IPART Review of recycled water prices for public water utilities

Sydney Water response to Issues Paper

October 2018

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1 Executive summary

Sydney Water welcomes the opportunity to share our views on IPART's Issues Paper for its review of recycled water prices for public water utilities. In this submission, we outline our perspective on the potential for recycled water to be part of water services which our customers value and the barriers we have encountered in our efforts to enable this under the current regulatory frameworks. We also provide responses to the specific questions posed by IPART in the Issues Paper.

Sydney Water strongly supports recycled water when it is part of the least cost Integrated Water Cycle Management (IWCM) solution. We actively encourage and pursue recycled water opportunities where they are part of the least cost solution so that our customers can enjoy the benefits of recycled water, when it is a prudent investment.

Recycled water is an integral piece of the water resources puzzle. We applaud IPART's early recognition of the value recycled water provides when combined in holistic delivery of water services our cities need. IPART's avoided cost guidelines, developed over a decade ago, acknowledges the links between potable water, recycled water, wastewater and stormwater.

Sydney Water's 23 schemes now deliver over 43 GL of recycled water each year. One of the best examples of where IWCM planning has enabled an innovative least cost solution is our scheme at Rouse Hill which is Australia's largest recycled water scheme. We are currently investigating several large-scale integrated water solutions that include a recycled water component. These schemes have the potential to benefit our customers and the community at large by the broader economic opportunities and benefits they will create.

Our recycled water projects play a vital role in securing the water supply of Sydney. They are part of a suite of measures to increase our resilience to drought. It is likely that the role recycled water plays in delivering integrated water management will become increasingly prominent in the context of:

- high population growth
- falling dam levels
- climate change, and
- drought.

We will continue to seek out opportunities to reuse our resources in a sustainable way wherever it is economically efficient.

1.1 Progression towards best practice water resource management

The water industry, and policy makers have long recognised IWCM as being the key to delivering water related services which protect both public health and the environment at the least cost to society. IPART quite rightly requires an IWCM plan when assessing the net cost or benefit of a water recycling scheme. When water related services are considered in isolation, they are unlikely

to realise the system-wide benefits required to support liveable cities and sustainable development.

There are several structural barriers which have prevented the preparation of a single comprehensive IWCM plan in Sydney Water's area of operation. Primarily, we face institutional challenges as the responsibility for water servicing, and different parts of the water cycle, are shared between a number of bodies, including Sydney Water, WaterNSW, private water utilities, local councils, NSW Planning, the Environmental Protection Agency, the Office of Environment and Heritage and NSW Health. Given this challenging institutional framework, IPART has sensibly allowed use of a number of existing planning processes to deliver the same outcome as a single IWCM plan. Sydney Water has made steady progress towards best practice water resource management through successive iterations of such plans. Sydney Water has either led or contributed to these plans, for example through:

- our Growth Servicing Investment and Integrated System Plans and regional master plans. These provide the basis for optimising water and wastewater services for current and future customers in each catchment and water delivery area we serve.
- the Metropolitan Water Plan (MWP). This is a whole-of-government approach to water planning for greater Sydney. It ensures our region has sufficient water resources now and in the future.
- the EPA's Hawkesbury Nepean Nutrient Regulatory Framework. This framework aims to ensure river health is delivered at the least cost to society.

Each of these initiatives make an important contribution to delivering IWCM in the Sydney region. We also note the progress Infrastructure NSW (INSW) has made towards developing a comprehensive IWCM plan for the South Creek catchment in Western Sydney. This planning has identified integrated water infrastructure options which result in broader social and environmental benefits. We expect this project will represent a step change in the way Sydney Water can plan, assess and deliver IWCM, which is a great outcome for customers.

We strongly support IPART continuing to require an IWCM plan (or equivalent) to determine the net cost or benefit provided by water recycling. We believe this is consistent with the next steps described in the 2017 Metropolitan Water Plan.

1.2 Issues with IPART's current framework

Overall, we consider the principles on which IPART has based their framework to be sound. These principles can support efficient investment in recycled water. However, we consider there are several areas of incremental improvement that will strengthen incentives for the efficient investment in recycled water. These include acknowledging and correcting elements of IPART's current methodology which:

- prevents utilities from recovering all of their prudent and efficient expenditure. For example, the methodology was unable to adjust charges when household water use changed materially following the millennium drought.
- risks unnecessary ringfencing of recycled water as a separate service which increases the risk that public utilities are unable to recover prudent and efficient investment. We consider that ringfencing is unnecessary when recycled water is part of the least cost integrated water solution.
- some aspects of the methodology and framework are ambiguous, creating uncertainty for investment. This has resulted in biasing investment towards traditional services and away from investment in recycled water projects even when they may have been economically efficient.

These issues are discussed in more detail in the body of this submission.

1.3 A way forward

To enable delivery of water related services which maximise the benefit to society, it is vital we move away from a product-based view of these services to an outcome-based view. Sydney Water supports IWCM planning which focuses on the outcomes for our customers and the environment, and is agnostic to the option used to deliver these outcomes. As such, we view recycled water as a servicing option which can form part of the least cost strategy to deliver the water related outcomes our communities need.

This way of looking at recycled water, that is, as a contributing rather than a separate service, is reflected in regulations in other jurisdictions. In other countries and elsewhere in Australia, recycled water is typically considered to be part of wastewater and/or water servicing, but with additional costs offset by recognising external benefits of the scheme. We consider this way of looking at recycled water would better incentivise utilities to investigate and then implement an optimised suite of projects that deliver all water related services at the least cost to society.

In NSW, recycled water pricing is regulated separately. We urge IPART to consider allowing recycled water to be simply integrated into its existing regulatory approach when setting Sydney Water's retail prices when it is the least cost approach so that the regulatory framework better incentivises the delivery of recycled water where it provides the greatest benefit to society.

We strongly advocate an integrated water resources developer charge in the future. This would align with a potential re-introduction of water, wastewater and stormwater developer charges. The current policy of zero developer charges for traditional water, wastewater and stormwater servicing and a non-zero developer charge for recycled water distorts investments away from recycled water and towards traditional servicing solutions. As our urban area expands, it is vital that development is provided a simple and clear, location-based signal of the incremental cost to provide new services. It is appropriate for water utilities to be able to levy developer charges where the cost to serve a development area is above the cost to serve the broader customer base. Existing customers should not bear the cost of servicing higher costs to serve areas. Allowance of an integrated water resources developer charge is the most efficient way for this to occur. We

acknowledge that this may not currently be possible under current policy settings but urge policy makers to consider how this might best be achieved.

A lighter-handed approach recycled water framework would also be consistent with recent recommendations made by the Productivity Commission and with the National Water Initiative principles. For schemes which represent the least cost to society, IPART need only consider the prudency and efficiency of such expenditure at each price review. This would be sufficient to ensure the consumers of all water products (water, wastewater, stormwater and recycled water) are adequately protected.

We consider there is a long history of utilities working to deliver water servicing solutions which maximise the benefits to consumers. Also, prescriptive methodologies have proven to be counterproductive in practice, undermining IPART's core objectives, such as full cost recovery, and in some instances, distorting investment decisions away from cost-effective recycled water schemes.

Sydney Water recommends that IPART adopt the following approach to regulate recycled water:

- provide principles and guidelines for the utility to follow when developing its own methodology for calculating recycled water, usage, connection and developer charges
- allow water utilities to enter bilateral agreements with developers and other voluntary customers to recover upfront and ongoing charges similar to the unregulated agreements IPART permitted us to enter with large non-residential customers1
- recognise that when recycled water meets a distinct Government objective (for example, BASIX compliance), utilities should be allowed to collect a distinct contribution from developers to account for this. Currently, when utilities collect a BASIX compliance contribution, it is not separately specified
- clarify that recycled water schemes, when least cost, will be exempt from the recycled water determination and ringfencing arrangements
- clarify that recycled water developer charges will be collected where the least cost IWCM solution would otherwise raise the postage stamp price.

In addition, Sydney Water supports a flexible approach to recognising additional wider benefits so that we can pursue the least cost servicing option from the perspective of society. We agree with IPART's position that the wider customer base may also benefit from recycled water schemes. We support IPART's view that external benefits should only represent non-use benefits experienced by the broader customer base (that is, not localised benefits).

Sydney Water is regulated on a number of fronts, so ideally, our wider regulatory obligations should be designed to ensure that the services we deliver provide optimal benefits to society. IPART's price setting process would then need only to capture the cost of delivering services at this optimal level. However, in practice, it is not always the case that all system-wide benefits are

[1] IPART, *Review of prices for Sydney Water Corporation from 1 July 2016 to 30 June 2020 – Final Report*, June 2016, p 45.

reflected in the minimum standard of service we must provide. For this reason, we support an approach that can recognise these broader benefits to enable delivery of optimal water related services for the communities we serve.

2 Introduction and summary

2.1 About recycled water

Recycled water provides a fit for purpose alternative to traditional water sources for a range of applications, from irrigation to industrial boiler feed water. When the primary benefit of a recycled water scheme is the least cost delivery of the core water related services our communities need, we do not see any benefit in applying a separate regulatory framework to assess that scheme. We view recycled water as an integral component of IWCM planning, which we consider to be the best practice planning IPART should expect for all services we deliver. Such planning ensures the optimal balance of infrastructure (water, wastewater, stormwater and recycled water) to deliver the water related services our communities need.

In cases where recycled water is part of the least cost (that is, prudent and efficient) servicing solution, it is unnecessary for the recycled water scheme to be assessed any differently to any other expenditure. Similarly, we see no reason why the prudent and efficient costs of such schemes should not form part of the revenue allowance which IPART determines at each price review.

On the other hand, there are cases where either developers or other end-use customers may wish to implement water recycling schemes even though they are not the least cost IWCM solution. We consider that these schemes require further regulatory oversight because there should be clear articulation of how the additional costs are funded.

Structure of this submission

This document provides Sydney Water's response to questions and issues raised by IPART. We have structured our submission to generally follow the order of issues in IPART's Issues Paper. IPART's questions are noted throughout the submission in italics. Within each chapter, we have provided additional commentary on key issues.

The rest of this document is structured as follows.

- Section 2.2 summarises our response to questions posed in IPART's Issues Paper
- Section 3 discusses the context for regulation of recycled water
- Sections 4 to 8 provide additional information on our responses. These sections align to the sections in the Issues Paper.

2.2 Summary of our response to each Issues Paper question

Form of regulation and cost recovery framework

1. **For voluntary recycled water schemes (where customers have effective choice), sewer mining and stormwater harvesting services, is our proposed approach of allowing unregulated pricing agreements and only setting prices when we receive a request for a scheme-specific review appropriate?**

   Yes. We support IPART adopting a light-handed approach of allowing unregulated pricing agreements. See Section **4.1**

   – Is an approach similar to the scheme-specific review process used in wholesale pricing appropriate?

   Yes. See Section **4.1**

   – Do we need to establish pricing principles for these services? If so, what should these be?

   No. We consider pricing principles unnecessary for voluntary schemes. See Section **4.1**

2. **Are our pricing objectives for pricing recycled water relevant and appropriate? If not, why, and which aspect(s) needs amending or removal?**

   Yes. See Section **4.2**

3. **Do you agree with our classification of recycled water scheme costs? If not, why and what changes are required?**

   Yes. We consider that these categories are sensible and useful. However, it would be useful to clarify that additional tax obligations are incorporated into the direct and indirect costs. See Section **4.2**

4. **Do you consider recycled water prices should be set with reference to incremental costs? If not, why, and what proportion of a utility's joint or common costs should be recovered through recycled water prices?**

   We consider that recycled water prices should recognise joint or common costs. This ensures that corporate overheads are reflected in prices. See Section **4.3**.

5. **Do you consider our requirement that the cost recovery framework must consider the 'base case', as defined by an integrated water resource plan, appropriate and relevant? If not, why, and what alternative approaches are superior?**

   Yes. We support using IWCM plans (or equivalent) to determine the net cost or benefit of a recycled water scheme. However, we note that there are practical limitations to applying this approach because in some cases, such planning may be incomplete. See Section **4.3**.

Pricing arrangements for mandatory recycled water schemes

6. **Should the definition of mandatory recycled water schemes be refined to refer to a customer's level of effective choice (ie, ability to opt-in to recycled water)? If not, how should we amend our definition of mandatory recycled water schemes (if at all)?**

   Yes. We support IPART's proposal to refine the definition of mandatory schemes to refer to a customer's effective choice. However, we consider that it is important the definition of 'mandatory schemes' does not inadvertently mean that schemes which form part of the least cost solution to society require prescriptive and additional regulatory oversight. See Section **5.1**.

7. **Do you agree that recycled water and developer charges should recover total scheme costs net of cost offsets? If not, why, and what other approach should we adopt?**

   Yes. However, there are a number of anomalies in IPART's current methodology that prevent this outcome. Ideally, the developer charge methodology would apply to the full suite of IWCM however the policy decision to set water and wastewater developer charges to zero and have non-zero developer charges for recycled water prevents this. See Section **5.2**.

8. **Should the recycled water prices of mandatory schemes be capped at the prevailing potable water price or be allowed to reflect the willingness-to-pay of recycled water customers?**

   We do not consider customer pricing needs to be prescribed by IPART. While we agree, recycled water prices should generally reflect the prevailing potable water price; water utilities should be allowed to depart from this when they have clear evidence customers are willing to pay a higher price**.** Section **5.3**.

9. **Do 'top-up' pricing thresholds remain appropriate for mandatory schemes where demand for recycled water exceeds supply? If so, what should the thresholds be amended to (if kept at all)?**

   No. Top-up pricing thresholds are not required and we consider that it they should be removed. We consider that the water utility should have the flexibility to specify how recycled water prices may vary. See Section **5.3**.

10. **Should the water utility still be able to set fixed charges for recycled water, within a reasonable limit? Or, should they be capped so that the combined charges for recycled water and potable water sum to no more than the potable water charges that would otherwise have been levied for the same level of consumption?**

    Yes. We consider that the regulatory framework should be flexible enough to accommodate different pricing structures including fixed charges. See Section **5.3**.

11. **Are the procedural guidelines for mandatory schemes needed, given that IPART would be determining these prices at each utility's respective price review?**

    No. We agree this would then be redundant. See Section **5.4**.

Recycled water developer charges methodology

12. **Does a methodology remain fit for purpose in setting recycled water developer charges?**

    Yes. We strongly agree that determining a methodology is preferable to fixing individual recycled water developer charges for each DSP area. However, we are concerned that a methodology risks being too prescriptive. As discussed in answer to Question 13 (below and in Section **6.2**), we have identified several aspects of the current methodology that can be improved. See Section **6.1**.

