

Cost Allocation Manual

**For the allocation of costs to the Declared
Services: Bondi, Malabar and North Head
sewerage reticulation networks**

May 2019

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Version history

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June 2018	Chwee Lim	KPMG	Kevin Jones, Chief Financial Officer	New sections 1, 2, New appendices A, B, C, D, E
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1 Purpose, scope, principles and governance of the cost allocation manual

1.1 Purpose

The purpose of this Cost Allocation Manual (CAM) is to describe the cost allocation method that Sydney Water proposes to use to calculate its costs for the declared services¹ provided to third parties.

Allocation of costs in a shared network is a complex exercise. This Manual explains Sydney Water's cost allocation methodology and describes how Sydney Water:

- distinguishes between direct and indirect costs;
- attributes and allocates costs to declared services; and
- calculates the costs of the declared services to reflect the costs associated with the provision of each service.

By explaining the basis of how costs have been, or will be, allocated, this Manual will assist access seekers in their discussions and negotiations with Sydney Water. It should also assist IPART if it is called upon to arbitrate a dispute as to terms of access to the declared services, and it demonstrates compliance with IPART's Cost Allocation Guide.²

Through providing the method for allocating the costs associated with the provision of the declared services, the CAM allows new entrants to make appropriate investment decisions reflecting the cost of service. Thereby the CAM can facilitate the efficient entry and competition in services either upstream or downstream of the declared service.

1.1.1 Legislative context – the WIC Act

Section 42 of the *Water Industry Competition Act 2006* (WIC Act), extracted below, requires Sydney Water to prepare and maintain a CAM for declared services:

42 Service providers to have approved cost allocation manuals

- 1) Within 3 months after an infrastructure service becomes the subject of a coverage declaration, the service provider:*
 - a) must keep separate accounts for such of its infrastructure services as are the subject of the declaration; and,*
 - b) must submit a cost allocation manual to IPART in relation to that infrastructure.*
- 2) A cost allocation manual must be in the form of a document that, in accordance with any rules under subsection (3), sets out the basis on which the service provider proposes to establish and maintain accounts for those of its infrastructure services as are the subject of a coverage declaration.*

¹ See definition in section 1.1.2

² IPART, "Cost Allocation Guide – Water Industry Competition Act 2006, March 2018."

3) *The Minister may from time to time, by order published in the Gazette, establish rules for the preparation of cost allocation manuals.*

1.1.2 Declared services

A declared service is one which is covered by the access regime established under Part 3 of the WIC Act³ and subject to a Coverage Declaration.

The intent of the access regime is to promote competition in upstream or downstream water industry infrastructure markets.

A Coverage Declaration establishes a legal right⁴ to negotiate access to the service at a price⁵, and if necessary have access disputes determined through arbitration. The CAM is a key tool to assist in calculating the access price.

The declared services at the commencement of the WIC Act were, and remain at this date, Sydney Water's North Head, Bondi and Malabar sewerage reticulation networks.

Appendix B outlines Sydney Water's operations broadly and more specifically details the declared sewerage transportation services as required by IPART's Cost Allocation Guide.

Some declared services may be non-standard in nature, such as interconnection services, and dependent on the unique circumstances of a third-party access proposal. Appendix C outlines the details of declared sewerage interconnection services as required by IPART's Cost Allocation Guide.

1.2 Scope

The purpose of the CAM limits the scope of application of the CAM to the declared sewerage services only - Sydney Water's North Head, Bondi and Malabar sewerage reticulation networks. Specifically, for these three networks, the Coverage Declarations capture:

- the transportation of wastewater, and
- interconnection services.

In more detail, these include:

- A service for the transportation of wastewater provided by means of either the Bondi, Malabar and North Head sewerage reticulation networks, from a customer's boundary trap to points of interconnection
- A service for the connection of new sewers to the Bondi, Malabar and North Head sewerage reticulation networks at points of interconnection.

The CAM describes how Sydney Water allocates total regulated costs for the declared services. As a result of the regulation of Sydney Water's services, Sydney Water has available a regulated asset base and costs, as determined by IPART from the prevailing retail price determination.

³ See IPART, *"The NSW Water Industry Access Regime, A guide to the declaration of infrastructure under the Water Industry Competition Act 2006."*

⁴ Pursuant to Part 3 Division 6 of the WIC Act.

⁵ Coverage declaration does not entitle an access seeker to access.

These assets and costs are used as the base for calculating access prices for the declared services. This will help to promote consistency between regulated costs and access prices.

1.3 Principles supporting the CAM

Sydney Water has adopted several principles in the development of its CAM. These include the principles outlined in IPART's Cost Allocation Guide, plus two other additional broad principles. Each is outlined below.

1.3.1 Principles adopted from IPART's Cost Allocation Guide

The causality principle in allocating costs

Sydney Water understands and interprets this principle to be that all costs (capital and operating) must be allocated to the relevant service which causes those costs to be incurred.

More specifically, Sydney Water's sewerage treatment systems (Systems) are defined by geographic boundaries (see Figure 8 in Appendix B). They are discrete and do not interconnect. As a result, direct capital costs are identified at a geographic System level.

This concept is extended to a high proportion of operating costs, and further attributed to the specific declared services within the Systems. For example, approximately 75% of wastewater operating costs are attributed to or allocated on a causal basis, via one of the following relationships:

- a direct cost traceable to the provision of the service. For example, the cost of electricity to operate individual pumps in a wastewater network
- a direct cost, but an allocator based on verifiable relationship is used to allocate to individual service. For example, the bulk cost of treatment chemicals is allocated to treatment plants on an actual usage basis
- a shared (pooled) cost where a relevant, reliable and verifiable causal relationship, such as relative use, exists for use as an allocator. For example, odour monitoring costs, which are allocated to wastewater transport plant by throughput.

Allocating costs where a causal relationship cannot be established

We interpret this principle to mean where a causal relationship does not exist, or where it is not practicable to precisely identify and measure causal allocators, it is then necessary to substitute a close approximation to an ideal causal allocation. We use this approach for allocating corporate overhead costs which are common and are not directly linked to services.

Section 2 of the CAM sets out the method for allocating indirect costs and the rationale for the choice of allocators.

Total costs to be allocated

We understand this to be that the sum of costs of each service must add up to the annual allowable regulated revenue requirement of each service.

For Sydney Water, a cross-check is built into our cost allocation worksheets, as part of broader governance and quality assurance processes (see section 1.4), which ensures that the total cost of the wastewater service equals the forward-looking costs determined by IPART in the prevailing retail price determination.

A cost should only be allocated once

We interpret this principle broadly to be that costs within a service, as well as between services should only be counted or allocated once. There should be no cross subsidisation.

As with the cross-checks/governance outline in the 'Total costs to be allocated' principle, a separate reconciliation exercise of costs with IPART's determined costs ensures that costs are only allocated once, precluding double counting or over allocation. This will demonstrate that cost has been neither created nor lost as a result of the allocation.

Periodic review of the basis for cost allocation

Sydney Water understands this principle to be one in which allocators should not be regarded as static or permanent, and as such allocators should be updated as often as is practical, to ensure causal relationships remain relevant.

As part of Sydney Water's governance process, we will update allocators periodically as technologies and operations trigger change or improved allocators become available. The basis and frequency for review of the cost allocation method is addressed in section 1.4.2.

1.3.2 Additional broad principles adopted

Allocations of costs between Services are to be on a mutually consistent basis

This principle means that Sydney Water will not, for example, allocate the same type of cost by use of different allocators for different services or Systems within the same service. If different allocators are used to allocate a single category of cost to different services, then it will not be possible to demonstrate that:

- a shared cost has been allocated completely and that the allocated costs in total do not exceed the shared cost, and
- the resulting allocations represent allocations of efficient cost.

Can be practically implemented

We take this principle to mean that although ideal allocators are always preferred, in some cases it may not be practicable to precisely identify and measure causal allocators of cost without undue cost and effort. In such cases, Sydney Water substitutes a close approximation to an ideal allocator which will not result in allocations materially different to those of an ideal causal allocation. Our rationale for selection of cost allocators is provided in section 2.

1.3.3 WIC Act pricing principles

The Act requires that, if called upon to approve an access undertaking or determine a dispute in relation to access pricing, IPART must have regard to the pricing principles set out in section 41 of the Act.

Adherence to the principles set out in sections 1.3.1 and 1.3.2 ensures that the CAM complies with the WIC Act pricing principles. This means that the CAM employs a fully allocated cost framework based on justified causal allocators which:

- a) ensures that there is no double counting of costs, as the allocation of costs must be capable of reconciliation to the total costs being allocated.
- b) avoids the allocation of any cost that is not fairly attributable to a service.

Through the application of this CAM, the price of access for the declared services will reflect the cost incurred in providing the service and ensure that there is no cross-subsidisation between Sydney Water's services at the expense of its potential competitors in upstream or downstream markets.

1.4 Governance

This section outlines the relevant accountabilities within Sydney Water for the initial implementation, continued application, maintenance/updates, internal monitoring, reporting and quality assurance of the CAM and separate accounts.

1.4.1 Accountabilities and responsibilities

Overall responsibility for the governance and sign-off of the CAM is with the Managing Director. A statement signed by the Managing Director and Chief Financial Officer, as part of the governance of the CAM, is included as Appendix A.

Sydney Water's Finance Services Group has overall responsibility for updating, maintaining and applying the CAM. Table 1 sets out the specific accountabilities and responsibilities for updating, maintaining, applying and monitoring the application of the CAM.

Records and information systems described in the CAM will be available for external audit at Sydney Water's head office.

Table 1 - CAM accountabilities and responsibilities

Role	Accountability and/or responsibility
Managing Director	<ul style="list-style-type: none"> Accountable for approving the CAM in accordance with Section 42 of the WIC Act requirement
Chief Finance Officer	<ul style="list-style-type: none"> Responsible for endorsing the CAM, and ensuring its implementation to establish and maintain separate cost accounts for each of its declared services
Head of Commercial Performance, Finance Services	<ul style="list-style-type: none"> Responsible and accountable for applying the detailed principles and policies described in this CAM as the basis for attributing costs to, or allocating costs between categories of Sydney Water's wastewater declared services Implement the CAM and maintain associated costing procedures and guidelines for staff Day-to-day responsibility for updating, maintaining, applying, internally monitoring and reporting on the application of the CAM
Head of Regulatory Economics	<ul style="list-style-type: none"> Provide advice on design, implementation and ongoing compliance obligations for the CAM Monitor and advise on relevant changes to the Cost Allocation Guidelines or any other regulatory developments that may impact on the CAM
All staff	<ul style="list-style-type: none"> Comply with all relevant costing procedures and guidelines

1.4.2 Duration and review

Following approval by IPART, this CAM will be considered current and will take effect at the date signed by Sydney Water's Managing Director. The CAM will remain and be considered current until it is periodically re-issued.

The CAM will be reviewed at the beginning of each regulatory pricing period. A review of the CAM may also occur in the event of major changes to Sydney Water's business that could impact the provision of services or the capture and recording of costs. This may include declaration of additional sewerage services or the replacement of the accounting and reporting systems.

Proposed changes to the CAM will then be submitted to IPART for approval in accordance with published guidelines.

1.4.3 Cost source for reconciliation

For the purposes of this CAM, Sydney Water uses the asset base and costs from the prevailing retail price determination as a base for calculating access costing for declared services. This ensures consistency between Sydney Water's regulated cost base and costs used for allocation to

declared services. Appendix D provides an explanation of IPART's prevailing retail price determination.

1.4.4 Compliance checklist

This section outlines the location of the content required to be provided in the CAM as required IPART's Cost Allocation Guide.

