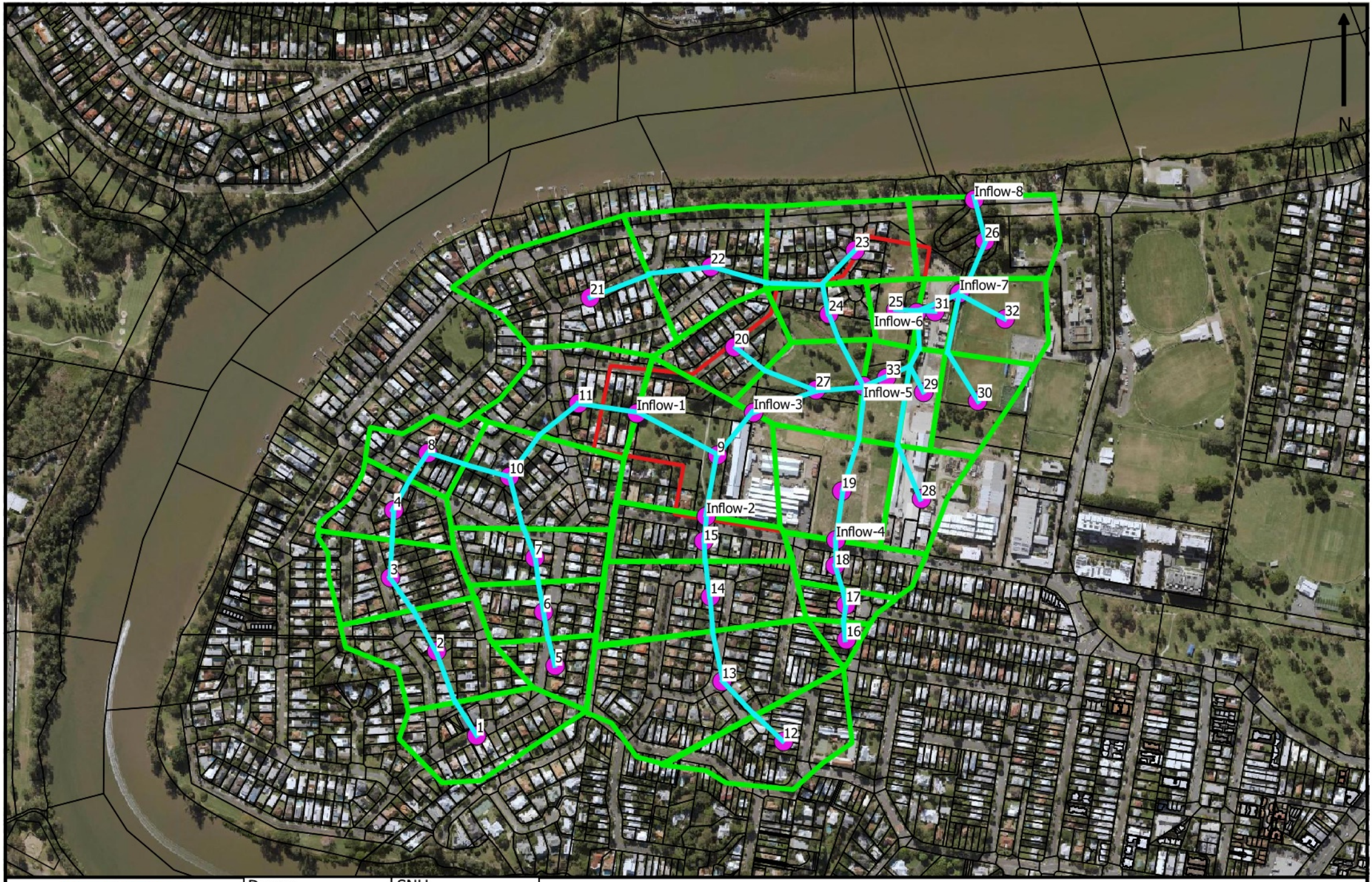
Figure 1
Catchment Plan



STORM WATER CONSULTING 1/820 Old Cleveland Rd, Carina QLD 4152 Phone (07) 3398 4992	Drawn	SNH	Yeronga Precinct	Figure 2
	Checked	JH		URBS Model Schematic
	Date	29/1/24		
	Scale	1:7,500 (A4)	Job No.	J8862