13. **Do the components of the methodology that we propose to maintain continue to be appropriate for the purposes of calculating recycled water developer charges? If not, how should these be updated?**

    We do not support IPART maintaining a prescriptive methodology. Better outcomes for customers can be achieved if IPART sets principles and guidelines for the utility to follow when developing its own methodology. However, given IPART's proposal, we have identified several issues with the current recycled water developer charge methodology that can be improved. Primarily, we note that the policy of zero developer charges for traditional water and wastewater servicing and a non-zero developer charge for recycled water creates a distortion. We advocate for a simple and clear developer charge that applies to the full IWCM service.

    We raise several other issues, as noted in Section **6.2**.

14. **Should we update the annual consumption for an equivalent tenement to be equal to the average consumption values that would be established at each water utility's prevailing periodic retail price determinations?**

    No. The annual consumption per equivalent tenement (ET) may vary substantially by scheme and over time. We consider that the utility should instead prepare its forecast of consumption per ET for purposes of determining the recycled water developer charge as this could then be set and adjusted in a timely manner if required based on evidence of actual water use at a scheme level. See Section **6.2.4**.

15. **Should the March-on-March CPI adjustment factor, as used in our retail price determinations, be applied to index recycled water developer charges over time?**

    It is appropriate that the March-on-March CPI should be used a default adjustment for CPI. However, there may be justification for using alternative inflation measures. Furthermore, it may be optimal for recycled water developer charges to escalate at a different rate. **See Section 6.2.4** .

16. **Are negative recycled water developer charges likely to arise? Should we preclude negative charges?**

    Negative recycled water developer charges should not arise because this would simply indicate that the recycled water scheme formed part of the least cost solution to meet the community's water related servicing needs. See Section **6.3**.

17. **Should we allow utilities and developers to opt-out of the recycled water developer charges determination through bilateral agreements? If so, why?**

    Yes. Allowing utilities and developers to opt-out via bilateral agreements, while retaining a regulatory backstop, is a more efficient approach. We consider that this will result in water utilities having the flexibility to provide customers with the services they value. See Section **6.3**

18. **Do the current procedural requirements, including DSP content requirements and IPART's role in reviewing and registering DSPs, remain appropriate?**

    No. We agree these can be modernised with minimal change in line with changes made in the review of other developer charges. See Section **6.4**

19. **Does the developer charges methodology create any undue barriers to the uptake of recycled water?**

    Yes. As we noted in our response to Question 13, the recycled water developer charges methodology creates barriers to the uptake of recycled water.

    We consider that there are also aspects of the broader recycled water regulatory framework that bias investment away from recycled water and towards traditional servicing solutions. See Section **6.5**.

Pricing arrangements for voluntary recycled water schemes

20. **There are arguments for and against allowing cost offsets for voluntary recycled water schemes, particularly given our proposed less intrusive form of regulation for such schemes:**

    – Should cost offsets be claimed for voluntary recycled schemes only where there is a shortfall in funding from users? Or, is there a case to allow for cost offsets to fund commercially viable recycled water schemes?

    – Does our proposed process for allowing cost offsets appropriately incentivise participants of voluntary recycled water schemes – that is, to allow cost offsets to be claimed only where the scheme costs and willingness-to-pay are subjected to an efficiency review by IPART?

    The charges associated with voluntary schemes are best left to negotiation. Where prices are cost-reflective, proponents have the appropriate incentives to invest in voluntary schemes. Where the avoided costs are high (in excess of forgone revenue), Sydney Water has an incentive to negotiate with the customer to support the development of the scheme.

    We do not consider it necessary for IPART to assess a voluntary customer's willingness-to-pay. There would be no efficiency loss if these services were negotiated between Sydney Water and our customers because IPART's efficiency review framework incentivises us to seek the least cost solution.

    See Section **7**.

Cost offsets – avoided and deferred costs

21. **What is the nature of avoided and deferred costs for the potable water and wastewater network? How should these elements affect our assessment and calculation of avoided and deferred costs?**

    We largely agree with IPART's summary of the nature of avoided and deferred costs for potable water and wastewater. Some operational avoided costs can be easily estimated, for example, avoided pumping and chemical dosing costs. However, larger avoided costs relating to downsizing or delaying our collection, distribution and treatment infrastructure are scheme-specific and need to be determined on a case by case basis. See Section **8.1**.

22. Do you consider the prevailing WACC to be the most appropriate discount rate for water utilities to calculate avoided and deferred costs? If not, why and what alternative would you recommend?

Yes. While the prevailing WACC may not be the most appropriate discount rate, we consider that using it to calculate avoided and deferred costs is simple, transparent and prevents investment distortions across the business. See Section **8.2**.

23. Is the LRMC the appropriate basis to value avoided costs relating to the provision of potable water and wastewater? If not, why and what alternative would you suggest?

For potable water, LRMC is the appropriate basis; however, some adjustment for location-specific costs may be appropriate as these would not be adequately reflected in the LRMC.

For wastewater, avoided costs are highly site specific and need to be assessed on a case by case basis. We consider that a system constraints report is a more accurate, lower cost option for signaling potential avoided costs in our wastewater systems. A system constraint report supports competitive neutrality, as it facilitates Sydney Water and private utilities developing innovative and low-cost options for addressing capacity constraints. Publishing the existence of a constraint without specifying a solution encourages innovation from third parties, ultimately benefitting the long-term interest of customers.

See Section **8.2**.

24. Would stakeholders benefit from a published LRMC methodology and regularly published LRMC estimates? If not, what other approach could we adopt to ensure that reliable and frequent estimates of LRMC are made publicly available?

We believe establishing appropriate methodologies is always beneficial, and support a published LRMC methodology. However, we do not support a regularly published LRMC estimates for water or wastewater for the reasons noted above. Further, we do not believe that regularly publishing a water LRMC is of material value as LRMC should remain relatively stable.

Instead of a generic LRMC for wastewater, we consider that a system constraint report would provide greater benefits without incentivising inefficient investment. This could be regularly published and specify geographical areas where recycling could feasibly avoid or defer infrastructure spending.

See also comments on Question 23 and Section **8.2**.

25. Do you agree that the avoided cost of reduced potable water demand should be adjusted to account for foregone postage-stamp price revenue from the recycled water customer base?

Yes. To ensure existing customers are no worse off, avoided costs should be adjusted for avoided (forgone) revenue. This also applies to wastewater in circumstances where there is foregone wastewater revenue. See Section **8.2** for further information.

26. Should we assess avoided and deferred cost claims as part of the price determination process?

Yes. We support IPART assessing these claims as part of the price review process and also providing preliminary findings upon application. We also support IPART extending the preliminary finding process to include other water conservation projects which have been assessed under the Economic Level of Water Conservation method. See Section **8.3**.

27. Do our requirements for submission of an avoided and deferred cost business case remain appropriate? If not, why, and what amendments do you recommend?

Yes. We consider the requirement for submissions to be appropriate. See Section **8.3**.

28. Does our current post-adjustment mechanism remain appropriate? If not, what revisions do you recommend?

No. We consider that there should not be an ex-post adjustment mechanism for avoided costs once IPART makes a decision. This is because it introduces an additional element of uncertainty and potentially biases investment away from recycled water.

See Section **8.3**.

29. ***Do you agree that, for the purpose of determining cost offsets to be paid for by the broader customer base, external benefits should only represent non-use benefits experienced by the broader customer base (ie, not localised benefits) as demonstrated by evidence of customer willingness-to-pay?***

Yes. See further detail in Section **8.4** on some qualification regarding evidence of customer willingness-to-pay.

Cost offsets – external benefits

30. **Do you agree with our view that the NPV calculations for external benefits should adopt an approach consistent with how we value avoided and deferred costs? If not, why, and what alternative approach should we adopt?**

Yes. We support an NPV approach to calculating external benefits.

31. **Do you agree that the assessment of external benefits should be consistent with the approach for avoided and deferred costs?**

Yes. We support an approach that can recognise broader benefits to enable delivery of optimal water related services for the communities we serve. We consider that any method should not be overly prescriptive and be limited to IPART outlining principles and approach. This will allow flexible methods which can accommodate the specific circumstances of each project. See further detail in Section **8.4**.

32. **What factors should we consider in assessing external benefits? Why should we consider these factors?**

We are working with a number of regulators, water utilities and government agencies to develop a state-wide framework to assess the costs and benefits of IWCM plans, which includes recycled water schemes. The key factors IPART should consider when assessing external benefits include:

- The effectiveness of regulatory instruments to address the externality, that is, whether the regulatory framework already recognises the benefit
- The extent to which the externality impacts on the broader community
- Whether there are other, better means to address the externality.

See Section **8.4**.

3 Recycled water in context

3.1 The rationale for regulation

When considering how best to regulate recycled water, it is important to start by considering what amenity or outcome the use of recycled water provides or enables respectively. This will inform the rationale for regulation and help to establish how IPART can best meet its legislative requirements to regulate. As noted in the previous chapter, recycled water is not declared as a monopoly services by the NSW Premier.[2] Rather, 'water supply services' are listed as monopoly services. As such, we question what circumstances a separate framework might be required, if at all.

For a sub-set of non-potable applications, such as garden watering and toilet flushing, recycled water can deliver the same amenity as potable water. Although water from recycled water schemes is typically lower in quality than potable water, recycled water is plumbed so that it can be used for all non-potable purposes and is therefore, for those specific uses, a fit-for purpose substitute for potable water. In these cases, we consider regulation of the charges for that recycled water should match that of the regulation of charges for the potable equivalent. The consumer is receiving the same amenity from using the recycled water as they would do if they used potable water (for that sub-set of non-potable purposes). If a separate framework is used to single out one method of delivery of this amenity to consumers, it is likely to create an arbitrary barrier for adoption of that method.

Similarly, the purpose of all wastewater and much stormwater infrastructure is to manage water born pollutants. Recycled water infrastructure can also be used to meet this same outcome. For example, in Rouse Hill, the third-pipe recycled water network was the least cost to ensure no net increase in nutrient discharge to the river catchment. More recently, Sydney Water has managed waterway health by releasing recycled wastewater into South Creek to deliver environmental flow. In both cases, the management of pollution could have been delivered by more traditional methods, however, society has benefited by adoption of the least cost method. We see no benefit in subjecting such least cost and more innovative servicing solutions to a separate framework. Rather, innovation should be fostered by ensuring that pricing regulation is consistent, no matter what method is used to meet water-related servicing outcomes.

There is potential for a separate regulatory framework to become a barrier to water utilities pursuing the lowest cost integrated solutions. This will become increasingly important to Sydney Water as we pursue more innovative solutions to address Sydney's growing needs and to ensure water security in times of drought.

When the primary benefit of a recycled water scheme is the delivery of the core water related services our communities need, we do not see any benefit in applying a separate regulatory framework to assess that scheme. That is, in cases where the least cost (that is, prudent and efficient) servicing solution includes the sale of recycled water, there is no need for this scheme to

[2] Independent Pricing and Regulatory Tribunal (Water, Sewerage and Drainage Services) Order 1997 (IPART Order for Sydney Water, Hunter Water and Central Coast Council).

be assessed any differently than any other expenditure by a water utility. Similarly, we see no reason why prudent and efficient costs of such schemes should not form part of the revenue allowance under the same terms and conditions for all water-related services which IPART determines at each price review.

On the other hand, there are cases where either developers or other end-use customers may choose to implement water recycling schemes even though they are not the least cost IWCM solution. We consider that these schemes require further regulatory oversight because there should be clear articulation of how the additional costs are funded. This is not to say utilities are not capable of developing their own methodologies to ensure this happens, rather that it is appropriate IPART provide pricing principles which the cost recovery structure of such schemes must comply with.

3.2 Regulation in other jurisdictions

The regulatory framework for recycled water in which Sydney Water operates differs substantially to other jurisdictions. In other jurisdictions, recycled water costs are recovered from a combination of usage charges for recycled water and the charges for all other services in a more integrated manner than in NSW. For example:

- In South Australia, recycled water services are simply included in SA Water's Revenue Determination for water and wastewater services. Recycled water revenue is included in SA Water's wastewater services and recycled water revenues are treated as a cost offset to their wastewater retail business.[3]
- In Victoria, Melbourne Water recovers the gap between recycled water revenue and costs through wastewater charges.[4]
- In South-East Queensland, 'unrecovered amounts' are allocated to potable water and wastewater charges in proportion to avoided cost allocations.[5]

A set of pricing principles for 'recycled water and stormwater use' are included in the National Water Initiative (NWI) pricing principles.[6] These principles are consistent with IPART's recycled water pricing principles in that they aim to enable cost recovery. However, the NWI principles differ by emphasising a light-handed and flexible approach. The first principle states:

> *Light handed and flexible regulation (including use of pricing principles) is preferable, as it is generally more cost-efficient than formal regulation. However, formal regulation (e.g.*

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3 See https://www.sawater.com.au/__data/assets/pdf_file/0006/165255/2018-19-Alternate-Water-Pricing-Policy-Statement.pdf.

4 For Melbourne Water's approach see section 9.5 (page 108) of the Melbourne Water's 2013 plan, available at https://www.melbournewater.com.au/media/284/download .

5 See page 117 of 'SEQ Retail Water Long-Term Regulatory Framework – Pricing Principles – Part C', available at http://www.qca.org.au/getattachment/efb59735-af8c-4ce1-bddb-cdc5f1b07817/Part-C.aspx.

6 National Water Initiative Pricing Principles, section 4.

establishing maximum prices and revenue caps to address problems arising from market power) should be employed where it will improve economic efficiency.

Consistent with this principle, the regulatory framework in other jurisdictions is generally light-handed.

The regulatory environment differs in other jurisdictions in other relevant ways, including:

- In both Sydney Water's and Hunter Water's areas of operation, developer charges for water and wastewater have been set to zero by the then NSW Government. In other jurisdictions, developer charges may be collected to pay for investments in water and wastewater infrastructure.
- In NSW, third-pipe recycled water schemes provide a key local benefit of meeting BASIX planning requirements. In some jurisdictions, a recycled water service does not have the same benefit of negating the need for a plumbed rainwater tank. For example, in 2013 the Queensland Government removed the requirement to install rainwater tanks.7 In Victoria, a rainwater tanks (or recycled water connection) is not required if a solar water heater system is installed.8 Alternative water supplies (such as rainwater tanks or recycled water) are still required in some other jurisdictions.9

7 http://statements.qld.gov.au/Statement/2012/12/14/reforms-to-cut-thousands-from-new-home-costs.