Compliance with IPART's Cost Allocation Guide formal requests

Table 2 - Checklist of compliance with IPART's Cost Allocation Manual Guide

IPART Requested Requirements	CAM Location
A version history and date of issue for the document	Page 1
A statement of the nature, scope and purpose of the document and the way in which it is to be used by the service provider.	Page 2 – 4
Details of accountabilities within the service provider for the document to set out clearly: <ul style="list-style-type: none"> • the service provider's commitment to implementing the cost allocation manual, and • responsibilities within the service provider for updating, maintaining and applying the cost allocation manual and for internally monitoring and reporting on its application. 	Page 6
Statement signed by MD and CFO attesting that the information contained in the Cost Allocation Manual is accurate and the service provider intends to comply with the Cost Allocation Method	Appendix A Page 34
A description of the service provider's operational structure, including its water and wastewater systems, the services within these systems and non-financial data that can inform cost allocation (including, for example, water and/or wastewater flows per system and key assets per system).	Appendix B, pages 35 to 39
Details of non-standard declared services i.e.: Interconnections	Appendix C Page 40
The service provider's cost allocation methodology, which includes the detailed principles and policies to be used for attributing costs directly to, or allocating costs between, its systems and services.	Page 4 – 6 and 10 - 15
A description of how and where the service provider will maintain records of the attribution or allocation of costs to its infrastructure services, in order to enable such contribution or allocation to be audited or otherwise verified by a third party, including IPART, if required.	Page 6 – 7

A description of how the service provider will monitor its compliance with the cost allocation methodology specified in its cost allocation manual.	Page 6
A description of how a service provider will review and, if necessary, update its cost allocation manual.	Page 7
Contact details for stakeholders who have questions related to the cost allocation manual.	Page 1
Explanation and justification for allocating the Regulatory Asset Base (RAB) across services	Page 15 - 21, and Appendix E
Explanation and table showing the key allocation principles and methodologies underpinning the capital costs capturing process to allocate its capital costs.	Page 21 – 22
Explanation and tables showing the key drivers underpinning the allocation of operating and maintenance costs in the Value Driver Model (VDM) that Sydney Water uses to allocate its operating costs.	Page 23 – 33
A more comprehensive list of direct operating Cost Items, and how/why these items are classified as 'direct'; how these relate to relevant cost allocation principles (including the cost allocation principles listed in IPART's Draft Cost Allocation Guide)	Page 25, and Table 6
A more comprehensive list of shared (indirect) Cost Items, the means of allocating each of these items to services (Cost Objects) and the justification or rationale for each means of allocation; how these relate to relevant cost allocation principles (including the cost allocation principles listed in IPART's Draft Cost Allocation Guide)	Page 30, and Table 7, Table 8

2 Cost allocation methods and policies

This section begins by broadly outlining the general overview of the process that Sydney Water adopts in attributing and allocating its costs to its declared services. It then briefly explains Sydney Water's accounting and reporting systems, which are the sources of data and information that feed into the cost allocation process, and how these systems implement the cost allocation method. The section then concludes by describing in detail the cost allocation process across different categories of costs.

2.1 Overview - cost allocation to declared services

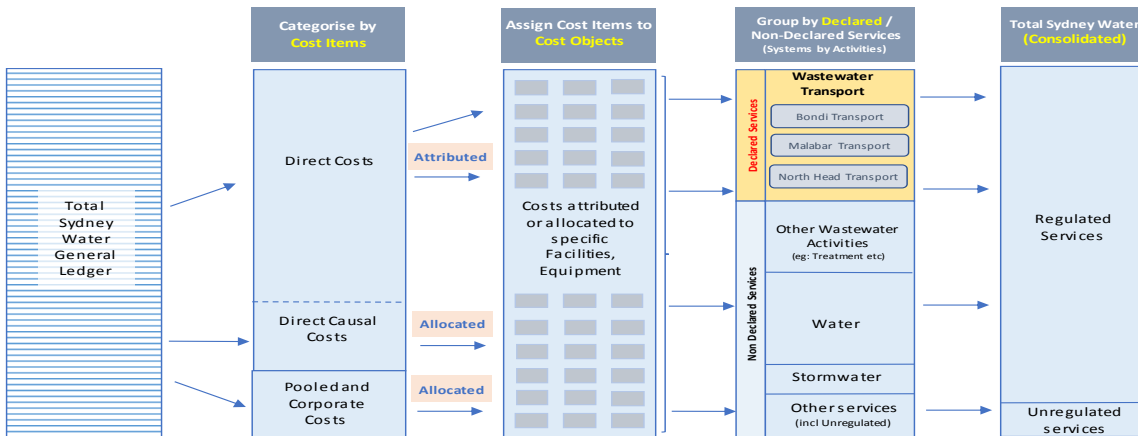
Under Sydney Water's cost allocation methodology, all costs are categorised as a 'type' of cost, known as a Cost Item. These costs are then organized into whether they are direct, direct causal, or shared (pooled and corporate) costs.⁶ The Costs Items are then attributed or allocated to Cost Objects and eventually to its relevant service (including the declared services), in line with the principles set out in this CAM. This is shown in Figure 1.

- Direct costs are costs where a direct traceable cause and effect relationship with the provision of the service can be demonstrated. These can either be directly attributed to the service or allocated on a causal basis where allocation is needed, and a clear verifiable traceable cause and effect relationship exists between the item and the output of the service.
- Pooled and corporate costs are both shared costs. In respect of pooled costs, there exists a relationship where the allocation of the cost can be made using a relevant, reliable and verifiable factor. Corporate costs are not directly linked to services (i.e. are indirect) and are instead allocated on a practical and reasonable basis.

Further details on the cost hierarchy and the method of cost allocations are laid out in the later part of this section.

⁶ This terminology is slightly different from the terms used in IPART's Cost Allocation Guide which distinguishes between direct and indirect costs. This is primarily because under our reporting systems the majority of declared service costs are directly traceable or have a relevant, reliable and verifiable causal relationship, to individual Cost Objects. For example we have referenced pooled costs as a direct cost as they are allocated on a direct causal basis while under the Guide they could be viewed as an indirect cost. The use of different terminology does not have any impact on the outcomes of the cost allocation methodology used by Sydney Water which have been drafted to align with IPART's principles as discussed in section 1.

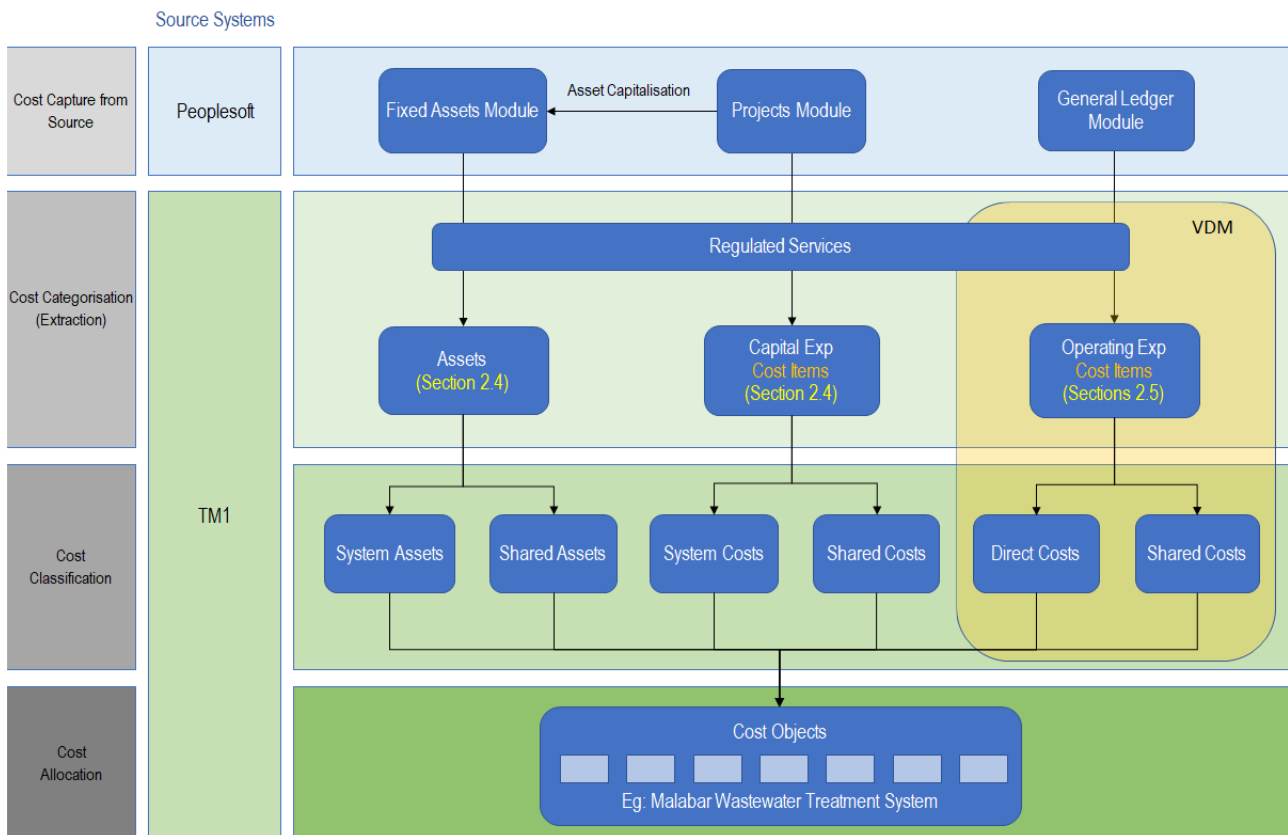
Figure 1 - High-level overview of Sydney Water’s cost allocation process



2.2 Sydney Water’s accounting and reporting systems

The calculation of Sydney Water’s costs starts with source inputs from two of its financial management, accounting and reporting systems: *PeopleSoft* and *TM1*. These systems are used to supply and process data for Sydney Water’s cost allocation process. Their roles in Sydney Water’s costing processes are shown in Figure 2.

Figure 2 - Sydney Water’s cost disaggregation process



2.2.1 *PeopleSoft* system

Sydney Water uses *PeopleSoft* as a financial management forecasting and reporting system to capture its costs. This includes IPART's determined cost allowances for Sydney Water.

PeopleSoft is Sydney Water's primary financial system for both statutory and regulatory financial reporting purposes. The system itself and the financial information therein is subject to annual external scrutiny and reviews. There is a dedicated accounting team that manages the internal controls, master data, security of information, as well as integration with other systems and reporting tools.

For operating expenditure, the general ledger cost and payroll accounts are used to collect and forecast inputs such as labour, chemicals, materials and subcontract services. These costs are assigned to each cost centre (rolled up to business unit levels), and provide an input view of costs, which support much of the internal forecasting and statutory reporting within Sydney Water.

For capital expenditure, costs are recorded and budgeted in projects modules in *PeopleSoft*, and work orders in the Maximo Asset Management system, and the capital project costs are ultimately capitalised to an asset in the Fixed Asset Register in *PeopleSoft*.

2.2.2 *TM1* system

Sydney Water uses the *TM1* system to receive and extract actual and forecast data from the financial management and forecasting systems, for analytical and summary reporting purposes. Similar to *PeopleSoft*, the *TM1* system is managed as part of Sydney Water's financial management process.

In *TM1*, each cost is categorised and organised as a 'type' of cost, known as a **Cost Item**⁷ (for example, chemicals, electricity and labour). The Cost Items are then assigned to particular operations, equipment or facilities, known as **Cost Objects**. For example, a cost may be attributed to an asset which is part of the Malabar reticulation network, which is one of the declared services. A Cost Object is any activity or asset for which costs can be separated measured.

