



**WAGGA  
WAGGA**  
CITY COUNCIL

Wagga Wagga City Council

## **Development Servicing Plan – Stormwater**

November 2007



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## Summary

This Development Servicing Plan (DSP) covers stormwater developer charges in regard to five specific development areas served by Wagga Wagga City Council. These are Bomen, Estella / Boorooma, Wagga Urban – East of Willans Hill, Wagga Urban – West of Willans Hill and Forest Hill.

Wagga Urban – West of Willans Hill is DSP Area A, Estella / Boorooma and Wagga Urban – East of Willans Hill have been agglomerated into DSP Area B, Forest Hill is DSP Area C and Bomen is a fourth DSP Area D.

This DSP has been prepared in accordance with the *Developer Charges Guidelines for Water Supply, Sewerage and Stormwater* (2002) issued by the Minister for Land and Water Conservation, pursuant to section 306 (3) of the *Water Management Act 2000*.

The areas covered by this DSP are shown on the plans in Appendix C.

The asset descriptions, timing and expenditures for works serving the areas covered by this DSP are shown in Appendix A.

Standards of service to be provided in the DSP area are summarised in Section 5.

The stormwater developer charges for the area covered by this DSP have been calculated as follows:

**Table 1 Stormwater Developer Charges**

Area	Stormwater Developer Charge (\$ per ET)
<b>DSP A</b>	
Urban West of Willans Hill	\$3,007
<b>DSP B</b>	
Estella / Boorooma	\$1,721
Urban East of Willans Hill	
<b>DSP C</b>	
Forest Hill	\$642
<b>DSP D</b>	
Bomen (wholly industrial)	\$207

Developer charges relating to this DSP are for the purpose of enabling the Council to require contributions from developers as a precondition to the granting of a certificate of compliance for development pursuant to s64 of the *Local Government Act 1993* and s306 of the *Water Management Act 2000*, and will be reviewed after a period of 5 to 6 years.

In the period between any reviews, developer charges will be adjusted annually on the basis of the movements in the CPI for Sydney, excluding the impact of GST.

The developer shall be responsible for the full cost of the design and construction of stormwater drainage works within subdivisions, and externally to connection with the trunk drainage system.

A companion document, Development Servicing Plan – Stormwater, Background Document dated November 2007 identifies the characteristics of the assets covered by this DSP and is available from Council.

# 1. Introduction

Section 64 of the *Local Government Act 1993* enables a local government council to levy developer charges for water supply, sewerage and stormwater. This derives from a cross-reference in that Act to section 306 of the *Water Management Act 2000*.

A Development Servicing Plan (DSP) is a document, which details the stormwater developer charges to be levied on development areas utilising stormwater infrastructure.

This DSP covers stormwater developer charges in regard to the 5 identified major development areas served by Wagga Wagga City Council.

This DSP has been prepared in accordance with the *Developer Charges Guidelines for Water Supply, Sewerage and Stormwater* (December 2002) issued by the Minister for Land and Water Conservation, pursuant to section 306(3) of the *Water Management Act 2000*.

This DSP supersedes any other requirements related to stormwater infrastructure developer charges for the area covered by this DSP. This DSP takes precedence over any of Council's codes or policies where there are any inconsistencies relating to stormwater developer charges.

## 2. Administration

### 2.1 Reference

This Policy is called the Stormwater Development Servicing Plan (DSP) for the Wagga Wagga City Council.

### 2.2 Areas of land to which this Policy Applies

This policy applies to all land within the identified DSP urban and rural areas of Wagga Wagga City Council, which are serviced or are proposed to be serviced by stormwater services. This policy applies to all developments and land uses within the areas defined and which utilise or propose to utilise stormwater infrastructure. The areas covered by this DSP are summarised in Table 2 and are shown in Appendix C.

**Table 2 Areas of Land Covered by this Stormwater DSP**

DSP Name	Description
DSP A Wagga Urban West	The Area covered by this DSP is shown on plans in Appendix C.
DSP Boundaries	The basis for defining the DSP area boundaries is as follows:  Wagga Urban – West of Willans Hill includes the suburbs of Wagga Wagga, Ashmont, Turvey Park, Mount Austin, Glenfield Park, Tolland, Lloyd and Bourkelands. The area is bounded by the levee bank generally to the north and east, the Olympic Highway and lots adjacent to Adams Street and Swan Street to the west, the ridgeline of hills between Red Hill Road & Dunns Road to the south, the ridgeline of Willans Hill generally to the east.  The area zoning includes residential (2a, 2b, 2c, 2d, 1c, 1e), General Business (3a), Neighbourhood Business (3b), Light Industry (4b), Special Uses (5a), Recreation (6a) and Hillscape (7b).
DSP B Estella/Boorooma and Wagga Urban East	The Area covered by this DSP is shown on plans in Appendix C. The DSP area includes two sub-areas being Estella/Boorooma and Wagga Urban – East of Willans Hill.
DSP Boundaries	The basis for defining the DSP area boundaries is as follows:
Estella/Boorooma	The Estella and Boorooma area is bounded by Pine Gully Road to the west, Old Narrandera Road and Olympic Highway (Colin Knott Drive) to the south, Amundsen Street to the east and Farrer and Estella Roads to the north.  The area zoning includes residential (2a, 2c and 1e), Special Uses (School and Community Buildings) and Neighbourhood Business zone.

DSP Name	Description
Wagga Urban East	<p>Wagga Urban – East of Willans Hill includes the suburbs of Koorungal, East Wagga, Tatton, Lake Albert and Springvale. The area is bounded by Hammond Ave to the north, the ridgeline of Willans Hill and the ridgeline of hills between Red Hill Road &amp; Dunns Road and the western lots of Springvale generally to the west, lots south of Dunns Road, Lloyd Road and Gregadoo Road to the south, lots generally to the east of Mitchell Road and Tasman Road to the east. An area generally south of Copland Street, east of lots to the east of Koorungal Road and north of the east-west prolongations of Vincent Road and Blaxland Road are excluded from this area.</p> <p>The area zoning includes residential (2a, 2b, 2c, 1b, 1c, 1d, 1e), Neighbourhood Business (3b), Industrial (4a), Special Uses (5a), Recreation (6a, 6b), Riparian (7a) and Hillscape (7b).</p>
DSP C Forest Hill	<p>The Area covered by this DSP is shown on the plans included in Appendix C.</p>
DSP Boundaries	<p>The basis for defining the DSP area boundaries is as follows:</p> <p>Forest Hill includes the suburb of Forest Hill. The area is bounded by the Sturt Highway to the north, Elizabeth Avenue and a future unnamed Road to the west, the RAAF base boundary to the east, and Don Kendell Drive and a future unnamed Road to the south.</p> <p>The area zoning is residential (1a Rural Living Area).</p>
DSP D Bomen	<p>The Area covered by this DSP is shown on the plans included in Appendix C.</p>
DSP Boundaries	<p>The basis for defining the DSP area boundaries is as follows:</p> <p>The Bomen area is bounded by East Bomen Road &amp; Webb Street to the north, the prolongation of Dorset Street to the west, large lots to the east of Byrnes Road and lots to the south of Bomen Road.</p> <p>The area zoning includes Industrial (1g and 4a), Offensive or Hazardous Industry (4c) and Special Uses (5a).</p>

## 2.3 Payment of Charges

Developer charges are payable as follows:

**Table 3 Payment of Developer Charges**

Circumstance	Payment of Developer Charges
In the case of a consent for subdivision:	Before the subdivision linen plan(s) (Subdivision Certificate) are released by Council to the applicant.
In the case of a consent for development not involving subdivision but where a subsequent building Construction Certificate is required:	Where an Occupation Certificate must be obtained for the building – prior to its issue; and Where an Occupation Certificate is not required – prior to occupation of the building
In the case of a consent for development involving both a subdivision and building works requiring a subsequent building Construction Certificate:	Before the linen plan(s) (Subdivision Certificate) are released by Council to the applicant; or Where an Occupation Certificate must be obtained for the building; prior to its issue; or Where an Occupation Certificate is not required – prior to occupation of the building; whichever occurs first.
In the case for a consent for any other development:	Prior to occupation / use of the development.

## 2.4 Transitional Provision

In this clause, *former plan* means a plan that is repealed or replaced by this Plan.

This clause applies to a development application lodged on or before 21 November 2006 in respect of which a payment could have been required under a former plan if the former plan had not been repealed or replaced by this Plan.

Notwithstanding any other provision of this Plan, the amount payable under this Plan in respect of development to which this clause applies is the sum of the amount payable under former plan and 50% of any increase between the amount payable under the former plan and the amount payable under this Plan.

## 2.5 Deferred or Periodic Payments

Wagga Wagga City Council may accept the deferment or periodic payment of a Developer Charge in respect of subdivisions only, subject to the following conditions:

- t Lodgement of an unconditional bank guarantee to cover the amounts of such charges.
- t All money due as part of such charges being payable in full within twelve (12) months from the date of uplifting of the plan of subdivision.
- t The proposal applies to subdivision releases of five (5) lots or more.



- † The decision to accept a deferred payment is at the sole discretion of the General Manager or his/her delegate.

Charges deferred in this manner shall be indexed in accordance with Section 2.6 and the charges paid shall be those applicable at the time of payment.

## 2.6 Monitoring and Review/Update of Developer Charges

The developer charges calculated in this plan are based on current projections of growth in population and development and Council's assessment of infrastructure that will be required to service this growth. It is important that trends are monitored to ensure that contributions received are spent in a manner that provides services in an efficient and effective way.

Council's commitment to future works will be dependent on development and any change in the current projections may necessitate the rescheduling of future works. This plan therefore will require periodic review every 5 years, to ensure the developer contributions remain valid. Public exhibition is only required when, on review, Council decides that a new DSP is warranted. Any review of the plan would include a public exhibition period of 30 working days. This is in accordance with Section 2.5 of the Developer Contribution Guidelines.

If a major change occurs in the Council's circumstances, such as the need for capital works that had not been included in the DSP or changes in planning strategy, the Council may carry out a review in less than 5 years, subject to Department of Energy, Utilities and Sustainability (DEUS) approval. If the review results in a new DSP, the new DSP will be exhibited and registered in accordance with the requirements of the Developer Charges Guidelines.

Following adoption of this DSP, developer charges will be adjusted on 1 July each year on the basis of the change in Consumer Price Index (CPI) for Sydney in the preceding 12 months to December, excluding the impact of GST. This is in accordance with Section 2.5 of the Developer Charges Guidelines.

## 2.7 Calculation of Charges – This Section of the DSP Stormwater was rescinded by Wagga Wagga City Council at their Ordinary Meeting on 27 June 2022. For information on the calculation of Section 64 Stormwater infrastructure contributions, please see the Implementation Guide Development Servicing Plan Stormwater.

Charges have been estimated using methodology including standard industry costing and experience with similar Council projects completed in 2005/2006. The determination of developer charges will be on the following basis. This simplified method is adopted to reduce administrative costs associated with the calculation of charges.

### 2.7.1 Calculation of Charges for Rezonings and Subdivision - This Section of the DSP Stormwater was rescinded by Wagga Wagga City Council at their Ordinary Meeting on 27 June 2022. For information on the calculation of Section 64 Stormwater infrastructure contributions, please see the Implementation Guide Development Servicing Plan Stormwater.

The developer charges set out in Table 10 are per typical residential allotment. For the purposes of the determination of the relevant charges, a standard residential lot size of 800 m<sup>2</sup> has been assumed.



**Normal Residential and Rural Residential Development - This Section of the DSP Stormwater was rescinded by Wagga Wagga City Council at their Ordinary Meeting on 27 June 2022. For information on the calculation of Section 64 Stormwater infrastructure contributions, please see the Implementation Guide Development Servicing Plan Stormwater.**

For normal residential and rural residential development, the developer charges will simply be the number of lots multiplied by the developer charge per lot.

**Medium Density Residential and Non-Residential Development - This Section of the DSP Stormwater was rescinded by Wagga Wagga City Council at their Ordinary Meeting on 27 June 2022. For information on the calculation of Section 64 Stormwater infrastructure contributions, please see the Implementation Guide Development Servicing Plan Stormwater.**

For other development (i.e. medium density residential and non-residential including commercial and industrial), the following approach will apply for DSP Areas A, B and C. A different method applies to Bomen because it is entirely industrial.

The developer charges will be based on the standard developer charge per typical 800 square metre residential allotment and factored for the runoff coefficient and lot size. The runoff coefficient varies with the type of development as set out below.

The type of development will determine the runoff coefficient in accordance with Table 5.4 of the *Guidelines for Stormwater Drainage Design – Part 3*. The runoff coefficient of the new development type is input into the top row and the runoff coefficient C<sub>100</sub> for normal residential is selected for inputting in the bottom row. The runoff coefficients compare to those for normal residential development as follows:

**Table 4 Runoff Coefficients**

Type of Development	Fraction Impervious (f)	Runoff coefficient for 100 year ARI (C <sub>100</sub> )
Normal Residential	0.6	0.74
Rural Residential (Zone 1(b) and 1(c))	0.45	0.62
Medium Density Residential	0.7	0.83
Commercial	0.95	1.00
Industrial	0.9	1.00

The other major factor is lot area. Because the charges will relate back to a typical residential lot size of 800 m<sup>2</sup> that excludes roads and open space, the determination of area of the subject development will also be determined on the basis of the nett effective lot areas.

Credit will be provided where applicable for previous developer charges and to reflect previous zoning, such that the charge reflects the increase. The examples below are provided to clarify this.