8 See http://www.vba.vic.gov.au/__data/assets/pdf_file/0003/20397/PN-55-2014-Residential-Sustainability-Measures.pdf.

9 For example, in South Australia, https://www.sa.gov.au/topics/water-energy-and-environment/water/rainwater-tanks/rainwater-tanks.

4 Regulation of prices for recycled water and related services

In this chapter, we provide responses to IPART's questions relating to the form of regulation, pricing objectives and the cost recovery framework. Our responses reflect our concern that least cost and more innovative servicing solutions should not be subject to a separate framework. Rather, innovation should be fostered by ensuring that pricing regulation is consistent, no matter what method is used to meet water-related servicing outcomes.

4.1 Form of regulation

Question 1 *For voluntary recycled water schemes (where customers have effective choice), sewer mining and stormwater harvesting services, is our proposed approach of allowing unregulated pricing agreements and only setting prices when we receive a request for a scheme-specific review appropriate?*

Yes. This has proved to be an effective regulatory approach in the past.

Question 1(continued)

– Is an approach similar to the scheme-specific review process used in wholesale pricing appropriate?

Yes. Sydney Water supports all recycled water scheme proposals being assessed in an equitable manner.

Question 1(continued)

– Do we need to establish pricing principles for these services? If so, what should these be?

We do not think IPART needs to establish separate pricing principles for voluntary schemes. The National Water Initiative pricing principles are clear and appropriate. We support IPART adopting principles consistent with those from the National Water Initiative for recycled water pricing, in summary:

- light handed and flexible regulation (including use of pricing principles) is preferable
- cost allocation should be on a beneficiary pays basis

- regard to price of substitutes (potable and raw water) may be necessary
- pricing should:
    - reflect differentiation in the quality or reliability of supply
    - reflect integrated water resource planning (IWRP) where appropriate
    - recover efficient, full direct costs
    - be adjusted for avoided costs and externalities
    - be transparent, understandable to users and published[10]
    - include volumetric use charging
    - allow consumer education and time for the community to adapt.

Sydney Water supports the principles for regulation of recycled water pricing being applied to all recycled water scheme proposals. Regardless, we consider that voluntary schemes are best dealt with by negotiation.

4.2 Pricing objectives

Question 2 *Are our pricing objectives for pricing recycled water relevant and appropriate? If not, why, and which aspect(s) needs amending or removal?*

Yes. The objectives remain relevant and appropriate. However, we have a number of concerns regarding how these objectives are being reflected in the recycled water framework and related legislation.

First, we are concerned about the difference between recycled water price regulation for public and for private water utilities. Currently, the legislation governing pricing for public and private water recycling schemes does not allow IPART to treat them in the same way. S51(2)(b) of the *Water Industry Competition Act* (**WIC Act**) states the Minister can only refer schemes to IPART for a price determination that are mandated under another Act. As such, IPART is currently unable to determine prices for private schemes yet must regulate prices for public schemes. This discrepancy means IPART is unable to achieve their objective of adopting a pricing framework which does not unduly disadvantage public water utility recycled water schemes, relative to private scheme operators.

The WIC Act is currently being reviewed. Sydney Water supports changes being introduced to this Act to ensure the frameworks for price determination for public and private water recycling schemes are consistent. For competition to result in the maximum benefit to consumers, it must be

[10] In the case of a voluntary scheme conducted under a commercial agreement, it would be inappropriate and unnecessary to publish the prices publicly as they would be commercial in confidence and only applicable to the party to that agreement.

conducted on a level playing field. We consider it timely for the difference between the Sydney Water and Water Industry Competition Act requirements being addressed so that IPART can regulate pricing for public and private recycled water schemes equitably.

Second, the approach of ring-fencing introduces complexity and risk. We appreciate that IPART is concerned that regulated water utilities could cross-subsidise the costs of recycled water schemes by subsidising scheme costs through the broader water and wastewater customer base. However, the ring-fencing approach differs to what commonly occurs elsewhere. It results in carving out a subset of water services, which becomes smaller in scale and more exposed to regulatory risk.

4.3 Cost recovery framework

Question 3 *Do you agree with our classification of recycled water scheme costs? If not, why and what changes are required?*

Yes, we agree the following categories represent a sensible and useful classification:

- direct capex and opex to produce, store and deliver recycled water (treatment, storage and reticulation infrastructure costs)
- facilitation costs (any additional integration related costs)
- indirect costs, (incremental overhead costs)

We note that IPART does not currently allow recovery of the tax on recycled water assets which are gifted to a water utility. We consider this should be allowed as it is a component of direct capex. We discuss this further in Section 5.2.

Question 4 *Do you consider recycled water prices should be set with reference to incremental costs? If not, why, and what proportion of a utility's joint or common costs should be recovered through recycled water prices?*

There are arguments for and against using incremental costs:

- When recycled water services are supplementary to water and wastewater services it is appropriate to use an incremental cost approach. In such cases, incremental costs should be broadly defined to include those associated with corporate costs, customer services and other costs that might often be classified as common costs.[11]

[11] This is consistent with NWI Principles which state that 'Direct costs include any joint/common costs that a scheme imposes, as well as separable capital, operating and administrative costs.

- On the other hand, in the interest of promoting efficient competition, there is an argument for IPART to adopt the stand-alone costs approach rather than the incremental approach. This would place all entities who provide a recycled water product on the same footing regardless of how many other services they provided. As WIC Act licenced utilities are currently required to provide a new source of water, a stand-alone approach may go some way to address this additional requirement which only private utilities face. However, we consider it preferable this discrepancy in requirements between public and private utilities is addressed in the upcoming review of the WIC Act.

However, the most important consideration, no matter which approach is taken, is that it is consistent with price setting of other services. Currently there has been an inconsistency in approach which is a problem for Sydney Water. IPART's decided in their 2016 determination of our retail prices to allocate 1.2% of our total corporate costs (about $2 million per annum) from our general customer base, to recycled water. However, recycled water developer charges for each of our schemes had previously been set to exclude joint or common costs. Consequently, Sydney Water has been left with a funding shortfall for those corporate costs allocated to recycled water.

As our current recycled water developer charges cannot be changed retrospectively, it is most important there is consistency in approach to ensure revenue adequacy[12]. That is, joint or common costs should not be allocated to a recycled water scheme if the recycled water developer charges were determined having excluded joint or common costs.

Given the approach IPART adopted in the 2016 determination, Sydney Water recommends that utilities should be allowed to include joint or common costs in determining future recycled water developer charges. Our preference would be that this is made more explicit in IPART's recycled water determination. In addition, to ensure cost recovery, in future retail pricing determinations the amount of joint or common cost allocated to recycled water should be no more than the joint or common costs that have previously been collected via developer charges.

Question 5 *Do you consider our requirement that the cost recovery framework must consider the 'base case', as defined by an integrated water resource plan, appropriate and relevant? If not, why, and what alternative approaches are superior?*

We agree with IPART that it is necessary for water utilities to assess the costs and benefits of recycled water projects in a system-wide context and that that this should be done by comparison to a base or BAU case. Ideally, this base case would be the suite of projects previously found to be the least cost to deliver all water related services under an integrated water cycle management

[12] We note that if joint or common costs are added in to the cost recovery for recycled water services, they would have no effect on end-user recycled water usage and or connection charges. Rather, they would rather only inflate the recycled water developer charge.

(IWCM) plan [13]. However, given the fragmented responsibilities for water management in Sydney, there are few comprehensive IWCM plans in our area of operations.

To address this, Sydney Water uses outputs from existing plans, such as the Metropolitan Water Plan when developing integrated system plans for our area of operations. We strongly support IPART continuing to allow utilities to augment and amend existing planning documents to achieve the same functionality as a stand-alone IWCM plan to avoid duplication of effort.

Sydney Water has made steady progress towards best practice water resource management through successive iterations of such plans, for example:

- our Growth Servicing Investment and Integrated System Plans and regional master plans. These provide the basis for optimising water and wastewater services for current and future customers in each catchment and water delivery area we serve
- the Metropolitan Water Plan. This is a whole-of-government approach to water planning for Greater Sydney. It ensures our region has sufficient water resources now and for the future.
- the EPA's Hawkesbury Nepean Nutrient Regulatory Framework. This framework aims to ensure river health is delivered at the least cost to society.

Each of these initiatives make an important contribution to delivering IWCM in the Greater Sydney region. We also note the progress Infrastructure NSW has made towards developing a comprehensive IWCM plan for the South Creek catchment in Western Sydney. This planning has identified integrated water infrastructure options which result in broader social and environmental benefits. We expect this project will represent a step change in the way Sydney Water can plan, assess and deliver IWCM, which is a great outcome for customers.

We strongly support IPART continuing to require an IWCM plan (or equivalent) to determine the net cost or benefit provided by water recycling. We believe this is consistent with the next steps described in the 2017 Metropolitan Water Plan, and DPE's proposal for a Greater Sydney Water Strategy.

Appendix 1 contains further discussion of some of the difficulties we have experienced in the past in relation to identifying avoided costs, recent initiatives to address this problem, and implications for IPART's update to their avoided cost guidelines in this review.

[13] IPART has used the term integrated water resource plan (IWRP), we consider this is the same as what is more commonly referred to as an IWCM plan.

5 Mandatory recycled water schemes

In this section, we respond to the questions posed by IPART in the chapter of the Review Paper on Mandatory recycled water schemes and address some additional issues not specifically raised.

The cost recovery framework for mandatory schemes is inextricably linked to recycled water developer charges (covered in Chapter 6). When considering the appropriate form of regulation for mandatory schemes, it is important to recognise that the recycled water developer charge is the balancing item that that primarily determines cost recovery[14].

This chapter only considers prices for recycled water usage charges and recycled water fixed charges for mandatory schemes. However, the pricing principles that apply to these charges could and should equally apply to other recycled water schemes, where customers do not have effective choice. This includes recycled water customers of a private scheme.

In this regard, Sydney Water is concerned there is no regulatory oversight of the charges applied by private operators who have market power over their customers. The WIC Act is currently being reviewed. Consequently, we propose IPART consider that the framework for public utilities might be more broadly applied to private schemes in the future.

5.1 Definition of mandatory schemes

> ***Question 6*** *Should the definition of mandatory recycled water schemes be refined to refer to a customer's level of effective choice (ie, ability to opt-in to recycled water)? If not, how should we amend our definition of mandatory recycled water schemes (if at all)?*

We support IPART adjusting their definition of mandatory schemes on condition that their subsequent regulation of end-user prices of such schemes:

- is light-handed
- requires prices to be consistent with the LRMC of balancing supply and demand for all water uses (that is for potable, and non-potable uses)
- is consistent with postage stamp prices (when they exist).

It is clear that an end use customer whose property is connected to a recycled water scheme has little effective choice to opt out of the scheme. This is true for schemes delivered by both public and private water utilities. We support IPART having the ability to ensure all customers are protected from potential abuses of monopoly power, regardless of who delivers the scheme. That being said, we do not see a strong case for prescriptive regulation of end user prices at this time.

[14] Revenue from end user charges play a minor role. By construction, higher expected revenue from end-user charges directly results in lower recycled water developer charges. There is limited ability to raise end-user charges (above the expected levels) to recover any shortfalls.

We consider the prices recycled water end-use customers face can be largely self-regulated due to the intrinsic link between the amenity provided by potable and recycled water. So long as potable water prices continue to be regulated through the retail price determination, utilities are likely to self-regulate recycled water prices so they remain in step with prevailing potable water prices. For example, we consider it highly unlikely for a utility (either public or private) to set recycled water usage charges above those already set for potable water. To date, it is our understanding that both public and private utilities have proposed and chosen to set usage charges below that of the prevailing potable usage price. As such, we believe IPART should allow all utilities to set their own recycled water connection and usage charges and only step in and complete a review if a utility proposes to set their prices in a manner which is inconsistent with either the LRMC or the current prevailing price of potable water.

Although we are not aware of problems with the way public and private utilities have set end user prices to date, in the interests of encouraging efficient competition, it is our strong preference that the upcoming review of WIC Act enables an equitable framework for pricing and protection of consumers of both public and private recycled water schemes.

5.2 Cost recovery framework for mandatory schemes

Question 7 *Do you agree that recycled water and developer charges should recover total scheme costs net of cost offsets? If not, why, and what other approach should we adopt?*

Yes. However, more precisely, the expected recycled water and developer charges should recover the expected total scheme costs net of cost offsets. Our chief concern is that there are several issues with the current methodology that prevent this outcome.

It is primarily the recycled water developer charges methodology that determines whether cost recovery is achieved. This is because recycled water developer charges are set to recover scheme costs *less* all offsets and other revenue sources. Consequently, any change to the offsets and other revenue sources will (at the time of next review) flow through to an adjustment to the recycled water developer charge.

We consider the current articulation of the recycled water developer charges methodology and cost recovery guidelines have been unclear and appear to be in contradiction to IPART's Issues Paper.

To date, Sydney Water has taken a conservative interpretation of the current determination. That is, although there is a statement in the final report which implies that a wider period of costs might be included[15], we have only included the capital costs forecast to occur in the first 30 years of the

[15] IPART, *Pricing arrangements for recycled water and sewer mining – Sydney Water Corporation, Hunter Water Corporation, Gosford City Council and Wyong Shire Council - Final Report,* September 2006. page 40.

scheme in our recycled water developer charges calculations. This is because there are at least four sections of the 2006 determination and report which imply a 30-year limit:

- Schedule 1, clause 2: *n – the forecast period for the assessment of expected revenues and costs and is 30 years from the date of calculating the RWDC*
- Box 5.1 of the Report: *n = the forecast horizon for the assessment of future revenues and costs and is to be equal to 30 years*
- Section 7.4 of the Report: *Calculate the "total direct cost" of the recycled water scheme, in present value terms, having regard to all Capital Expenditure (capex) and Operating Expenditures (opex) expected over a 30-year planning horizon.*
- Appendix C of the Report, page 78: *Estimates of future capital and operating costs should be over a time period of 30 years, consistent with the time period used to calculate developer charges.*

In addition, we have provided IPART with copies of each of our eight recycled water developer charge calculation sheets for approval, and they have never questioned this interpretation. As such, we were surprised to find that in the Issues Paper, IPART states, the current methodology sets no limit to the period for which past and future assets are included in the calculations.

We strongly support IPART's stated interpretation in the Issues paper as our previous interpretation (that is, to limit cost recovery of capital expenditure to a 30-year period) has resulted in significant under-recovery of costs for some of our recycled water schemes to date. Our strong preference is for IPART to allow utilities to set their own recycled water developer charges methodology. However, in Section 6.2, we have also outlined how the existing methodology and guidelines might be adjusted to achieve IPART's intention for full cost recovery.

