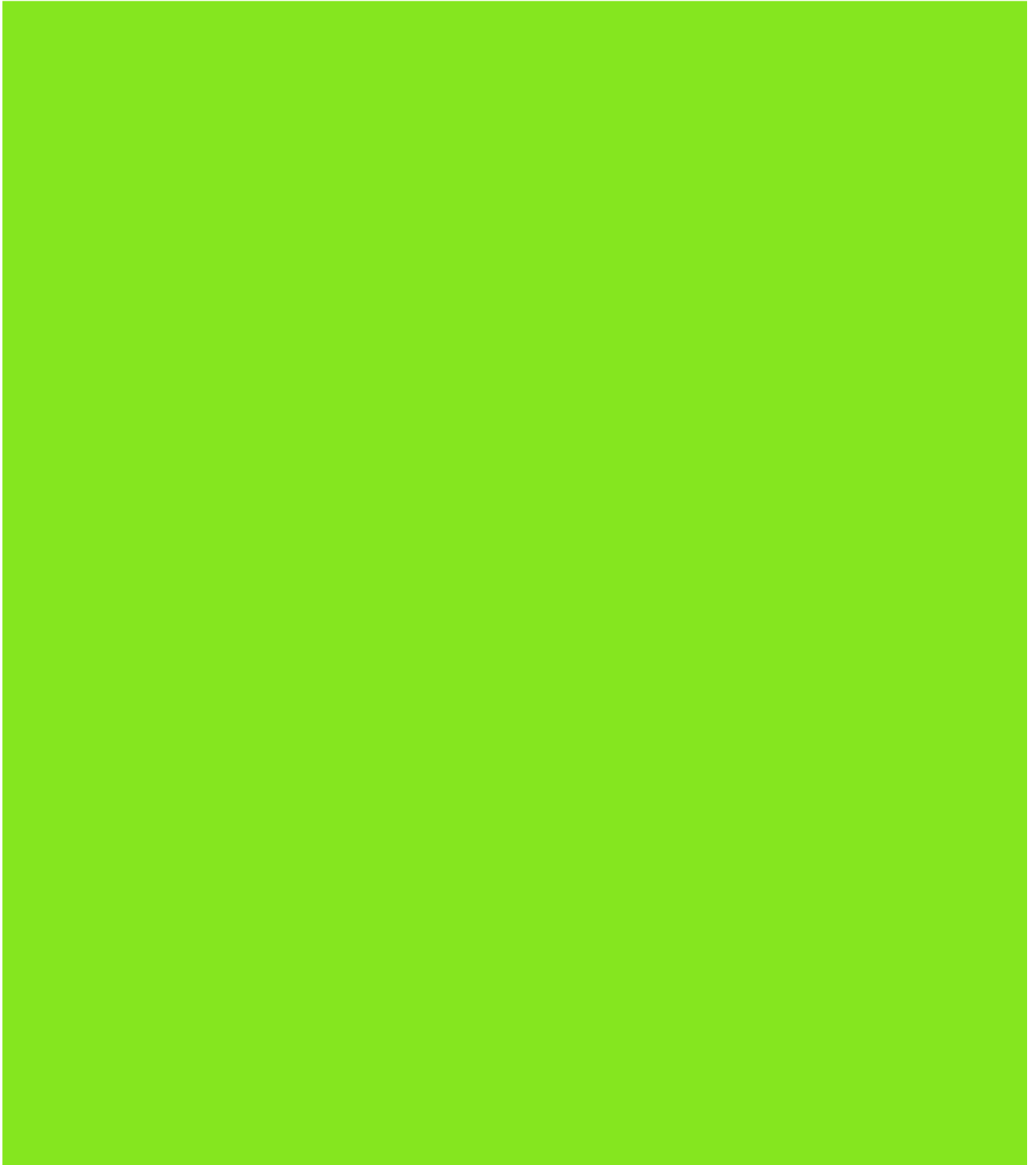


3.0 Estuarine Stormwater Outlets and Catchment GPTs



3.1 Background

The Parramatta River Estuary has a highly urbanised catchment and as such water quality will continue to be a major environmental issue which the various Councils, regulatory authorities, and stakeholders will need to proactively manage. Typical problems in estuaries due to the water quality of catchment runoff include:

- Nutrient enrichment leading to accelerated eutrophication.
- Low dissolved oxygen (DO) levels associated with eutrophication and/or flow restrictions.
- Suspended sediments that reduce light penetration into the water, or can smother plant growth or harm fish.
- Toxic contaminants in the water column or sediments, particularly petroleum hydrocarbons and heavy metals from point discharges and non-point source runoff. Toxic contaminants can also enter the food chain and bio-accumulate in fish.
- Algal blooms, which can also be toxic to marine organisms and humans, and
- The proliferation of invasive species (introduced plants and algae).

Cardno, Lawson and Treloar (2008) identified high levels of gross pollutants as the 3rd highest ranked issue in the estuary, indicating that the existing network of gross pollutant traps (GPTs) were insufficient. Limited information on the location of GPTs, the various types of GPTs being operated, and the volume of gross pollutants removed from each GPT were further identified as a significant knowledge gap.

This component of the study aims to incorporate available stormwater drainage and GPT information into a centralised database for the study area, and assess where additional GPTs could be installed.

3.2 Methods

Spatial data compiled by Cardno, Lawson and Treloar (2008) was converted from MapInfo into ArcGIS format and reviewed to identify data deficiencies. Additional spatial data was sourced directly from various local government authorities and stakeholders. Desktop assessment was conducted using ESRI® ArcMap™ (Version 9.3.1) to assess the available data attributes for inclusion into the project database. Attributes included:

- Sub-catchment size.
- Land use.
- Stormwater outlets, and
- The presence or absence of GPTs.

Background review of publicly available information via Statement of Environment (SoE) reporting and other relevant documentation (e.g. Stormwater Management Plans and policies) was conducted to fill information gaps.

Field investigations included ground truthing of the mapped location of stormwater outlets, and identification and GPS measurement of stormwater outlets that were not evident on existing GIS data layers.

The outcomes of both desktop and field investigations were used to produce mapped layers of stormwater outlets, and the location of GPTs. Mapped layers were then assessed against sub-catchment areas and the sensitivity of downstream aquatic environments, in order to determine areas in which additional stormwater management would be of benefit.

3.3 Limitations

Issues encountered in undertaking this component of the study included the following:

- Non-uniformity of data attributes allocated to each drainage line within each of the various spatial layers provided.