For the purpose of this CAM, each Cost Object represents an individual component required to provide a declared service. Hence each Cost Object can be assigned to both a system and a service level. For example, electricity (Cost item) can be attributed to the Elizabeth Bay Sewage Pumping Station – SP0019 (Cost Object) which is part of the declared Bondi sewerage reticulation network (System).

Through this structure, it is possible to collect all relevant costs for a particular activity at a particular location, and then group the Cost Objects in such a way that they form the base cost for a particular service, in this case the declared services. Note that no Cost Object applies to more than one system or one service.

⁷ Cost Items created in *TM1* can be traced back to the cost centre (part of the general ledger and forecasting system that is subject to internal control processes). However, the Cost Items do not mimic the structure of the cost centres in the general ledger. Instead, they are based on organisational activities or processes such as the Mechanical/electrical Network Technician Cost Items, which reflect the whole departmental cost for a function.

For the purpose of the cost disaggregation process, three categories of costs are identified:

1. Assets
2. Capital Expenditure
3. Operating Expenditure

} Capital Related

Operating expenditure is either identified as direct, direct causal, or pooled and corporate costs. The pooled and corporate costs are generally shared costs, and the attribution or allocation of these costs to the relevant Cost Object is based on the nature of the expenditure and in accordance with this Manual, see Section 2.5.

The capital related costs represent a charge for (i) a return on capital at a WACC rate, and (ii) a depreciation type charge, and are allocated to Cost Objects.

The assets, together with the forecast capital expenditure, are identified as either relating to system assets, or shared asset costs. For example, shared asset capital costs could be related to non-system corporate or retail assets. Costs incurred for system assets are directly attributed to the asset that supports the Cost Objects. The attribution or allocation of capital expenditure for the non-system assets to the relevant Cost Object is based on the nature of the expenditure and in accordance with this Manual, see Section 2.4.

Sydney Water’s management systems and processes support identifying direct costs at a highly dis-aggregated level. The majority of total costs (more than 75%) are either directly attributable to Cost Objects or can be allocated on a directly causal basis. Only a small proportion of total costs comprise shared costs. These shared costs are appropriately allocated across Cost Objects using the most relevant cost allocator. The choice of allocator is discussed below.

2.2.3 Cost Objects hierarchy

Using Sydney Water’s hierarchy for organizing and assigning costs, (see Table 3 below), costs are generally allocated to the lowest Cost Object at which data is available for each Cost Item. For example, vehicle costs for treatment plants are allocated directly to the specific facility (level 80), while vehicle costs for networks are allocated using a driver based on network km to the Supply Zone (level 50).

Table 3 - Cost Objects hierarchy

Category	Level	Water / Recycled Water	Sewerage	Stormwater
Company	10	SWC	SWC	SWC
Service	20	Water / Recycled Water	Wastewater	Stormwater
System	30	Delivery System	WWTS	Receiving Water
	40	Distribution System	Catchment	Catchment
	50	Supply Zone	SCAMP	
	60	Pressure Zone		
	80	Facility	Facility	Facility

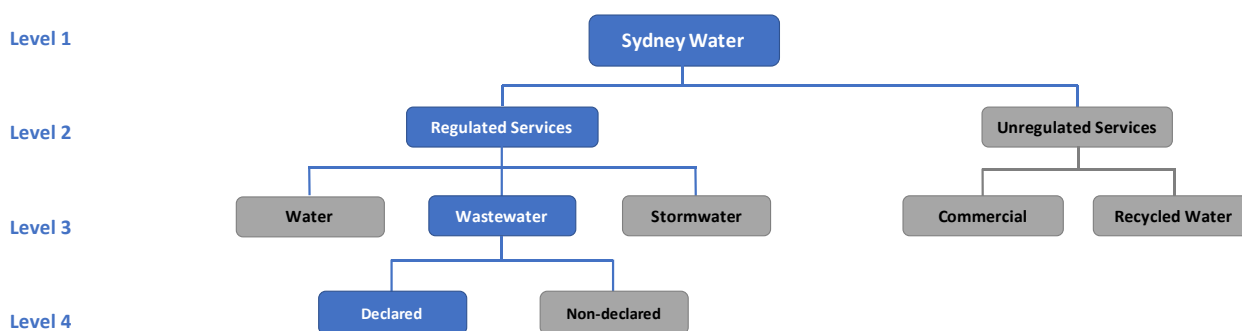
Includes costs for Declared Services

The TM1 system consolidates costs at the Wastewater Treatment System (WWTS)/ Delivery System (level 30) by service and by activity (Treatment/Transport). The three declared services, Malabar, Bondi and North Head, are Transport, so they are a subset of the total asset base directly aligned with the overall asset hierarchy. These declared services are the primary Cost Objects of the cost allocation process for this Manual.

2.3 Sydney Water’s cost hierarchy

Given that the scope of the CAM applies only to Sydney Water’s declared sewerage services, it is helpful to map out the position of the declared sewerage services in Sydney Water’s cost hierarchy, as shown in Figure 3.

Figure 3 - Hierarchy and cost disaggregation of declared services

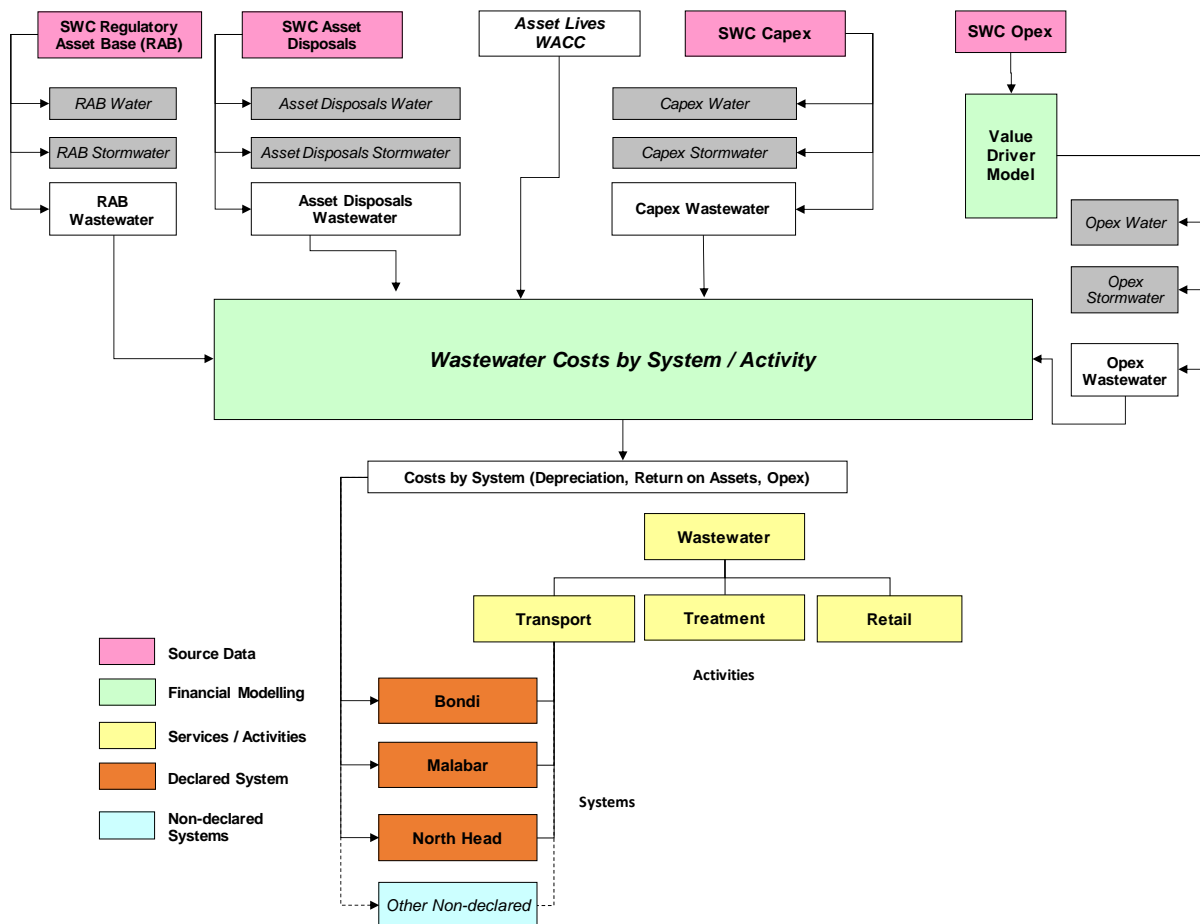


The subject of the CAM, declared sewerage services, is located at level 4 of the hierarchy, and is delineated from non-declared sewerage services.

At a further level of detail, Figure 4 shows the overall costing system relationships for Regulated Services, and in particular the Wastewater cost structure leading to Declared Services costs.

The cost of each declared service comprises capital related costs and operating costs, which are considered separately below.

Figure 4 - High level overview of cost allocation of regulated services



2.4 Capital related costs

A capital related cost represents a charge for i) a return on assets at a WACC rate, and ii) a depreciation type charge that re-pays the capital funding of regulated assets over the life of the asset. The depreciation charge is calculated in accordance with the methodology and asset lives determined by IPART in its retail price determination.

The key determinants for capital-related costs are Regulatory Asset Base (RAB) allocations and capital expenditure on system assets plus non-system assets.

2.4.1 Regulatory Asset Base

Sydney Water's return on assets depends on the RAB and the regulated rate of return (WACC), established by IPART.

The RAB was introduced by IPART in 1999-2000, with the value of the asset base aligned with Sydney Water's revenues for 1998-99. It was set at a level that was under half the depreciated replacement value of Sydney Water's assets at that time. The RAB is rolled forward at the beginning of each subsequent regulatory period to include actual capital expenditure from the previous period as assessed by IPART to have been efficient. Hence IPART determines the opening RAB value at the start of each regulatory period. Further, at each retail price determination IPART approves a forward capital expenditure program, the cost of which is taken account of in prices set during the determination.

Methodology to allocate the RAB to Cost Object level

The RAB as determined by IPART is divided into water, wastewater, stormwater and corporate assets. However, in determining the RAB, IPART does not disaggregate wastewater capital costs into either separate activities (e.g. transport, retail), or by geographic System. In addition, individual assets are not separately identified in the RAB as it is purely a financial construct. Thus, there is no direct connection between the RAB and individual assets.

To allocate the RAB across the geographic Systems and declared services, Sydney Water has established a 'line in the sand' opening RAB for 2016-17, at the start of the current retail price determination period. This is broken down into various relevant components utilising detailed asset information contained in the Fixed Asset Register (FAR). This approach is considered appropriate as the asset values in the FAR have been valued using the depreciated Modern Engineering Equivalent Replacement Asset (MEERA) values.⁸ MEERA is seen as an appropriate basis for valuing the FAR as it provides an asset value that reflects efficiencies in engineering approaches and construction technologies as they relate to assets.

Further, the Corporate RAB consists of assets which are shared and subsequently allocated to respective services. and we have further recognised these assets as consisting of (1) Retail assets and (2) Residual Corporate assets e.g. workplace buildings, digital assets etc. The allocation approach for these shared assets is described in the section titled – Allocation of shared assets.