5.3 Recycled water customer pricing for mandatory schemes

Question 8 *Should the recycled water prices of mandatory schemes be capped at the prevailing potable water price or be allowed to reflect the willingness-to-pay of recycled water customers?*

We do not consider customer pricing needs to be prescribed by IPART. While we agree recycled water prices should generally reflect the prevailing potable water price; water utilities should be allowed to depart from this when they have clear evidence customers are willing to pay a higher price.

In the majority of cases, recycled water systems are topped-up from potable-water sources. This is an efficient outcome, balancing the costs of infrastructure to meet peak demands against the marginal cost of potable water supply. Consequently, the marginal cost of supplying recycled water will be identical to the marginal cost of potable water (which should match the potable water price).

From an efficiency viewpoint, this suggests, the recycled water price should match the potable water price in these cases.[16]

However, in other cases, the cost of supplying recycled water may exceed the potable water price, and may be of greater value. For example, in Long Bay California users are charged more than the potable water price for high quality boiler feed water produced from wastewater effluent. These customers had previously bought potable water and conducted their own demineralisation. With the option of high quality recycled water, they saved significant costs and were happy to pay more than potable price for that product.

Another exception may be if the potable water price is not optimal. For example, during a drought, in the absence of drought pricing on potable water, the true marginal cost of supplying additional recycled water will be higher than the sub-optimal price of potable water. To avoid this situation, a possible solution could be that drought pricing be applied to both potable and recycled water use during periods of constrained supply.

Care must also be taken when interpreting consumers' willingness-to-pay (WTP) for recycled water. For example:

- when WTP is less because recycled water is treated to a lower quality than potable-water. Although such recycled water is treated to a lower quality than potable-water, it is only used for purposes that do not require potable water. Therefore, for these purposes it can be reasonably considered a substitute of equal value.
- when WTP is more because recycled water may still be available when potable water is restricted. The freedom from restrictions may be a feature of being connected to recycled water. It is not a feature of the recycled water itself (that is, it exists no matter how much recycled water is used). In addition, the relative benefit is lessened to the extent that similar households might also be free from restrictions by virtue of a rainwater tank and because households with recycled water will still likely incur social pressure to reduce water consumption.
- when WTP is more because consumers perceive recycled water is better for the environment. While there are potential environmental benefits of recycled water schemes, the benefits do not generally stem from greater recycled water consumption (given additional use at higher volumes is generally made up of potable top-up). When these environmental benefits are already captured in a way that reduces the cost of the scheme, such increased WTP may be a result of misguided understanding.

In light of the above considerations, we believe it is generally appropriate that, subject to consumer acceptance, the recycled water price should match the potable water price (reflecting that, at the margin, the cost of provision is the same).

16 That is, setting prices equal to marginal cost encourages efficient use of the water.

We expect there will be some exceptions where recycled water prices should exceed the prevailing potable water price. Although it seems unlikely, it is also possible that the optimal recycled water price should exceed the potable-price if the potable-price is not cost-reflective.

Question 9 *Do 'top-up' pricing thresholds remain appropriate for mandatory schemes where demand for recycled water exceeds supply? If so, what should the thresholds be amended to (if kept at all)?*

We agree that specific prices for each range of top-up is overly prescriptive and that it is best the thresholds be removed. Rather, consistent with the flexibility offered by the current guidelines, it is better for water agencies to specify how recycled water prices may vary with demand.

As discussed above in our response to Questions 8 we recommend that the price of recycled water generally be allowed to move towards being equal to potable-water to reflect the marginal cost of supply.

Question 10 *Should the water utility still be able to set fixed charges for recycled water, within a reasonable limit? Or, should they be capped so that the combined charges for recycled water and potable water sum to no more than the potable water charges that would otherwise have been levied for the same level of consumption?*

We see no reason to impose such a restriction so long as utilities are not recovering more than the total cost to provide the scheme. It is possible, the regulatory environment could change such that it may be desirable and feasible to levy fixed charges, for example, if BASIX was expanded to require on-going compliance, customers may see a fixed charge as being equitable with the alternative on-going cost to maintain a rainwater tank.

However, currently we do not expect to charge fixed-charges for recycled water. The main consumer benefit of our existing third-pipe (mandatory) recycled water services currently stems from obtaining a BASIX certificate and being able to avoid the installation of a plumbed rainwater tank. For many customers, they will not perceive any ongoing benefit once the BASIX certificate is obtained.

5.4 Procedural requirements for mandatory schemes

Question 11 *Are the procedural guidelines for mandatory schemes needed, given that IPART would be determining these prices at each utility's respective price review?*

No. We agree these procedural guidelines would then be redundant.

5.5 Other issues: Non-residential developer charges

The current determination appears to allow discretion for how non-residential properties can, or should, be treated. That is, it would appear non-residential developer charges can be based on:

- a property's impact on infrastructure requirements on an average day
- a property's impact on infrastructure requirements on a peak day
- a combination of assumptions.

Even if the new determination retains this flexibility, we consider it would be beneficial for Sydney Water to publish a policy which states how we will interpret IPART's new determination for non-residential properties.

6 Recycled water developer charges methodology

6.1 Form of regulation for developer charges

Question 12 *Does a methodology remain fit for purpose in setting recycled water developer charges?*

We strongly agree that determining a methodology is preferable to fixing individual recycled water developer charges for each DSP area. However, we are concerned that setting a single methodology risks being too prescriptive. As discussed below in answer to Question 13, there are several issues with the current methodology which have led to inefficient outcomes.

To help address these issues, we recommend making the methodology less prescriptive, or require utilities to develop their own methodology which must align with IPART's pricing principles. The primary concern is that recycled water developer charges should be set to recover the difference between expected costs, revenue and cost offsets. We consider there is little need to prescribe guidelines beyond this basic requirement.

6.2 Potential improvements to the methodology components

Question 13 *Do the components of the methodology that we propose to maintain continue to be appropriate for the purposes of calculating recycled water developer charges? If not, how should these be updated?*

There are a number of anomalies within the current methodology. These result in the framework being unable to meet three of IPART's objectives:

- provide revenue adequacy
- achieve economic efficiency
- be transparent and simple.

Our strong preference is for IPART to provide guiding principles to allow utilities to set their own recycled water developer charges methodology. However, we have also outlined below how the existing methodology and guidelines might be adjusted to achieve the above objectives. Appendix 3 also provides a more detailed discussion of these anomalies.

6.2.1 Changes to ensure revenue adequacy

This section suggests changes which could be made to the current methodology for developer charges to ensure utilities are able to still fully recover their efficient costs when they deliver

schemes which require additional funding from developers. We have listed the suggestions in order of materiality.

Remove the limit to the period for which past and future assets and operational costs are included in the calculations

A 30-year time limit on cost recovery is a problem because the ongoing costs of recycled water scheme are likely to be significantly greater than the ongoing revenue from the recycled water usage charges.[17] As this is best shown by example, we have provided this in Appendix 2 where it can be seen that under the current determination, utilities will incur a funding shortfall in the second 30-year period of around 24 per cent of the sum of all avoided costs and recycled water developer charges collected in the initial 30-year period.[18]

Allow recovery of the tax liability on assets free of charge (AFOC)

There is no allowance for the tax liability which results when utilities receive recycled water AFOC[19]. The formula for the recycled water developer charges, as expressed in the current determination, does not include an allowance for the tax liability and therefore under a strict application of the current determination formula, utilities will under-recover their costs.

This could be simply addressed by either explicitly listing tax on AFOC as a recoverable cost or by being less prescriptive as to what costs are included.

Allow recovery of joint or common costs

The recycled water developer charges formula refers to capital costs and operating costs but does not explicitly refer to joint or common costs. Conceivably joint or common costs could be considered part of operating costs; nevertheless, this would best be clarified.

Allow utilities to define ET on a case by case basis

Specifying an annual consumption per ET is problematic as recycled water per ET may vary substantially by scheme and may vary over time. This is discussed further in our answer to Question 14 below.

6.2.2 Changes to ensure economic efficiency

Allow use of risk-based costs and forecasts

There is significant uncertainty over costs and revenue associated with recycled water solutions which will lead to inefficient outcomes if they are not managed well (see discussion in Box 1 below). The existing recycled water framework is largely silent on how uncertainty may be handled.

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17 A disparity between ongoing costs and revenue arises because there is a difference when benefits are received and costs are incurred. Much of the customer benefit from a recycled water scheme comes from obtaining a BASIX certificate, which is issued at the time of development. However, much of the cost is an ongoing.

18 Equal to (1+ 4.9%)^-30.

19 The value of the AFOC is treated as additional revenue of Sydney Water and as additional expense of the developer. Consequently, Sydney Water bears an additional tax-liability from revenue as it is not offset by an expense.

If utilities cannot make an allowance for risk then (due to the asymmetric nature of risks) they are likely to under-recover costs. In calculating a recycled water developer charge, appropriate allowance should be made for any additional risk.

Appendix 3 provides further discussion of particular risks for schemes which are not least cost (that is, which require additional developer contributions above that required to achieve BASIX and other environmental and planning requirements). To mitigate the additional risk in these situations we recommend IPART allow:

- bilateral agreements between water utilities and developers
- use of risk-based costs and forecasts in developer charge calculations.

Box 1: Uncertainty over costs and revenue associated with recycled water schemes

Currently, there is significant uncertainty over costs and revenue associated with recycled water schemes. These risks are largely the result of when actuals do not reflect the forecast of:

- capital and operating costs, and
- revenue, primarily due to deviation from the projected customer connections (that is, ETs) including, in some cases, a risk that developers will choose not to connect developments to a recycled water scheme.

Relative to other investments the risks to water utilities are more significant because:

- the uncertainty is greater (in part due to the relative lack of experience with recycled water schemes)
- water utilities are more exposed to variation in costs and revenues for recycled water, and
- the risks include regulatory risks that are outside of Sydney Water's control.

Many of the risks are asymmetric in that the downside risk is greater than the upside risk. For example, an error in the projection of the ETs can lead to an over or under recovery of the costs of the scheme. Due to the nature of the calculation a 10% over estimate leads to a greater loss to Sydney Water than the gain from a 10% under estimate.[20]

The five-year review process helps to mitigate some of the planning uncertainty but the mitigation is asymmetric in that it does more to reduce the risk of over-recovery than the risk of under-recovery. For example, because recycled water developer charges are paid up-front, Sydney Water is not able to

[20] This can be demonstrated with the following example. Assume the PV of ETs has an equal probability of being either 1500, 2000, and 2500. The expected PV of ETs is 2000. However, if this value is used to determine the RWDC then Sydney Water would on average under-recover. In this example, the RWDC used would be around 4 per cent less than the RWDC required to achieve cost recovery on average. This issue exists because when there is uncertainty in L the 'expected value of 1/L' is greater than '1/(expected value of L)'. An implication is that to achieve the principal of cost recovery, when there is uncertainty around the PV of ETs, the value of L used in determining the RWDC needs to be smaller than the expected value of L.

recover funds if recycled water developer charges are set too low. However, if recycled water developer charges prove to be too high developers may seek to recoup funds from Sydney Water.[21]

Recognise different BASIX compliance benefits for houses and multi-unit dwellings

Multi-units do not generally need rainwater tanks to meet BASIX requirements. As such there may be a far lower BASIX compliance benefit of a recycled water scheme to multi-units. Under the current definition of ET, the recycled water developer charges for multi-units may significantly overstate the benefits to these dwelling in meeting BASIX. This results in one group of customers subsidising another.

6.2.3 Changes to improve transparency and simplicity

Clarify the assumptions to be used at the five-year review

The current determination provides limited details as to how the recycled water developer charges should be updated at review. For example, the determination does not specify:

- what values should be updated in recalculating the recycled water developer charges, and
- the time-period that should be used.

As discussed in Section 6.1 we recommend the 30-year period be removed as it prevents cost recovery. We also recommend that all values be revised as part of the five-year review. This would help to mitigate the impact of the high levels of uncertainty associated with recycled water schemes.

Recognise the need for separate forecasts for developer and usage charge collection

The recycled water developer charges formula appears to rely on a single profile of ETs for both the timing of the recycled water developer charges and the timing of when recycled water revenue is received. However, there is a difference in when the recycled water developer charges is paid and when a recycled water end-use customer begins to use, and pay for the service. The recycled water developer charge is paid by developers at the time an application is made. This may be some years prior to when a dwelling is completed, consumes recycled water and therefore contributes to the ET count (in accordance to the definition of an ET).

Allow recovery of the additional tax liability due to the role of operating cost in avoided cost

The current avoided cost framework specifies that forecast avoided operating costs are capitalized. This means that these effectively get included as assets in the RAB. However, assets created under the avoided cost framework are not included in the tax asset base and tax depreciation

[21] Consider the situation whereby the rate of development is constant (e.g. 400 new ETs per year) but that the number of connected developments is uncertain. If (as a result of a review) the projected number of ETs is revised downwards, the revised RWDC will increase but the revised RWDC will apply to a proportion of ETs that is relatively less than if the number of connections had been revised upwards.

calculations. The avoided cost formula therefore increases the present value of a utility's tax liability and increases the total pre-tax revenue required by a utility to service the regulated wastewater service. This could be addressed by:

- not capitalising the avoided operating costs, or
- clarifying that an allowance for differences in tax liabilities can be included in the avoided cost amount.

6.2.4 Changes to specific assumptions

Question 14 *Should we update the annual consumption for an equivalent tenement to be equal to the average consumption values that would be established at each water utility's prevailing periodic retail price determinations?*

The 2006 recycled water developer charges Determination states that for the purposes of calculating revenues and operating costs an assumption of 110kL recycled water usage per equivalent tenement (ET) should be used. Since the time of the 2006 determination, water use and particularly outdoor water use has fallen considerably. The 110kL assumption now results in an overestimate of the recycled water revenue collected and therefore and underestimate of the recycled water developer charges required to achieve cost recovery. The impact will in part be offset by an overestimate of the forecast operating costs, however, operating costs are largely fixed in nature and therefore the offset is very small.

Specifying an annual consumption per ET is problematic as recycled water per ET may vary substantially by scheme and may vary over time. Furthermore, there does not appear to be any rationale for prescribing the level of recycled water usage per ET for the purposes of calculating the recycled water developer charges. Rather we believe it would be more appropriate that the utility prepare its forecast of consumption per ET using the best data available at the time.