- Issues in determining pipe diameter during field work given that field work had to be conducted during the lowest possible tides to inspect seawalls, erosion and facilities. As most field work was conducted from boats, physical access to measure pipe diameters was effectively precluded.
- A significant lack of information relating to GPT location and type, and other information of relevance to maintenance regimes of each GPT and volume and type of gross pollutants removed.
- Errors in translating spatial data provided in MapInfo format to ESRI ArcGIS format. Not all data was able to be translated. This was largely overcome by obtaining spatial data directly from stakeholders².
- Sub-catchment boundaries were not available for all areas. This was overcome by manually digitising an estimated boundary from contour layers. As only 10m interval contours were available for the entire study area, estimated sub-catchment areas presented should be interpreted with caution. However, the indicative surface areas and proportion of catchment areas that lie within various LGAs are considered sufficient for comparative use in this study.

3.4 The Estuary and its Tributaries

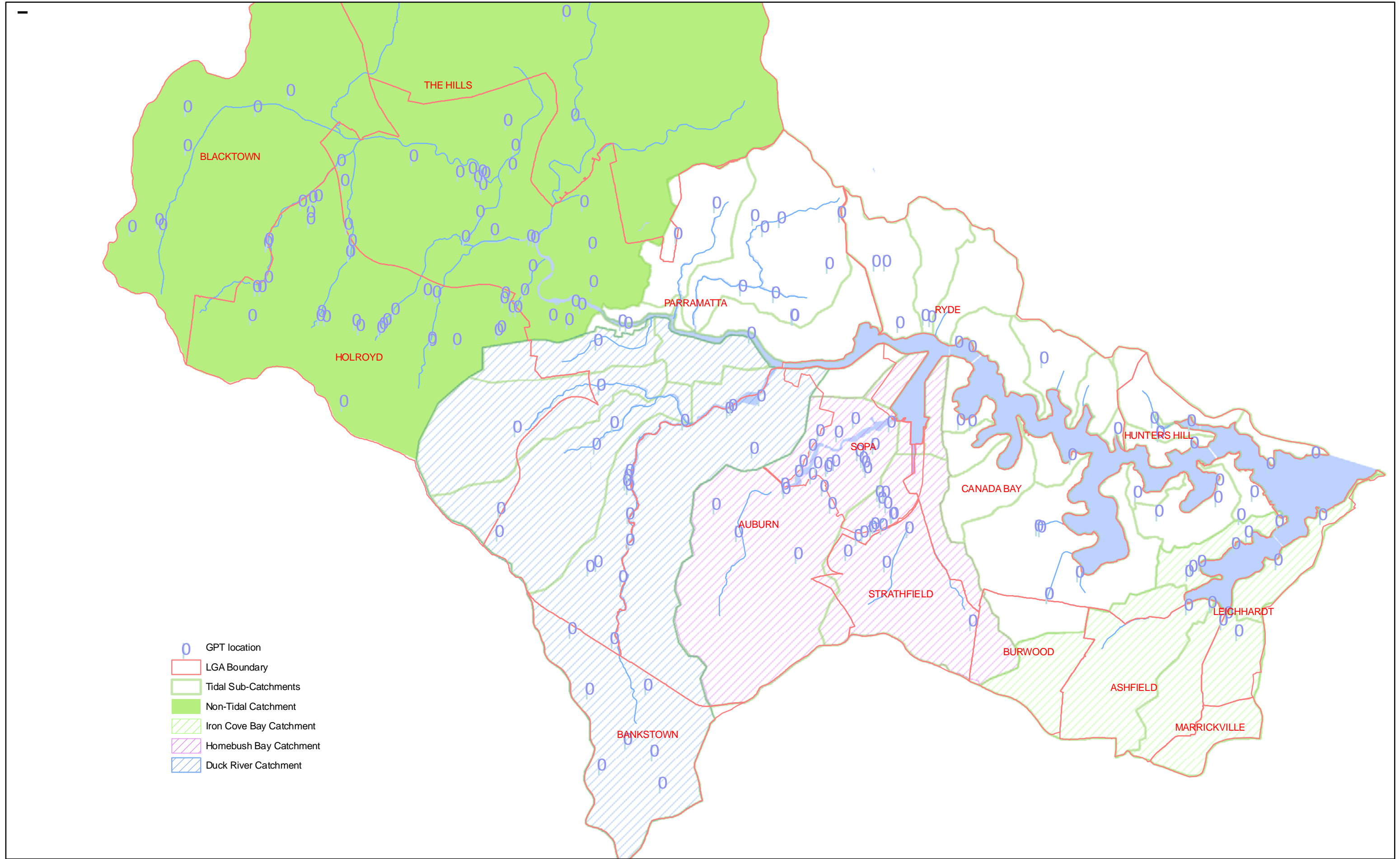
The estuary comprises: the river extending from Parramatta Weir to Clarkes Point, Woolwich in the north and Yurulbin Point, Birchgrove in the south; its tributaries, including natural watercourses, canals, and minor drainage lines; and embayments (Figure 3-1). Table 3-1 summarises the main tributaries entering the river within the study area, the various sub-catchment areas, and LGAs. The main sub-catchments (Duck River, Homebush Bay and Iron Cove Bay) are described individually in Sections 3.5 to 3.7 and the remaining sub-catchments are described within the context of each LGA in Section 9.0.








Table 3-1. Estuary tributaries, canals, and bays.

Catchment	Area (ha)	LGA
River North (Clarkes Point)	60	Hunters Hill
Tarban Creek	228	Hunters Hill
River North (Betts Park & Gladesville Reserve)	69	Hunters Hill
Looking Glass Bay	24	Ryde
Glades Bay	108	Ryde
Morrisons Bay	197	Ryde
River North (Kissing Point Reserve, Bennelong Reserve & Settlers Park)	158	Ryde
Charity Creek	247	Ryde
Smalls Creek	215	Ryde
Archer Creek	287	Ryde
River North (George Kendall & Eric Primrose Reserves)	327	Parramatta
Ponds Subiaco	846	Parramatta
Vineyard Creek	414	Parramatta

² GIS layers obtained on an individual basis were provided as shape files in suitable format for ArcGIS. Quality control was not undertaken due to time constraints. However on interrogation the existing geo-referencing of each shapefile appeared to be at an accuracy which was suitable for use in this study.