When allocating the wastewater RAB to wastewater system assets (i.e. excluding the corporate assets), our approach to valuing system assets in the FAR on a depreciated MEERA basis is as follows:

- assets acquired post 2000 are entered at the time at their historical prudent and efficient capital expenditure value allowed by IPART under the relevant determination. At each determination,

⁸ A modern engineering equivalent replacement asset should be of commercially available technology and should not require a redesign or re-engineering of an entity's existing plant. This means the cost of a modern equivalent asset should reflect the cost of reinstating an asset with the same utility using modern materials, labour and design

the capital expenditure allowed for the forward-looking program is largely established using the modern equivalent engineering replacement values.

- Assets acquired pre 2000 and still used in operations are included in the FAR at their depreciated MEERA values
- all assets are depreciated and subject to indexation consistently with the methodology and asset lives set by IPART in the most recent pricing determination.

The implementation of this process is described below, and a schematic overview of the cost allocation process is shown in Figure 5.

- For the CAM, the RAB needs to be able to be disaggregated into its component parts (i.e. Cost Objects) for the declared services. The IPART determined RAB does not have this level of detail. Therefore, the FAR, which does have this detail in its structure, is used as a proxy to divide the RAB into the detail required.
- The FAR is adjusted for several differences between the methodology of the FAR and the RAB, such as CPI indexation to asset values and exclusion of gifted assets. This produces an adjusted FAR, which is a reasonable base to be used as a metric to divide and allocate the RAB to the relevant Cost Objects. This also ensures consistency with the approaches used in price determinations.
- To ensure that the return on assets does not exceed that in the prevailing IPART determination, the assets within the adjusted FAR will then be given a corresponding RAB value. The cost allocation method allocates values to individual assets in the following manner:
 - The post 2000 wastewater assets will have a RAB value that equates to their historical indexed prudent and efficient capital expenditure value allowed by IPART
 - The pre 2000 wastewater treatment assets will have a RAB value that equates to its depreciated MEERA value
 - The pre 2000 wastewater transport assets will be valued as a residual between the pre 2000 WasteWater RAB for each system and the wastewater treatment assets to ensure that the total value aligns with the total RAB for each system.

Note that this approach mentioned above, we called “residual approach”, will only apply to wastewater declared services.

- To ensure consistency, the RAB asset classifications are maintained. The process utilises IPART’s determined civil, electrical, mechanical, electronic or non-depreciable (CEMELND) values in the RAB for water, wastewater, stormwater to match with the corresponding assets in the adjusted FAR base

This process leads to:

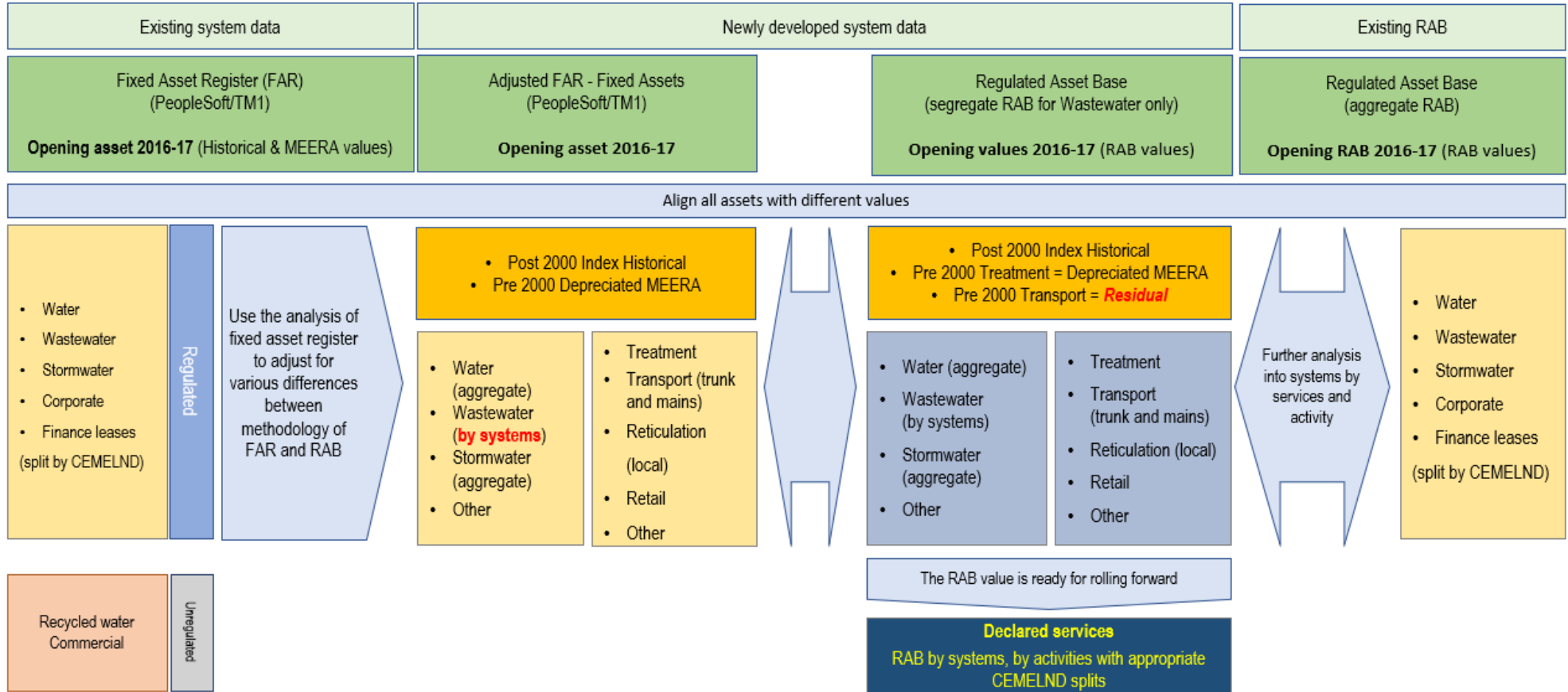
- The establishment of a RAB for the declared and non-declared sewerage services, based on a reasonable bottom-up asset allocation approach that uses detailed asset information from the FAR.
- The allocation of the RAB for declared services to the appropriate Cost Object level, i.e. across geographic areas and by relevant activity.
- The maintenance of the link between the RAB value for wastewater service and the prevailing retail price determination, including its determined CEMELND values.
- Identification of separate retail and corporate shared assets, for further appropriate allocation in accordance with this Cost Allocation Manual.

This approach will demonstrate that the costs allocated to the declared services reflect the efficient costs of the service plus supports incentives for entry in the services open to competition consistent with the WIC Act pricing principles (see section 1.3.3).

Further details of this process and a worked example are presented in Appendix E. Sydney Water will apply this methodology in the future in response to any access requests.

The RAB also includes work in progress (WIP). The WIP can be identified directly with the Cost Objects and is therefore allocated directly to the relevant service. At the beginning of each regulatory period, capital expenditure for the previous period enters the RAB at its actual cost from the FAR, but only if deemed by IPART to have been efficient expenditure.

Figure 5 - Overview of the process of setting the initial RAB 2016-17



Allocation of shared assets

The approach described in 2.4.1 results in all System capital assets being assigned correctly to the relevant declared service which utilise those assets, and the value being consistent with the total RAB valuation determined by IPART.

A number of remaining assets are being used to support multiple services and therefore their costs need to be allocated in an appropriate manner across those services. These assets are either classified as retail or corporate.

The method for allocating the RAB of shared assets is as follows:

1) Retail assets

Retail activity is not part of the declared service, and hence the retail assets are separately identified and included in the retail costs of the relevant downstream activity. We have included the allocation method for this shared asset here for completeness purposes.⁹

- This generally comprises assets such as billing systems, meters and some other interface assets that support retail functions.
- The method used to allocate the retail asset costs to services is aligned with the method used for IPART's wholesale pricing determination (i.e. approximately 60:40, water-to-wastewater). This method is consistent with the causality principle, which is based on cause and consumption frequency of the retail functions.
- Further allocation of the costs to geographical Systems will be based on numbers of dwellings/customers served in each System.

2) Shared Corporate assets

- This generally comprises assets such as corporate digital, shared office equipment, and non-system lands that are shared corporate-wide.
- Corporate RAB value is determined as part of the retail price determination.
- The Corporate asset costs are then further allocated to the declared services based on relative RAB values.

Allocating asset disposals to RAB

Asset disposals reduce the RAB and the return on assets for individual Services. Most of Sydney Water's disposals are relating to market land and buildings, and land held for sale, which are categorised as Corporate assets.

⁹ This will also help to demonstrate that the CAM does not result in cross subsidisation between the declared and non-declared services.

System-related asset disposals are relatively minor and can be directly identifiable to respective services. Corporate asset disposals, where identifiable, are directly assigned by Sydney Water to its related service associated with the geographic wastewater systems based on the location of the disposal. For the remaining corporate asset disposals, the reduction will be distributed to services (including declared services) based on their proportionate RAB values. This approach is consistent with the cost allocation principles presented in section 1.3 and the methodology used for allocating capital assets costs.

2.4.2 Capital expenditure

Capital expenditure is allocated/attribution to Cost Objects (and then to services) after the initial RAB allocation as described in section 2.4.1. Sydney Water's cost allocation method generally allocates capital costs directly to the services, including to Transport and to Treatment activities (i.e. Cost Objects) by WWTS. Sydney Water's sewerage system assets are very much defined by geographic boundaries, they are discrete, and generally do not interconnect. Thus, a high proportion of capital expenditure is directly attributable to geographical region, consistent with IPART's causality principle in allocating costs. The forecast infrastructure-related expenditure is recorded at a system level, including asset location, type and purpose.

Methodology to allocate forecast capital expenditure into the RAB

Sydney Water has a detailed capital work program and, in most cases, wastewater capital expenditure can be directly identified with an individual Cost Object and hence to the relevant declared service.

The cost allocation method uses the forward-looking expenditure program approved by IPART in its retail price determination. This ensures that costs allocated to the declared services do not exceed those allowed by IPART. As explained above the capital expenditure for the forward-looking program is largely established using the depreciated MEERA values.

For cost allocation purposes, all historical capital expenditure costs within Sydney Water are mapped to only one Cost Object and the total capital expenditure allocated must balance to total Sydney Water cost that flows from *PeopleSoft*.

Analysis of wastewater services reveals that capital expenditure can generally be directly attributed with ease to different Cost Objects components, and thus to declared services. A high proportion of capital expenditure (> 80%) can be directly attributed to the declared services.

Table 4 below shows the allocation of 2016-17 forecast capital expenditure to system and shared assets. Some examples of corporate and retail capital expenditure (allocated in a year) are also shown in the table, for information. ¶

Table 4 - Breakdown for Sydney Water's Capital expenditure forecast for a typical year (2016-17)

Capital expenditure	Total
Directly Attributable Costs	
System assets	83%
<u>Examples:</u>	
Treatment plant renewal (Treatment)	
Pumping station upgrade (Transport)	
Sewermain renewal (Transport)	
Install Odour Control Units (Transport)	
Shared Costs	
Retail assets	6%
<u>Examples:</u>	
Retail digital assets incl billing system replacement	
Meter replacement	
Corporate assets	11%
<u>Examples:</u>	
Corporate digital assets	
Shared building, plant & equipment	
Total	100%

Allocation of shared capital expenditure

Corporate capital expenditure is currently allocated to water, wastewater and stormwater services in the retail price determination based on the relative percentages of capital expenditure allowed by IPART for the 3 categories of services over the regulatory period.¹⁰ These corporate capital costs are allocated to systems and services based on their relative proportion of the RAB values, consistent with the method used for allocating corporate asset values.