Question 15 *Should the March-on-March CPI adjustment factor, as used in our retail price determinations, be applied to index recycled water developer charges over time?*

It is generally appropriate that the March-on-March CPI should be used a default adjustment for CPI. However, there may be justification in the future for using alternative inflation measures. It may be more efficient (for example, to address scheme specific risks) that the recycled water developer charge for a scheme increases at different rate to the inflation rate. We recommend that the regulation of recycled water developer charges should be sufficiently flexible to allow water

utilities to propose a different escalation rate where this can be shown to result in a more efficient outcome.

6.3 Other potential improvements to the developer charge methodology

Question 16 *Are negative recycled water developer charges likely to arise? Should we preclude negative charges?*

In the unlikely case the developer charge methodology returned a negative result, it would appropriate to pass that saving back to end-use customers, not developers. Negative recycled water developer charges would in effect mean that the recycled water scheme in question is the least-cost solution to service a development.[22] In such cases it is appropriate that utilities proceed with that solution. A negative recycled water developer charge would result in existing customers being worse-off as a result of the scheme. We consider developers receive a positive benefit from the availability of water related services so would not need further incentives or payments which would effectively come from the existing customer base.

Question 17 *Should we allow utilities and developers to opt-out of the recycled water developer charges determination through bilateral agreements? If so, why?*

Yes. Utilities and developers should be able to opt-out of using IPART's recycled water developer charges methodology through bilateral agreements.

It may be of interest to both the water-utility and the developer to opt-out. Through a bilateral agreement, the developer and the utility can come to a more suitable arrangement. For example, a utility and developer may agree to change how the recycled water developer charges vary overtime so as to better manage risks, manage financing and to incentivise the optimal roll-out.

6.4 Improvements to procedural requirements for recycled water developer charges

Question 18 *Do the current procedural requirements, including DSP content requirements and IPART's role in reviewing and registering DSPs, remain appropriate?*

[22] As reflected in the recycled water developer charge formula, it would mean the present value of scheme cost (net of revenue) was greater than the present value of cost offsets.

We agree the procedural requirements for DSPs can be modernised with minimal change in line with changes made in the review of other developer charges. However, given IPART's intention to only set recycled water retail charges at each price determination, we consider that material changes to a developer charge (resulting from a subsequent retail pricing decision) should flow through with immediate effect. This would be appropriate, since consultation would have already happened during that retail price review.

6.5 Removal of undue barriers to the uptake of recycled water schemes

Question 19 *Does the developer charges methodology create any undue barriers to the uptake of recycled water?*

Yes, due to the issues described above in response to Question 13, the recycled water developer charges methodology creates undue barriers to the uptake of recycled water.

Another barrier to the uptake of recycled water schemes relates to how risks related to scheme costs and revenues are managed. Ring-fenced recycled water assets must be funded by a water utility upfront for an uncertain long-term outcome. In other jurisdictions, recycled water assets are treated as wastewater and water assets and consequently risks associated with the ongoing cost (and revenues) of these schemes are shared across the broader customer base. While we appreciate the approach adopted helps to encourage competition, it nevertheless remains a barrier to the uptake of recycled water schemes.

7 Voluntary recycled water schemes

Question 20 *There are arguments for and against allowing cost offsets for voluntary recycled water schemes, particularly given our proposed less intrusive form of regulation for such schemes:*

– Should cost offsets be claimed for voluntary recycled schemes only where there is a shortfall in funding from users? Or, is there a case to allow for cost offsets to fund commercially viable recycled water schemes?

– Does our proposed process for allowing cost offsets appropriately incentivise participants of voluntary recycled water schemes – that is, to allow cost offsets to be claimed only where the scheme costs and willingness-to-pay are subjected to an efficiency review by IPART?

Offsets for voluntary recycled schemes are best determined by negotiation. A voluntary recycled scheme customer or third party is incentivised to opt in to a scheme to the extent they benefit from that choice. Utilities have incentive to encourage third parties/customers to negotiate favourable price terms and conditions where the utilities avoided costs exceed any forgone revenue.

An efficiency review by IPART may be impractical. We consider it would be difficult for IPART to obtain relevant information from voluntary customers or third parties needed to conduct such a review. There are many factors that would influence the negotiation between voluntary customers and utilities. These include assessment of both the other costs and benefits of the arrangement to the customer and the alternative options for the utility.

8 Recycled water cost offsets

8.1 Nature of avoided / deferred costs

Question 21 *What is the nature of avoided and deferred costs for the potable water and wastewater network? How should these elements affect our assessment and calculation of avoided and deferred costs?*

It is widely recognised recycled water schemes can lead to avoided and deferred costs. These are primarily related to a reduction in water needed from alternative sources and effluent that needs to be discharged to the environment by some alternative means.

Avoided and deferred costs can be offset avoided and deferred revenue. When prices accurately reflect costs, the avoided/deferred revenue will directly offset the avoided/deferred cost.

The need to calculate avoided water costs in detail will be rare. This is because the usage price (set to LRMC) should be a close estimate of the per-unit avoided cost, and will be a reasonable estimate in most cases. The exception will be where there are significant localised capacity constraints.

Recycled water may be more likely to generate avoided or deferred costs for wastewater services. here will generally be no change in wastewater revenue, as households will still be charged for the service. However, there may be a reduction in wastewater costs, such as downstream treatment or disposal infrastructure.

Recycled water may result in avoided costs associated with externalities. Consistent with IPART guidelines these should only be considered when these externalities are not reflected in the price (and therefore internalised). In this regard the LRMC of water, by construction, implicitly incorporates many of the more significant environmental costs associated with supplying water to meet the Metropolitan Water Plan, such as Shoalhaven transfers and environmental flow releases in the Hawkesbury Nepean River.

In voluntary schemes, the avoided costs associated with water and wastewater will tend to be offset by avoided revenue.

8.2 Calculation of avoided / deferred costs

Question 22 *Do you consider the prevailing WACC to be the most appropriate discount rate for water utilities to calculate avoided and deferred costs? If not, why and what alternative would you recommend?*

We agree that the regulatory WACC is the most appropriate rate of return because it is simple and transparent. Further, the risks are non-systematic and therefore should not be reflected in the WACC.

The discount rate should provide an appropriate risk-weighted return on investment. IPART's WACC method estimates the cost of capital for a benchmark firm. IPART assumes that the benchmark is an efficient firm operating in a competitive market and facing similar risks to the regulated business. In our experience, the risks associated with a recycled water project are greater than the risks of undertaking our core regulated business.

We consider that the additional risks associated with investment in recycled water schemes (compared to traditional water services) are more appropriately dealt with outside the WACC through other mechanisms. These could include:

- making allowance for risk in cost and revenue forecasts
- true-up mechanisms to mitigate risks
- a light handed regulatory regime to enable Sydney Water to negotiate prices with our customers that enable us to recover our prudent and efficient costs

Specific adjustments to recognise the higher risks of recycled water schemes will ensure that water utilities have the right incentives to invest in these types of projects, and not bias investment decision towards traditional servicing approaches.

Question 23 *Is the LRMC the appropriate basis to value avoided costs relating to the provision of potable water and wastewater? If not, why and what alternative would you suggest?*

Potable water

For potable water, LRMC is the appropriate basis; however, some adjustment for location specific costs may be appropriate. The potable water price is a transparent measure of the LRMC.

In regard to the specific issues raised by IPART in its paper:

- IPART states *"For potable water supply, current LRMC estimates generally only reflect water source costs, and do not consider network distribution and other costs. We consider the LRMC should reflect the latest available information that includes all relevant stages of the supply chain, including network capacity constraints."*

  Sydney Water has recently prepared LRMC estimates that do consider and include network distribution and other costs.

- IPART states *"Due to the integrated nature of water supply networks, potable water LRMC estimates generally do not vary by location within a water utility's network (since LRMC estimates generally do not include network costs)."*

  Sydney Water's LRMC estimate includes network distribution and other costs. There is potential for LRMC for water to vary by location and we recommend adjusting the water LRMC to accordingly.

- IPART states *"The LRMC of water supply is only a viable proxy for avoided costs where there is evidence of sustained changes to potable water demand. If a recycled water scheme does not deliver permanent or longstanding reductions in demand, use of LRMC will overstate the costs avoided by the recycled water scheme."*

  We do not consider this to be a material issue. Recycled water schemes generally do deliver permanent and longstanding reductions in demand. Furthermore, if (as we argue below is appropriate) adjustment is made for avoided revenue then any variation will be small.

- IPART states *"We currently estimate the potable water LRMC during price reviews for individual water utilities. Whilst these estimates are made publicly available, they are specific to both the time of the price review and the chosen modelling assumptions. Water utilities may take a different view on these modelling assumptions, or otherwise have access to additional information that could yield alternative LRMC estimates."*

  Sydney Water's estimates LRMC for the purpose of pricing. Our estimates reflect the information available and our best assessment of the modelling assumptions

Wastewater

It would be inappropriate to use a single, broadly averaged LRMC for wastewater in isolation. As noted by IPART, the cost of treating wastewater can vary substantially by wastewater system. Avoided costs will not only vary between systems but will be highly location specific within systems. Pumping stations, large trunk mains and wet weather storage infrastructure are significantly costly infrastructure and each wastewater system will have a number of these assets, which my only service a portion of a wastewater catchment. It would therefore be highly inefficient to provide a signal based on a broad wastewater catchment average. The effect would be to hinder cost-effective projects going ahead in some locations while incentivising inefficient projects in others.

Within a system, the costs to provide wastewater services will be affected several factors including:

- the capacity of piping network
- the timing of wastewater production. Wastewater systems are developed for peak-use
- the type of waste, in particular where odour or corrosion is an issue.

In light of the above, we consider it would be impractical to rely on LRMC as basis for examining the avoided costs of wastewater as these must be considered on a case by case basis.

Question 24 *Would stakeholders benefit from a published LRMC methodology and regularly published LRMC estimates? If not, what other approach could we adopt to ensure that reliable and frequent estimates of LRMC are made publicly available?*

We do not believe stakeholders would benefit from a published LRMC methodology and regularly published LRMC estimates.

The potable water price, with locational adjustments as necessary, is a practical basis for LRMC for avoided costs associated with potable water. By construction, LRMC should change slowly over time.[23] The potable water price is already indexed to inflation and is updated periodically.

With regards to wastewater, there does not appear to be a material benefit to a LRMC methodology. As noted by IPART, estimating the LRMC of wastewater is complex and challenging. A risk with a prescriptive LRMC methodology is that the methodology constrains an accurate measure of the avoided costs. A preferred approach is to focus on principles and process to ensure avoided costs are appropriately calculated.

Question 25 *Do you agree that the avoided cost of reduced potable water demand should be adjusted to account for foregone postage-stamp price revenue from the recycled water customer base?*

Yes. Avoided costs should be adjusted for foregone (avoided) revenue. This includes forgone potable water revenue and forgone revenue on other services where applicable.

Adjusting for forgone revenue is necessary to ensure existing customers are no worse off. This was noted in the 2006 IPART Report which stated (p. 35) [emphasis added]:

> *Avoided costs should only be transferred to parties other than direct users of recycled water to the extent that it* ***leaves those parties no worse off*** *than they would have been without the recycling scheme.*
>
> *Therefore, avoided costs should be determined by establishing the total costs of meeting demand and how they would be borne both 'with' and 'without' the recycled water scheme. This requires that both incremental costs and* ***incremental revenues (or revenue foregone)*** *be considered under the recycled scheme and under the alternative scenario.*

However, the avoided cost formula presented in the 2006 guidelines regarding the avoided cost formula neglected to include terms for revenue (either incremental revenues or revenue foregone).

[23] A strict application of LRMC may see reasonably large changes in LRMC in the short-run as a result of changes in drought conditions. However, recycled water schemes cannot generally be implemented quickly and so the relevant LRMC should not be materially influenced by conditions in the short-run.

There may be cases where forgone wastewater revenue will also be relevant. The avoided cost of reduced wastewater production should similarly be adjusted to account for foregone revenue from wastewater usage-charges where applicable.

There is also potential for the forgone revenue to be in-excess of the avoided costs. However, this effect is likely to be small for potable water because the majority of the LRMC relates to the provision of bulk water, which is largely common our area of operations.

8.3 Assessment of cost offset claims

Question 26 *Should we assess avoided and deferred cost claims as part of the price determination process?*

Yes. We support IPART assessing these claims as part of the price review process. We also consider that there is merit in providing a non-binding, preliminary view on avoided and deferred cost claims upon application. We consider that this approach strikes the right balance between our need for certainty and the needs of our customers in ensuring that IPART's framework only includes legitimate avoided and deferred costs.

We also support IPART expanding the scope of their non-binding preliminary view assessments to include all water conservation activities, of which recycled water forms a large part. This would ensure consistent treatment for all water conservation activities.

At each retail price review, IPART sets revenue allowances based on a forecast of **average** weather conditions. The ELWC method could allow Sydney Water to identify water conservation projects that will become economically viable at lower dam levels, triggered by drier than average weather. If actual weather conditions triggered the need for increased spending on water conservation projects identified under the ELWC, a non-binding preliminary assessment of these projects by IPART would support these activities being implemented in a timely manner for the benefit of the community.

Non-binding preliminary assessments would provide Sydney Water some confidence that prudent and efficient costs will ultimately be recovered. However, this approach may still not be sufficient for operating expenditure projects, such as temporary recycled water schemes, in the absence of a cost pass-through mechanism.

Question 27 *Do our requirements for submission of an avoided and deferred cost business case remain appropriate? If not, why, and what amendments do you recommend?*

Yes. We support the requirements.

Question 28 *Does our current post-adjustment mechanism remain appropriate? If not, what revisions do you recommend?*

No. We consider that avoided and deferred costs should not be revisited once a decision is made. When we evaluate investment options, we consider the best information available at the time and proceed with the optimal investment based on that information. Reopening an important component of decision-making introduces an additional element of uncertainty, potentially biasing investment decisions towards traditional servicing approaches and away from recycled water schemes.

8.4 Nature of external benefits

Question 29 *Do you agree that, for the purpose of determining cost offsets to be paid for by the broader customer base, external benefits should only represent non-use benefits experienced by the broader customer base (ie, not localised benefits) as demonstrated by evidence of customer willingness-to-pay?*

Yes. We agree external benefits should only represent non-use benefits experienced by the broader customer base (that is, not localised benefits). Customers should also have demonstrated they are willing to pay for these externalities.

We note that obtaining meaningful evidence of our customer's willingness-to-pay is very difficult. Results may be biased through improper survey techniques, such as the way questions are framed. Further, obtaining a sample of customers that accurately represents our broader customer base is difficult and costly.