Catchment	Area (ha)	LGA
River North (foreshore reserves downstream of weir)	40	Parramatta
Upper catchment	10,884	Parramatta, The Hills, Blacktown, Holroyd
River South (foreshore reserves downstream of weir)	23	Parramatta
Duck River	4,531	Parramatta, Bankstown, Auburn, Holroyd
River South	109	SOPA
Homebush Bay	2,966	Canada Bay, Strathfield, Burwood, Auburn, SOPA
Brays Bay	85	Canada Bay
Yaralla Bay	77	Canada Bay
Majors Bay	216	Canada Bay
Kendall Bay	75	Canada Bay
Hen and Chicken Bay	849	Canada Bay, Burwood
Abbotsford Bay	48	Canada Bay
Five Dock Bay	206	Canada Bay
River South	78	Canada Bay
Iron Cove Bay	1,814	Canada Bay, Leichhardt, Marrickville, Ashfield, Burwood
Total Catchment Area	25,367	



-  GPT location
-  LGA Boundary
-  Tidal Sub-Catchments
-  Non-Tidal Catchment
-  Iron Cove Bay Catchment
-  Homebush Bay Catchment
-  Duck River Catchment

3.5 Duck River Catchment

3.5.1 Description

The Duck River Catchment covers an area of approximately 4,715 ha and is located within Auburn, Bankstown, Holroyd and Parramatta LGAs. The confluence of the Duck River and Parramatta River occurs at Silverwater just to the west of the Silverwater Bridge.

The major tributaries of Duck River are Duck Creek, and A'Becketts Creek. The lower reaches of A'Becketts Creek, Duck Creek and Duck River are tidally affected and form part of the estuary study area. However, for the purposes of stormwater management, DECCW defines the Duck River catchment as:

'that area which drains to the Duck River and its tributaries, together with other catchments located to the south of the Parramatta River and which drain to the Parramatta River at points downstream of the Parramatta Weir and upstream of the mouth of Homebush Bay.'

Under this definition, additional catchment areas comprising Clay Cliff Creek and foreshore land on the south bank of Parramatta River (between Clay Cliff Creek and Duck River's confluence with Parramatta River) are considered as part of the Duck River catchment. This contributes a further catchment area of 317.1 ha and 184.9 ha (respectively) although these lands drain to the Parramatta River upstream of the Duck River confluence and are not hydrologically connected to Duck River (Figure 3-2).

The primary land use along Duck River is open space and recreation, with large areas of playing fields, parks and reserves. The major land uses away from the river corridor include low to medium density residential areas, industrial zones, transport and service infrastructure. Small pockets of commercial land use are located within the catchment, primarily in commercial centres on major road routes, including the Parramatta CBD. Land use within the Duck River catchment is summarised in Table 3-2.

Table 3-2. Duck River Catchment Land Use

Sub-Catchment	Residential / Special Use	Industrial / Commercial	Open Space / Environmental Protection	Total (ha)
Duck River	1,585.5	955.10	407.7	2,948.3
	34%	20%	9%	62%
Duck Creek	634.2	45.3	90.6	770.1
	13%	1%	2%	16%
A'Becketts Creek	588.9	45.3	45.3	679.5
	12%	1%	1%	14%
Clay Cliff Creek	45.3	226.5	45.3	317.1
	1%	5%	1%	7%
Total (ha)	2,854.0	1,272.20	588.9	4,715.00
Percent of Catchment	60%	27%	13%	100%

3.5.2 Stormwater Management

Responsibility for stormwater management within the catchment lies across several local government authorities including Parramatta, Bankstown, Holroyd and Auburn Councils, and Sydney Water Corporation (SWC), Sydney Rail Authority (SRA) and NSW Roads Traffic Authority (RTA). Table 3-3 summarises the LGAs and stakeholders in the catchment.

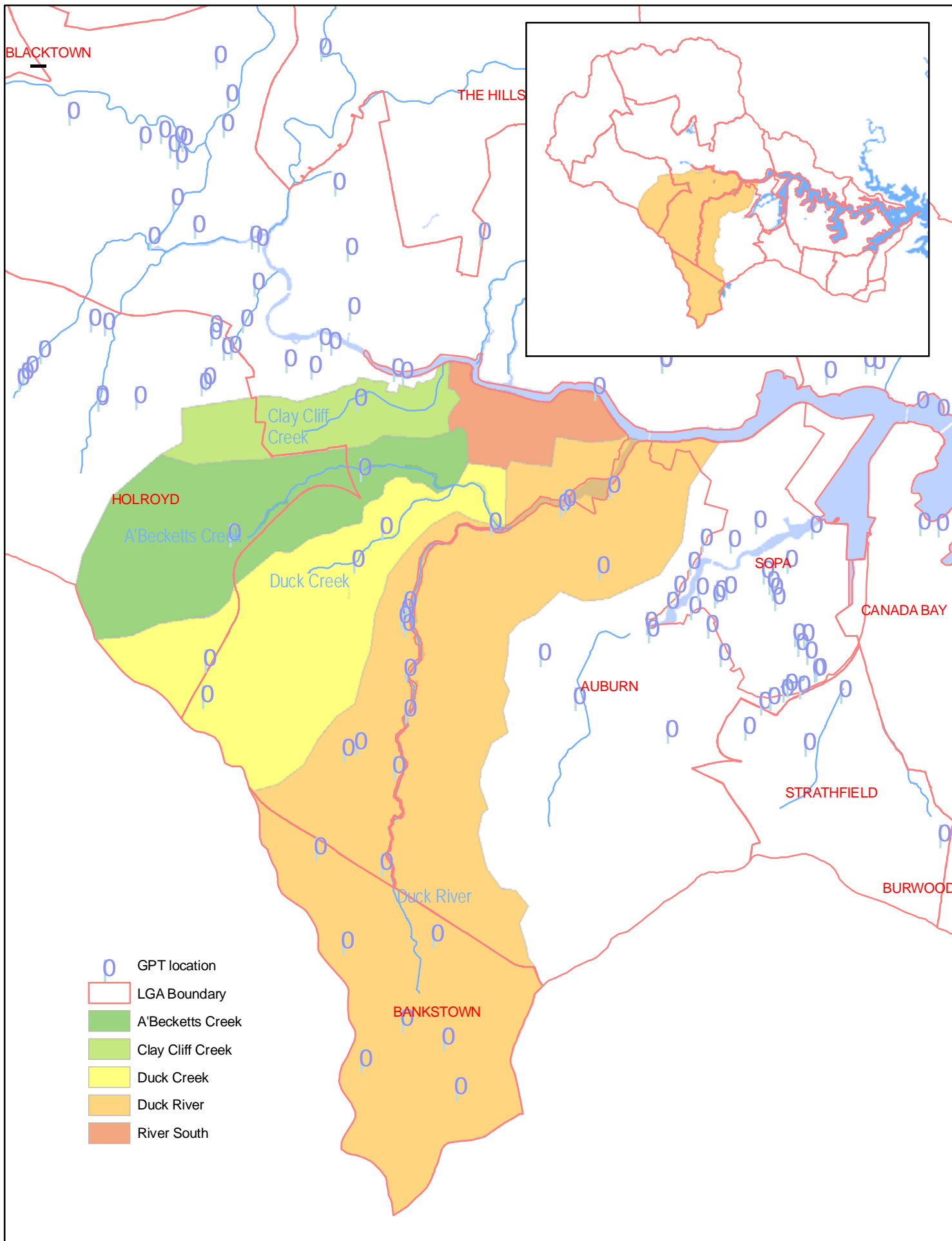
Table 3-3. Stormwater Management Responsibility in the Duck River Catchment