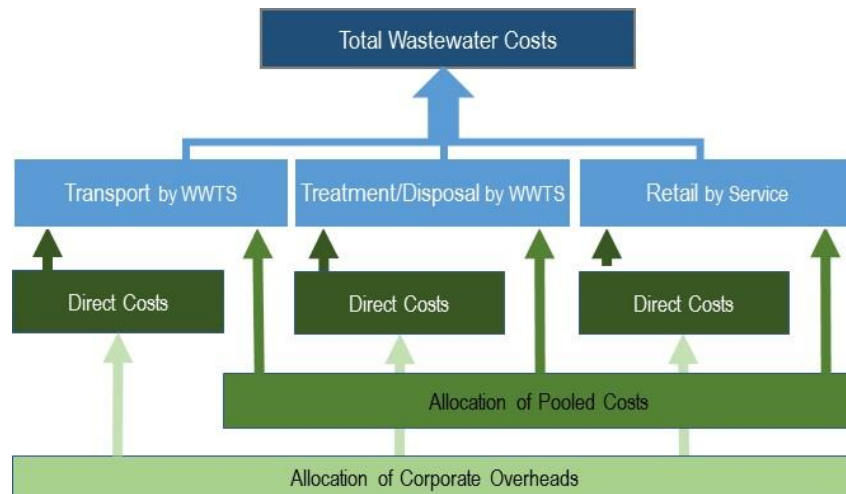
For allocating corporate capital expenditure, Sydney Water considers that the RAB value for declared services provides a reasonable reflection of the utilisation of these corporate assets across the different services. Other possible allocators are less likely to be effective, given that these common corporate assets do not necessarily have a continuous or directly proportional relationship with units of service outputs. In addition, using RAB values will provide a practical, equitable and stable allocator for these assets.

¹⁰ See Section 6, of IPART June 2016, Review of prices for Sydney Water Corporation, 2016 - 2020.

2.5 Operating costs

Figure 6 presents the cost allocation method to illustrate how the total wastewater service costs are estimated. The allocation of operating costs to their respective services and cost categories is made using our VDM system consistent with the principles outlined in section 1.3.

Figure 6 - Operating costs and allocation



2.5.1 Methodology to allocate operating costs to Cost Object level

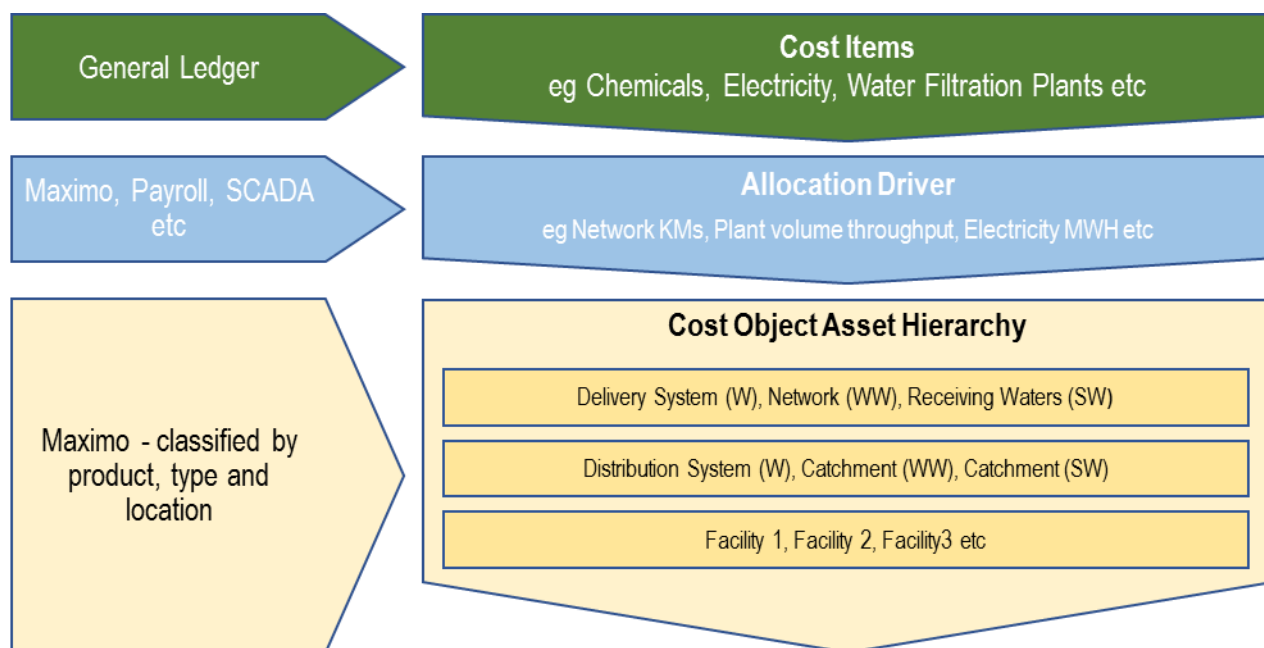
VDM is a driver-based cost allocation system developed by Sydney Water in the TM1 enterprise software. VDM is used for the purposes of attributing and allocating costs from various organisational cost centres to organisational activities and processes (i.e. Cost Items) linked to its services and activities (i.e. Cost Objects) provided.

Cost Items are assigned (i.e. attributed or allocated) to a Cost Object are then placed in one of the following cost categories:

- direct costs are costs where a direct traceable cause and effect relationship with the provision of the service can be demonstrated. These can either be directly attributed to the service or allocated on a causal basis where allocation is needed, and a clear verifiable traceable cause and effect relationship exists between the item and the output of the service.
- pooled costs, which are generally shared costs at operational level, where a relationship associated with these costs can be allocated using a relevant, reliable and verifiable factor such as share of volume of flows managed.
- corporate costs, which are common costs such as some non-specific IT, HR and executive costs where allocation is made to Services proportionate to their respective direct operating cost (as described below).

The linkage and allocation process in the VDM system, from Cost Items to their potential Cost Object is broadly represented in Figure 7 below.

Figure 7 - Summary of VDM cost allocation process



For cost allocation purposes, each operating cost within Sydney Water is mapped to only one Cost Item and then assigned to a Cost Object. The output from the VDM must balance to the total of Sydney Water’s operating cost (as per the relevant price determination) that flows from *PeopleSoft*. This ensures that the IPART’s cost allocation principles of a) total costs to be allocated and b) a cost should only be allocated once, are achieved.

As long as the VDM is balanced (it has a built-in reconciliation) there can be no duplication of costs allocated. Table 5 shows an example of a high-level reconciliation table in the VDM system.

Table 5 - Reconciliation within VDM system

	Determined costs	VDM direct (pre-allocation)	Variance	VDM (post allocation)	Variance
	A	B	A - B	C	C - B
Water Purchase	392,176,441	392,176,441	0	392,176,441	0
Operations	202,220,554	202,220,554	0	202,220,554	0
Maintenance	227,616,823	227,616,823	0	227,616,823	0
Indirect Costs	109,355,352	109,355,352	0	109,355,352	0
External Operations	118,593,250	118,593,250	0	118,593,250	0

These Cost Items are identified either as directly attributed to a Cost Object where a direct link is known and available, or indirectly to a Cost Object where costs are not able to be mapped directly and need to be allocated using an appropriate allocator.

Allocation of direct operating costs

Direct costs from Cost Items are mapped with source data in Sydney Water's Maximo work and asset management system. A high proportion (approximately 75%) can generally be identified and attributed or allocated directly to Cost Objects, where a direct traceable or causal link or driver is known and available.

Direct costs include direct labour (treatment), electricity usage and chemicals that are incurred against Cost Objects such as wastewater treatment plant costs where costs are directly mapped to the specific plant (for example, the Gerringong-Gerroa wastewater plant operations contract).

Examples of direct causal costs are network contractor, network labour and plant/equipment costs which are clearly attributed to Cost Objects (e.g. networks) using a common allocator such as the proportionate network kilometers. Other examples are odour monitoring costs that are dependent on volume throughput, which can then be used to allocate across treatment plants.

Examples of drivers include network km, flow volumes, maintenance hours, analysis sampling points, electricity MWh by specific meter, specific chemical volumes which are sourced from systems such as Maximo, IICATS or SCADA. These drivers can also be based on cost data - for example, some are based on historical general ledger spend. The cost in the general ledger can be mapped directly to a facility (for example, biosolids costs are mapped using costs for the facilities producing them). The driver selected are the most relevant available in VDM.

All allocators / drivers are dynamic in amounts and so will reflect the latest operating measures and consequently will change over time in line with changes in the operational data – for example, increased maintenance hours for the Malabar sewerage reticulation network will result in an increased share of costs where maintenance hours are the allocator.

Table 6 below shows a summary of the direct costs items for wastewater including declared services, and the reason why costs are considered traceable and if not, what allocators have been used and why they have been used.

Table 6 - Direct costs

Cost Centre	Cost item	Variable / Fixed	Direct Causal / Traceable	Reason why it is Traceable	Allocator if Causal	Declared Services?
Treatment BU						
Operations						
	Treatment labour	Semi Variable	Traceable	Directly attributable to facility by type of cost by plant eg: energy costs are metered separately and can be attributed directly to the individual facility		
	Electricity	Variable				
	Chemicals	Variable				
	Vehicles	Fixed*				
	Material Plant & Equip	Variable				
	Biosolids Removal	Semi Variable				
	Grit Removal	Variable				
	Licences/Permits	Semi Variable				
	Service Contractors	Fixed*				
	Chemicals (Residual)	Variable	Causal		Allocation of direct chemicals by system	
Maintenance						
	Operations Maintenance (Reactive Maintenance)	Semi Variable	Traceable	Directly attributable to system by plant (eg maintenance hours etc)		
	Facility Maintenance	Fixed*		Facility Maintenance by plant		
	Opex Program Treatment (Planned Major Maintenance)			Causal		Plant flows (volume)

Table 6 - Direct costs (continued)

Cost Centre	Cost item	Variable / Fixed	Direct Causal / Traceable	Reason why it is Traceable	Allocator if Causal	Declared Services?
Networks						
	Operations					
	Electricity	Variable	Traceable	Energy costs are metered separately at each site that are grouped to the individual networks including declared networks		✓
	Chemicals	Variable		Chemicals used in networks to reduce bad odour and pipe corrosion can be directly traced to Chemical Dosing Units (CDUs), which are part of network system (including declared networks)		✓
	System Operations Wastewater Networks	Semi Variable		Specific system contract cost relating to the Blue Mountains Tunnel that is traceable specifically to the Winmalee Wastewater network only (which is not a declared service)		
	Networks Labour	Semi Variable	Causal		Split by product based on Network Kilometers. Network Kilometers is the appropriate allocator for these cost items as higher network kilometers will lead to greater costs.	✓
	Vehicles	Fixed*		✓		
	Material, Plant & Equip	Variable		✓		
	Licences/Permits	Semi Variable		✓		
	Service Contractors	Fixed*		✓		

Table 6 - Direct costs (continued)

Cost Centre	Cost item	Variable / Fixed	Direct Causal / Traceable	Reason why it is Traceable	Allocator if Causal	Declared Services?
Maintenance						
	Operations Maintenance	Semi Variable	Traceable	Maintenance hours directly attributable to network assets including those in declared services		✓
	Mechanical/Electrical Network techs	Semi Variable	Causal		Split to Wastewater networks (including declared services) based on Network Kilometers. Network Kilometers is the appropriate allocator for these cost items as higher network kilometers will lead to greater costs.	✓
	Facility Maintenance	Fixed*				✓
	Opex Program Networks					✓
	Mechanical/Electrical Contract Management Fee	Fixed*	Traceable	Maintenance hours are directly charged against specific facilities in Wastewater networks including declared networks for Mechanical/Electrical work		✓
Civil Delivery						
	Civil Maintenance and Network Tech costs	Fixed*	Traceable	Civil Maintenance hours are directly charged against specific network assets including those in declared services		✓
	Direct Civil Contracts		✓			
	Civil Projects (Major Maint)		Causal		Network kilometers is the most appropriate allocator due the high correlation between the these cost items and the length of the network in each wastewater networks including declared networks	✓
	Civil Contracts Management (Residual civil contracts)		✓			