The charge will therefore be calculated as follows for other than normal residential and rural residential development.

$$\text{Developer Charge} = \frac{\text{Nett area of development (m}^2\text{)}}{800 \text{ m}^2} \times \text{Runoff Coefficient (C}_{100}\text{)} \times \text{Developer Charge}$$



**Bomen - This Section of the DSP Stormwater was rescinded by Wagga Wagga City Council at their Ordinary Meeting on 27 June 2022. For information on the calculation of Section 64 Stormwater infrastructure contributions, please see the Implementation Guide Development Servicing Plan Stormwater.**

For Bomen, the Developer Charges will be based on the Developer Charge per ET factored for the area based on one ET having an area of 800 m<sup>2</sup>. The charge shall be calculated as follows:

$$\text{Developer Charge} = \frac{\text{Nett area of development (m}^2\text{)} \times \text{Developer Charge}}{800 \text{ m}^2}$$

**2.7.2 Calculation of Charges for Existing Development with no previous s94 contributions. - This Section of the DSP Stormwater was rescinded by Wagga Wagga City Council at their Ordinary Meeting on 27 June 2022. For information on the calculation of Section 64 Stormwater infrastructure contributions, please see the Implementation Guide Development Servicing Plan Stormwater.**

There are many instances where development rezoning and / or subdivision has previously occurred with no developer contributions. In these instances, the developer charge for stormwater will be based upon the impervious area created by the development. The impervious area will include the building footprint and roads, carparking, etc.

The charge will be calculated as follows:

$$\text{Developer Charge} = \frac{\text{Nett impervious area (m}^2\text{)} \times \text{Runoff Coefficient (C}_{100}\text{)} \times \text{Developer Charge}}{800 \text{ m}^2 \times 0.74}$$

**2.8 Examples - This Section of the DSP Stormwater was rescinded by Wagga Wagga City Council at their Ordinary Meeting on 27 June 2022. For information on the calculation of Section 64 Stormwater infrastructure contributions, please see the Implementation Guide Development Servicing Plan Stormwater.**

Examples of the calculation of developer charges are set out below.

**2.8.1 Normal Residential Subdivision - This Section of the DSP Stormwater was rescinded by Wagga Wagga City Council at their Ordinary Meeting on 27 June 2022. For information on the calculation of Section 64 Stormwater infrastructure contributions, please see the Implementation Guide Development Servicing Plan Stormwater.**

A residential subdivision is proposed within DSP Area B at Estella. The subdivision will include 60 lots varying between 650 and 1250 square metres. The lot size does not affect the calculation.

The developer charge will be 60 x \$1,721 = \$103,260.

**2.8.2 Rural Residential Subdivision and Re-subdivision to Standard Residential - This Section of the DSP Stormwater was rescinded by Wagga Wagga City Council at their Ordinary Meeting on 27 June 2022. For information on the calculation of Section 64 Stormwater infrastructure contributions, please see the Implementation Guide Development Servicing Plan Stormwater.**

A rural residential subdivision is developed in the Wagga East DSP area containing 10 lots varying from 2,000 to 5,000 square metres. The size of the lots does not affect the calculation.

The developer charge will be 10 x \$1,721 = \$17,210.

Subsequently, two of the lots are subdivided to create a standard residential subdivision of 8 lots.

The developer charge will be calculated based upon the 10 lots less the 2 lots for which developer contributions have already been made.



The developer charge will be  $10 \times \$1,721 - 2 \times \$1,721$   
 $= \$13,768.$

**2.8.3 Industrial Development - This Section of the DSP Stormwater was rescinded by Wagga Wagga City Council at their Ordinary Meeting on 27 June 2022. For information on the calculation of Section 64 Stormwater infrastructure contributions, please see the Implementation Guide Development Servicing Plan Stormwater.**

An industrial development at East Wagga is proposed with a total site area of 4 ha. There will be 12 lots totalling 34,000 m<sup>2</sup> in this development.

The developer charge =  $\frac{34,000 \text{ m}^2 \times 1.00 \times \$1,721}{800 \text{ m}^2 \times 0.74}$   
 $= \$98,841$

**2.8.4 Redevelopment to Dual Occupancy - This Section of the DSP Stormwater was rescinded by Wagga Wagga City Council at their Ordinary Meeting on 27 June 2022. For information on the calculation of Section 64 Stormwater infrastructure contributions, please see the Implementation Guide Development Servicing Plan Stormwater.**

An existing residential allotment in Turvey Park is rezoned for the purpose of construction of a second dwelling on the lot. The developer charge will be that for the medium density lot less that for a normal

residential lot. This is calculated as the proportional increase in the runoff coefficient multiplied by the developer charge per normal residential lot.

$$\begin{aligned}\text{The developer charge} &= \frac{(0.83 - 0.74)}{0.74} \times \$3,007 \\ &= \$365.72\end{aligned}$$

### **2.8.5 Industrial Development at Bomen**

An existing vacant lot at Bomen which is zoned industrial and for which no developer contributions have been paid requires approval for a shed and carpark totalling 1800 square metres in area.

$$\begin{aligned}\text{The developer charge} &= \frac{1,800 \text{ m}^2 \times \$207}{800 \text{ m}^2} \\ &= \$465.75\end{aligned}$$

An area at Bomen is rezoned to a 4 lot industrial subdivision. The nett area of the 4 lots is 46,000 square metres.

$$\begin{aligned}\text{The developer charge} &= \frac{46,000 \text{ m}^2 \times \$207}{800 \text{ m}^2} \\ &= \$11,902.50\end{aligned}$$

## 3. Demographic and Land Use Planning Information

### 3.1 Growth Projections

Growth projections for populations and number of Equivalent Tenements (ETs) within the urban and rural areas of Wagga Wagga City Council are shown in Table 5, Table 6 and Table 7. These projections are from 1996 (10 years ago) to 2016 (10 years hence), which is Council's current planning horizon.

**Table 5 Growth Projections for Populations in areas covered by DSP A and B**

Area	Population in 2006	Population in 2016
<b>DSP A</b>		
Urban – West of Willans Hill	19088	32643
<b>DSP B</b>		
Estella / Boorooma	2016	3052
Urban – East of Willans Hill	15150	17332
<b>DSP C</b>		
Forest Hill	1835	2222
<b>DSP D</b>		
Bomen (wholly industrial)	0	0

The number of ETs in DSP A, B and C were estimated based on the number of residential, rural residential and non-residential assessments within each service area and growth projections. Results are summarised in the following tables.

**Table 6 DSP A – Assessments and ETs**

Year	Number of Assessments	Cumulative Number of ETs
1996/1997	10834	11538
1997/1998	10998	11690
1998/1999	11039	11728
1999/2000	11074	11761
2000/2001	11155	11842
2001/2002	11195	11879
2002/2003	11259	11939
2003/2004	11393	12063
2004/2005	11536	12202

Year	Number of Assessments	Cumulative Number of ETs
2005/2006	11693	12348
2006/2007	11693	12348
2007/2008	11826	12492
2008/2009	11960	12636
2009/2010	12093	12780
2010/2011	12226	12924
2011/2012	12360	13068
2012/2013	12493	13212
2013/2014	12626	13356
2014/2015	12759	13500
2015/2016	12893	13644
2016/2017	13034	13796

**Table 7 DSP B – Assessments and ETs**

Year	Number of Assessments	Cumulative Number of ETs
1996/1997	6605	7917
1997/1998	6633	7948
1998/1999	6643	7963
1999/2000	6712	8032
2000/2001	6741	8064
2001/2002	6767	8093
2002/2003	6846	8171
2003/2004	6888	8215
2004/2005	6970	8296
2005/2006	6997	8327
2006/2007	7052	8378
2007/2008	7179	8534
2008/2009	7307	8691
2009/2010	7434	8847

Year	Number of Assessments	Cumulative Number of ETs
2010/2011	7561	9004
2011/2012	7689	9160
2012/2013	7816	9317
2013/2014	7943	9473
2014/2015	8070	9630
2015/2016	8198	9786
2016/2017	8337	9954

**Table 8 DSP C – Assessments and ETs**

Year	Number of Assessments	Cumulative Number of ETs
1996/1997	514	487
1997/1998	514	487
1998/1999	524	496
1999/2000	524	496
2000/2001	524	496
2001/2002	524	496
2002/2003	533	505
2003/2004	533	505
2004/2005	533	505
2005/2006	533	505
2006/2007	569	538
2007/2008	598	564
2008/2009	626	591
2009/2010	655	618
2010/2011	683	644
2011/2012	712	671
2012/2013	741	697
2013/2014	769	724
2014/2015	798	750
2015/2016	826	777
2016/2017	858	806





### **3.2 Land Use Information**

This DSP should be read in conjunction with the City of Wagga Wagga Development Control Plan 2005.

## 4. Stormwater Infrastructure

The existing stormwater infrastructure serving the four (4) DSP areas is shown on the plans included as Appendix D.

### 4.1 Estimates of Capital Costs

The estimated capital costs of works serving the area covered by this DSP are shown in the Capital Charge calculation included as Appendix A.

It should be noted that both the existing and future stormwater works are included in the Capital Charge calculation.

### 4.2 Timing of Works and Expenditure

The timing and expenditure for works serving the areas covered by this DSP are also shown in Appendix A.

## 5. Standards of Service

System design and operation are based on providing the following standards of service.

### 5.1 Stormwater Design

Refer to Wagga Wagga Engineering Guidelines to Services and Development 1996: Part 3- Guidelines for Stormwater Drainage Design.

### 5.2 Stormwater Maintenance

Maintenance standards of service should be increased from reactive to scheduled maintenance.

### 5.3 Water Quality

Refer to Wagga Wagga Urban Stormwater Management Plans for Water Quality and Maintenance.

## 6. Design Parameters

### 6.1 Stormwater Capacity

Refer to Wagga Wagga Engineering Guidelines for Subdivisions and Developments- Part 3: Guidelines for Stormwater Drainage Design. The following has been extracted from Part 3: Section 3, Design Recurrence Intervals.

#### 6.1.1 Minor System Drainage – Roads

**Table 9 Minor System Drainage Design Recurrence Intervals**

Land Use	A.R.I
Rural	10 years
Rural Residential	10 years
Urban Residential	10 years
Commercial	10 years
Industrial	10 years

#### 6.1.2 Reserves/Detention Basins

Trickleflow drainage pipelines should be designed with a minimum capacity of 2/3 of the 1 in 1 year storm with a minimum pipe size being 375 mm diameter.

#### 6.1.3 Major System Drainage

A check is to be undertaken to ensure the 100 year Average Recurrence Interval (ARI) flow rate has a safe “escape route” when the minor system fails. Major system drainage is not to be confused with trunk drainage.

#### 6.1.4 Trunk Drainage

All trunk drainage systems are to be designed to a 100 year ARI flow rate for the Critical Storm, with floor levels to have a 0.5 metre freeboard on top of calculated top water levels.

## 7. Calculated Developer Charges

### 7.1 Summary

The developer charges for the three DSP areas are as follows:

**Table 10 Summary of Capital Charge, Reduction Amount and Developer Charges**

Area	Capital Charge (\$ per ET)	Reduction Amount (\$ per ET)	Developer Charge (\$ per ET)
<b>DSP A</b>			
Wagga Urban – West of Willans Hill	\$3,557	\$550	\$3,007
<b>DSP B</b>			
Estella / Boorooma			
Wagga Urban – East of Willans Hill	\$1,821	\$100	\$1,721
<b>DSP C</b>			
Forest Hill	\$882	\$240	\$642
<b>DSP D</b>			
Bomen (wholly industrial)	\$307	\$100	\$207

These amounts have been calculated on the basis of the following capital charges and reduction amounts.

### 7.2 Capital Charge

The capital charges for the four (4) DSP areas were calculated based upon the stormwater drainage system being a single scheme for each sub-area. The identified works are required to complete the drainage network sufficient to service the projected growth to 2016.

There are two basic approaches to calculating the capital charge per ET, the return on investment (ROI) approach and the spreadsheet approach. Council has adopted the ROI Factor approach to calculate the capital charge. The ROI approach consists of the following two steps:

#### Step 1 Uniform lot take up

$$ROI = - PMT (r/100, t, I) \times t / (1+r/100)$$

where: r = discount rate (%)

t = take-up period (years)

PMT () is an Excel function which calculates the required uniform annual loan payments.

## **Step 2 Multiply the capital cost per ET by the ROI factor**

$$\text{Capital Charge} = \text{Capital Cost per ET} \times \text{ROI factor}$$

Details of Capital Charge calculations are included in Appendix B.

Based upon the calculated Capital Charges for each sub-area, Estella / Boorooma and Wagga Urban – East of Willan’s Hill were agglomerated into a single DSP area (B). The weighted average Capital Charges for the agglomerated DSP areas were calculated in accordance with the Guidelines.

### **7.3 Reduction Amount**

The Direct NPV method was adopted to calculate the Reduction Amount for the four (4) DSP areas.

The reduction amount was calculated taking into account the renewal works, works to improve service standard levels and debt reduction (refer to Appendix B).

### **7.4 Reviewing/Updating of Calculated Developer Charges**

Developer charges relating to this DSP are for the purpose of enabling the Council to require contributions from developers as a precondition to the granting of a certificate of compliance for development pursuant to s64 of the *Local Government Act 1993* and s306 of the *Water Management Act 2000*, and will be reviewed after a period of 5 to 6 years

In the period between any reviews, developer charges will be adjusted on 1 July each year on the basis of movements in the CPI for Sydney, in the preceding 12 months to December, excluding the impact of GST.

### **7.5 Infrastructure Works**

The developer shall be responsible for the full cost of the design and construction of stormwater works within subdivisions, and externally to connect to the trunk drainage system, which is nominally assessed as that with the capacity of a 1200 mm diameter pipe or equivalent.

### **7.6 Cross-subsidy**

Council plans to recover the full cost of the assets from the development, therefore no cross subsidy is provided by existing ratepayers to new development.

## 8. Reference Documents

Background information and calculations relating to this DSP are contained in the following documents:

- † Development Servicing Plan – Stormwater, Background Document, August 2006.
- † Engineering Guidelines for Subdivisions and Developments- Part 3: Guidelines for Stormwater Drainage Design.
- † Stormwater Management Plan
- † Wagga Wagga Development Control Plan 2005

These documents contain calculations for the capital charge and reduction amount including asset commissioning dates, details of assets, MEERA valuation of assets, and financial modelling for calculation of reduction amounts. These documents can be reviewed in Council's offices by appointment. To review the documents, please contact Wagga Wagga City Council on telephone (02) 6926 9100.