Catchment	Responsibilities
Duck River	<ul style="list-style-type: none"> • Parramatta: drainage to the river from the west • Auburn: drainage to the river from the east • Bankstown: land draining into the upstream end of the river • Sydney Water: open concrete trapezoidal channels • Roads Traffic Authority: major road crossings, including M4 Motorway, Parramatta Road and Hume Highway • SRA: Railway crossings for the Main Western Line and Liverpool via Regents Park
Duck Creek	<ul style="list-style-type: none"> • Parramatta: majority of drainage to creek • Holroyd: small portion of drainage to the upstream end of creek • Sydney Water: brick lined main channel of creek and open concrete lined channel of tributary (known as Little Duck Creek) • State Rail Authority: railway crossings for the Main Western Line, Carlingford Line and Campbelltown Line via Granville
A'Becketts Creek	<ul style="list-style-type: none"> • Parramatta: small portion of the drainage to the creek • Holroyd: majority of drainage to creek • Sydney Water: open concrete lined channels at the downstream and upstream ends of the creek • Roads Traffic Authority: major road crossings at James Ruse Drive, M4 Motorway and Parramatta Road • State Rail Authority: railway crossings for the Main Western Line, Carlingford Line and Campbelltown Line via Granville
Clay Cliff Creek	<ul style="list-style-type: none"> • Holroyd: Small portion of drainage to the creek • Parramatta: Majority of drainage to the creek • Sydney Water: concrete lined channel (included covered section) which forms most of the mainstream channel of the creek • State Rail Authority: railway crossings for the Main Western Line
Total Catchment Area	<ul style="list-style-type: none"> • Auburn: 24% • Bankstown: 20% • Parramatta: 39% • Holroyd: 17%

Table 3-4 summarises those stormwater devices that were mapped within the Duck River Catchment during this study, however this is not a complete list of the current situation. As outlined in Section 3.2, information was found to be highly variable in terms of reporting the number, location or type of stormwater device found in each sub-catchment area.

Table 3-4. Duck River Catchment Stormwater Devices

Type	Location	Watercourse	LGA / Owner
Ecosol	Wigram St, Harris Park	Clay Cliff Creek	Parramatta
Pit Inserts x 5	Merrylands Shopping Centre	A'Becketts Creek	Holroyd
Basket	Harris St, under M4, Granville	A'Becketts Creek	Parramatta
CDS unit	Morton St, Council Depot, Granville	Duck Creek	Parramatta
Humeceptor	Memorial Dr, cnr Edith, Granville	Duck Creek	Parramatta
Rocla Cleansall	Elizabeth Street, Guildford	Duck Creek	Sydney Water
Ecosol	Shirley St, Rosehill	Duck Creek	Parramatta
Ecosol inserts	Guildford Rd, Guildford	Duck Creek	Parramatta
Sediment Basin	Myrtle Street, Granville	Duck River	Parramatta
Sediment Basin	Neilson Street, Granville	Duck River	Parramatta
Sediment Basin	Seventh Street, Granville	Duck River	Parramatta
Sediment Basin	Mimosa Street, Granville	Duck River	Parramatta
Trash Rack	Rudolph Street, South Granville	Duck River	Parramatta
Litter Boom	Boundary Road, South Granville	Duck River	Parramatta
Nets x 2	Blaxcell Road, South Granville	Duck River	Parramatta
Litter Boom	Maluga Reserve, Birrong	Duck River	Bankstown
Trash Rack	Chester Hill Community Garden	Duck River	Bankstown
Litter Boom	Sefton Golf Course	Duck River	Bankstown
Gross Pollutant-sediment trap	Jensen Park, Regents Park	Duck River	Bankstown
Trash Rack	Chester Hill Primary School	Duck River	Bankstown
Trash Rack	Regents Park	Duck River	Bankstown
Trash Rack	Shell Refinery	Duck River	Parramatta
Rocla Cleansall	Hume Park, Silverwater	Duck River	Sydney Water
Rocla Cleansall	O'Neil Park, Yagoona	Duck River	Sydney Water
Litter Boom - broken	Silverwater	Duck River	Auburn
Net	Wellington Rd, South Granville	Duck River	Parramatta
Nets x 2	Mons Rd, South Granville	Duck River	Parramatta
Net	Dixmude St, Granville	Duck River	Parramatta



PARRAMATTA RIVER ESTUARY PROCESSES STUDY
DUCK RIVER CATCHMENT

AUG 2010
 60097281



3.6 Homebush Bay Catchment

3.6.1 Description

The Homebush Bay catchment has an area of approximately 2,966 ha, of which 54% lies within the Auburn LGA, 21% in Strathfield, 15% in Burwood, and 9% in the City of Canada Bay LGAs. SOPA is responsible for management of the catchment area covered by SREP 24 – Homebush Bay (approximately 550 ha or 18% of the catchment).

The main tributaries of Homebush Bay include Powells Creek and Haslams Creek, which contribute approximately 1,150 ha and 1,700 ha to the Homebush Bay catchment respectively (refer Figure 3-3).

Land use in the Homebush Bay catchment area includes residential commercial, special uses (e.g. Rookwood Necropolis, hospitals, and schools), industrial, major roads, railways, and extensive parklands and natural areas.

The history of land use within the Homebush Bay catchment has left a significant legacy in terms of contaminated land and sediments within the bay itself. This in combination with continued poor water quality of receiving waters has resulted in Homebush Bay being considered one of the most polluted waterways in NSW.