Table 6 - Direct costs (continued)

Cost Centre	Cost item	Variable / Fixed	Direct Causal / Traceable	Reason why it is Traceable	Allocator if Causal	Declared Services?
Projects & Services						
	Flow Monitoring	Fixed*	Traceable	Costs are charged directly based on the number of sampling points in each network facility including those in declared networks		✓
	Alarm Monitoring			Costs are charged directly to treatment plants based on the number of control points by plant		
	Field Samples			Costs are incurred based on quantity of samples collected by network (including declared networks) or plant		✓
	Analysis Samples					✓
	Air Quality Monitoring		Causal	Costs are allocated based on volume throughput by network (including declared networks) or plant. This is the best available allocator to spread to both wastewater transport and treatment.		✓

*These fixed costs may be regarded as variable / semi-variable over long time horizons

Allocation of shared operating costs

The remainder of the costs (less than 25%) are considered shared costs, and are subject to allocation as follows:

- Pooled costs – these are a pool of divisional common costs (around 10% of total operating costs). For these shared costs, where practicable, a reasonable causal allocator is identified to allocate the costs. In some instances, for example the IT software and managed services costs, where a more precise causal based method of allocation cannot be established without undue cost and effort, Sydney Water has applied 'direct operating costs' as the allocator. This reflects the cost allocation principles set out in section 1.3, including enabling the CAM to be 'practically implemented'.
- Corporate costs (less than 15% of total operating cost) - these are costs that are generally "headquarters" common costs (for example IT, HR) and are not directly linked to service and are considered to be indirect costs. They are allocated to Cost Objects based on the proportion of direct operating costs calculated for each Cost Object. This approach supports the principles set in section 1 as this allocator is practical and is capable of reconciliation to the total cost being allocated. Furthermore, this approach has previously been endorsed by IPART, as part of the retail price determination. In the absence of data pertaining to a more relevant allocator, Sydney Water has maintained the application of 'direct operating costs' as an allocator for this type of shared common costs.

It should be noted that to the extent that operating costs are directly allocated to declared services through the methodology set out in Table 6, these costs are excluded from the above allocation calculations. This meets IPART's principle that a cost should only be allocated once.

Table 7 and Table 8 below show a summary of the shared Costs Items for the wastewater services (including declared services), as well as the allocators and rationale why they are used for cost allocation.

This demonstrates that the allocation of shared costs for the declared services are done on a mutually consistent basis and that different allocators are not used for the same type of costs consistent with the principles set out in section 1.3.

Table 7 - Pooled costs

Business Unit	Cost item	Variable / Fixed	Allocator	Reason for Allocator	Reason why it is Pooled cost	Declared Services?
GM/Projects & Services Customer Delivery Support function	Indirect Labour	Fixed	Network Km	Both of these cost items are divisional overheads appropriately allocated by size/volume of system. The allocators used are the best available and reasonable indicators of comparative size of systems/plants.	Indirect costs relating to divisional management and technical functions supporting the delivery of services.	✓
	Other Overhead costs		Plant Flows			
Digital Services	IT Support costs	Semi Variable	Direct costs	This cost item is appropriately allocated by comparative cost of network system taking both maintenance and operational costs into consideration.	Specific software and managed services costs relating to direct operational systems	✓
Finance Services	Property Costs eg: Land Tax and Rates	Fixed	Sydney Water Land Value by System	Proportionate value of Sydney Water owned land by system and activity is considered a reasonable proxy for a cost item which is based on valuations of land parcel.	Indirect property costs supporting operational groups	✓
Customer Services (Retail)	Customer interface/call centre costs	Semi Variable	Costs identified at an aggregated level and then allocated to services based on IPART determined splits ie 60:40. Further allocation to a system level is based on a proportionate basis.	IPART have previously determined that retail costs are appropriately split 60:40 to water/wastewater. Further allocation is then done on a properties served basis to the system level. This is deemed a reasonable proxy of interactions with customers.	Costs relating to customer interfacing activities such as meter reading, contact center and billing.	✓

Table 7 - Pooled costs (continued)

Business Unit	Cost item	Variable / Fixed	Allocator	Reason for Allocator	Reason why it is Pooled cost	Declared Services?
Business Customer Relations	Business Customer Services cost	Fixed	Based on Retail cost which is split 60:40 to water/wastewater and then allocated further to a system level based on a properties served basis	This method is considered the best available allocator to proportion these costs to Wastewater systems including Declared services.	Costs relating to managing non-residential connections and compliance work that is not part of Retail	✓
Liveable City Solutions	Divisional cost	Fixed	Fixed % by product then direct costs or Maintenance hours	These costs are mainly related to asset knowledge and planning including network assets in declared wastewater services. Maintenance hours is a reasonable indicator of time / effort needed towards planning and replacing these assets.	These costs are indirect costs incurred by business supporting functions that are treated as direct costs to Wastewater systems including the Declared systems	✓

Table 8 - Corporate costs

Cost Centre	Cost item	Variable / Fixed	Allocator	Reason for Allocator	Reason why it is Corporate cost	Declared Services?
Digital Services	All Digital IT costs (excl direct support and digital retail costs)	Fixed	Allocated to services (including declared services) proportionate to their respective direct cost.	As corporate overheads by definition cannot be linked to system, they should be applied on a proportional direct cost allocation giving a consistent corporate costs "mark-up". This approach has been previously endorsed by IPART.	Common costs that have no ideal causal allocator towards the production of services	✓
Finance Services	Finance Division costs (excl property costs)					
People & Corporate Services	PCS Division costs					
Customer Strategy & Regulation	CSR Division costs					
Office of the MD	OMD Costs					

3 Appendices

3.1 Appendix A – Managing Director’s and Chief Financial Officer’s statement

Section 2 of IPART’s Cost Allocation Guide - Water Industry Competition Act 2006, requires Sydney Water’s Managing Director and Chief Financial Officer to confirm that the information contained in the cost allocation manual is accurate and confirms Sydney Water’s intention to comply with the cost allocation methodology.

On behalf of Sydney Water Corporation, we confirm that:

- This document “Cost Allocation Manual for the allocation of costs to Declared Services: Bondi, Malabar and North Head sewerage reticulation networks” dated May 2019 sets out Sydney Water’s cost allocation method in accordance with Section 42 of the Water Industry Competition Act (2006).
- Sydney Water intends to comply with the cost allocation method set out in this Manual.
- Sydney Water will review and update the manual as appropriate.

For and on behalf of Sydney Water Corporation.

.....
Kevin Young, Managing Director

.....
Kevin Jones, Chief Financial Officer

.....
Date

.....
Date

3.2 Appendix B – Sydney Water’s operations and declared (sewerage) services

Sydney Water provides drinking water, recycled water, sewerage services and to a lesser degree stormwater services, to residences and businesses in Sydney, Illawarra and the Blue Mountains. Each of Sydney Water’s services is described in more detail below.

3.2.1 Water

Sydney Water supplies more than 1.4 billion litres of water to more than 1.8 million homes and businesses each day.

Untreated water is purchased from WaterNSW, the organisation responsible for bulk water supply in the Greater Sydney Region. About 80 per cent of Sydney’s supply comes from the Warragamba Dam.

This water is treated at water filtration plants in accordance with the Australian Drinking Water Guidelines, developed by the National Health and Medical Research Council in collaboration with the Natural Resource Management Ministerial Council. Organic matter, sediment and minerals such as iron and manganese are removed and the water is disinfected. The largest plant at Prospect treats more than 80 per cent of Sydney’s water. The Prospect, Woronora, Illawarra and Macarthur water filtration plants are owned and operated by the private sector.

Treated water is purchased from Sydney Desalination Plant Pty Ltd during periods of drought.

Treated water is distributed via Sydney Water’s network of 251 service reservoirs, 153 pumping stations and 22,000 kilometres of water mains.

3.2.2 Recycled water

Sydney Water recycles over 60 million litres of wastewater a day. A number of wastewater recycling schemes are in place that help reduce demand for water and discharges of treated wastewater to the environment. These schemes include Australia’s largest recycling scheme, the Advanced Water Treatment Plant at St Mary’s, and Australia’s largest residential recycling scheme, at Rouse Hill in Sydney’s northwest.

3.2.3 Wastewater (including the declared services)

Sydney Water’s wastewater network services around 1.8 million homes and businesses in the Greater Sydney region. Daily, on average, the network collects, treats and disposes of more than 1.4 billion litres of wastewater by making use of about 25,000 km of wastewater mains in 24 separate wastewater treatment systems (**WWTS**) with 29 Wastewater Treatment Plants/Water Recycling Plants ¹¹(WWTP/WRP) and Storm Plants. Each of the 24 WWTS is defined by

¹¹ During the millennium drought, Sydney Water moved towards a naming convention for treatment plants that highlighted which ones were able to recycle significant volumes of wastewater. This naming convention does not necessarily mean that the primary purpose of the plant is to produce recycled water. Rather, that we have been able to install additional infrastructure at this plant to enable some form of recycling for wastewater treatment purposes.

geographic boundaries and comprise of a reticulation network and one or more WWTP's or WRP's.

These plants are owned and operated by Sydney Water, except for the Gerringong Gerroa WRP which is operated by the private sector under a contract with Sydney Water.

Each wastewater system includes a reticulation network that transports wastewater to a WWTP or WRP. Wastewater collected in the wastewater system flows to a WWTP or WRP where it is treated before being reused or discharged to rivers or oceans in accordance with licence conditions issued by the Environment Protection Authority. All captured bio-solids are used for agricultural or horticultural purposes.

Around 80 per cent of Sydney's wastewater is processed by the three largest WWTPs which are Malabar, North Head and Bondi. These plants are primary treatment plants and discharge to ocean via the deep ocean outfalls that extend up to 3.7 km from the coastline.

There are 16 inland plants that discharge into the Hawkesbury-Nepean, South Creek, Berowra Creek and Cattai Creek catchments. These plants are required to treat wastewater to much higher levels, known as tertiary treatment.

In addition, Sydney Water regulates and charges for the trade waste that is discharged into the wastewater system. Trade waste regulation is necessary to protect the wastewater assets from corrosion, ensure wastewater treatment services and products are not affected by substances in trade waste and to protect people working around wastewater. Sydney Water charges for the cost of accepting, transporting and treating trade waste in accordance with the current retail price determination. Agreements on discharge levels and concentrations are negotiated with each trade waste customer.

The declared services

The declared services are the wastewater reticulation networks that form part of the Bondi, Malabar and North Head WWTS. These three networks are physically separate and drain to geographically distinct areas. The reticulation networks are made up of not only pipes and pumps, but also many other features you would expect in modern wastewater transport systems such as telemetry, odour and corrosion mitigation systems and wet weather overflow assets and other abatement measures (such as storage tunnels). The WWTPs at Bondi, Malabar and North Head that service each network are not included as declared services. Third party access seekers would need to organise alternate treatment services located near the three reticulation networks. Figure 8 shows a map of these systems.