## 9. Other DSP's and Related Plans

Other than this Stormwater DSP, Wagga Wagga City Council has prepared a *City of Wagga Wagga Section 94 Contributions Plan* and a s64 Sewerage Development Servicing Plan.



## 10. Glossary

Capital Cost	The Present Value (MEERA basis) of assets used to service the development.
Capital Charge	Capital cost of assets per ET x Return on Investment (ROI) Factor.
CPI	Consumer Price Index
Developer Charge (DC)	A charge levied on developers to recover part of the capital cost incurred in providing infrastructure to new development.
Discount Rate	The rate used to calculate the present value of money arising in the future.
DSP	Development Servicing Plan
DCP	Development Control Plan
DEUS	Department of Energy, Utilities and Sustainability
DLWC	Department of Land and Water Conservation
ET	Equivalent Tenement. A measure of the demand a development will place on the stormwater infrastructure in terms of the stormwater discharge for an average residential dwelling.
IPART	Independent Pricing and Regulatory Tribunal
LEP	Local Environmental Plan
MEERA	Modern Equivalent Engineering Replacement Asset
NPV	Net Present Value
Post 1996 Asset	An Asset that was commissioned by a utility on or after 1 January 1996 or that is yet to be commissioned.
Pre-1996 Asset	An Asset that was commissioned by a utility before 1 January 1996.



PV	Present Value. The value now of money, or ETs, in the future.
Reduction Amount	The amount by which the capital charge is reduced to arrive at the developer charge. This amount reflects the present value of the capital contribution that will be paid by the occupier of a development as part of future annual charges.
ROI	Return on investment. Represents the income that is, or could be, generated by investing money.



## Appendix A

# Calculation of the Capital Charge

Capital Charge for Stormwater Trunk Drainage Serving the Area

## Capital Charges

### Bomen

Component	Year Commissioned	Effective year of commissioning for ROI <sup>1</sup>	Total Capital Cost (2006/07\$) (\$M)	PV of Capital Cost <sup>2</sup> (2006/07\$) (\$M)	Capacity (ETs)	Cost per ET (\$ per ET)	Year when Capacity is Taken-Up	Take-up Period (Years)	Return on Investment Factor	Capital Charge per ET (2006/07\$)
<b>Post 1996 Works</b>										
<b>Existing</b>										
Bomen Road opposite Rodneys Transport - Detention Basin	2004/2005	2004/2005	0.025	0.025	1,788	14	2016	13	1.45	20
Hereford St to Olympic Highway - Earth lined open channel incorporating wetlands and dams - length 850m	2004/2005	2004/2005	0.10	0.100	1,788	56	2016	13	1.45	81
<b>Future</b>										
Drainage – Trickle flow east of Hereford St under Railway Line to Byrnes Rd and continue north – 1KM (1050mm)	2012/2013	2012/2013	0.50	0.323	1,788	181	2016	5	1.14	206
<b>Total</b>			0.6	0.4		251				307

Rate of return (pre 1996)

3%

Rate of return (post 1996)

7%

1. The commissioning date of the pre-1996 works has been brought forward to 1995/1996 (ie, to start in January 1996).
2. The post 1996 works have been divided into existing and future assets. The effective commissioning date is 2016, unless the asset capacity extends beyond.
3. Present Value of capital works is calculated from 2006/2007 as the base year.

## Capital Charges

### Estella

Component	Year Commissioned	Effective year of commissioning for ROI <sup>1</sup>	Total Capital Cost (2006/07\$) (\$M)	PV of Capital Cost <sup>2</sup> (2006/07\$) (\$M)	Capacity (ETs)	Cost per ET (\$ per ET)	Year when Capacity is Taken-Up	Take-up Period (Years)	Return on Investment Factor	Capital Charge per ET (2006/07\$)
<b>Pre 1996 Works</b>										
Gunn Drive near Schooner Place - Detention Basin	1995/1996	1995/1996	0.08	0.08	1,098	73	2016	22	1.34	98
Gunn Drive near Pugsley Ave - Detention Basin	1990/1991	1995/1996	0.08	0.08	1,098	73	2016	22	1.34	98
Pugsley Ave near Doman St - Detention Basin	1990/1991	1995/1996	0.08	0.08	1,098	73	2016	22	1.34	98
Cooba Place east - Detention Basin	1991/1992	1995/1996	0.08	0.08	1,098	73	2016	22	1.34	98
Cooba Place west - Detention Basin	1992/1993	1995/1996	0.08	0.08	1,098	73	2016	22	1.34	98
Cooramin Street and across causeway then through paddock - unformed open drain - length 600m	1980/1981	1995/1996	0.5	0.50	1,361	367	2020	26	1.41	519
<b>Post 1996 Works</b>										
<b>Future</b>										
Drainage – New Estella western and southern subdivisions Piped drainage Pine Gully Rd- Old Narrandera Rd to Olympic Way	2011/2012	2011/2012	0.722	0.50	1,098	458	2016	6	1.18	538
Drainage – Boorooma upgrade downstream drainage of new land releases	2015/2016	2015/2016	0.24	0.12	1,098	114	2016	2	1.03	118
<b>Total</b>			<b>1.0</b>	<b>0.6</b>		<b>571</b>				<b>1,665</b>

Rate of return (pre 1996) 3%

Rate of return (post 1996) 7%

1. The commissioning date of the pre-1996 works has been brought forward to 1995/1996 (ie, to start in January 1996).
2. The post 1996 works have been divided into existing and future assets. The effective commissioning date is 2016, unless the asset capacity extends beyond.
3. Present Value of capital works is calculated from 2006/2007 as the base year.

## Capital Charges

### Forest Hill

Component	Year Commissioned	Effective year of commissioning for ROI <sup>1</sup>	Total Capital Cost (2006/07\$) (\$M)	PV of Capital Cost <sup>2</sup> (2006/07\$) (\$M)	Capacity (ETs)	Cost per ET (\$ per ET)	Year when Capacity is Taken-Up	Take-up Period (Years)	Return on Investment Factor	Capital Charge per ET (2006/07\$)
<b>Pre 1996 Works</b>										
Elizabeth Avenue opposite oval - earth lined open channel - length 400 m	1970/1971	1995/1996	0.35	0.35	806	434	2016	22	1.34	582
<b>Post 1996 Works</b>										
<b>Future</b>										
Drainage - Trickle flow stream west of Elizabeth Ave – 450 metres open channel (900)	2009/2010	2009/2010	0.24	0.19	806	240	2016	8	1.25	300
<b>Total</b>			0.2	0.2		240				882

Rate of return (pre 1996)

3%

Rate of return (post 1996)

7%

1. The commissioning date of the pre-1996 works has been brought forward to 1995/1996 (ie, to start in January 1996).
2. The post 1996 works have been divided into existing and future assets. The effective commissioning date is 2016, unless the asset capacity extends beyond.
3. Present Value of capital works is calculated from 2006/2007 as the base year.

## Capital Charges

### Wagga Urban - East of Willans Hill

Component	Year Commissioned	Effective year of commissioning for ROI <sup>1</sup>	Total Capital Cost (2006/07\$) (\$M)	PV of Capital Cost <sup>2</sup> (2006/07\$) (\$M)	Capacity (ETs)	Cost per ET (\$ per ET)	Year when Capacity is Taken-Up	Take-up Period (Years)	Return on Investment Factor	Capital Charge per ET (2006/07\$)
<b>Pre 1996 Works</b>										
Kimberley Drive near Malebo Place - Detention Basin	1986/1987	1995/1996	0.08	0.08	8,857	9	2016	22	1.34	12
Horsley Street - Detention Basin	1986/1987	1995/1996	0.08	0.08	8,857	9	2016	22	1.34	12
Koorringal Road near Delvin Place- Detention Basin	1986/1987	1995/1996	0.12	0.12	8,857	14	2016	22	1.34	18
East and west of Tasman Road - earth lined open channel - length 2243m	1971/1972	1995/1996	0.785	0.79	9,231	85	2020	26	1.41	120
West of Tasman Road - earth lined open channel - length 400m	1971/1972	1995/1996	0.14	0.14	9,231	15	2020	26	1.41	21
South of Copland Street - earth lined open channel - length 270m	1971/1972	1995/1996	0.095	0.10	9,231	10	2020	26	1.41	15
South of Copland Street - earth lined open channel - length 480m	1971/1972	1995/1996	0.168	0.17	9,231	18	2020	26	1.41	26
South of Copland Street - earth lined open channel - length 680m	1971/1972	1995/1996	0.238	0.24	9,231	26	2020	26	1.41	36
Railway corridor west of Lake Albert Road - earth lined open channel - length 195m	1976/1977	1995/1996	0.068	0.07	8,857	8	2016	22	1.34	10
East of Lake Albert Road and South of Copland Street - earth lined open channel - length 562m	1982/1983	1995/1996	0.281	0.28	9,231	30	2020	26	1.41	43
Lake Albert Road through Koorringal Mall - 1200 dia RCP - length 232m	1970/1971	1995/1996	0.2	0.20	8,857	23	2016	22	1.34	30
West of Ziegler Avenue - 1350 dia RCP - length 324m	1972/1973	1995/1996	0.273	0.27	8,857	31	2016	22	1.34	41
Menzies Avenue - 1500 dia RCP - length 443m	1972/1973	1995/1996	0.372	0.37	8,857	42	2016	22	1.34	56
Chifley Crescent - 1800 dia RCP - length 78m	1972/1973	1995/1996	0.078	0.08	8,857	9	2016	22	1.34	12
West of Koorringal Road - 1800 dia RCP - length 241m	1980/1981	1995/1996	0.241	0.24	8,857	27	2016	22	1.34	36
Koorringal Road - twin 1200 dia RCP - length 32m	1972/1973	1995/1996	0.05	0.05	8,857	6	2016	22	1.34	8
East of Koorringal Road - earth lined open channel - length 347m	1960/1961	1995/1996	0.174	0.17	8,857	20	2016	22	1.34	26
East of Koorringal Road & north of Kyeamba Avenue - earth lined open channel - length 374m	1957/1958	1995/1996	0.187	0.19	8,857	21	2016	22	1.34	28
Berala Street - 1200 dia RCP - length 432m	1972/1973	1995/1996	0.311	0.31	8,857	35	2016	22	1.34	47
Chifley Crescent - 1350 dia RCP - length 97m	1972/1973	1995/1996	0.082	0.08	8,857	9	2016	22	1.34	12
East of Koorringal Road & south of Kyeamba Avenue - earth lined open channel - length 270m	1965/1966	1995/1996	0.135	0.14	8,857	15	2016	22	1.34	20
Marloo Crescent & Walana Crescent - 1350 dia RCP - length 390m	1974/1975	1995/1996	0.328	0.33	8,857	37	2016	22	1.34	50
East of Koorringal Road from Walana Crescent - earth lined open channel - length 315m	1975/1976	1995/1996	0.158	0.16	8,857	18	2016	22	1.34	24
Plumpton Road opposite Lansdowne Avenue - grassed open channel - length 254m	1977/1978	1995/1996	0.183	0.18	9,231	20	2020	26	1.41	28
Plumpton Road north of Lansdowne Avenue - 1800dia RCP culvert - length 26m	1977/1978	1995/1996	0.026	0.03	9,231	3	2020	26	1.41	4

Component	Year Commissioned	Effective year of commissioning for ROI <sup>1</sup>	Total Capital Cost (2006/07\$) (\$M)	PV of Capital Cost <sup>2</sup> (2006/07\$) (\$M)	Capacity (ETs)	Cost per ET (\$ per ET)	Year when Capacity is Taken-Up	Take-up Period (Years)	Return on Investment Factor	Capital Charge per ET (2006/07\$)
Lake Albert Road at end of Tatton Trunk drain - 3 x 1800dia RCP culvert - length 42m	1977/1978	1995/1996	0.16	0.16	9,231	17	2020	26	1.41	24
Lake Albert Road - upper end of Marshalls Creek at end of Tatton Trunk drain and Lake Albert overflow - earth lined open channel - length 1680m	1950/1951	1995/1996	0.84	0.84	9,231	91	2020	26	1.41	128
Vincent Road Marshalls Creek - 2 x locations road culvert crossings approx twin box cell 1800 x 1800 - length 20m each	1978/1979	1995/1996	0.12	0.12	9,231	13	2020	26	1.41	18
Vincent Road Marshalls Creek - earth lined open channel - length 405m	1978/1979	1995/1996	0.203	0.20	9,231	22	2020	26	1.41	31
Springvale Drive - earth lined open channel - length 420m	1977/1978	1995/1996	0.147	0.15	9,231	16	2020	26	1.41	22
Nelson Drive - 2 x 1800dia RCP culvert - length 13m	1977/1978	1995/1996	0.04	0.04	9,231	4	2020	26	1.41	6
Nelson Drive - earth lined open channel - length 750m	1977/1978	1995/1996	0.375	0.38	9,231	41	2020	26	1.41	57
Nelson Drive adjacent to Boat Club - 2 x 1500dia RCP culvert - length 51m	1977/1978	1995/1996	0.086	0.09	9,231	9	2020	26	1.41	13
Main Street south of Lake Street - earth lined open channel - length 780m	1983/1984	1995/1996	0.78	0.78	9,231	84	2020	26	1.41	119
East of Main Street - earth lined open channel - length 122m	1993/1994	1995/1996	0.043	0.04	9,231	5	2020	26	1.41	7
Brunskill Road - earth lined open channel - length 487m	1981/1982	1995/1996	0.171	0.17	9,231	19	2020	26	1.41	26
<b>Post 1996 Works</b>										
<b>Existing</b>										
Plumpton road near Stirling Boulevard - Detention Basin	2005/2006	2005/2006	0.12	0.12	9,231	13	2020	16	1.58	21
Plumpton Road opposite Lansdowne Avenue - Detention Basin	1999/2000	1999/2000	0.12	0.12	9,231	13	2020	22	1.86	24
Immediately west and south of Kooringal Road levee bank south of the Sturt Highway - grassed open channel - length 600m	2006/2007	2006/2007	0.36	0.36	9,231	39	2020	15	1.54	60
West of Mason Street - concrete lined channel - length 72m	2001/2002	2001/2002	0.072	0.07	8,857	8	2016	16	1.58	13
Red Hill Road south side - grassed open channel - length 655m	1997/1998	1997/1998	0.472	0.47	8,857	53	2016	20	1.76	94
Red Hill Road north side - grassed open channel - length 946m	1997/1998	1997/1998	0.681	0.68	8,857	77	2016	20	1.76	136
Plumpton Road - Tatton Trunk Drain - grassed open channel - length 947m(880m+67m Lansdowne channel)	2006/2007	2006/2007	0.72	0.72	9,231	78	2020	15	1.54	120
Lake Albert Road - O'Halloran Park Trickleflow - grassed open channel - length 586m	2005/2006	2005/2006	0.293	0.29	8,857	33	2016	12	1.41	47
Featherwood Drive - earth lined open channel - length 510m	2004/2005	2004/2005	0.179	0.18	9,231	19	2020	17	1.63	32
Drainage - Copland Street – Pump Station (west of Kooringal Rd in industrial subdivision behind levee) and Drainage – allow \$200k	2006/2007	2006/2007	0.24	0.24	8,857	27	2016	11	1.37	37