3.6.2 Stormwater Management

Several authorities and organisations have responsibility for stormwater management within the Homebush Bay catchment. These include the following

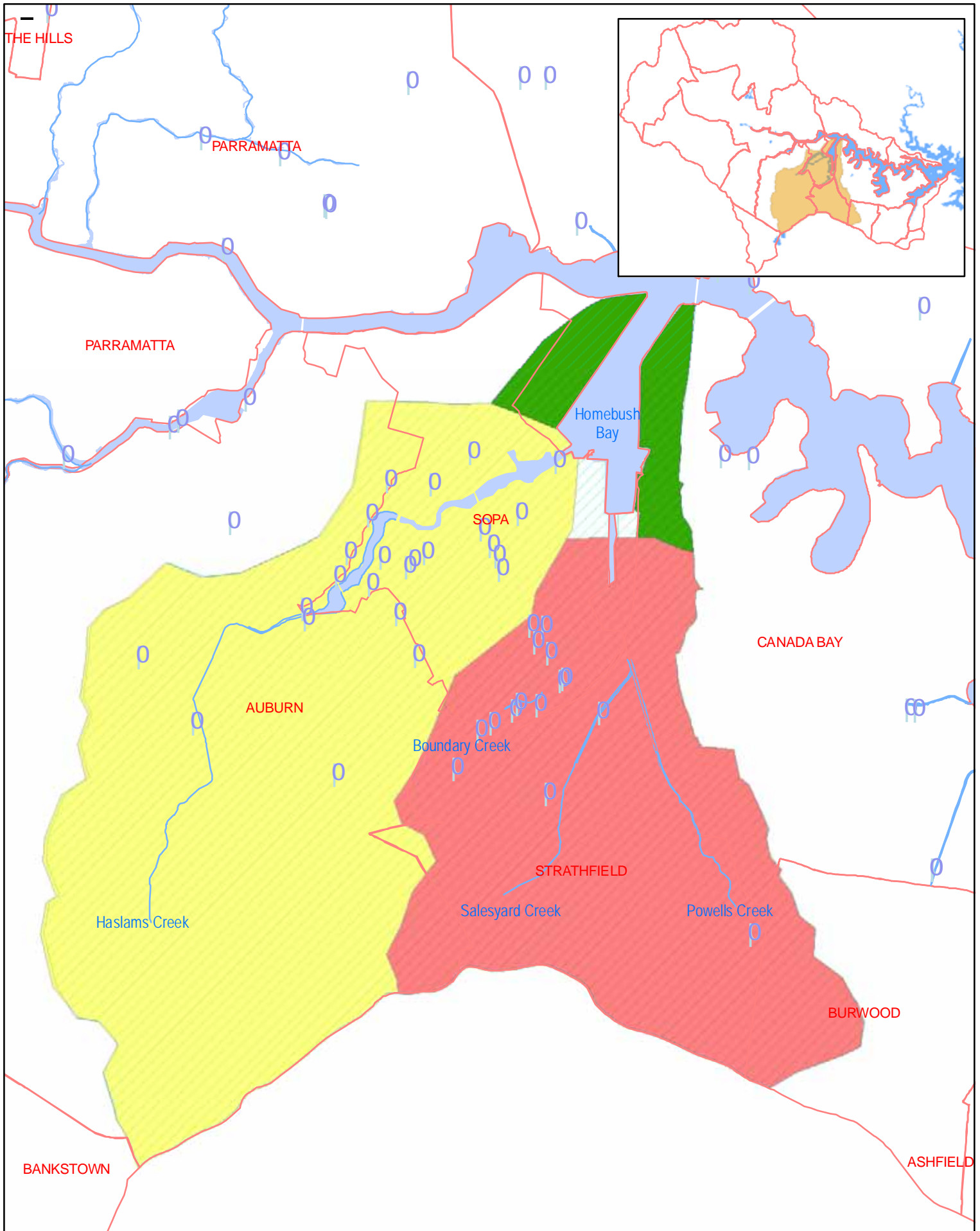
- Auburn, Strathfield, Burwood and City of Canada Bay Councils, and SOPA;
- Sydney Water (SW) – management of stormwater drainage in identified major drainage systems;
- NSW Roads Traffic Authority (RTA) – responsible for the management of stormwater from the M4 Motorway, Parramatta Road, Centenary Drive, Olympic Drive and Homebush Drive;
- State Rail Authority (SRA) – stormwater drainage from rail and associated facilities, most of which discharges directly into Council or SW stormwater drainage systems; and
- Rookwood Necropolis – stormwater management in cemetery

Table 3-5 summarises those stormwater devices found within the Homebush Bay catchment area, however this information will need to be updated. As per Section 3.2, not all stormwater device information has been captured during this study. Additionally, the locations of a number of GPTs included in Table 3-5 have also been approximated and should be considered only as an indicative location represented on GIS layers prepared for this study.

Table 3-5. Homebush Bay Catchment Stormwater Devices

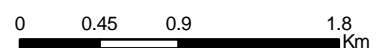
Name	Location	Waterway	LGA
Litter Boom	Downstream M4, Homebush Bay	Haslams Creek	Auburn
Trash Rack	Australia Avenue, Homebush	Boundary Creek	Auburn-SOPA
Trash Rack	Australia Avenue, Homebush	Boundary Creek	Auburn-SOPA
CDS Unit	NWF, Sydney Olympic Park	Haslams Creek	Auburn-SOPA
CDS Unit	Sydney Olympic Park	Powells Creek	Auburn-SOPA
CDS Unit	Downstream M4, Sydney Olympic Park	Boundary Creek	Auburn-SOPA
CDS Unit	Newington	Haslams Creek	Auburn-SOPA

Name	Location	Waterway	LGA
CDS Unit	Newington	Haslams Creek	Auburn-SOPA
CDS Unit	Newington	Haslams Creek	Auburn-SOPA
CDS Unit	EWQP, Sydney Olympic Park	Haslams Creek	Auburn-SOPA
Litter Boom	Bennelong Rd, Homebush Bay	Haslams Creek	Auburn-SOPA
CDS Unit	Sydney Olympic Park	Powells Creek	Auburn-SOPA
Gross Pollutant Trap	Lidcombe Oval and Velodrome	Haslams Creek	Auburn- Sydney Water
Gross Pollutant Trap	Phillips Park, Lidcombe	Haslams Creek	Auburn-Sydney Water
Trash Racks x 6	Flemington Shopping Centre	Powells Creek	Strathfield
Trash Racks x 16	Strathfield Shopping Centre	Powells Creek	Strathfield
Trash Racks x 13	Homebush Shopping Centre	Boundary Creek	Strathfield
Litter Boom	Bressington Park, Homebush	Powells Creek	Strathfield-Sydney Water



PARRAMATTA RIVER ESTUARY PROCESSES STUDY
HOMEBUSH BAY CATCHMENT

AUG 2010
60097281



3.7 Iron Cove Bay Catchment

3.7.1 Description

The Iron Cove Bay catchment has an area of approximately 1,815 ha, of which 43% lies within Ashfield LGA, 21% in Leichhardt, 13% in Burwood, 13% in City of Canada Bay, and 9% in Marrickville LGAs.