Malabar sewerage Reticulation Network

The Malabar sewerage reticulation network covers about 500 square kilometres generally south of the Parramatta River to Botany Bay, west to Liverpool then south to Campbelltown. It services a population of over 1.7 million people and disposes 0.5 billion litres of wastewater each day. The network comprises about 6,800 kilometres of reticulation and about 158 pumping stations. The combined wastewater flow is conveyed to the Malabar WWTP by two trunk main sewers, known as

Southern and Western Suburbs Ocean Outfall Sewer (SWSOOS) Trunk Main Sewer 1, and Trunk Main Sewer 2.

Liverpool, Glenfield WRPs and Fairfield Storm plant are included in the Malabar WWTS licence issued by the Environmental Protection Agency (EPA). Each of these plants functions as a wet weather overflow point for the Malabar transport system. Malabar is predominantly a gravity transport system. A key design feature of gravity systems is their designated wet weather overflow points. These points are essential to the safe operation of the transport system. They ensure that surges, caused by wet weather, do not back-up and flow out elsewhere, such as inside people's homes or in any other location not specified in the WWTS licence.

All three plants act as a wet weather overflow abatement measure. Discharge from Liverpool WRP to the Georges River only occurs during significant wet conditions. Although all three plants only discharge to the river during wet weather, our Sydney Water's WWTS licence requires that the wet weather flows from both Liverpool and Glenfield are treated using a biological treatment process. Biological treatment processes cannot be turned off and on quickly. As such, both these plants need to run continuously and treat all flows, both wet and dry. During dry weather, these treated flows are still unsuitable for discharge to the river, so the Liverpool and Glenfield plants discharge treated effluent to the Malabar sewerage reticulation network system. Fairfield only operates in wet weather as it does not rely on a biological treatment process.

Given their primary purpose is licenced wet weather overflow points, the three plants at Liverpool, Glenfield and Fairfield are treated as part of the Malabar transport system for the purposes of cost allocation.

North Head Sewerage Reticulation Network

The catchment area of the North Head network has an area of about 416 square kilometres covering the northern suburbs, extending to Manly and Narrabeen in the east and to Blacktown in the west. It includes suburbs south and west of the Parramatta River and parts of the Hornsby Shire and Ku-ring-gai Municipality. The sewerage network services a population of over 1.5 million people and handles around 0.4 billion litres of wastewater each day.

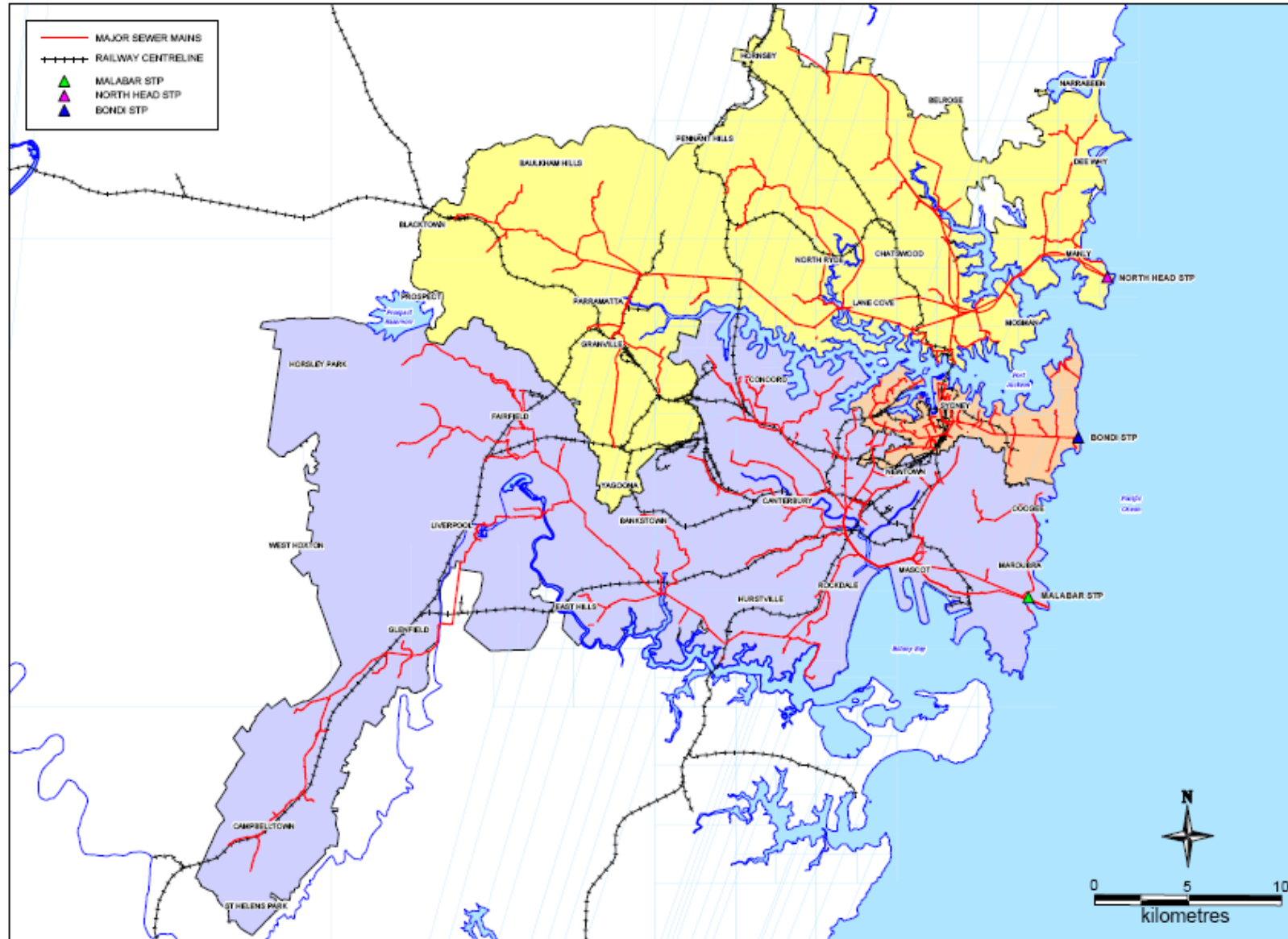
The approximate length of the North Head sewerage reticulation network is 5,500 kilometres. Eighty-six pumping stations discharge into these sewers, which drain into the trunk main sewer called the Northern Suburbs Ocean Outfall Sewer (NSOOS) which in turn leads to the North Head WWTP.

Bondi Sewerage Reticulation Network

The Bondi sewerage reticulation network services a residential population of over 245,000 and an employment population exceeding 335,000. It disposes around 0.2 billion litres of wastewater each day. The catchment has an area of approximately 3,800 hectares lying generally to the immediate south of Port Jackson and extending westward from the coast to Balmain as well as to the central business district of Sydney.

The approximate length of the Bondi sewerage reticulation network is 772 kilometres and there are 38 wastewater pumping stations. The network drains into the trunk main sewer called the Bondi Ocean Outfall Sewer (BOOS) that conveys flows to the Bondi WWTP.

Figure 8 - Map of Sydney Water's Malabar, North Head and Bondi Sewerage treatment systems



3.3 Appendix C – Non-standard Declared Services: Interconnections

The declared interconnection services typically would be non-standard in nature, and dependent on the unique circumstances of a third-party access proposal. The service could however vary from a relatively simple connection to Sydney Water’s infrastructure, to a complex connection where amplification to Sydney Water’s infrastructure will be required, and thus the costs for the connection will have to be dealt with on a case by case basis.

Access seekers interconnecting to Sydney Water’s trunk infrastructure will require services to deliver or extract effluent to or from the Sydney Water Network. The infrastructure used to interconnect the services is categorised as lead-in or lead out infrastructure.

- **Lead-out infrastructure**

The sewerage network (linear and pumping) that connects the Access Seeker’s precinct or plant to Sydney Water’s trunk sewerage system. The access seeker will use the lead out to deliver their wastewater stream to be transported with the Sydney Water wastewater network.

- **Lead-in infrastructure**

The wastewater network (linear and pumping) that connects the Sydney Water wastewater network to an access seeker’s wastewater treatment facility. The access seeker will use the lead-in to extract their wastewater stream to be transported with the Sydney Water wastewater network.

Ownership and funding of the interconnection infrastructure is dependent upon the nature of access seeker development, and in particular whether the lead-in or lead-out infrastructure is a new investment, and if the infrastructure will be used exclusively by the access seeker. General principles governing the ownership and funding of the lead-in or lead-out infrastructure will be consistent with those in Sydney Water’s policy on “Funding Infrastructure to service growth”¹² in that:

- access seekers will be required to pay for and own interconnection infrastructure servicing their precinct exclusively as well as any adjustments and deviations to existing Sydney Water assets due to the access seeker development
- access seekers will co-fund with Sydney Water the cost of interconnection infrastructure that services the access seeker’s precinct as well as other third-party properties.

Where applicable, the principles and methodology used in the CAM would be similarly applicable to the allocation of costs for interconnection services.

¹² Sydney Water Policy on Funding Infrastructure to Service Growth 2015.

3.4 Appendix D – IPART’s determination of efficient costs

IPART’s guidelines¹³ state that Section 41(3) of the WIC Act:

Recognises the importance of ensuring consistency between retail prices and access prices. For example, some access pricing methodologies may be inconsistent with the maintenance of postage stamp retail pricing, where applicable, as they facilitate inefficient ‘cherry picking’.

The prices of Sydney Water’s retail water supply and wastewater services are set by IPART, which typically sets prices for a four-year period — the current IPART Price Determination commenced in July 2016 and will run to June 2020.

Sydney Water’s prices are set to recover its efficient costs, including a return on its assets. IPART uses the Building Block approach to establish an efficient cost base for Sydney Water. Under this approach, costs comprise:

- operating and maintenance costs;
- a return on assets, being the Weighted Average Cost of Capital set by IPART (4.9% post-tax real until June 2020);
- a return of assets – that is, depreciation which is based on the asset lives by asset class set out in the current IPART retail price Determination. Assets are valued at a regulatory asset base which is significantly less than the written down replacement cost;
- a return on working capital; and
- regulatory tax allowance.

At each determination IPART conducts an efficiency review. This involves examining the efficiency and prudence of operating costs and capital expenditure over the past determination period. It also approves forward operating and capital expenditure programs to be included in prices for the following determination. The review process includes a comparison of Sydney Water’s performance with international benchmarks and industry best practice.

¹³ IPART, “Draft Cost Allocation Guide – Water Industry Competition Act 2006, 10 October 2008.”

3.5 Appendix E – Allocating the RAB to establish the initial asset value for each service

An allocation methodology is required for calculating the RAB value for each of declared services for two reasons:

- IPART retail price determination sets the RAB Value at the aggregated level for either water, wastewater or stormwater services and does not provide RAB values for specific systems or services
- The RAB was introduced by IPART in 1999/00, with the value of the asset base aligned with Sydney Water's revenues for 1998/99. It was set at a level that was under half the depreciated replacement value of Sydney Water's assets. Therefore, consideration is needed on how to allocate the difference between current RAB aggregated value and the depreciated replacement value. Any difference in valuation only exists for pre-2000 assets, as post 2000 assets are added to the RAB at the prudent and efficient levels allowed by IPART at each determination.

The starting point for allocating RAB values was the RAB amount calculated and reported by IPART in its Retail Price Determination issued on 14 June 2016 (for the 4-year pricing period commencing from 1 July 2016). This value was applied to qualifying asset records held in the FAR and assets under construction as at 1 July 2016.

The first stage of the process was to classify all asset records as either;

- water, recycled water, wastewater, stormwater or corporate; then, either,
- treatment, trunk/transport, reticulation (or corporate); then, either,
- civil, electrical, mechanical, electronic or non-depreciable (CEMELND).