Component	Year Commissioned	Effective year of commissioning for ROI <sup>1</sup>	Total Capital Cost (2006/07\$) (\$M)	PV of Capital Cost <sup>2</sup> (2006/07\$) (\$M)	Capacity (ETs)	Cost per ET (\$ per ET)	Year when Capacity is Taken-Up	Take-up Period (Years)	Return on Investment Factor	Capital Charge per ET (2006/07\$)
Drainage - Improvements open drain western side Plumpton Rd – improve batter 200metres (opp Lansdowne)	2006/2007	2006/2007	0.02	0.02	8,857	2	2016	11	1.37	2

<b>Future</b>										
Drainage - Duplicate 1050mm Copland St to proposed pump station - 610 metres	2010/2011	2010/2011	0.30	0.22	8,857	25	2016	7	1.21	31
Drainage - Eastern Industrial Levee feasibility study	2007/2008	2007/2008	0.24	0.22	8,857	25	2016	10	1.33	34
Drainage - Ridgeline (Bourkelands) – contour banks – 2.5 kms - Urban East DSP boundary	2011/2012	2011/2012	0.06	0.04	8,857	5	2016	6	1.18	6
Tarcoola Rd Extension - Road/Lane construction acquisition of land to follow future Eastern industrial levee to Koorungal Road include drainage – 300 metres roadway/	2010/2011	2010/2011	0.32	0.24	8,857	27	2016	7	1.21	33
Drainage - Duplication of drainage line under Hammond Ave at Stuart Rd (exist 600mm)	2010/2011	2010/2011	0.02	0.01	8,857	2	2016	7	1.21	2
Drainage – Extend trickle flow south along Plumpton Rd (western side) from Stirling Blvd- 350metres (375mm)	2009/2010	2009/2010	0.30	0.24	8,857	27	2016	8	1.25	34
Drainage - Extend trickle flow along Plumpton Rd (western side) to 200m north of Stringybark Ck Culvert (450)	2009/2010	2009/2010	0.18	0.14	8,857	16	2016	8	1.25	20
<b>Total</b>			<b>4.7</b>	<b>4.4</b>		<b>489</b>				<b>1,932</b>

Rate of return (pre 1996)

3%

Rate of return (post 1996)

7%

1. The commissioning date of the pre-1996 works has been brought forward to 1995/1996 (ie, to start in January 1996).
2. The post 1996 works have been divided into existing and future assets. The effective commissioning date is 2016, unless the asset capacity extends beyond.
3. Present Value of capital works is calculated from 2006/2007 as the base year.

## Capital Charges

### Wagga Urban - West of Willans Hill

Component	Year Commissioned	Effective Year of Commissioning for ROI <sup>1</sup>	Total Capital Cost (2006/07\$) (\$M)	PV of Capital Cost <sup>2</sup> (2006/07\$) (\$M)	Capacity (ETs)	Cost per ET (\$ per ET)	Year when Capacity is Taken-Up	Take-up Period (Years)	Return on Investment Factor	Capital Charge per ET (2006/07\$)
<b>Pre 1996 Works</b>										
Yentoo Drive near Jarrah Place - Detention Basin	1994/1995	1995/1996	0.12	0.12	13,587	9	2016	22	1.34	12
Pinaroo Drive near Karoom Street - Detention Basin	1985/1986	1995/1996	0.12	0.12	13,587	9	2016	22	1.34	12
Karoom Street near Glenfield Road - Detention Basin	1980/1981	1995/1996	0.12	0.12	13,587	9	2016	22	1.34	12
Karoom Street near Kobi Place - Detention Basin	1980/1981	1995/1996	0.12	0.12	13,587	9	2016	22	1.34	12
Dalman Parkway near Bandera Ave - Detention Basin	1980/1981	1995/1996	0.16	0.16	13,587	12	2016	22	1.34	16
Jabiru Place - Detention Basin	1991/1992	1995/1996	0.12	0.12	13,587	9	2016	22	1.34	12
Undurra Drive - Detention Basin	1980/1981	1995/1996	0.12	0.12	13,587	9	2016	22	1.34	12
Glenfield Road near Railway line - Detention Basin	1980/1981	1995/1996	0.16	0.16	14,155	11	2020	26	1.41	16
Glenfield Road - Anderson Oval - Detention Basin	1980/1981	1995/1996	0.16	0.16	13,587	12	2016	22	1.34	16
Bruce Street - Detention Basin	1980/1981	1995/1996	0.16	0.16	13,587	12	2016	22	1.34	16
Overdale Drive - Detention Basin	1988/1989	1995/1996	0.1	0.10	13,587	7	2016	22	1.34	10
Bourkelands Drive near Brooklyn Drive - Detention Basin	1994/1995	1995/1996	0.12	0.12	13,587	9	2016	22	1.34	12
Red Hill Road north side - east of Dalman Parkway - earth lined open channel - length 1245m	1980/1981	1995/1996	0.897	0.90	14,155	63	2020	26	1.41	89
Red Hill Road south side - east of Dalman Parkway - earth lined open channel - length 422m	1993/1994	1995/1996	0.304	0.30	14,155	21	2020	26	1.41	30
Red Hill Road at Glenfield Road - twin 1050dia RCP - length 30m	1976/1977	1995/1996	0.03	0.03	14,155	2	2020	26	1.41	3
Red Hill Road north side - east of Glenfield Road - grassed open channel - length 585m	1978/1979	1995/1996	0.422	0.42	13,587	31	2016	22	1.34	42
Red Hill Road south side - east of Glenfield Road - grassed open channel - length 525m	1978/1979	1995/1996	0.378	0.38	13,587	28	2016	22	1.34	37
Red Hill Road south side - east of Bourke Street - grassed open channel - length 242m	1987/1988	1995/1996	0.174	0.17	13,587	13	2016	22	1.34	17
South of Undurra Drive - grassed open channel - length 111m	1980/1981	1995/1996	0.056	0.06	13,587	4	2016	22	1.34	6
South of Undurra Drive - grassed open channel - length 131m	1980/1981	1995/1996	0.066	0.07	13,587	5	2016	22	1.34	7
West of Banderra Ave - grassed open channel - length 245m	1990/1991	1995/1996	0.123	0.12	13,587	9	2016	22	1.34	12

Component	Year Commissioned	Effective Year of Commissioning for ROI <sup>1</sup>	Total Capital Cost (2006/07\$) (\$M)	PV of Capital Cost <sup>2</sup> (2006/07\$) (\$M)	Capacity (ETs)	Cost per ET (\$ per ET)	Year when Capacity is Taken-Up	Take-up Period (Years)	Return on Investment Factor	Capital Charge per ET (2006/07\$)
North of Langi Crescent - grassed open channel - length 256m	1990/1991	1995/1996	0.128	0.13	13,587	9	2016	22	1.34	13
West of Banderra Ave & South of Dalman Parkway - grassed open channel - length 205m	1990/1991	1995/1996	0.103	0.10	13,587	8	2016	22	1.34	10
North of Quabara Place - grassed open channel - length 80m	1983/1984	1995/1996	0.04	0.04	13,587	3	2016	22	1.34	4
Glenfield Road north of Bruce Street - 2700 x 900 box culvert - length 25m	1983/1984	1995/1996	0.045	0.05	13,587	3	2016	22	1.34	4
Awaba Avenue - 2700 x 900 box culvert - length 25m	1983/1984	1995/1996	0.045	0.05	13,587	3	2016	22	1.34	4
South of Maher Street - grassed open channel - length 635m	1983/1984	1995/1996	0.318	0.32	13,587	23	2016	22	1.34	31
South of Bruce Street - grassed open channel - length 304m	1979/1980	1995/1996	0.152	0.15	13,587	11	2016	22	1.34	15
North of Maher Street - grassed open channel - length 602m	1979/1980	1995/1996	0.301	0.30	13,587	22	2016	22	1.34	30
West of Bourke Street near Leavenworth Drive - twin 1200dia RCP - length 83m	1979/1980	1995/1996	0.1	0.10	13,587	7	2016	22	1.34	10
Bourke Street near Leavenworth Drive - 1200dia RCP - length 27m	1979/1980	1995/1996	0.035	0.04	13,587	3	2016	22	1.34	3
East of Bourke Street near Leavenworth Drive - 1200dia RCP - length 166m	1979/1980	1995/1996	0.12	0.12	13,587	9	2016	22	1.34	12
Bourke Street north of Red Hill Road - 1200dia RCP - length 174m	1972/1973	1995/1996	0.126	0.13	13,587	9	2016	22	1.34	12
North of Girraween Mews - grassed open channel - length 347m	1993/1994	1995/1996	0.122	0.12	13,587	9	2016	22	1.34	12
West of Pinaroo Drive behind South City - grassed open channel - length 370m	1993/1994	1995/1996	0.185	0.19	13,587	14	2016	22	1.34	18
North of Dalman Parkway - grassed open channel - length 446m	1978/1979	1995/1996	0.322	0.32	13,587	24	2016	22	1.34	32
East of Pinaroo Drive - grassed open channel - length 318m	1985/1986	1995/1996	0.159	0.16	13,587	12	2016	22	1.34	16
North of Yentoo Drive - grassed open channel - length 233m	1994/1995	1995/1996	0.117	0.12	13,587	9	2016	22	1.34	12
Railway corridor drainage Fernleigh Road to Glenfield Road north side - earth lined open channel - length 968m	1970/1971	1995/1996	0.484	0.48	13,587	36	2016	22	1.34	48
Railway corridor drainage Fernleigh Road to Glenfield Road south side - earth lined open channel - length 934m	1970/1971	1995/1996	0.467	0.47	13,587	34	2016	22	1.34	46
South West of Riverina Australian Football Club - grassed open channel - length 158m	1990/1991	1995/1996	0.054	0.05	13,587	4	2016	22	1.34	5
South of Fernleigh Rd- grassed open channel - length 415m	1986/1987	1995/1996	0.208	0.21	13,587	15	2016	22	1.34	21
North of Fernleigh Rd- earth lined open channel - length 402m	1982/1983	1995/1996	0.141	0.14	13,587	10	2016	22	1.34	14

Component	Year Commissioned	Effective Year of Commissioning for ROI <sup>1</sup>	Total Capital Cost (2006/07\$) (\$M)	PV of Capital Cost <sup>2</sup> (2006/07\$) (\$M)	Capacity (ETs)	Cost per ET (\$ per ET)	Year when Capacity is Taken-Up	Take-up Period (Years)	Return on Investment Factor	Capital Charge per ET (2006/07\$)
North of Maher Street - grassed open channel - length 172m	1979/1980	1995/1996	0.086	0.09	13,587	6	2016	22	1.34	8
Glenfield Road east side north of Bruce Street - grassed open channel - length 253m	1976/1977	1995/1996	0.127	0.13	13,587	9	2016	22	1.34	13
Glenfield Road east side north of Katoa Place - grassed open channel - length 267m	1976/1977	1995/1996	0.134	0.13	14,155	9	2020	26	1.41	13
Glenfield Road west side adjacent to Rules Club - grassed open channel - length 318m	1985/1986	1995/1996	0.229	0.23	14,155	16	2020	26	1.41	23
Glenfield Road west side adjacent to Rules Club - 1800 dia RCP - length 30m	1976/1977	1995/1996	0.055	0.06	14,155	4	2020	26	1.41	5
Glenfield Road west side north of Fernleigh Road earth lined open channel - length 472m	1983/1984	1995/1996	0.34	0.34	14,155	24	2020	26	1.41	34
Fernleigh Road at Glenfield Road - 4 cell 2400 x 1000 box culvert - length 13m	1985/1986	1995/1996	0.13	0.13	14,155	9	2020	26	1.41	13
Bourke Street at Jack Avenue - 1200dia RCP - length 43m	1961/1962	1995/1996	0.04	0.04	13,587	3	2016	22	1.34	4
Jack Avenue - 1200dia RCP - length 420m	1957/1958	1995/1996	0.303	0.30	13,587	22	2016	22	1.34	30
Jack Avenue easement near Wren Street - 1500dia RCP - length 245m	1976/1977	1995/1996	0.206	0.21	13,587	15	2016	22	1.34	20
Easement between Meads Place and Warren Place - grassed open channel - length 225m	1976/1977	1995/1996	0.113	0.11	13,587	8	2016	22	1.34	11
Easement between Meads Place and Warren Place - 1200dia RCP - length 75m	1976/1977	1995/1996	0.054	0.05	13,587	4	2016	22	1.34	5
Easement near Jack Avenue and Warren Place - grassed open channel - length 377m	1976/1977	1995/1996	0.189	0.19	13,587	14	2016	22	1.34	19
Sturt Highway near McNickle Road - twin cell 2400 x 2400 box culvert - length 40m	1970/1971	1995/1996	0.18	0.18	14,155	13	2020	26	1.41	18
Sturt Highway north side adjacent to Ashmont Avenue - earth lined open channel - length 2375m	1976/1977	1995/1996	1.188	1.19	14,155	84	2020	26	1.41	119
Sturt Highway north side west of Pearson Street - earth lined open channel - length 305m	1986/1987	1995/1996	0.22	0.22	14,155	16	2020	26	1.41	22
Sturt Highway towards Flowerdale Lagoon - earth lined open channel - length 225m	1986/1987	1995/1996	0.162	0.16	14,155	11	2020	26	1.41	16
Sturt Highway towards Flowerdale Lagoon - earth lined open channel - length 125m	1995/1996	1995/1996	0.09	0.09	14,155	6	2020	26	1.41	9
West of Moorong Street & south of Flowerdale Lagoon - earth lined open channel - length 650m	1988/1989	1995/1996	0.468	0.47	14,155	33	2020	26	1.41	47
Moorong Street at Sturt Highway - 1200dia RCP - length 162m	1995/1996	1995/1996	0.117	0.12	14,155	8	2020	26	1.41	12
Moorong Street at Kincaid Street - 1200dia RCP - length 105m	1995/1996	1995/1996	0.076	0.08	13,587	6	2016	22	1.34	7
Spring Street - 1200dia RCP - length 205m	1970/1971	1995/1996	0.148	0.15	14,155	10	2020	26	1.41	15
Moorong Street at Travers Street - 1500dia RCP - length 140m	1995/1996	1995/1996	0.118	0.12	13,587	9	2016	22	1.34	12