The main tributaries of Iron Cove Bay are Hawthorne Canal and Dobroyd Canal, with the remaining flows to the bay conveyed through lesser stormwater drainage lines.

Hawthorne Canal drains a sub-catchment area of approximately 616 ha of which 71% is residential; 6% light industry; and 4% comprises commercial land use. Dobroyd Canal drains a sub-catchment area of 848 ha with urban development covering almost all of the area (refer Figure 3-4).

The remaining contributing catchment areas include 194.3 ha on the eastern shore of the bay (within Leichhardt LGA), and a further 156.3 ha on the western shore of the bay within (Canada Bay LGA). These areas are predominantly residential with open space concentrated along the foreshore.

3.7.2 Stormwater Management

Both Hawthorne and Dobroyd Canals are tidally influenced open concrete channels which are designed to rapidly deliver high volumes of runoff to the estuary. Sydney Water (SW) is responsible for all of Dobroyd Canal, and Hawthorne Canal to the downstream limit at Marion Street.

Historically, both Hawthorne and Dobroyd Canals have been shown to convey heavy loads of gross pollutants and oils as well as dissolved and suspended contaminants (Woodlots and Wetlands, 1999). Woodlots and Wetlands (1999) identified both canals as pollution 'hot spots' with Hawthorne Canal disproportionately conveying contaminant loads at least three times that expected from modelled or otherwise anticipated inputs compared to catchment size.

It is recognised that ten years has passed since the Woodlot and Wetland assessment (2009) and many pollution control initiatives have since been implemented by relevant regulatory authorities (e.g. SW, local government authorities). However during field inspections, sediments deposited immediately downstream of Hawthorne Canal were found to be extremely high in fine silt and organic matter, particularly deciduous plant matter, and previously mapped seagrass beds were not detected.

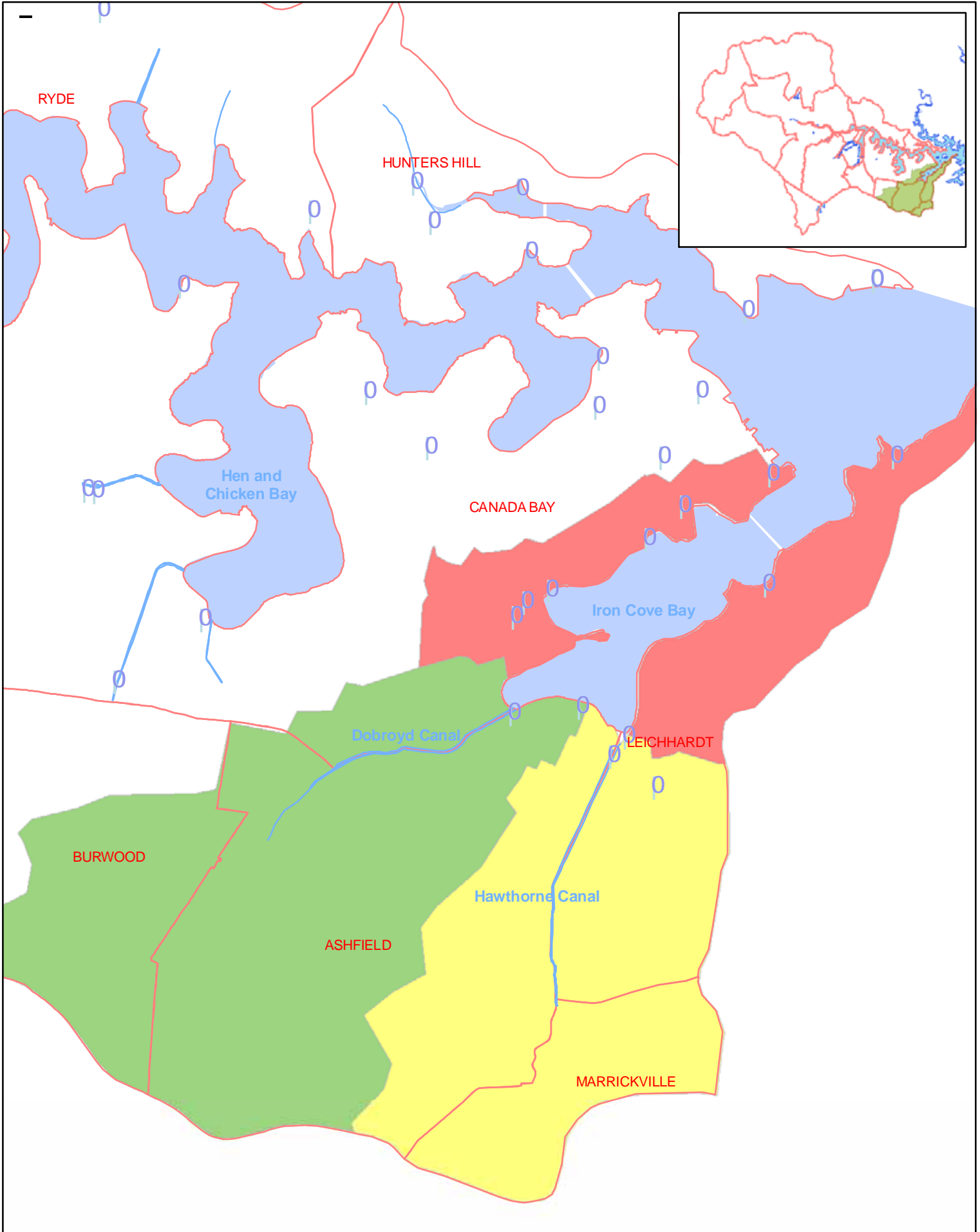
SW maintains two litter booms that collect litter and other gross pollutants from both canals. Table 3-6 summarises the amount of litter collected from these booms annually and Table 3-7 summarises those stormwater devices found within the Iron Cove Bay catchment area, however this information is not complete, as per Section 3.2.