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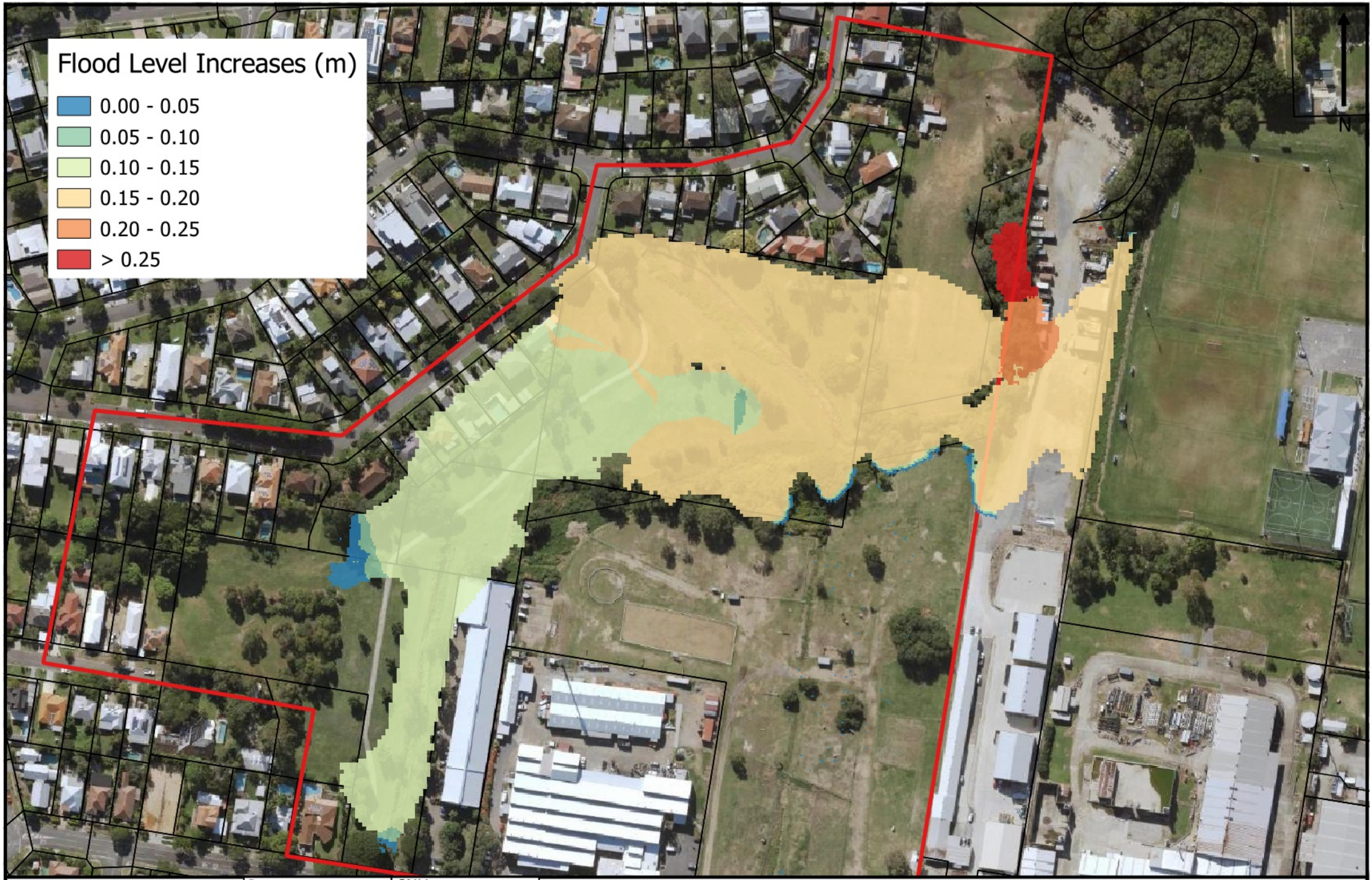
Figure 3

TUFLOW Model Schematic

STORM WATER CONSULTING 1/820 Old Cleveland Rd, Carina QLD 4152 Phone (07) 3398 4992	Drawn	SNH	Yeronga Precinct	Figure 4
	Checked	JH		
	Date	29/1/24		Existing Condition 1% AEP Overland Flow Flood Contours (m AHD)
	Scale	1:2,500 (A4)	Job No.	J8862

STORM WATER CONSULTING 1/820 Old Cleveland Rd, Carina QLD 4152 Phone (07) 3398 4992	Drawn	SNH	Yeronga Precinct		Figure 5 Developed Condition 1% AEP Overland Flow Flood Contours (m AHD)
	Checked	JH			
	Date	29/1/24			
	Scale	1:2,500 (A4)	Job No.	J8862	



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Drawn	SNH
Checked	JH
Date	29/1/24
Scale	1:2,500 (A4)