Component	Year Commissioned	Effective Year of Commissioning for ROI <sup>1</sup>	Total Capital Cost (2006/07\$) (\$M)	PV of Capital Cost <sup>2</sup> (2006/07\$) (\$M)	Capacity (ETs)	Cost per ET (\$ per ET)	Year when Capacity is Taken-Up	Take-up Period (Years)	Return on Investment Factor	Capital Charge per ET (2006/07\$)
Travers Street west of Fitzmaurice Street - 1350dia RCP - length 205m	1976/1977	1995/1996	0.173	0.17	13,587	13	2016	22	1.34	17
Travers Street east of Fitzmaurice Street - 1350dia RCP - length 60m	1976/1977	1995/1996	0.051	0.05	13,587	4	2016	22	1.34	5
Best Park - grassed open channel - length 191m	1976/1977	1995/1996	0.067	0.07	13,587	5	2016	22	1.34	7
Best Park - grassed open channel - length 194m	1980/1981	1995/1996	0.068	0.07	13,587	5	2016	22	1.34	7
Best Park - grassed open channel - length 227m	1980/1981	1995/1996	0.08	0.08	13,587	6	2016	22	1.34	8
Ashmont Drain west of Pearson Street - grassed open channel - length 400m. Note approx 40m of this concrete lined	1983/1984	1995/1996	0.35	0.35	14,155	25	2020	26	1.41	35
Ashmont Drain along Pearson Street - earth lined open channel - length 305m	1983/1984	1995/1996	0.25	0.25	14,155	18	2020	26	1.41	25
Ashmont Drain along Pearson Street under Dobney Ave - triple cell 1800 x 1200 box culvert - length 117m	1983/1984	1995/1996	0.702	0.70	14,155	50	2020	26	1.41	70
Urana Street West adjacent to road overpass - twin cell 2500 x 1200 box culvert - length 25m	1983/1984	1995/1996	0.075	0.08	14,155	5	2020	26	1.41	7
South of Urana Street West adjacent to road overpass - earth lined open channel - length 170m	1983/1984	1995/1996	0.123	0.12	14,155	9	2020	26	1.41	12
Bourke Street, Showground and Chaston Street - 1200dia RCP - length 1680m	1963/1964	1995/1996	1.21	1.21	13,587	89	2016	22	1.34	119
Grandview Avenue, Trevor St, Coleman St & Inverary Street - 1800 x 1800 box culvert - length 612m	1936/1937	1995/1996	0.918	0.92	13,587	68	2016	22	1.34	91
Railway corridor north of Coleman Street - earth lined open channel - length 366m	1964/1965	1995/1996	0.183	0.18	13,587	13	2016	22	1.34	18
Brookong Avenue to Railway corridor - 2400 x 1650 concrete channel - length 70m	1936/1937	1995/1996	0.126	0.13	13,587	9	2016	22	1.34	12
Murray Street east Brookong St to Morgan St - 1800 x 1800 box culvert - length 619m	1936/1937	1995/1996	0.929	0.93	13,587	68	2016	22	1.34	92
Murray Street west Brookong St to Morgan St - 1800 x 1800 box culvert - length 467m	1936/1937	1995/1996	0.701	0.70	13,587	52	2016	22	1.34	69
East end Brookong Ave - 1200dia RCP - length 231m	1936/1937	1995/1996	0.167	0.17	13,587	12	2016	22	1.34	16
Edward Street between Fox St & Little Best Street - 1500dia RCP - length 140m	1936/1937	1995/1996	0.118	0.12	13,587	9	2016	22	1.34	12
Edward St, Thorne St and Morgan Street - 2400 x 2400 box culvert - length 730m	1936/1937	1995/1996	1.314	1.31	13,587	97	2016	22	1.34	130
Morgan Street from Best Street to Fox Street - 1200 x 1200 box culvert - length 137m	1936/1937	1995/1996	0.165	0.17	13,587	12	2016	22	1.34	16
Morgan Street from Fox Street to Murray Street - 1800 x 1800 box culvert - length 164m	1936/1937	1995/1996	0.246	0.25	13,587	18	2016	22	1.34	24

Component	Year Commissioned	Effective Year of Commissioning for ROI <sup>1</sup>	Total Capital Cost (2006/07\$) (\$M)	PV of Capital Cost <sup>2</sup> (2006/07\$) (\$M)	Capacity (ETs)	Cost per ET (\$ per ET)	Year when Capacity is Taken-Up	Take-up Period (Years)	Return on Investment Factor	Capital Charge per ET (2006/07\$)
Morgan Street, Docker Street to Forsyth Street - concrete lined channel 2800 x 1200 - length 482m	1963/1964	1995/1996	0.868	0.87	13,587	64	2016	22	1.34	86
Forsyth Street east of Docker Street culvert entry to lagoon - twin cell 1800 x 1200 box culvert + 1200dia RCP - length 30m	1963/1964	1995/1996	0.14	0.14	13,587	10	2016	22	1.34	14
South of Railway Street between Flinders St & Richard St - earth lined open channel - length 279m	1966/1967	1995/1996	0.14	0.14	13,587	10	2016	22	1.34	14
Railway Street - between Flinders St & Richard St - 2400 x 600 box culvert - length 467m	1978/1979	1995/1996	0.701	0.70	13,587	52	2016	22	1.34	69
North of Railway Street - earth lined open channel - length 377m	1975/1976	1995/1996	0.189	0.19	13,587	14	2016	22	1.34	19
Edward Street - Railway land to Bolton Park - 2400 x 1000 box culvert - length 135m	1975/1976	1995/1996	0.203	0.20	13,587	15	2016	22	1.34	20
Bolton Park Drainage - 1500dia RCP - length 134m	1964/1965	1995/1996	0.133	0.13	13,587	10	2016	22	1.34	13
Bardo Lane south - 1500dia RCP - length 441m	1964/1965	1995/1996	0.39	0.39	13,587	29	2016	22	1.34	38
Bardo Lane north - 1500dia RCP - length 238m	1964/1965	1995/1996	0.22	0.22	13,587	16	2016	22	1.34	22
Tarcutta Street from Tony Ireland Park to river - 1350dia RCP - length 72m	1964/1965	1995/1996	0.08	0.08	13,587	6	2016	22	1.34	8
<b>Post 1996 Works</b>										
<b>Existing</b>										
Fernleigh Road west of Glenfield Road - twin 2100 x 1000 box culvert - length 20m	2005/2006	2005/2006	0.07	0.07	13,587	5	2016	12	1.41	7
Jack Avenue - 1500dia RCP - length 130m	2004/2005	2004/2005	0.11	0.11	13,587	8	2016	13	1.45	12
Easement between Meads Place and Warren Place - 1500dia RCP - length 62m	2004/2005	2004/2005	0.053	0.05	13,587	4	2016	13	1.45	6
Swan Street - grassed open channel - length 200m	2006/2007	2006/2007	0.1	0.10	14,155	7	2020	15	1.54	11
Sturt Highway south adjacent to Ashmont Avenue - earth lined open channel - length 260m	1997/1998	1997/1998	0.13	0.13	14,155	9	2020	24	1.96	18
Sturt Highway south from Ashmont Avenue to Pearson Street - earth lined open channel - length 1461m	1997/1998	1997/1998	1.052	1.05	14,155	74	2020	24	1.96	145
Sturt Highway adjacent to Veale Street - earth lined open channel - length 106m	1997/1998	1997/1998	0.077	0.08	14,155	5	2020	24	1.96	11
Ashmont Drain east of Best Park - grassed open channel - length 500m	2006/2007	2006/2007	0.36	0.36	13,587	26	2016	11	1.37	36
Ashmont Drain north of Best Park - grassed open channel - length 494m	2006/2007	2006/2007	0.356	0.36	14,155	25	2020	15	1.54	39

Component	Year Commissioned	Effective Year of Commissioning for ROI <sup>1</sup>	Total Capital Cost (2006/07\$) (\$M)	PV of Capital Cost <sup>2</sup> (2006/07\$) (\$M)	Capacity (ETs)	Cost per ET (\$ per ET)	Year when Capacity is Taken-Up	Take-up Period (Years)	Return on Investment Factor	Capital Charge per ET (2006/07\$)
Ashmont Drain crossing under Sturt Highway - triple cell 3000 x 1500 box culvert - length 30m	1997/1998	1997/1998	0.11	0.11	14,155	8	2020	24	1.96	15
Railway corridor drainage adjacent to Showground - earth lined open channel - length 490m	1998/1999	1998/1999	0.245	0.25	13,587	18	2016	19	1.72	31
Showground - earth lined open channel - length 480m	1998/1999	1998/1999	0.24	0.24	13,587	18	2016	19	1.72	30
Red Hill Road near Birri Place - Detention Basin	2004/2005	2004/2005	0.12	0.12	14,155	8	2020	17	1.63	14
Yentoo Drive near Gidgee Place - Detention Basin	2000/2001	2000/2001	0.12	0.12	13,587	9	2016	17	1.63	14
Yentoo Drive near Kamaroo Ct - Detention Basin	1999/2000	1999/2000	0.12	0.12	13,587	9	2016	18	1.67	15
Barrima Drive - Detention Basin	2006/2007	2006/2007	0.1	0.10	13,587	7	2016	11	1.37	10
Red Hill Road near Barton Avenue - Detention Basin	1998/1999	1998/1999	0.12	0.12	14,155	8	2020	23	1.91	16
Holbrook Rd near Deakin Avenue - Detention Basin	2006/2007	2006/2007	0.12	0.12	14,155	8	2020	15	1.54	13
Bourke St near Bourkelands Drive - Detention Basin	2000/2001	2000/2001	0.12	0.12	13,587	9	2016	17	1.63	14
Kaloona Drive - Detention Basin	2000/2001	2000/2001	0.12	0.12	13,587	9	2016	17	1.63	14
Bourkelands Drive near Illeura Drive - Detention Basin	1997/1998	1997/1998	0.12	0.12	13,587	9	2016	20	1.76	16
Red Hill Road north side - west of Dalman Parkway - earth lined open channel - length 680m	2004/2005	2004/2005	0.49	0.49	14,155	35	2020	17	1.63	56
Red Hill Road south side - west of Dalman Parkway - earth lined open channel - length 600m	2004/2205	2004/2205	0.432	0.43	14,155	31	2020	17	1.63	50
Red Hill Road at Glenfield Road - twin 1350dia RCP - length 28m	2002/2003	2002/2003	0.04	0.04	14,155	3	2020	19	1.72	5
Red Hill Road north side - east of Bourke Street - grassed open channel - length 584m	1997/1998	1997/1998	0.421	0.42	13,587	31	2016	20	1.76	55
Red Hill Road south side - east of Bourke Street - grassed open channel - length 422m	1997/1998	1997/1998	0.304	0.30	13,587	22	2016	20	1.76	39
Holbrook Rd south of Red Hill Road east side - earth lined open channel - length 400m	2001/2002	2001/2002	0.2	0.20	14,155	14	2020	20	1.76	25
Holbrook Rd south of Red Hill Road west side - earth lined open channel - length 380m	2001/2002	2001/2002	0.19	0.19	14,155	13	2020	20	1.76	24
Glenfield Road west side north of Red Hill Road - grassed open channel - length 925m	2006/2007	2006/2007	0.666	0.67	14,155	47	2020	15	1.54	72
Railway corridor drainage adjacent to Showground - earth lined open channel - length 490m	1998/1999	1998/1999	0.245	0.25	13,587	18	2016	19	1.72	31
Showground - earth lined open channel - length 480m	1998/1999	1998/1999	0.24	0.24	13,587	18	2016	19	1.72	30

Component	Year Commissioned	Effective Year of Commissioning for ROI <sup>1</sup>	Total Capital Cost (2006/07\$) (\$M)	PV of Capital Cost <sup>2</sup> (2006/07\$) (\$M)	Capacity (ETs)	Cost per ET (\$ per ET)	Year when Capacity is Taken-Up	Take-up Period (Years)	Return on Investment Factor	Capital Charge per ET (2006/07\$)
Tarcutta Street from Tony Ireland Park to river - 1800dia RCP - length 113m	2001/2002	2001/2002	0.25	0.25	13,587	18	2016	16	1.58	29
Drainage - Improvements Edwards St West of Moorong St to Flowerdale pumps – 500metres (900mm)	2006/2007	2006/2007	0.09	0.09	13,587	7	2016	11	1.37	9
Drainage – Trickle Flow on Red Hill Rd from Dalman Parkway west to detention basin adjacent to Railway line – approximately 1km	2006/2007	2006/2007	0.92	0.92	13,587	68	2016	11	1.37	93