Table 3-6. Litter collected from SW booms

Litter Collected (cubic metres)				
Canal	2004/05	2005/06	2006/07	2007/08
Dobroyd	23.11	20.24	9.65	9.36
Hawthorne	50.96	27.10	35.05	36.60

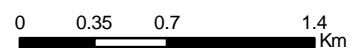
Table 3-7. Iron Cove Bay Stormwater Devices

Name	Location	Waterway	LGA
CDS Unit	Brent Street, Rodd Point	Rodd Point	Canada Bay
CDS Unit	Barnstaple Road, Five Dock	Rodd Point	Canada Bay
CDS Unit	Noble Street, Five Dock	Rodd Point	Canada Bay
CDS Unit	Brett Park nr Day Street, Drummoyne	Sisters Bay	Canada Bay
CDS Unit	Henley Marine, Drummoyne	Half Moon Bay	Canada Bay
CDS Unit	Dawn Fraser Swimming Pool, Balmain	Iron Cove Bay	Leichhardt
Net Tech	Leichhardt Park	Iron Cove Bay	Leichhardt
Gross Pollutant Trap	King Georges Park, Leichhardt	Iron Cove Bay	Leichhardt
Gross Pollutant Trap	Francis Street, Leichhardt	Iron Cove Bay	Leichhardt
Trash Rack	Richard Murden Reserve, Haberfield	Iron Cove Bay	Ashfield
Litter Boom	Dobroyd Canal	Iron Cove Bay	Ashfield – Sydney Water
Litter Boom	Hawthorne Canal	Iron Cove Bay	Leichhardt – Sydney Water



PARRAMATTA RIVER ESTUARY PROCESSES STUDY
IRON COVE BAY CATCHMENT

AUG 2010
60097281



3.8 LGAs Stormwater Devices

Table 3-8 provides a summary of each LGA's catchment area, the number of (known) pollution control devices within each LGA, and reported quantities of waste collected (where available).

Table 3-8. LGA catchment areas, no. of GPTs and / or waste removed

LGA	Catchments (ha)	Area (ha)	No. of GPTs	Waste (tonnes / yr)	Comments
Ashfield	Iron Cove Bay	777	nd	nd	
Auburn	Homebush Bay, Duck River	3,150	nd	61+	2007-08: data for all of LGA, does not include those maintained by SOPA
Bankstown	Duck River	926	68-	207-	2007-08: data for all of LGA, includes waste collected outside study area
Blacktown	Upper Parramatta River	2,386	125	207-	2007-08: data for all of LGA, includes waste collected outside study area
Burwood	Iron Cove Bay, Hen & Chicken Bay, Homebush Bay	243	nd	nd	nd
Canada Bay	Iron Cove Bay, Hen & Chicken Bay, Homebush Bay, Majors Bay, Yaralla Bay, Brays Bay, Kendall Bay, Abbotsford Bay, Five Dock Bay, and River South	1,980	22	79+	2007-08: data from 12 of 22 devices
Holroyd	Duck River, Upper Parramatta River	2,683	34	156	2007-08: data for all of LGA
Hunters Hill	Tarban Creek, River North	328	31-	3-	2008-09: data for all of LGA, includes waste collected outside study area
Leichhardt	Iron Cove Bay, River South	390	40-	144-	2007-08: data for all of LGA, includes waste collected outside study area
Marrickville	Iron Cove Bay	173	nd	nd	nd
Parramatta	Upper Parramatta River, Vineyard Creek, Ponds-Subiaco Creeks, Duck River, River South and North	5, 681	44	135	2006-07: data for all of LGA

LGA	Catchments (ha)	Area (ha)	No. of GPTs	Waste (tonnes / yr)	Comments
Ryde	River North, Archers Creek, Smalls Creek, Charity Creek, Bedlam Bay, Glades Bay, Looking Glass Bay	1,292	10	209-	2008-09: data for all of LGA, includes waste collected outside study area
Strathfield	Homebush Bay	653	35	nd	Trash racks only
The Hills	Upper Parramatta River, Vineyard Creek	4,389	nd	nd	nd
Sydney Olympic Park	Homebush Bay, River South	550	32	nd	nd
Sydney Water	n/a	n/a	12	nd	nd
Total Area	25,051	25,051	429+/-	1,071+/-	
nd	No data				
-	Denotes less waste likely to be collected due to total no. of GPTs and/or waste collected within catchment outside of study area				
+	Denotes more waste likely to be collected as data available for only some of the GPTs				
+/-	Denotes less or more waste likely to be collected as data set incomplete, and yearly reporting inconsistent				

It should be noted that each Council conducts a number of stormwater management initiatives in addition to the operation and maintenance of stormwater pollution control devices. These initiatives typically include:

- Street sweeping, which on average is conducted on a weekly basis in high usage commercial areas (such as shopping centres and business districts), and on a two to three weekly basis in residential and other land use areas;
- Stormwater harvesting and re-use projects;
- Water Sensitive Urban Design (WSUD);
- Incorporation of stormwater management policies and requirements in development control plans (DCPs);
- Drain stencilling and other environmental education activities;
- Creek rehabilitation projects which aim to arrest erosion and prevent sedimentation from entering the estuary; and
- Annual Clean Up Australia Day events which include sites within the study area.

NSW Maritime's Environmental Services team remove more than 3,500 cubic meters per year of rubbish from both Parramatta and Lane Cover Rivers. Rubbish collected ranges from large objects such as trees and tyres to the debris washed into the harbour from harbour side suburbs and small items left behind on beaches and other foreshore locations by members of the public.

3.9 Management Considerations

3.9.1 Stormwater Management Plans

In the late 1990s, the NSW Government partly funded the preparation of stormwater management plans (SMPs) in urban catchments across the State. The then Environment Protection Authority was responsible for administering this program and issued relevant directions to Councils and other stakeholders (e.g. RTA, SW) to produce plans covering their areas of responsibility.

This program resulted in the preparation of a number of SMPs, which were adopted in 1999 with a three year implementation strategy. SMPs relevant to the study area include the following:

- Duck River Stormwater Management Plan (1999, *Reviewed in 2004 – by Bankstown City Council along with other SMPs for catchments in the Bankstown LGA*):
Prepared for Auburn; Bankstown; Holroyd; and Parramatta Councils;
- Homebush Bay Catchment Stormwater Management Plan (1999):
Prepared for Auburn; Burwood; Concord; and Strathfield Councils; and the Olympic Coordination Authority;
- Lower Parramatta River Stormwater Management Plan (1999):
Ashfield, Burwood, Concord, Drummoyne, Hunters Hill, Leichhardt, Marrickville and Ryde Councils;
- Mid Parramatta River Stormwater Management Plan (1999)
Councils of Parramatta City and Ryde City;
- Upper Parramatta River Stormwater Management Plan (1999, *Revised 2002*):
Prepared for Baulkham Hills, Blacktown, Holroyd and Parramatta Councils, and the Upper Parramatta River Catchment Trust.

It is unclear as to what proportion of the recommendations made in the above listed SMPs have been implemented. Bankstown City Council conducted a review of several SMPs (2004-2008) and found that many actions were not completed because they were:

- Underestimated in terms of workload, resources and time required;
- Deemed not feasible for economic, social or environmental reasons;
- Put on hold awaiting the outcome of other studies;
- Categorised as completed when they had only been investigated and not carried out; or

- Some recommended actions constitute core business, such as maintenance of pollution control devices and street sweeping.