The second stage of the process involved isolating assets (or proportions of assets) in the FAR that do not form part of the RAB. These are assets that, either:

- do not contribute to regulated services (mainly, recycled water infrastructure);
- assets that have been handed over to Sydney Water by developers at no cost to Sydney Water; or,
- assets that have been funded by cash contributions from developers.

The third stage of the process involved allocating RAB values to qualifying assets held as at 1 July 2016. This process was carried out in three parts as follows:

- a. assets acquired post 30 June 2000 (Post 2000 assets) are valued at their historical indexed prudent and efficient capex value allowed by IPART under the relevant determination.

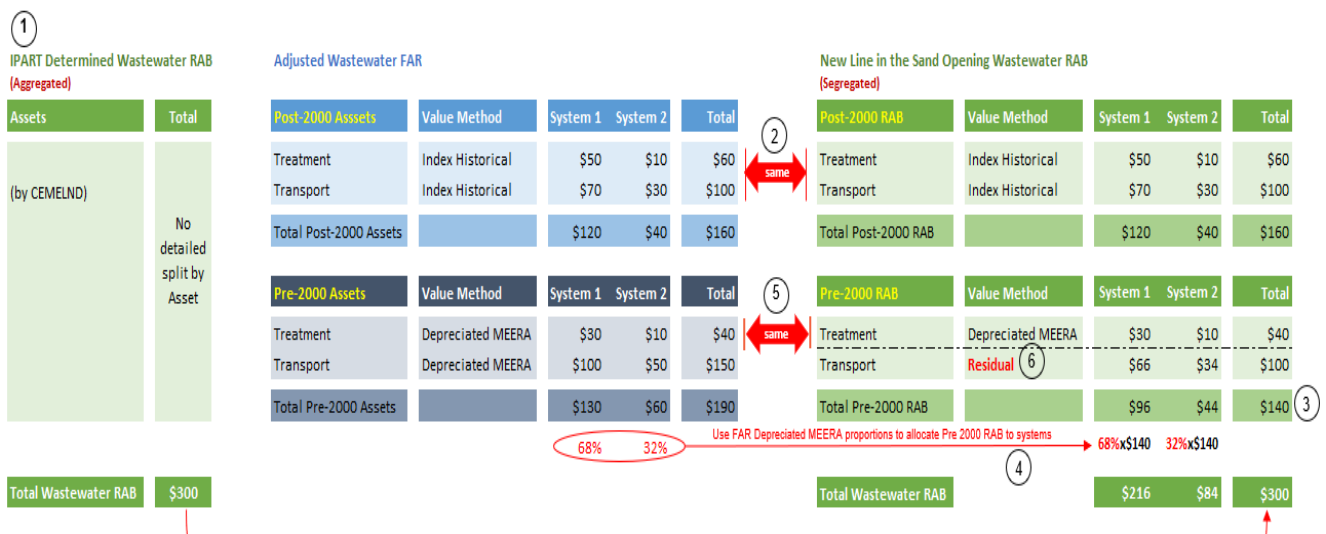
- b. The total value of Assets acquired before 30 June 2000 (Pre 2000 assets) by CEMLND were initially quantified by deducting the value of the Post 2000 assets (as referred to in a. above) from the Total RAB as determined by IPART as at 1 July 2016. Dissections were then carried out by system, using MEERA values as the allocation base.
- c. Pre 2000 Treatment assets were then valued at their current depreciated MEERA value by CEMLND and System with Pre 2000 Transport assets being allocated the residual value to align with the Total Pre 2000 assets calculated in b. above, by CEMLND and System.

Post 2000 and Pre 2000 assets records are combined to arrive at final asset values by Product, Function CEMLND and System which aligns with the asset values shown in the RAB dissection as at 1 July 2016 (by water, wastewater, stormwater and corporate / by CEMELND) and as approved by IPART.

To illustrate the process a worked example of the allocation method is described in Figure 9 below.

Figure 9 - Simple worked example process of setting initial segregated RAB for each service

Figures shown below are for illustration purposes only



1. To establish a RAB value for individual Wastewater assets, we start with the aggregated IPART Determined RAB value (totalling \$300m in the example) which comprises of post-2000 assets and pre-2000 assets. No detailed split of the RAB is available apart from CEMELND splits.
2. The value and segregation (to systems and service) of the post-2000 RAB assets will be the same as the post-2000 indexed historical assets in the adjusted FAR (totalling \$160 in the example).
3. The balance after subtracting the total post-2000 RAB will be the total value of the pre-2000 RAB (eg: \$300 less \$160 = \$140).
4. The pre-2000 RAB asset value (\$140 in the example) is then allocated across systems based on the pre-2000 Depreciated MEERA value proportions in the adjusted FAR (eg: Total System 1 Pre-2000 asset will be 68% x \$140 = \$96 and Total System 2 Pre-2000 asset is 32% x \$140 = \$44).
5. The values and segregation to systems of Pre-2000 RAB Treatment assets will reflect the Pre-2000 Depreciated MEERA assets in the adjusted FAR (eg: \$30 and \$10 for Systems 1 and 2 respectively in the example).
6. The residual RAB values of each system will be treated as Pre-2000 Transport RAB values: (eg: \$96 - \$30 = \$66 for System 1 and \$44 - \$10 = \$34 for System 2). This completes the process of setting initial segregated RAB for each of the declared services.

These capital assets are not shared costs and can be directly identified to the Cost Objects. Therefore, in this context, the allocation of the RAB in the CAM refers to the need to assign the correct asset value for each declared service which (a) reflects the assets deployed in that service plus (b) achieves consistency with IPART's total RAB determination.

The approach described above achieves this in a manner consistent with the principles discussed in section 1 because it a) enables total costs to be allocated, b) allocates costs only once, and c) ensures that the capital costs are allocated on a direct and causal relationship. The RAB value calculated under this approach ensures that IPART's determined depreciation allowance is appropriately and consistently allocated to each service.

This approach of assigning the RAB value to respective Cost Objects is considered to be appropriate and sound, as the resultant allocated RAB for the Cost Object reflects reasonable allocation based on asset value in the FAR. This approach achieves IPART's causality principle, as the RAB values allocated to each of the declared service reflects to some extent the value of the assets which are being used to provide that service.

It also aligns with another cost allocation principle which states that the annual sum of all Sydney Water's assumed costs allocated across systems (including declared and non-declared systems) must reconcile with its IPART assumed total cost at the prevailing retail price determination.

4 Glossary

Term	Definition
2008 Manual	Cost Allocation Manual for declared services submitted to IPART in 2008
Activities	Value chain processes that make up the service i.e.: transport, treatment, retail
BOOS	Bondi Ocean Outfall Sewer
Building Block Approach	<p>The determination of efficient costs (of providing Sydney Water’s regulated services) using the following types of costs or ‘building blocks’</p> <ul style="list-style-type: none"> • return on assets • regulatory depreciation • allowance for meeting tax obligations • allowance for working capital <p>operating expenditure</p>
Business Customer Relations	Business area in Sydney Water that manages non-residential connections and compliance work that is not part of retail.
Common Costs	Costs that can be directly allocated to two or more identifiable causes such as activities or Cost Objects. costs are generally allocated to the lowest Cost Object at which data is available for each cost item.
Corporate Costs	Common costs such as IT, HR and executive costs which are allocated to services in proportion to their direct costs
Cost Item	The type of cost, for example chemicals, electricity etc.
Cost Object	Objects such as systems, operations, equipment, facilities etc. that Cost Items are either attributed or allocated against depending on the level of the object in the Cost Object hierarchy.
Coverage Declaration	Legal right to negotiate access to services with a binding arbitration available for disputes relating to access
CPI	Consumer Price Index
Current Price Determination	IPART determination setting prices for Sydney Water Corporation’s water, sewerage, stormwater and other services. Final Determination No. 5, 2016 sets prices from 1 July 2016 to 30 June 2020.
Declared Services	The transport services provided by Bondi, North Head and Malabar wastewater reticulation networks

Direct Cost	A cost where a direct traceable cause and effect relationship with the provision of the service can be demonstrated. These can either be directly attributed to the service or allocated on a causal basis where allocation is needed, and a clear verifiable traceable cause and effect relationship exists between the item and the output of the service.
EPA	Environmental Protection Agency
Facility	A system of infrastructure components designed to work together and controlled as a single entity e.g.: pumping station, treatment plant etc.
FAR	Fixed Asset Register
Finance Services	Refers to the Finance Services group that provides financial management, commercial acumen and insights, and integrated supply chain and property services internally within Sydney Water
IICATS	Integrated Instrumentation, Control, Automation, and Telemetry Systems
Indirect Cost	Costs where there is no direct causal relationship to the service provided, for instance corporate costs
Interconnection	Trunk infrastructure required by Access Seekers to deliver or extract effluent to or from the Sydney Water Network
IPART	The NSW Independent Pricing and Regulatory Tribunal
IPART's Cost Allocation Guide	Refers to Cost Allocation Guide - Water Industry Competition Act 2006 – March 2018
Liveable City Solutions	Business area within Sydney Water that is responsible for asset knowledge, planning and building/delivery of Sydney Water infrastructure
MAXIMO	Sydney Water's Asset Maintenance Management System
MEERA	Modern Engineering Equivalent Replacement Asset
NSOOS	Northern Suburbs Ocean Outfall Sewer
PeopleSoft	The current financial management system that Sydney Water uses for General Ledger, Asset Management, Accounts Payable, Accounts Receivable, Projects, Purchasing etc.
Pooled Costs	Divisional common costs that are allocated using relevant causal allocators
RAB	Regulatory Asset Base; the assets on which Sydney Water is permitted to earn a return on and of assets in its regulated prices, as determined by IPART.

Recycled water	Water that has been treated to enable its use for certain industrial, commercial and/or household applications, but is not intended to meet the standards for drinking water required by the National Health and Medical Research Council's Australian Drinking Water Guidelines.
Retail	Customer interface activities involving billing, meter reading (customer accounts and billing) and customer service contact (customer interactions)
SCADA	Supervisory control and data acquisition
SCAMP	Sewer Catchment Asset Management Plan
Shared Assets	Assets that are not directly attributable to a system
Sewerage Reticulation Network	The system of pipes and pumping stations in a geographic area that transports wastewater from a customer's premises to the Wastewater Treatment Plant
Supply Zone	Assets within a specific geographical area independently supplied by a dedicated reservoir or gravity trunk main
SWSOOS	Southern and Western Suburbs Ocean Outfall Sewer
Sydney Water	Sydney Water Corporation as established by the Sydney Water Act.
System	Wastewater system, as defined by geographical boundary
System Assets	Assets directly attributable to a system
TM1	IBM Cognos TM1 is an enterprise planning software used to implement collaborative planning, budgeting and forecasting solutions, as well as analytical and reporting applications
Transport Service	The service of using a reticulation (wastewater) network to move wastewater from customers' premises to a Wastewater Treatment Plant
Treatment and Disposal Service	Process of treating raw wastewater, extraction of biosolids and discharge of treated effluent to the environment
Unregulated Services	Services that are not considered a monopoly service, and are generally contestable, and therefore not subject to regulation
VDM System	Value Driver Model system that allocates operating costs to assets or services
WACC	Weighted Average Cost of Capital. The WACC is the efficient cost of a hypothetical benchmark business's debt and equity, weighted to take account of the relative share of debt and equity in its capital structure.

WIC Act	Water Industry Competition Act (2006)
WIP	Work in Progress (in the context of capital expenditure)
WRP	Water Recycling Plant
WWTP	Wastewater Treatment Plant
WWTS	Wastewater Treatment System comprising a reticulation network and one or more Wastewater Treatment Plants