<b>Future</b>										
Drainage - Improvements Monier Drain – Pearson St/Dobney Ave to Ashmont drain – 320 metres – open drain	2008/2009	2008/2009	0.24	0.21	13,587	15	2016	9	1.29	20
Drainage – Trickle Flow Red Hill Rd Hudson Dr to Glenfield Rd	2007/2008	2007/2008	0.27	0.25	13,587	18	2016	10	1.33	25
Drainage - Improvements end Kincaid St to Flowerdale pump station – 800 metres (900)	2009/2010	2009/2010	0.36	0.29	13,587	21	2016	8	1.25	27
Drainage – Fernleigh Rd Trickle flow from culvert north through easement to detention basins – (beside carwash – west of rules club) – 300metres (450mm)	2012/2013	2012/2013	0.36	0.23	13,587	17	2016	5	1.14	20
Central Culverts - Morgan St, Forsyth St, Shaw St, Gurwood St	2007/2008	2007/2008	0.5	0.47	13,587	34	2016	10	1.33	46
Drainage Upgrades from Internal Flood Study	2010/2011	2010/2011	0.5	0.37	13,587	28	2016	7	1.21	33
Drainage Day, Higgins, Tarcutta St	2013/2014	2013/2014	0.25	0.15	13,587	11	2016	4	1.10	12
Drainage – Improvements downstream (Thru Jubilee Oval to Red Hill Rd) 0.5 km (1050mm)	2011/2012	2011/2012	0.3	0.21	13,587	15	2016	6	1.18	18
Drainage – From headwall to Bourke St from Overdale Dr easement – 100 m (450)	2010/2011	2010/2011	0.032	0.02	13,587	2	2016	7	1.21	2
Drainage – Contour ridge line (Lloyd)– approx 5 km - Urban west DSP boundary	2013/2014	2013/2014	0.12	0.07	13,587	5	2016	4	1.10	6
<b>Total</b>			<b>35</b>	<b>34</b>		<b>2,499</b>				<b>3,557</b>

Rate of return (pre 1996)  
Rate of return (post 1996)

3%  
7%





## Appendix B

# Calculation of the Reduction Amount and Developer Charges

**Table 1 - Calculation of Developer Charges using the Direct NPV Method  
Wagga Wagga City Council - Stormwater for DSP Area A - Urban West**

Base Data		
Capital charge per ET	(2006/07\$)	3,557
	Year 1	2006/07
Debt at end of 2005/06 (\$'000)		-
Cash and investments at end of 2005/06 (\$'000)		-
Net debt (\$'000)		-
Discount rate for future works		7%

Assessments at year end													
	Year No.	0	1	2	3	4	5	6	7	8	9	10	11
	Year	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Residential (including backlog works)		11,227	11,227	11,331	11,435	11,539	11,643	11,747	11,851	11,955	12,059	12,163	12,272
Rural Residential		7	7	34	62	89	116	144	171	198	225	253	283
Non-residential		419	419	420	421	422	423	424	425	426	427	428	429
ET per Residential assessor		0.93											
ET per Rural Residential assessor		1.43											
ET per non-residential assessor		4.18											
Capacity for future customers (ET)		-											

Capital works												
	Base year	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Renewals	(2006/07\$'000)	4,684	-	-	-	-	-	-	-	-	-	-
Inflation from Base year to Year 1 (%)		0.00%										
Capital Works for Improved Standards (2006/07\$'000)		146	500	120	324	482	120	288	250	0	0	0
Government Grant on Works for Improved standards (2006/07\$'000)		-	-	-	-	-	-	-	-	-	-	-
Inflation from 2006/07 to 2006/07 (%)		0.00%										
Last year of the program		2016/17										

PV of ET													
Total equivalent tenements (ET)		12,181	12,181	12,321	12,461	12,600	12,740	12,880	13,020	13,159	13,299	13,439	13,587
Growth (ET)		0	140	140	140	140	140	140	140	140	140	140	140
PV of 10 years of growth (ET)		986											
PV ETs		13,167											

PV of renewal works												
	Year No.	1	2	3	4	5	6	7	8	9	10	11
Renewals (\$'000) in 2006/07\$		4,684	0	0	0	0	0	0	0	0	0	0
PV of 50 year of renewals at discount rate of 7% pa		5,472										
<b>PV Renewals per ET (\$)</b>		<b>416</b>										

PV of Works for Improved Standards to existing population												
	Year No.	1	2	3	4	5	6	7	8	9	10	11
Works for Improved Standards (\$'000) in 2006/07\$ after Government grant		146	500	120	324	482	120	288	250	0	0	0
PV of works for Improved Standards at discount rate of 7% pa		1,783										
<b>PV Standards per ET (\$)</b>		<b>135</b>										

The Reduction Amount is the greater of		
(1)	PV Renewals per ET + PV Standards per ET	551
(2)	Capital Charge - [(N/(N-F)) * [Capital Charge - PV Renewals per ET - PV Standards per ET - Net Debt per ET]	551
Where:	Capital Charge =	3,557
	N - PV of present and future ETs =	13,167
	F - Capacity for future customers =	0
	Net debt per ET =	0

Developer Charge Calculation		
Reduction Amount is therefore	\$551	say \$550
Developer Charge for 2006/07 in 2006/07\$		
Capital Charge	\$3,557	
less Reduction amount	\$550	
<b>Developer Charge</b>	<b>\$3,007</b>	

**Table 2 - Calculation of Developer Charges using the Direct NPV Method  
Wagga Wagga City Council - Stormwater for DSP Area B - Urban East and Estella/Boorooma**

Base Data		
Capital charge per ET	(2006/07\$)	1,821
	Year 1	2006/07
	Debt at end of 2005/06 (\$'000)	- include borrowings and overdraft
	Cash and investments at end of 2005/06 (\$'000)	- include all cash and investments, including sinking fund etc.
	Net debt (\$'000)	-
	Discount rate for future works	7%

Assessments at year end		Year No.	0	1	2	3	4	5	6	7	8	9	10	11
		Year	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
	Residential (including backlog works)		5,574	5,629	5,729	5,829	5,929	6,029	6,130	6,230	6,330	6,430	6,530	6,640
	Rural Residential		1,016	1,016	1,034	1,052	1,071	1,089	1,107	1,125	1,143	1,162	1,180	1,199
	Non-residential		407	407	416	425	434	443	452	461	470	479	488	497
	ET per Residential assessment		0.93											
	ET per Rural Residential assessment		1.43											
	ET per non-residential assessment		4.18											
	Capacity for future customers (ET)		-											

Capital works		Base year	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Renewals		Year	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
	(2006/07\$'000)		-	-	-	-	-	-	-	-	-	-	-
	Inflation from Base year to Year 1 (%)		0.00%										
	Capital Works for Improved Standards (2006/07\$'000)		231	156	0	0	270	0	0	0	0	0	0
	Government Grant on Works for Improved standards (2006/07\$'000)		-	-	-	-	-	-	-	-	-	-	-
	Inflation from 2006/07 to 2006/07 (%)		0.00%										
	Last year of the program		2016/17										

PV of ET		Year No.	0	1	2	3	4	5	6	7	8	9	10	11
	Total equivalent tenements (ET)		8,327	8,378	8,534	8,691	8,847	9,004	9,160	9,317	9,473	9,630	9,786	9,954
	Growth (ET)			51	157	157	157	157	157	157	157	157	157	168
	PV of 10 years of growth (ET)			1,156										
	PV ETs			9,483										

PV of renewal works		Year No.	1	2	3	4	5	6	7	8	9	10	11
	Renewals (\$'000) in 2006/07\$		0	0	0	0	0	0	0	0	0	0	0
	PV of 50 year of renewals at discount rate of 7% pa			229									
	PV Renewals per ET (\$)			24									

PV of Works for Improved Standards to existing population		Year No.	1	2	3	4	5	6	7	8	9	10	11
	Works for Improved Standards (\$'000) in 2006/07\$ after Government grant		231	156	0	0	270	0	0	0	0	0	0
	PV of works for Improved Standards at discount rate of 7% pa			583									
	PV Standards per ET (\$)			61									

The Reduction Amount is the greater of		
(1)	PV Renewals per ET + PV Standards per ET	86
(2)	Capital Charge - $[(N/(N-F)) * (\text{Capital Charge} - \text{PV Renewals per ET} - \text{PV Standards per ET} - \text{Net Debt per ET})]$	86
Where:	Capital Charge =	1,821
	N - PV of present and future ETs =	9,483
	F - Capacity for future customers =	0
	Net debt per ET =	0

Developer Charge Calculation	
Reduction Amount is therefore	\$86 say \$100
Developer Charge for 2006/07 in 2006/07\$	
Capital Charge	\$1,821
less Reduction amount	\$100
<b>Developer Charge</b>	<b>\$1,721</b>

**Table 3 - Calculation of Developer Charges using the Direct NPV Method  
Wagga Wagga City Council - Stormwater for DSP Area C - Forest Hill**

Base Data	
Capital charge per ET	(2006/07\$) 882
Year 1	2006/07
Debt at end of 2005/06 (\$'000)	- include borrowings and overdraft
Cash and investments at end of 2005/06 (\$'000)	- include all cash and investments, including sinking fund etc.
Net debt (\$'000)	-
Discount rate for future works	7%

Assessments at year end		Year No.	0	1	2	3	4	5	6	7	8	9	10	11
		Year	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Residential (including backlog works)			530	566	595	623	652	680	709	738	766	795	823	855
Rural Residential			-	-	-	-	-	-	-	-	-	-	-	-
Non-residential			3	3	3	3	3	3	3	3	3	3	3	3
ET per Residential assessor			0.93											
ET per Rural Residential assessor			1.43											
ET per non-residential assessor			4.18											
Capacity for future customers (ET)			-											

Capital works		Base year	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
		Year	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Renewals	(2006/07\$'000)		-	-	-	-	-	-	-	-	-	-	-
Inflation from Base year to Year 1 (%)			0.00%										
Capital Works for Improved Standards (2006/07\$'000)			0	0	0	216	0	0	0	0	0	0	0
Government Grant on Works for Improved standards (2006/07\$'000)			-	-	-	-	-	-	-	-	-	-	-
Inflation from 2006/07 to 2006/07 (%)			0.00%										
Last year of the program			2016/17										

PV of ET		Year No.	0	1	2	3	4	5	6	7	8	9	10	11
		Year	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Total equivalent tenements (ET)			505	538	564	591	618	644	671	697	724	750	777	806
Growth (ET)				33	27	27	27	27	27	27	27	27	27	29
PV of 10 years of growth (ET)				221										
PV ETs				726										

PV of renewal works		Year No.	1	2	3	4	5	6	7	8	9	10	11
		Year	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Renewals (\$'000) in 2006/07\$			0	0	0	0	0	0	0	0	0	0	0
PV of 50 year of renewals at discount rate of 7% pa			0										
<b>PV Renewals per ET (\$)</b>			<b>0</b>										

PV of Works for Improved Standards to existing population		Year No.	1	2	3	4	5	6	7	8	9	10	11
		Year	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Works for Improved Standards (\$'000) in 2006/07\$ after Government grant			0	0	0	216	0	0	0	0	0	0	0
PV of works for Improved Standards at discount rate of 7% pa				176									
<b>PV Standards per ET (\$)</b>			<b>243</b>										

The Reduction Amount is the greater of	
(1)	PV Renewals per ET + PV Standards per ET 243
(2)	Capital Charge - [(N/(N-F)) * [Capital Charge - PV Renewals per ET - PV Standards per ET - Net Debt per ET]] 243
Where:	
	Capital Charge = 882
	N - PV of present and future ETs = 726
	F - Capacity for future customers = 0
	Net debt per ET = 0

Developer Charge Calculation	
Reduction Amount is therefore	\$243 say \$240
Developer Charge for 2006/07 in 2006/07\$	
Capital Charge	\$882
less Reduction amount	\$240
<b>Developer Charge</b>	<b>\$642</b>

**Table 4 - Calculation of Developer Charges using the Direct NPV Method  
Wagga Wagga City Council - Stormwater for DSP Area D - Bomen (Wholly Industrial)**

Base Data		
Capital charge per ET	(2006/07\$)	307
	Year 1	2006/07
	Debt at end of 2005/06 (\$'000)	- include borrowings and overdraft
	Cash and investments at end of 2005/06 (\$'000)	- include all cash and investments, including sinking fund etc.
	Net debt (\$'000)	-
	Discount rate for future works	7%

Assessments at year end												
Year No.	0	1	2	3	4	5	6	7	8	9	10	11
Year	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Residential (including backlog works)	-	-	-	-	-	-	-	-	-	-	-	-
Rural Residential	-	-	-	-	-	-	-	-	-	-	-	-
Non-residential	40	40	45	50	55	60	65	70	76	81	86	91
ET Equivalency is based upon 1 ET =	800.00	m <sup>2</sup>										
Capacity for future customers (ET)	-											

Capital works												
Base year		Year										
Year		2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Renewals	(2006/07\$'000)	-	-	-	-	-	-	-	-	-	-	-
	Inflation from Base year to Year 1 (%)	0.00%										
	Capital Works for Improved Standards (2006/07\$'000)	0	0	0	0	0	0	220.358	0	0	0	0
	Government Grant on Works for Improved standards (2006/07\$'000)	-	-	-	-	-	-	-	-	-	-	-
	Inflation from 2006/07 to 2006/07 (%)	0.00%										
	Last year of the program	2016/17										

PV of ET												
Total equivalent tenements (ET)	788	788	888	988	1,088	1,188	1,288	1,388	1,488	1,588	1,688	1,788
Growth (ET)	0	100	100	100	100	100	100	100	100	100	100	100
PV of 10 years of growth (ET)	702											
PV ETs	1,490											

PV of renewal works												
Year No.		1	2	3	4	5	6	7	8	9	10	11
Renewals (\$'000) in 2006/07\$	2006/07	0	0	0	0	0	0	0	0	0	0	0
PV of 50 year of renewals at discount rate of 7% pa		0										
<b>PV Renewals per ET (\$)</b>		<b>0</b>										