8.5 Calculation of external benefits

Question 30 *Do you agree with our view that the NPV calculations for external benefits should adopt an approach consistent with how we value avoided and deferred costs? If not, why, and what alternative approach should we adopt?*

Yes**.** We support an NPV approach to calculating external benefits.

8.6 Assessment of external benefits

Question 31 *Do you agree that the assessment of external benefits should be consistent with the approach for avoided and deferred costs?*

Yes. We support an assessment framework for external benefits that is consistent with IPART's approach for avoided and deferred costs. Sydney Water is regulated on a number of fronts, so ideally, our wider regulatory obligations should be designed to ensure that the services we deliver provide optimal benefits to society. IPART's price setting process would then need only capture the cost of delivering services at this optimal level. However, in practice, it is not always the case that all system-wide benefits are reflected in the minimum standard of service we must provide. For this reason, we support an approach that can recognise these broader benefits to enable delivery of optimal water related services for the communities we serve.

We agree with IPART's position that the wider customer base may also benefit from recycled water schemes; including externalities will enable us to pursue the least cost solution from the perspective of society.

We consider that any method should not be overly prescriptive and be limited to outlining IPART's principles and approach. This is so that the method is flexible enough to accommodate the specific circumstances of the project.

Question 32 *What factors should we consider in assessing external benefits? Why should we consider these factors?*

We support IPART's view that external benefits should only represent non-use benefits experienced by the broader customer base (that is, not localised benefits). The assessment of external benefits should occur at the same time as the assessment of avoided and deferred costs and should be subject to an equivalent post-adjustment mechanism.

Key factors IPART should consider when assessing external benefits include:

- The effectiveness of regulatory instruments to address the externality. As is commonly recognised externalities are generally best addressed through targeting the externality at source; that is, through some regulatory instrument designed to specifically address the externality
- The extent to which the externality impacts on the broader community
- Whether there are other, better means to address the externality.

Appendix 1 – Avoided cost quantification in absence of a single IWCM plan

Avoided potable water costs

Demand and supply balance planning for our area of operations is conducted via a whole-of-government approach. The resulting plan, the Metropolitan Water Plan, (MWP) ensures our region has sufficient water resources now and for the future. As such, for the water supply element of the water cycle, the MWP most closely resembles the planning IPART specifies in their avoided cost guidelines. IPART's 2011 avoided cost guidelines[24] state that avoided costs should be calculated:

> *…by subtracting the cost of meeting a certain supply/demand outcome under the IWRP[25] with the development of a particular recycled water scheme from the total cost of the IWRP without the recycled water scheme.*

However, the most recent iteration of the MWP does not report some of the key requirements for avoided cost claims as described in IPART's 2006 recycled water determination report[26]. In particular:

- calculating the 'levelised cost' of each water-efficiency and supply-side option to give a cost per kilolitre for the option
- ranking options to meet projected system demands based on their levelised costs, to determine the order of implementation
- sequencing the implementation of projects to balance supply and demand over time. As avoided and deferred costs are calculated as a net present value, well documented and planned sequencing of projects is a key requirement in order for the Tribunal to be satisfied that avoided and deferred costs being claimed are efficient and prudent.

As such, it has been difficult for Sydney Water to provide the level of evidence IPART requires, even for projects which are noted in the MWP as being required to balance supply and demand.

As a work-around to this issue, we have generally assumed the avoided potable water cost for any recycled water project is equal to the annual volume of potable water avoided at the long run marginal cost (LRMC). The LRMC represents the cost of a supplying a permanent increment in water. It is calculated regularly using the best available information at the time. In effect, for water supply, the LRMC represents the best estimate 'base-case' value of water-supplied for all purposes in absence of a single IWCM plan.

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[24] IPART, *Assessment Process for Recycled Water Scheme Avoided Costs, Water Guidelines, 2011*

[25] Integrated water resource plan. In our response, we have used the term IWCM plan.

[26] IPART, *Pricing arrangements for recycled water and sewer mining - Sydney Water Corporation, Hunter Water Corporation, Gosford City Council and Wyong Shire Council, Determinations Nos 8 & 9, 2006.*

Avoided wastewater costs

For wastewater, it is generally inappropriate to use LRMC as a basis for estimating avoided cost. The cost to provide wastewater services is highly location specific, so use of a single LRMC would misrepresent the true value of avoided costs. Therefore, to estimate the avoided costs of wastewater we have compared estimates of cost to provide wastewater services in a particular catchment with and without the recycled water scheme. Although this is consistent with the 2006 guidelines, it may not have delivered as optimal an outcome had we been able to consider all elements of the water cycle in an integrated way. This is because stormwater management has a strong nexus with wastewater management.

Both wastewater and stormwater have a significant impact on waterway heath. We consider there will be significant additional benefits when options to manage both these services are considered together. That is, options to manage both point and diffuse sources of pollution should be considered on an equal footing.

Avoided stormwater costs

Generally, Sydney Water is not the body responsible for delivering stormwater services in our area of operations. This has been a key barrier for wastewater and stormwater management options being compared together. Nevertheless, there has been significant progress towards this occurring in recent times.

The EPA's proposed new Hawkesbury Nepean Nutrient Regulatory Framework aims to ensure river health is delivered at the least cost to society. We consider this emerging framework has the potential to enable integrated management of wastewater and stormwater.

Avoided integrated water resource costs

Although there is still no single IWCM plan for our area of operations, there has been steady progress towards best practice water resource management over many years. In particular, we consider the progress Infrastructure NSW has made towards developing a comprehensive IWCM plan for the South Creek area in western Sydney represents a game changer in the ability for us to deliver IWCM. Early indications are that comprehensive IWCM planning has the greatest potential to deliver a cool parkland city at the least cost to society. We anticipate this initiative will result in a better outcome for customers by enabling the wider economic benefits of integrated water resource management to be realised.

Implications for the update of IPART's guidelines on avoided cost

It is vital IPART's guidelines for avoided costs remain consistent and relevant with recent progress towards best practice IWCM planning. We recommend IPART work closely with the NSW Government to ensure their guidelines on avoided costs do not inadvertently stifle more holistic consideration of water resources which focuses on outcomes rather than products.

Appendix 2 – Example of cost under-recovery

The figure below illustrates a simple example of the significance of costs in later periods. It shows the present value (PV) of the ongoing costs and revenue of an example recycled water scheme.

In the example, it is assumed

- capital costs are the same in both 30-year periods 2020-49 and 2050-2079
- ongoing revenue covers (exactly) ongoing operating costs but not capital costs.

In the example, the PV of costs in the second 30-year period are 24% of the costs in the first 30-year period. However, using our current interpretation of the methodology, which we consider was implicitly accepted by IPART, only the first 30-year period is recoverable. This leaves us unable to recover 24% of our costs.

Figure 1 Demonstration of cost under-recovery

Key assumptions	
WACC	4.90%
Annual operating costs	2.5
Annnual revenue	2.5
Capital costs in 2020 & 205	150.0

	Present value (PV) by period	
	2020-2049	**2050-2079**
Capital costs	150	36
Operating costs	41	10
Revenue	41	10
Total net costs	**150**	**36**

PV 2050-2079 as % of PV 2020-2049 24%

$000s cost by year									
2020	**2021**	**2022**	—//—	**2049**	**2050**	**2051**	—//—	**2078**	**2079**
150.0	-	-		-	150.0	-		-	-
2.5	2.5	2.5		2.5	2.5	2.5		2.5	2.5
2.5	2.5	2.5		2.5	2.5	2.5		2.5	2.5
155.0	**5.0**	**5.0**		**5.0**	**155.0**	**5.0**		**5.0**	**5.0**

Appendix 2 – Expert review of regulatory framework for recycled water developer charges

Report for Sydney Water

Regulatory framework for recycled water developer charges

Dr Richard Tooth

22 October 2015

sapere research group

About the Author

Dr Richard Tooth is a Director with the Sydney office of Sapere Research Group. He specialises in providing advice on issues relating economic regulation, public policy and strategy to private and public sector clients. He works across a range of industries including water, energy, transport and financial services. He is also a Research Associate with the Centre for Water Economics Environment and Policy at the Crawford School of Economics and an Adjunct Professor with the University of Notre Dame Australia, School of Business. Dr Tooth has a PhD in Economics, a Master in Business Administration and a Bachelor of Science.

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Sapere Research Group is one of the largest expert consulting firms in Australasia and a leader in provision of independent economic, forensic accounting and public policy services. Sapere provides independent expert testimony, strategic advisory services, data analytics and other advice to Australasia's private sector corporate clients, major law firms, government agencies, and regulatory bodies.

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Contents

Glossary

2006 RWDC Determination	Determination No 8, 2006, Recycled Water Developer Charges
2006 RHRWC Determination	Determination No 9, 2006, Rouse Hill Recycled Water Charges
2006 Determinations and Report	IPART (2006), 'Pricing arrangements for recycled water and sewer mining: Determinations and Report', September 2006
2006 IPART Report	'Pricing arrangements for recycled water and sewer mining: Report'
AFOC	Assets provided free of charge — in effect, gifted assets
ARR	Allowable revenue requirement
BASIX	Building Sustainability Index
Capex	Capital expenditure
DSP	Development servicing plan
ET	Equivalent tenement
Gamma	A parameter used in calculating the value of tax-liabilities
IPART	Independent Pricing and Regulatory Tribunal
MEERA	Modern Engineering Equivalent Replacement Asset
NPV	Net present value
NWI	National Water Initiative
Opex	Operating expenditure
PV	Present value
RAB	Regulatory asset base
RWDC	Recycled water developer charge
RWT	Rainwater tank
SEPP	State Environmental Planning Policy
SWC	Sydney Water Corporation
SWCR	Sydney Water's Competition & Regulation team
WACC	Weighted average Cost of capital
WWTP	Wastewater treatment plant

Summary

Introduction

Sydney Water is currently in the process of preparing/updating draft Development Servicing Plans (DSPs) for two (and perhaps three) recycled water schemes – Rouse Hill and Hoxton Park (and Ropes Crossing). In preparing/updating the DSPs, Sydney Water is calculating the Recycled Water Developer Charge (RWDC) in accordance with the formula and parameters laid out in a 2006 determination made by the Independent Pricing and Regulatory Tribunal (IPART).

This paper aims to identify and highlight anomalies or potential improvements in the recycled-water framework pertaining to the RWDC.

Background

The most visible benefits of a recycled water scheme are as replacement services for the treatment of wastewater and the provision of water (that can be used for non-potable purposes). If these were the only benefits, we might expect that the costs of recycled water to be fully recovered from wastewater and water charges.

However, recycled-water has additional benefits to developers and ultimately consumers. Most significantly, the use of recycled-water negates the need to install a plumbed rainwater tank (RWT) to meet BASIX planning requirements. Consumers may also value recycled-water as source that is less likely to be restricted and for the perceived environmental benefits. Finally, a recycled-water scheme may be developed in response to a Government directive and used because it is mandated by regulation. For these additional reasons developers may be willing (or required) to contribute an additional charge (the RWDC) to fund a recycled-water scheme.

The 2006 RWDC Determination prescribes how the RWDC should be calculated to meet a number of core principles that include that the RWDC should involve full recovery of relevant costs and result in new development areas meeting the costs of the Recycled Water Developer Services provided. The RWDC aims to be consistent with these principles by being a residual charge that aims to addressing any funding gap.

The RWDC is calculated on an equivalent tenement (ET) basis, which is a measure of the demand on recycled water infrastructure relative to an average household. The RWDC is calculated (in present value terms) on a per-ET basis as the difference between the projected costs and revenue of the scheme. In summary the RWDC is on a per-ET basis the:

- projected costs, being the capital costs associated with scheme, plus operating costs, less
- sources of revenue, being recycled water charges, attributed revenue through wastewater services and other subsidies.

Issues with the regulatory framework

In this paper I have described three sets of issues with the RWDC formula and related regulation for recycled water. These are summarised as

- anomalies which mean that the RWDC will not be expected to result in full cost recovery
- issues relating to planning uncertainty and other risks, and
- other concerns with the regulatory framework for recycled water.

Anomalies preventing full recovery

There are a number of anomalies with the recycled water framework which mean the RWDC will likely result in an under recovery of costs. These can be summarised as:

- There is no allowance for costs beyond the first 30 year period.
- There is no allowance for tax liabilities obtained by Sydney Water and classified as assets free of charge (AFOC).
- Using the parameter prescribed by the 2006 RWDC Determination for the definition of the ET will lead to an over estimate of revenue obtained.

Planning uncertainty and related risks

As highlighted in this paper, there is significant uncertainty over costs and revenue associated with recycled water solutions. These risks include errors in the projected:

- capital and operating costs, and
- revenue, primarily due to errors in the projected customer connections (i.e. ETs) including risks that developers will choose not to connect developments to a recycled-water scheme.

Relative to other investments the risks to Sydney Water are more significant because:

- the uncertainty is greater (in part due to the relative lack of experience with recycled-water schemes)
- Sydney Water is more exposed to variation in costs and revenues for recycled water, and
- the risks include regulatory risks that are outside of Sydney Water's control.

Many of the risks are asymmetric in that the downside risk is greater than the upside risk. The five-year review process helps to mitigate some of the planning uncertainty but the mitigation is asymmetric in that it does more to reduce the risk of over-recovery than the risk of under-recovery.

The recycled-water framework is vague in terms of how uncertainty may be handled. If Sydney Water cannot make an allowance for risk then (due to the asymmetric nature of risks) then it will be expected to under-recover the costs. Ultimately Sydney Water should be expected to achieve a return on investments in recycled-water that are commensurate with the risks and therefore in calculating the RWDC, appropriate allowance should be made for these risks.

Other issues

There are other issues with the recycled water regulation, which by themselves would not result in under-recovery but may lead to distortions in recycled water decisions and/or add unnecessary complications. These are:

- a problem with the definition of ET that may result in a distortion of how the RWDC is allocated across different dwelling-types
- other issues with the avoided-cost methodology, including:
  - an inconsistency in the framework for calculating avoided costs for water
  - the lack of allowance for avoided costs beyond the first 30 period
  - the effect of capitalising the avoided operating costs, which will result in a higher tax liability for Sydney Water
- issues related to recycled-water sales
- inconsistent regulation for recycled water and regulation for water and wastewater services with regards to developer charges and tax, and
- lack of clarity over how elements of the framework are applied.

These issues may distort decisions to invest in recycled water.