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Figure 6
Afflux Impact Plot

APPENDIX B

URBS Data

```
"Index","Area","UH","UR","I"
#1,0.02662,1.00,0.00,0.70
#2,0.03069,1.00,0.00,0.70
#3,0.02464,1.00,0.00,0.70
#4,0.01756,1.00,0.00,0.70
#5,0.01166,1.00,0.00,0.70
#6,0.01755,1.00,0.00,0.70
#7,0.02036,1.00,0.00,0.70
#8,0.01471,1.00,0.00,0.70
#9,0.04706,0.50,0.50,0.40
#10,0.03671,1.00,0.00,0.70
#11,0.03240,1.00,0.00,0.70
#12,0.02836,1.00,0.00,0.70
#13,0.05775,1.00,0.00,0.70
#14,0.03644,1.00,0.00,0.70
#15,0.02075,1.00,0.00,0.70
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#17,0.00662,1.00,0.00,0.70
#18,0.01534,1.00,0.00,0.70
#19,0.03019,0.40,0.60,0.30
#20,0.02019,1.00,0.00,0.70
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#26,0.02987,0.00,1.00,0.00
#27,0.02363,0.20,0.80,0.20
#28,0.01555,1.00,0.00,0.80
#29,0.00828,1.00,0.00,0.90
#30,0.01718,0.00,1.00,0.10
#31,0.00663,1.00,0.00,0.90
#32,0.01882,0.00,1.00,0.10
#33,0.01066,0.00,1.00,0.00



143 Hyde Road, Yeronga - Existing
MODEL: Basic
USES: L, U
Default Parameters: alpha=1.20 m=0.8
Catchment File=4770_Ex.dat

Rain    #1      L=0.063
Route thru      #2      L=0.087
Add Rain        #2      L=0.078
Route thru      #3      L=0.063
Add Rain        #3      L=0.062
Route thru      #4      L=0.049
Add Rain        #4      L=0.057
Route thru      #8      L=0.051
Add Rain        #8      L=0.060
Route thru      #10     L=0.076
Store.
Rain    #5      L=0.043
Route thru      #6      L=0.042
Add Rain        #6      L=0.047
Route thru      #7      L=0.041
Add Rain        #7      L=0.049
Route thru      #10     L=0.084
Get.
Add Rain        #10     L=0.080
Route thru      #11     L=0.080
Add Rain        #11     L=0.094
Print. Inflow-1
Route thru      #9      L=0.231
Store.
Rain    #12     L=0.061
Route thru      #13     L=0.074
Add Rain        #13     L=0.079
Route thru      #14     L=0.056
Add Rain        #14     L=0.057
Route thru      #15     L=0.033
Add Rain        #15     L=0.039
```

```
Print. Inflow-2
Route thru      #9      L=0.186
Store.
Rain    #9      L=0.088
Print. Inflow-3
Get.
Get.
Route thru      #27     L=0.184
Store.
Rain    #16     L=0.028
Route thru      #17     L=0.029
Add Rain        #17     L=0.024
Route thru      #18     L=0.041
Add Rain        #18     L=0.041
Print. Inflow-4
Route thru      #19     L=0.164
Route thru      #27     L=0.081
Store.
Rain    #19     L=0.085
Route thru      #27     L=0.081
Store.
Rain    #20     L=0.058
Route thru      #27     L=0.087
Add Rain        #27     L=0.077
Store.
Rain    #21     L=0.098
Route thru      #22     L=0.102
Add Rain        #22     L=0.089
Route thru      #23     L=0.090
Store.
Rain    #23     L=0.075
Get.
Route thru      #24     L=0.046
Add Rain        #24     L=0.048
Route thru      #27     L=0.082
Get.
Get.
Print. Inflow-5
Get.
Get.
Route thru      #33     L=0.080
Route thru      #29     L=0.032
Route thru      #31     L=0.060
Store.
Rain    #28     L=0.092
Route thru      #29     L=0.126
Store.
Rain    #29     L=0.047
Store.
Rain    #33     L=0.040
Get.
Get.
Route thru      #29     L=0.032
Route thru      #31     L=0.060
Store.
Rain    #25     L=0.035
Store.
Rain    #31     L=0.027
Get.
Get.
Print. Inflow-6
Get.
Route thru      #31     L=0.068
Store.
Rain    #30     L=0.091
Route thru      #32     L=0.094
Store.
Rain    #32     L=0.083
Get.
Print. Inflow-7
Get.
Route thru      #32     L=0.030
Route thru      #26     L=0.134
Store.
Rain    #26     L=0.069
Print. Inflow-8
```

```
Get.
Print. B1-In
DAM ROUTE VBF=0 NUMBER=30
0.000000 0.000000
2.018426 0.148800
4.036851 0.297600
6.055277 0.504000
8.229967 0.812000
10.45023 1.120000
12.67050 1.398000
15.01252 1.602000
17.45482 1.832000
19.89711 2.052000
22.41819 2.212000
25.10472 2.373200
27.79124 2.534400
30.50376 2.662000
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63.42091 4.353955
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