PV of Works for Improved Standards to existing population												
Year No.		1	2	3	4	5	6	7	8	9	10	11
Works for Improved Standards (\$'000) in 2006/07\$ after Government grant		0	0	0	0	0	0	220	0	0	0	0
PV of works for Improved Standards at discount rate of 7% pa		147										
<b>PV Standards per ET (\$)</b>		<b>99</b>										

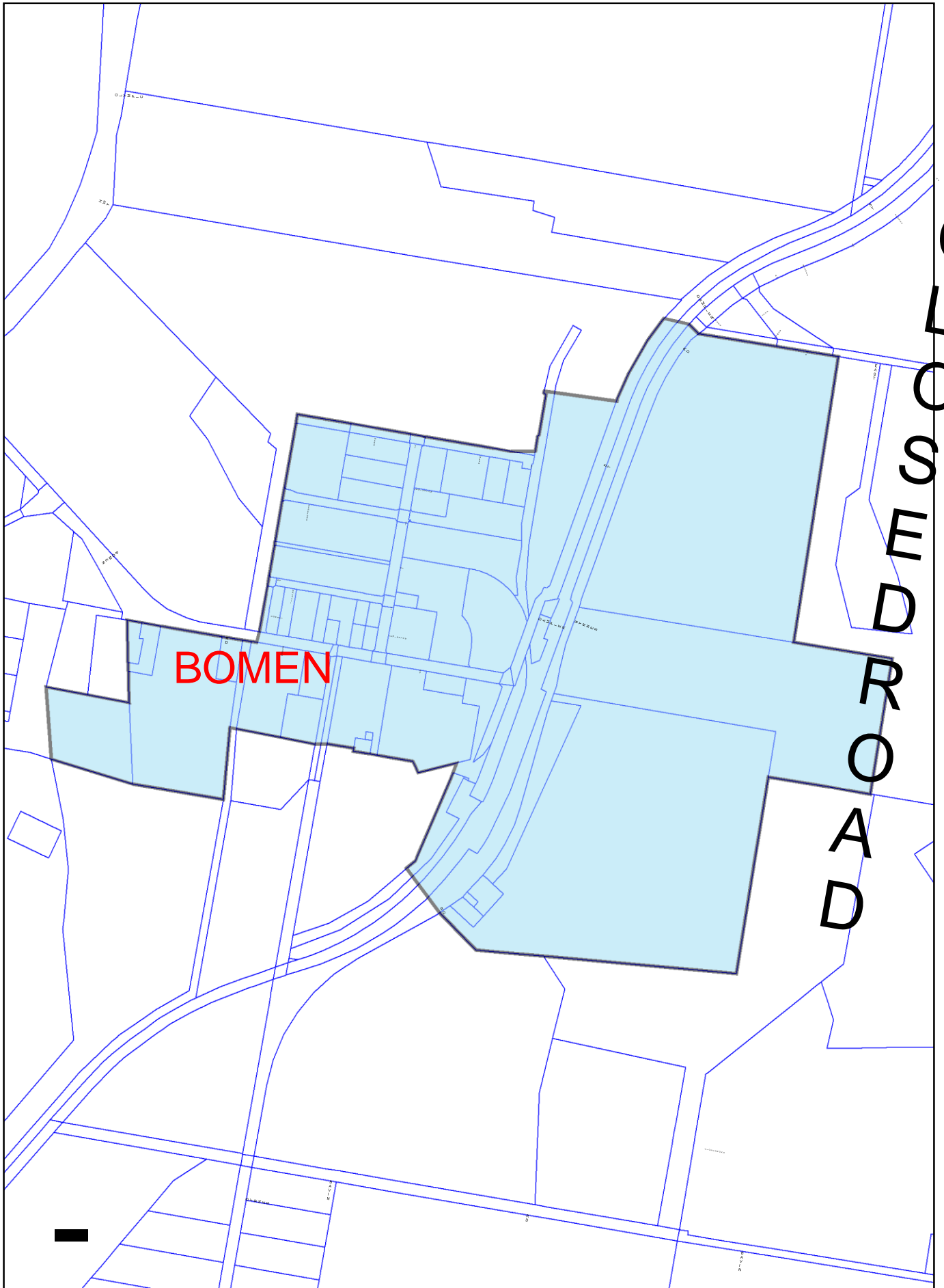
The Reduction Amount is the greater of		
(1)	PV Renewals per ET + PV Standards per ET	99
(2)	Capital Charge - $\{[N/(N-F)] * [Capital Charge - PV Renewals per ET - PV Standards per ET - Net Debt per ET]\}$	99
Where:	Capital Charge =	307
	N - PV of present and future ETs =	1,490
	F - Capacity for future customers =	0
	Net debt per ET =	0

Developer Charge Calculation		
Reduction Amount is therefore	\$99	say \$100
Developer Charge for 2006/07 in 2006/07\$		
Capital Charge	\$307	
less Reduction amount	\$100	
<b>Developer Charge</b>	<b>\$207</b>	