Conclusion

Contrary to core underlying principles, the RWDC framework as it currently stands does not result in Sydney Water expecting to recover its costs. Elements of the framework could be modified to address the issues. However, it is appropriate to ask why a prescriptive regulatory framework is required at all. In other jurisdictions, recycled water is subject to light-handed regulation and cost recovery is ensured through charges for the main (i.e. water and wastewater) services.

1. Introduction

Sydney Water is in the process of preparing or updating draft Development Servicing Plans (DSPs) for two (or perhaps three) recycled-water schemes – Rouse Hill and Hoxton Park (and Ropes Crossing). In doing so Sydney Water is required to prepare/update the Recycled Water Developer Charge (RWDC) calculation. Sydney Water is doing so based on the formula and parameters as laid out in IPART's 2006 Determination on the RWDC.

I have been asked by Sydney Water to provide advice on the following:

- The appropriateness of the current pricing methodology for calculating RWDCs (i.e. the methodology in the 2006 RWDC Determination).
- Potential anomalies in applying the methodology that aims to achieve the following basic principles that the RWDC should:
  - involve full recovery of relevant costs
  - reflect variations in the costs of servicing different development areas
  - result in new development areas meeting the costs of the recycled water Developer Services provided, and
  - cover only infrastructure expenditures on recycled water assets that can be clearly linked to the development.

The rest of this paper addresses the scope of the review. In doing so, I also discuss some related issues on the recycled-water regulatory framework.

2. Background

2.1 Recycled-water schemes

Sydney Water provides a range of recycled-water services. The schemes are categorised by IPART by how they are funded as:[1]

- Section 16A — schemes delivered pursuant to Government direction are funded from the general Sydney Water customer base (under Section 16A of the *IPART Act*)
- mandated schemes — schemes to service new development in growth areas of Sydney Water are generally funded through the RWDC and by recycled water usage charges, and
- voluntary schemes — commercial schemes are funded by scheme customers under contractual arrangements.

The schemes (as at 2012) are summarised in Table 1. Most schemes are voluntary schemes whereby Sydney Water assists non-residential customers (e.g. golf courses) to recycle water so as to reduce water-usage charges and potentially reduce wastewater charges. In providing these services, Sydney Water is typically competing with other providers.

The 2006 Determination framework that is the subject of this report applies to what IPART describes as mandated schemes. Of note, the term 'mandated' is a little misleading. For these schemes Sydney Water can require (via section 73 and 74 of the *Sydney Water Act)* that developers install recycled water reticulation and pay the RWDC. However, with a minor exception, developers are not required to connect the dwellings and customers can choose to disconnect from the recycled water scheme. The exception relates to Edmondson Park within the Hoxton Park scheme, which is within the boundary of a State Environmental Planning Policy (SEPP) that requires a recycled water scheme to be connected if it is available.

Table 1 Recycled-water schemes

Section 16A	Mandated schemes	Voluntary schemes
Rosehill/Camellia Rouse Hill Wollongong St Marys – Western Sydney Replacement Flows	Rouse Hill Hoxton Park Oran Park and Turner Road Colebee Ropes Crossing	Wollongong 6 schemes at golf courses 2 irrigation schemes 4 other voluntary schemes

Source: IPART 2012 Review of prices for Sydney Water Corporation

1 2012 IPART Review of prices for Sydney Water Corporation (p. 190).

2.2 Benefits of recycled water

It is first useful to consider the benefits of recycled-water schemes.

The most obvious benefits of recycled-water schemes are that they provide a replacement wastewater treatment service and a replacement source of water, which can be used for non-potable uses.[2]

If these were the only benefits, it would appear that the costs should be recovered through wastewater charges and water charges and there would be no need for the RWDC. Under the current framework Sydney Water receives a revenue allowance (known as the avoided cost) that aims to match the wastewater services replacement benefit. For water, it receives recycled-water usage charges that (broadly) reflect the value of recycled water to consumers (and Sydney Water may also claim avoided water costs). Therefore, additional cost-recovery would only be required if there were additional costs in excess of the benefits and in which case the scheme should not proceed.

However, there are additional benefits and also important qualifications to the benefits.

The most significant additional benefit is that, for new detached dwellings, connection to a recycled-water scheme removes the need to install rainwater tanks (RWTs) that would be required under BASIX planning regulation. The costs of RWTs are significant. They include up-front financial costs of materials and installation, (in the order of $7,000) and ongoing pumping costs, maintenance costs and the inconvenience (see Box 1 below).

Another potential benefit relates to improved water security for consumers. During a drought households with RWTs or recycled water may avoid water restrictions that are imposed on other households. This benefit also relies on regulation. For example, potentially restrictions could be avoided with application of scarcity pricing. In such case, the security benefit to consumers could be substantially reduced (although there may be financial benefits, depending on how the scarcity pricing is introduced).

Recycled-water schemes may also have benefits to the broader community. With regards to wastewater treatment a recycled-water scheme has potential to provide an improved service by reducing the environmental impact of wastewater disposal. Recycled-water schemes (and RWTs) may also have a water security benefit for the Sydney Water network. [3] However, this

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2 As recycled-water can only be used for non-potable users a recycled-water service does not negate the need for a potable water service.

3 The 2006 IPART Report (section 5.5) also recognises that a recycled-water scheme may potentially have a benefit in deferring (or avoiding) a potable water supply augmentation. IPART states that to recover this benefit, the value of avoided costs could be recovered through a developer charge for water services. (We have recovered some water augmentation/deferral costs re Rouse Hill using avoided costs framework in 2012 Determination.)

benefit may be reflected in the price of potable water and recycled water and therefore captured in the recycled water charges collected.[4]

The benefits of avoiding the need to install a RWT and the water security benefit provide a justification for why developers would be willing to develop the recycled water reticulation and pay a RWDC to Sydney Water to provide a recycled-water scheme. Another possible benefit to developers is that some consumers perceive recycled water to be more environmentally-friendly and may pay a premium for a recycled water system to be installed.

Box 1: Recycled water vs RWTs

Both recycled-water and plumbed RWTs may be used to meet BASIX requirements. In deciding between these two options there are a number of other considerations. These are discussed below.

Site impacts

- A RWT takes up space on the homeowner's property. On small blocks this can be a significant inconvenience and may lead to homeowners installing RWTs underground at much greater expense. In contrast, a recycled water service is barely noticeable.
- A recycled water scheme may have some local impacts. For example, for the recycled water option for Marsden Park development would have resulted in:
  - a small pressurised pot on every fourth property. These were expected to have minimal impact to residents but would require an easement to enable access for maintenance.
  - a recycled water treatment plant being located nearby to residential properties. This would have been relatively small (about the size of a toilet block) and it is expected that it would not have had a material impact on the local environment in terms of noise and/or odour.

Ongoing operating and maintenance costs to the home owner

- There will be ongoing maintenance costs associated with RWTs. These include effort by the householder to inspect the tank, keep gutters clean as well as longer term costs associated with pump replacement and repair. For the recycled water service there are no ongoing maintenance costs for the homeowner.
- Customers pay an ongoing usage charge (in the case of Sydney Water) for the recycled water service, but not for RWT water.
- The RWT tank service is pump operated. The electricity costs are not insignificant. Ferguson (2011) reports the median power usage as 62 kWh per household per year (with a cost of $15 a year).

Water quality

- Although not treated to drinking water standards, the recycled water product is treated and is likely to be of higher quality than RWT water which may be subject to

[4] Arguably recycled water may provide a more certain level of supply than other sources (such as RWTs and dams).

contamination. However, this should not be a material issue given the uses.

Customer service and billing

- The recycled water service is an additional service provided by Sydney Water, which requires an additional water meter, meter reading, customer servicing and item on the bill. An implication is that there may be some minor additional costs to Sydney Water.

Volume supplied

- It is expected that the recycled water scheme will provide slightly more water than RWTs. Recent estimates are the recycled water provides around 46kL per year per lot and that RWTs on average produce around 38kL per year per lot.
- The supply of recycled water is a certain supply. In contrast the supply from RWT is dependent on local climate, which may be partially correlated with the availability of other bulk supplies and overall demand for water.

2.3 The regulatory framework for recycled water

The RWDC is calculated as a residual amount that is intended to meet the costs of the scheme not captured by other sources of revenue.

The regulatory framework specifies that the cost of recycled-water schemes may be recovered through a combination of sources. Broadly these are:

1. An avoided cost (AC) amount which is added to the allowable revenue requirement (ARR) that determines prices for wastewater services. This amount is calculated as the costs of wastewater services that are avoided (or deferred) by the use of the recycled water scheme. An avoided cost for water services may also be recovered (this is discussed in detail in section 3.4.4).

2. Recycled water consumer charges that include a recycled water usage charge and potentially a service charge. Consistent with IPART guidelines, the recycled water usage price has been set with reference to the potable water price. IPART does not set recycled water prices; rather it monitors prices set by Sydney Water to ensure they are consistent with their pricing guidelines.[5]

3. Other subsidies and adjustments. These may include a Government subsidy or a modification to the ARR as a result of a Government directive.

4. The RWDC (recycled water developer charge). This charge is set to meet the costs left unfunded by the other charges.

The core regulatory framework is contained in the 2006 IPART paper titled 'Pricing arrangements for recycled water and sewer mining: Determinations and Report'. This document includes:

[5] In the Draft 2012 Determination (p. 123), IPART stated that 'It is our intention for this to be the last time we set prices for recycled water schemes.'

- Determination No 8, 2006, Recycled Water Developer Charges (hereafter the 2006 RWDC Determination)
- Determination No 9, 2006, Rouse Hill Recycled Water Charges (hereafter the 2006 RHRWC Determination), and
- Final report on 'Pricing arrangements for recycled water and sewer mining' (hereafter the 2006 Report).

2.3.1 Recycled Water Developer Charges

The RWDC is a type of developer charge (contribution). Develop charges are amounts paid by developers as a contribution to the cost of building and maintaining Sydney Water assets that serve a development. Prior to December 2008, Sydney Water levied developer charges for the provision of water, sewerage and drainage facilities in new developments.

The 2006 RWDC Determination specifies the methodology that water agencies must use to calculate recycled water developer contributions. The basic principles underlying the methodology are set out in Schedule 4 of the determination. These are that RWDCs should:

(a) involve full recovery of relevant costs

(b) reflect variations in the costs of servicing different development areas

(c) result in new development areas meeting the costs of the Recycled Water Developer Services provided, and

(d) cover only infrastructure expenditures on recycled water assets that can be clearly linked to the development.

The principle of cost recovery means that the developer pays the difference between the present value (PV) of costs and the revenues attributable to recycled water. The capital costs attributed to recycled water are the efficient capital costs for the recycled-water scheme less the avoided costs that reflect the attribution of cost towards wastewater services.[6]

The IPART formula is summarised in Box 2 below. The RWDC is calculated on per Equivalent Tenement (ET) basis. An ET is defined as 'a measure of the demand (determined by a Water Agency) that a Development will place on the infrastructure in terms of the recycled water consumption for an average residential dwelling.'

The 2006 RWDC Determination (Schedule 1, section 9.2) specifies that each water agency must review their RWDC every five years following the DSP[7] and as required by a determination of the Tribunal.

6 This may be alternatively described as the capital cost less the operating surplus.

7 Specifically once and no more than once in each five year period from the date a DSP is prepared.

Box 2: The recycled water developer charges formula - summary

The total recycled water developer contribution per property is calculated as:

$$RWDC = \frac{K_1}{L} + \frac{K_2}{L} - \frac{NPV(R_i - C_i)}{L} - \frac{PV(CO_i)}{L} \quad for\ i\ years\ 1,2 \ldots . n$$

Where:

RWDC – Recycled Water Developer Charge per Equivalent Tenement

$\boldsymbol{L}$ – the PV of the number of ETs in the DSP Area and the PV of the number of Equivalent Tenements to be developed in the DSP Area, calculated at discount rate r

K_1 – Capital Charge for Pre 2007 Assets which will serve the DSP Area calculated on an NPV basis

K_2 – Capital Charge for Post 2007 (Commissioned or Uncommissioned) Assets which will serve the DSP Area calculated on an NPV basis

R_i – the future Operating Revenues in each year i,

C_i – the future Operating Costs in each year i,

r – the Discount Rate, which is defined as the real pre-tax rate of return for Sydney Water Corporation stated in the Tribunal's Report Nos 5, 6 and 7, 2005 (as replaced and amended from time to time)

n – the forecast period for the assessment of expected revenues and costs and is 30 years from the date of calculating the RWDC

CO_i – cost offset in each year *i*, calculated as the sum of avoided costs, deferred costs, subsidies, or government directives received.

Source: IPART RWDC 2006 Determination

2.3.2 Related regulations

The avoided cost framework

The framework for the calculation and treatment of avoided (including deferred) costs of recycled water is provided in Appendix C of the 2006 IPART Report.

The proposed IPART formula is described in Box 3 below. In summary, the avoided costs are calculated as the forecast reduction in the NPV of future capital and operating costs as a result of the recycled water or sewer mining scheme. The formula applies to both wastewater and water; however as discussed in section 3.4.4 there is an issue in applying the formula for water.

The avoided costs are included in Sydney Water's regulatory asset base (RAB) for its regulated services, thereby enabling Sydney Water to recover the avoided costs.

Box 3: IPART's avoided cost methodology

IPART propose calculating avoided costs (AC) as

$$AC = NPV_r\left[K_{without,i} + OC_{without,i} - K_{with,i} - OC_{with,i}\right]$$
$$for\ i\ years\ 1, \ldots . n;\ n = 30$$

Where:

NPV_r is the Net Present Value discounted at rate r, which is the r is the WACC applying to the current pricing determination

$K_{without,i}$ is the forecast capital expenditure for year i without undertaking the recycled water scheme

$OC_{without,i}$ is the forecast operating expenditure for year i without undertaking the recycled water scheme

$K_{with,i}$ is the forecast capital expenditure for year i with the recycled water scheme

$OC_{with,i}$ is forecast operating expenditure for year i with the recycled water scheme.

Source: 2006 IPART Report, Appendix C.

Recycled water usage charges

The 2006 IPART Report (Section 7) describes the pricing arrangements for mandated recycled-water services.[8] Rather than making a price determination, IPART has decided to establish a set of pricing guidelines and monitor adherence to the guidelines.[9] The key components of the guidelines are as follows:

- The potable water price will constitute an effective ceiling on the price that can be charged for recycled water
- Recycled water prices should be linked to the potable water price where demand for recycled water is expected to exceed supply by more than 10 per cent. IPART's guidance is that the pricing depends on the extent that potable water is required to 'top-up' recycled water as highlighted in the table below.