It is further understood that the review of SMPs has happened, for the most part, in isolation of surrounding Councils and stakeholders. Only a very small number of projects happened collaboratively and not all of the catchment groups that were formed for the initial SMP development in 1998/1999 continue to meet on a regular basis.

3.9.2 Management Recommendations

The estuary's catchment is highly variable in character, and stormwater management must reflect this variation, i.e. ensuring that management activities and prioritisation of such are appropriately targeted. At the present time, there is insufficient information to appropriately inform and prioritise management activities on a catchment wide basis.

The following recommendations are aimed at filling existing knowledge gaps and providing a uniform template from which the Parramatta River Estuary Committee will be better guided:

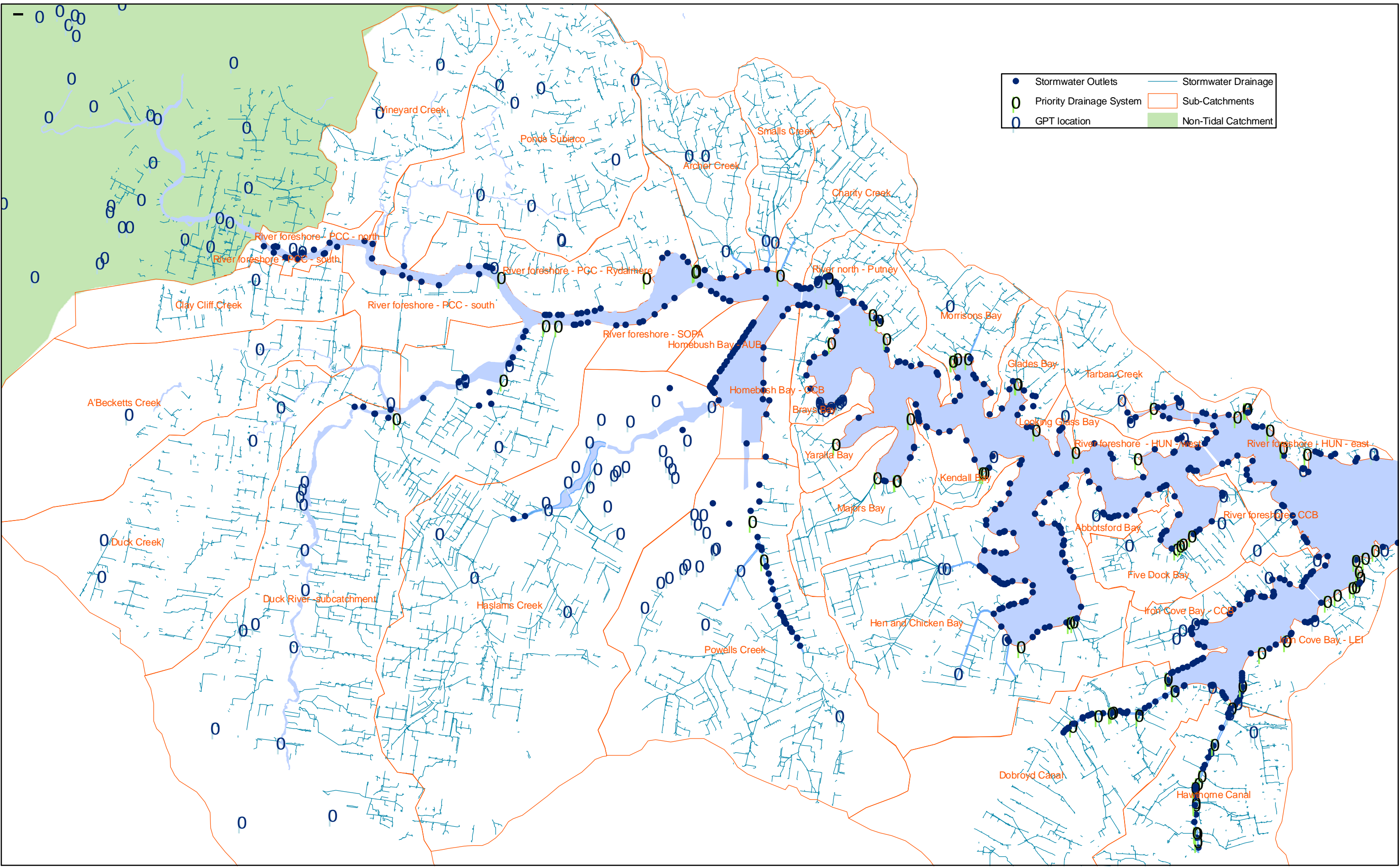
- Consolidation of stormwater management activities and reporting conducted by all stakeholders, including auditing of the stormwater management plans listed in Section 3.9.1;
- Facilitate uniformity of data collection and reporting format between stakeholders;
- Update knowledge gaps in terms of number, type and location of stormwater devices, and data collection of gross pollutants removed from each device (i.e. many Council's only report a total volume per annum for all devices, which doesn't allow for sufficient assessment of the appropriateness of either (a) the device, or (b) the maintenance regime); and
- Update and improve existing GIS / spatial data in terms of waterways, drainage lines, catchment and LGA boundaries, many of which are either outdated or inaccurate.

3.9.3 Prioritisation of Drainage Catchments

In the absence of comprehensive and consistent data relating to stormwater management devices for each catchment and / or LGA, the following sub-catchments preliminarily appear to warrant additional gross pollutant management:

- Duck River sub-catchments;
- Homebush Bay, upper catchment areas;
- Charity Creek;
- Glades Bay;
- Bedlam Bay;
- Yaralla Bay;
- Majors Bay;
- Hen and Chicken Bay;
- Five Dock Bay; and
- Iron Cove Bay: Upper reaches of both Hawthorne Canal and Dobroyd Canal

Further management recommendations in relation to stormwater management are provided in LGA specific management summaries (Section 9.0). Figure 3-5 identifies all stormwater outlets draining to the estuary, and highlights drainage systems in which gross pollutant control may be warranted. This was based on the location of existing GPTs, catchment size, sensitivity of downstream aquatic environment and land use within each catchment.



● Stormwater Outlets	— Stormwater Drainage
○ Priority Drainage System	▭ Sub-Catchments
○ GPT location	■ Non-Tidal Catchment

PARRAMATTA RIVER ESTUARY PROCESSES STUDY
 GROSS POLLUTANT CONTROL PRIORITY CATCHMENTS

AUG 2010
 60097281