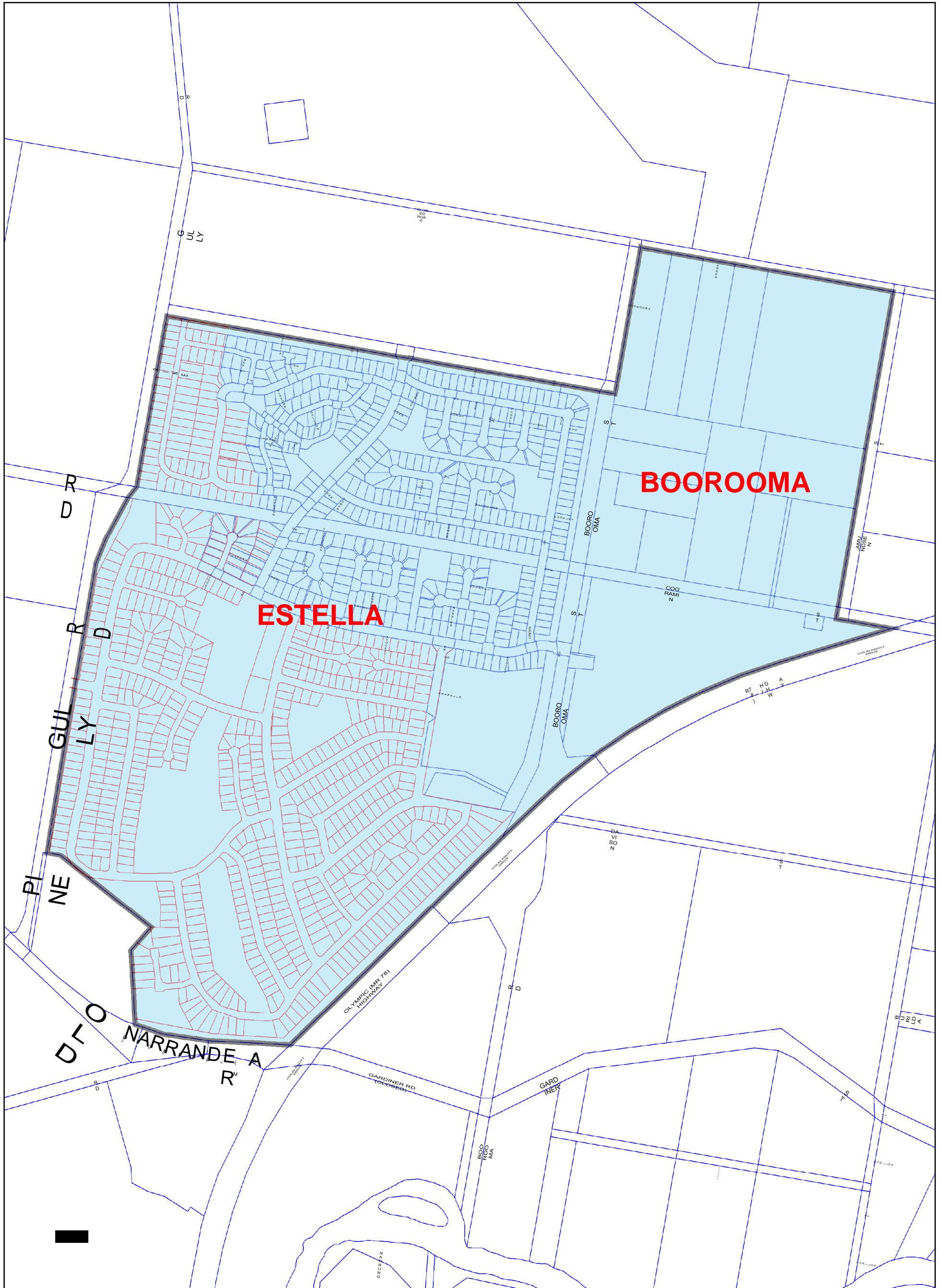


## Appendix C

# DSP Area Plans

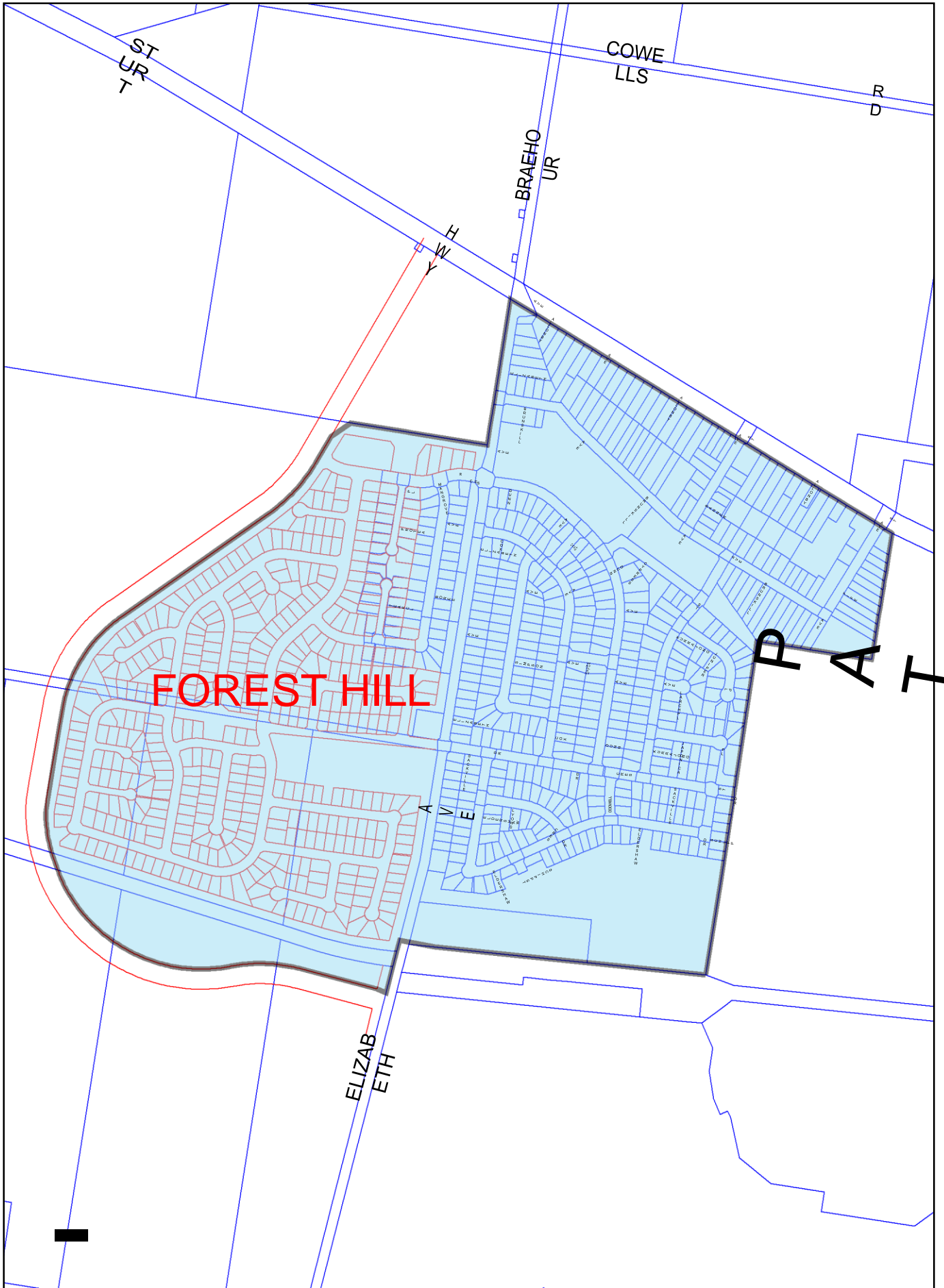


**BOMEN - DSP BOUNDARY**

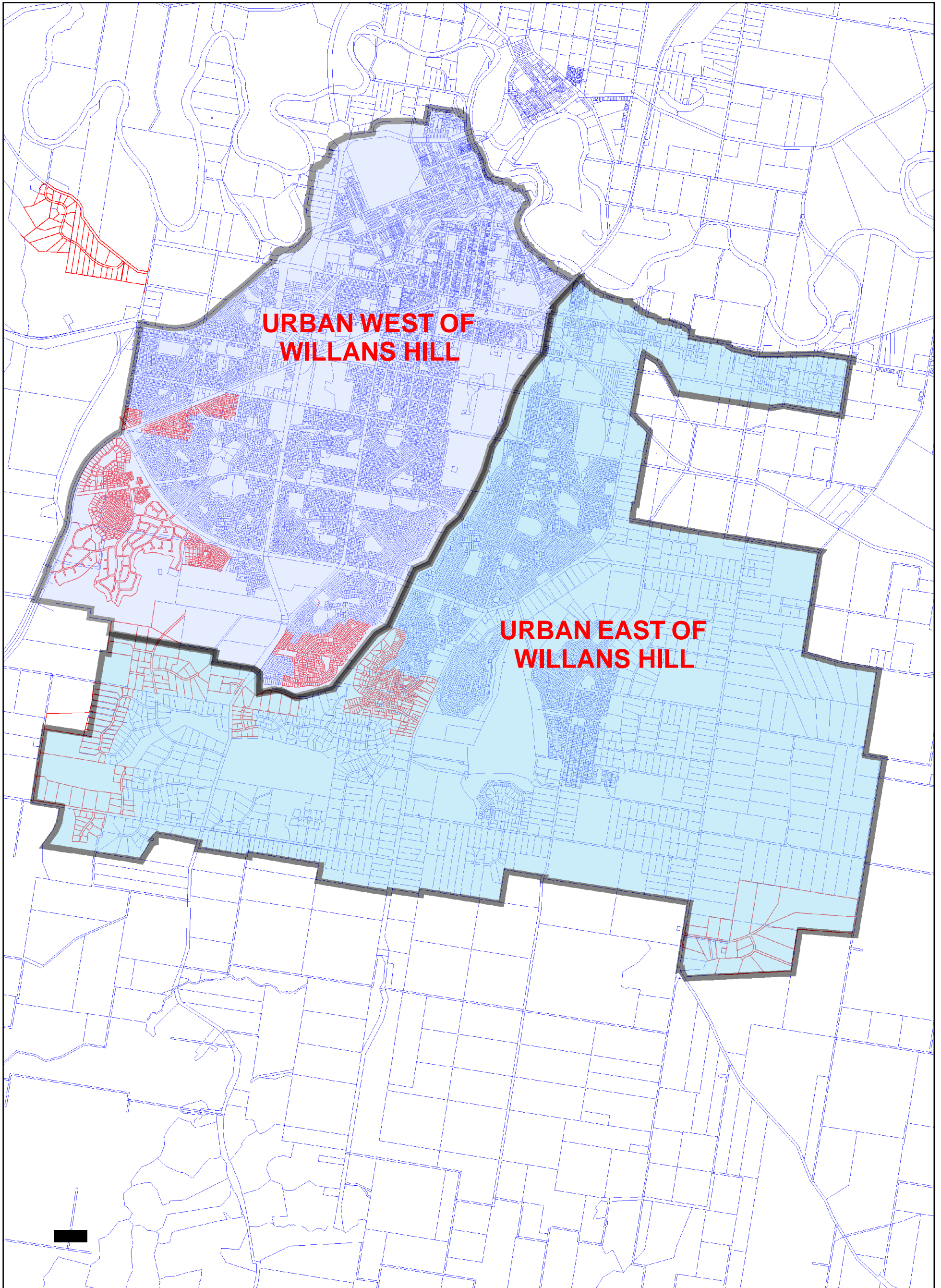


# ESTELLA & BOOROOMA DSP BOUNDARY





**FOREST HILL - DSP BOUNDARY**

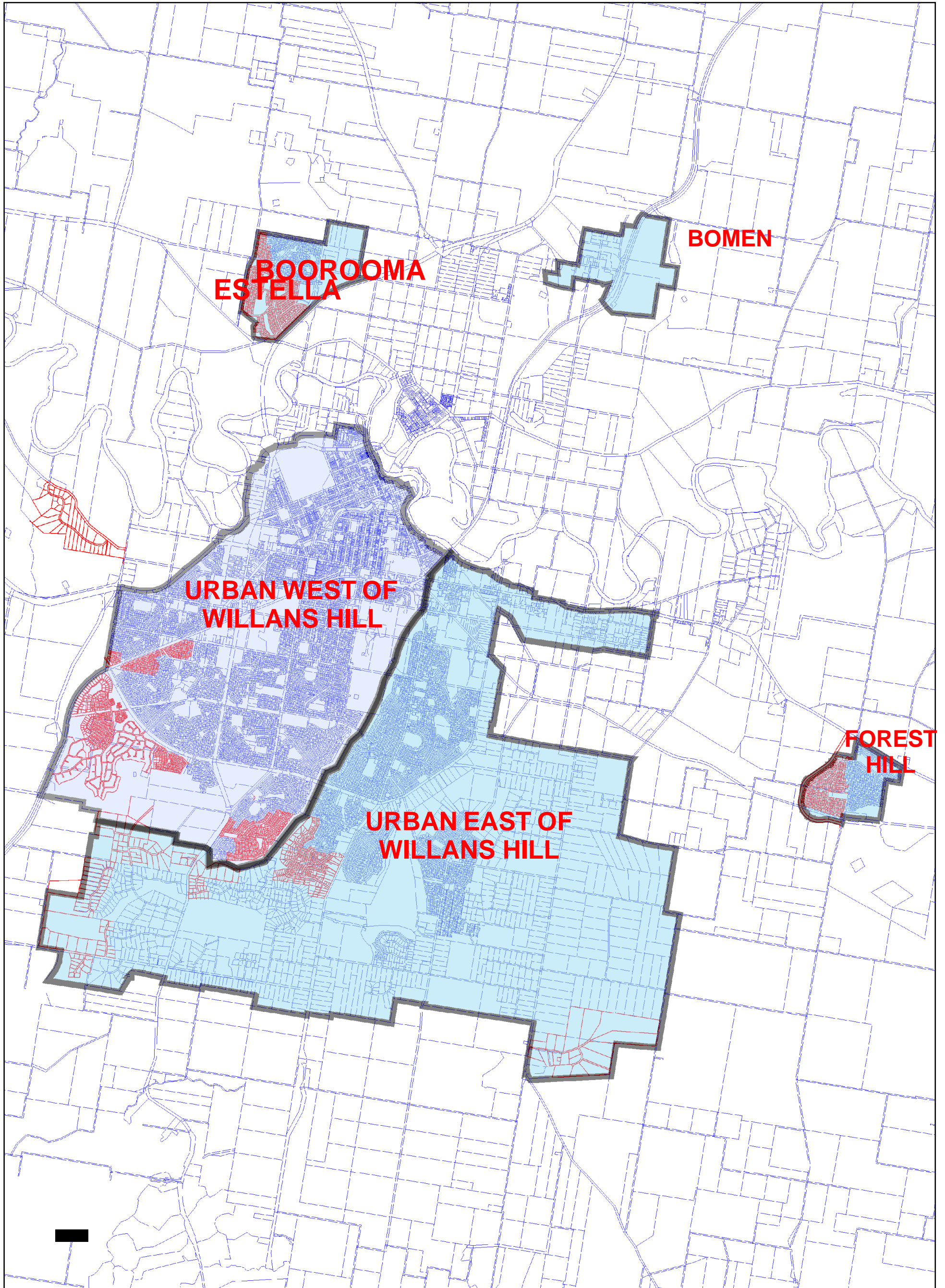


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**URBAN EAST OF WILLANS & URBAN WEST OF WILLANS  
DSP BOUNDARIES**





**OVERALL PLAN DEPICTING  
FIVE DSP BOUNDARIES**



## Appendix D

# Trunk Stormwater Drainage Plans

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- PIPED DRAIN OVER 200mm Ø
- OPEN CHANNEL (1200mm Pipe Equivalent)
- - - DRAINAGE BANK (Detention Basin/Drainage Contour Bank)
- - - NATURAL WATERCOURSE
- - - DRAINAGE PIPE (Under 1200mm Ø)
- DRAINAGE PIT/SPILLWAY/HEADWALL/PUMP STATION



REVISION AMENDMENT:  
SCALE:

A3 PLAN: 1:5000

ISSUED  
MANAGER TECHNICAL SUPPORT  
APPROVED BY  
CLIENT APPROVED  
DRAWN G.C. Day

DATE: 26.6.2006

CITY OF WAGGA WAGGA

DEPARTMENT OF ASSET MANAGEMENT

WAGGA WAGGA DRAINAGE NETWORK

URBAN DRAINAGE  
DRAINS EXCEEDING 1200mm DIAMETER

PLAN No.

**D.558**

SHEET 1 of 3

SHEETS

FILEPATH: X:\TeamRED\Greg Day\Drainage\GHD Delivery Service\Plan - Drains Exceeding 1200mm Diameter



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- PIPED DRAIN OVER 1200mm Ø
- OPEN CHANNEL (1200mm Pipe Equivalent)
- DRAINAGE BANK (Detention Basin/Drainage Contour Bank)
- NATURAL WATERCOURSE
- DRAINAGE PIPE (under 1200mm Ø)
- DRAINAGE PIT/SPILLWAY/HEADWALL/PUMP STATION

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PLAN No.  
**D.**



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PIPED DRAIN OVER 1200mm Ø  
OPEN CHANNEL (1200mm Pipe Equivalent)  
DRAINAGE BANK (Detention Basin/Drainage Contour Bank)  
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DRAINAGE PIPE Under 1200mm  
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PIT/SPILLWAY/HEADWALL/PUMP STATION

REVISION AMENDMENT:  
SCALE.

ISSUED MANAGER  
DATUM: AHD DESIGNED N/A

APPROVED BY  
CLIENT APPROVED  
DRAWN: G.C. Day

AS PLAN: 1:5000

Co - ORD. ISG DATE:

DATE: 26.6.2006

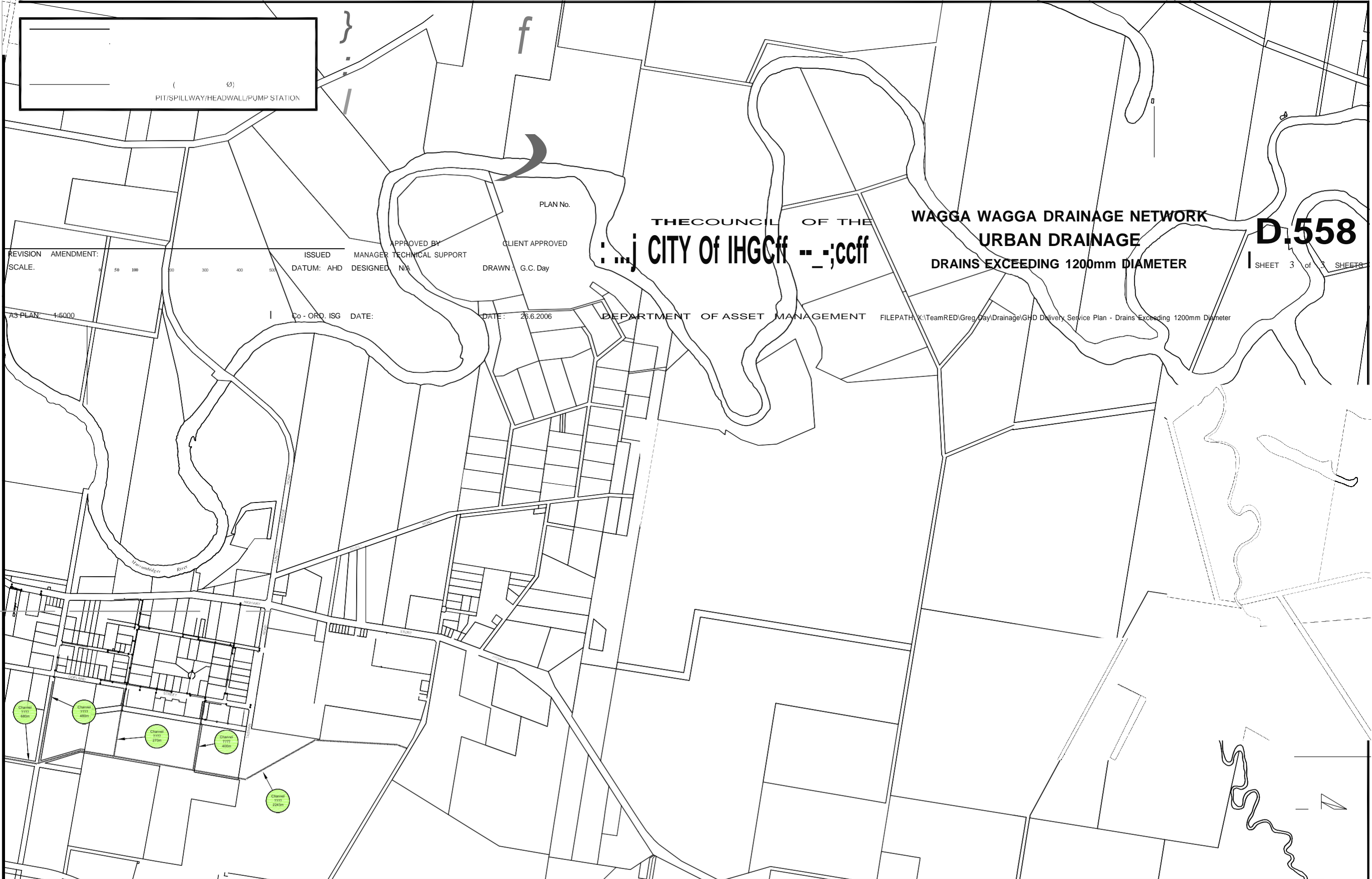
DEPARTMENT OF ASSET MANAGEMENT

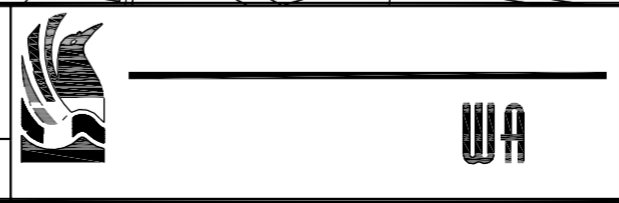
FILEPATH: X:\TeamRED\Greg Day\Drainage\GHD Delivery Service Plan - Drains Exceeding 1200mm Diameter

THE COUNCIL OF THE  
CITY OF WAGGA WAGGA

WAGGA WAGGA DRAINAGE NETWORK  
URBAN DRAINAGE  
DRAINS EXCEEDING 1200mm DIAMETER

D.558  
SHEET 3 of 3 SHEETS






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**Document Status**

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	ALR / FL	G Morrison	* GM	G Morrison	* GM	14/08/06
1	GHM	F Liao	* FL	G Morrison	* GM	23/08/06
2	GHM	F Liao	* FL	G Morrison	* GM	05/09/06
3	GHM	F Liao	* FL	G Morrison	* GM	30/10/06
4	F Liao	G Morrison	* GM	G Morrison	* GM	24/01/07
5	F Liao	G Morrison	* GM	G Morrison	* GM	19/02/07
6	F Liao	G Morrison	* GM	G Morrison	* GM	15/11/07