[8] The term "mandated scheme" used in the Determination principally refers to developers. In most of the schemes where RWDC is applicable (as a result of S73 planning requirements), there is no strict requirement for customers to connect and customers can disconnect (if the scheme is not in a SEPP's boundary).

[9] IPART maintains a role in monitoring prices against the guidelines. It does not appear to have any enforcement role.

Potable Water Top-up as a % of recycled water supply	Recycled water price as % of Potable Water Price
>10% and ≤15%	80%
>15% and ≤ 20%	90%
>20%	100%

- Prices may include a fixed component, which should not be so high as to act as an incentive for customers to disconnect from the recycled water scheme.
- Costs and revenues from recycled-water schemes are to be ring fenced from the regulated business.

There is no requirement for postage stamp pricing of recycled-water schemes; that is, the prices and the pricing structure may vary by scheme. Nevertheless recycled water charges will be similar to the extent that they are all linked to the same potable water price.

Tax framework

Subsequent to the 2006 IPART Determination, IPART has moved from the use of a pre-tax weighted average cost of capital (WACC) to a post-tax WACC for the calculation of its ARR.[10] Under the post-tax WACC methodology:

- Sydney Water's ARR for its regulated services includes an allowance for tax, and
- a real post-tax WACC is used to estimate the return on assets in the RAB.

An implication of the tax framework is that assets paid for by the developer and provided as AFOC (asset free of charge) to Sydney Water incur a tax liability. The value of the AFOC is, in effect, treated as additional revenue of Sydney Water and as additional expense of the developer. I understand the AFOC are not included in the RAB but are included in that tax asset base. [11]

Other developments and regulations

There are some related regulations, regulatory developments and guidelines relevant to this review. These include the following:

- In 2008 developer charges for water and wastewater services were removed.

[10] This change is described in IPART (2011).

[11] In response to Response to IPART's Draft Post-tax Determination, Sydney Water (2011, p. 8) discussed the tax cost of the AFOC. They state 'Sydney Water will also receive a tax depreciation benefit from receiving AFOC. The tax depreciation benefit is obtained over the life of the asset and is calculated on a straight-line basis for existing assets. For tax purposes depreciation is not inflated, and therefore declines in real terms over time. Assets received as AFOC are typically long-lived assets, and as a result the present value of the tax depreciation benefit of the AFOC is usually a small fraction of the initial tax liability. Therefore, Sydney Water incurs a significant net tax liability on the receipt of AFOC.'

- Every new dwelling is required to meet Building Sustainability Index (BASIX) planning requirements,[12] with the implication that plumbed RWTs need to be installed if a recycled-water is not used.

2.3.3 Regulation in other jurisdictions

The recycled-water regulatory framework faced by Sydney Water differs substantially to other jurisdictions.

A set of pricing principles for 'recycled water and stormwater use' are included in the National Water Initiative (NWI) pricing principles.[13] These principles are consistent with the framework faced by Sydney Water in that they emphasise cost-recovery; however, they differ substantially in emphasising a light-handed and flexible approach. The first principle states:

> *Light handed and flexible regulation (including use of pricing principles) is preferable, as it is generally more cost-efficient than formal regulation. However, formal regulation (e.g. establishing maximum prices and revenue caps to address problems arising from market power) should be employed where it will improve economic efficiency.*

Consistent with this principle, the regulatory framework in other jurisdictions tends to be light-handed. In other jurisdictions, recycled-water costs not recovered from usage charges are recovered through charges for the main (i.e. water and wastewater) services. For example:

- In South Australia, recycled-water services are simply included in SA Water's Revenue Determination for water and sewerage retail services. Recycled water revenue is included in SA Water's retail sewerage services.[14]
- In Victoria, the gap between recycled water revenue and costs is recovered through sewerage charges.[15]
- In South-East Queensland, 'unrecovered amounts' are allocated to potable water and sewerage charges in proportion to avoided cost allocations.[16]

Of note, the regulatory environment differs in other jurisdictions in other relevant ways. In particular:

- In other jurisdictions, developer charges may be collected to pay for investments in water and wastewater infrastructure.

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12 BASIX is implemented under the *Environmental Planning and Assessment Act*.

13 National Water Initiative Pricing Principles, (section 4), available at http://www.environment.gov.au/system/files/resources/34dbb722-2bfa-48ac-be7e-4e7633c151ed/files/nwi-pricing-principles.pdf.

14 See http://www.sawater.com.au/about-us/legislation-and-policies/policies/pricing-policies/recycled-stormwater.

15 For Melbourne Water's approach see section 9.5 of the Melbourne Water's 2013 plan, accessible at http://www.esc.vic.gov.au/getattachment/09cbbb92-f831-442e-9059-fba2b7e048a0/Melbourne-Water-Water-Plan.pdf.

16 See page 117 of 'SEQ Retail Water Long-Term Regulatory Framework – Pricing Principles – Part C', available at http://www.qca.org.au/getattachment/efb59735-af8c-4ce1-bddb-cdc5f1b07817/Part-C.aspx.

- In some jurisdictions a recycled-water service does not have the same benefit of negating the need for a plumbed RWT. For example, in 2013 the Queensland Government removed the requirement to install RWTs,[17] and in Victoria, a RWT (or recycled-water connection) is not required if a solar water heater system is installed.[18] Alternative water supplies (such as RWTs or recycled-water) are still required in some other jurisdictions.[19]

[17] http://statements.qld.gov.au/Statement/2012/12/14/reforms-to-cut-thousands-from-new-home-costs.

[18] See http://www.vba.vic.gov.au/__data/assets/pdf_file/0003/20397/PN-55-2014-Residential-Sustainability-Measures.pdf.

[19] For example, in South Australia, https://www.sa.gov.au/topics/water-energy-and-environment/water/rainwater-tanks/rainwater-tanks.

3. Issues and anomalies

3.1 Overview

There are many issues with the RWDC that would result in the core RWDC principles (most notably that related to cost recovery) not being met and other complications.

I have summarised these as:

- anomalies that will cause the RWDC to not result in full cost recovery
- issues relating planning uncertainty and other risks, and
- other concerns with the regulatory framework for recycled water.

3.2 Anomalies leading to under-recovery

3.2.1 Unfunded costs past the initial 30 year period

A critical issue with the recycled-water framework is that the formula for calculating the RWDC (and the avoided costs) is based on a 30 year time period.

Sydney Water will, *presumably,* still have the obligation of maintaining, operating and renewing the recycled-water schemes past this period. A significant risk to Sydney Water of such a scheme is that it is left with a large ongoing financial obligation. This ongoing financial obligation will be equal to the ongoing costs of the recycled-water scheme less the avoided costs and the recycled water charges.[20]

This would appear to be a significant issue for Sydney Water. For example, if Sydney Water's ongoing costs net of recycled-water charges received were consistent over time (i.e. were the same as at the beginning of any 30 year period) then the PV (today) of the unrecovered amount in the second 30 year period would be around 20 per cent of the avoided costs and the RWDC in the initial 30 year period.[21]

The issue could be addressed through the charging of a fixed connection fee for recycled water. This is consistent with the IPART pricing guidelines for recycled water; however, this may result in additional issues and risks including:

- increased billing and administration costs
- significant resistance from customers particularly where charges differ by scheme, and
- a risk that customers disconnect.[22]

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[20] In principle, if avoided costs are applied in future periods, this obligation should be independent of how costs are allocated between wastewater and recycled water services.

[21] Equal to (1+ 5.6%)^-30.

[22] I understand that this has happened already in some cases without the imposition of a service charge/connection fees.

It would appear the simplest approach to address the issue would be to adjust the RWDC formula (and the avoided cost formula) to include an allowance for unrecovered costs in future periods. This approach would require some modification to the framework.

3.2.2 Tax paid on assets free of charge

The assets paid for by a developer and provided as an AFOC (asset free of charge) to Sydney Water incur a tax liability. The value of the AFOC is, in effect, treated (like the RWDC) as additional revenue of Sydney Water and as additional expense of the developer. The AFOC are not included in the RAB but are included in the tax-asset base.

The formula for the RWDC as expressed in the determination does not include an allowance for the tax liability and therefore under a strict application of the current determination formula Sydney Water will under-recover its costs.

This could be easily addressed by modifying the RWDC formula to include an allowance for the tax-liability.

3.2.3 The recycled-water usage parameter

The 2006 RWDC Determination states that for the purposes of calculating revenues and operating costs an assumption of 110kL recycled-water usage per ET should be used. Since the time of the determination, water use and particularly outdoor water use has fallen considerably. I understand that actual recycled-water usage per ET is generally no more than half of the 110kL (i.e. up to 55 kL).

The use of the 110kL amount will distort the RWDC calculation. The 110kL assumption would clearly result in an overestimate of the recycled water revenue collected and therefore and underestimate of the RWDC required to achieve cost-recovery. This impact will in part be offset by an overestimate of the forecast operating costs, however, I understand that the operating costs are largely fixed in nature and therefore the offset is small.

Regardless, the recycled water use is likely to vary substantially by scheme and there does not appear to be any rationale for prescribing the level of recycled-water usage per ET.

3.3 Issues relating to uncertainty

The RWDC is based on a number of forward projections and therefore is subject to forecast error. This forecast error is a source of significant risk to Sydney Water. Relative to other investments, the risks to Sydney Water are more significant for several reasons.

First, the uncertainty is greater. Sydney Water has substantially less experience in recycled-water schemes than wastewater schemes. As a result there is greater uncertainty in estimates of future costs. There may also be greater certainty with forecasts of wastewater investments because the costs are determined (i.e. incorporated into a pricing submission) at a relatively later stage of planning than for recycled water assets. Furthermore, the risk of error in wastewater is reduced because costs are aggregated and prices determined for all of Sydney Water customers. In contrast, the RWDC is determined on a scheme by scheme basis. As a result there is greater risk of variation due to the smaller number of ETs over which the costs are recovered.

Second, Sydney Water is more exposed to cost and revenue variations with regards to recycled water. For both recycled-water services and wastewater services Sydney Water bears some risk to incorrect forecasts of costs; however, with regards to recycled water the level of exposure is greater. The costs of wastewater services are recovered (primarily) through wastewater service charges, which are modified for each regulatory period. The RWDC is modified periodically but as the RWDC is collected upfront, there is a higher risk that additional costs cannot be recovered.

Finally, for recycled-water there appears to be a greater level of regulatory risk. Significant risks include:

- IPART disputes the amount of avoided costs. This risk eventuated in the case of the Rouse Hill recycled water scheme. IPART's draft decision was to not award any avoided costs. Following additional information provided by Sydney Water, IPART awarded avoided costs but calculated a value ($20.1 million) that was materially lower than the value proposed by Sydney Water ($21.6 million).[23] This risk is discussed in the 2006 IPART Report (p. 56). To help address this risk, IPART indicated it will consider proposals, in response, to a suggestion that the Tribunal adopt a mechanism whereby prior approval can be obtained to the avoided cost recovery amount. Regulatory changes that affect the demand for recycled-water services. A reduction in the stringency of BASIX requirements or changes to drought policy could result in consumers (and therefore developers) significantly reducing the value they place on a recycled water connection.
- Sydney Water's proposed RWDC is contested and a lower RWDC is determined.[24] Of particular concern for Sydney Water is that this risk appears to be asymmetric in that if the RWDC is found to be too high there could be refunds but that Sydney Water would not receive compensation for RWDCs that are later found to be too low. This risk may be low. I understand that, to-date, the RWDC has not been contested.

The 2006 Determination, while quite prescriptive, is vague on how forecast uncertainty should be dealt with. Ideally Sydney Water should be able to calculate a RWDC that is expected to recover costs. Due to the asymmetric nature of the risks, this may mean that the expected RWDC will be greater than the RWDC that is calculated using best estimates. If Sydney Water cannot make such an allowance for risk then (due to the asymmetric nature of the risks) it will be expected to under-recover the costs.

There are different approaches to accounting for risk. One common approach to evaluating riskier projects is to apply a higher discount rate. While such a strategy is common, it is generally preferable and more defensible to more explicitly adjust for uncertainty by including a contingency in recognition that actual costs will often exceed best estimate and/or modelling different scenarios and calculating a weighted average (i.e. expected value) RWDC.

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[23] See IPART (2012, page 134).

[24] As noted in the 2006 IPART Report (page 42), 'Under section 31 of the IPART Act, the Tribunal may arbitrate disputes between water agencies and developers, where the developer is dissatisfied with the way an agency has calculated its developer charges.' On the same page it is noted that the Tribunal's developer charges determination will be binding for mandated schemes.

The key sources of risk and their impact are discussed further below.

3.3.1 Uncertainty in the connected developments (the L parameter)

As RWDCs are levied on a per ET basis, there is the risk for Sydney Water that development, and therefore revenue recovery, is slower or less than expected. This may be because, for example:

- the annual dwelling projections vary from estimated
- the timing profile for dwelling projections vary from estimated
- there are changes in the DSP boundary, and/or
- developers opt not to connect (where it is possible for them to do so).

An error in the projection of the ETs can lead to an over or under recovery of the costs of the scheme. If the actual value of *L* is greater than originally projected then, all else being equal, Sydney Water would over recover. Conversely, if the actual value of L is less then Sydney Water will under recover.

Adjusting for this risk is not straightforward. There are two key issues.

First, the risk to Sydney Water is not symmetric. For a given size of error, the cost of over estimation is greater than the benefit of under estimation.

This can be demonstrated with the following example. Assume the PV of ETs has an equal probability of being equal to 1500, 2000, and 2500. The expected PV of ETs is 2000. However, if this value is used to determine the RWDC then Sydney Water would on average under-recover. In this example, the RWDC used would be around 4 per cent less than the RWDC required to achieve cost recovery on average. This issue exists because when there is uncertainty in *L* the 'expected value of 1/*L*' is greater than '1/(expected value of *L*)'.

An implication is that to achieve the principal of cost recovery, when there is uncertainty around the PV of ETs, the value of *L* used in determining the RWDC needs to be smaller than the expected value of *L*.

Second, the effect of the DSP review is not symmetric when there is a change in the number of connections. Consider the situation whereby the rate of development is constant (e.g. 400 new ETs per year) but that the number of connected developments is uncertain. If (as a result of a review) the projected number of ETs is revised downwards, the revised RWDC will increase but the revised RWDC will apply to a proportion of ETs that is relatively less than if the number of connections had been revised upwards.[25]

3.3.2 Uncertainty in the costs and revenues

The actual costs and revenues may differ for a number of reasons. These include:

- variations to the servicing strategy over time (influence costs)

[25] Potentially a revised RWDC may be determined but not apply to any developments.

- variations in delivery costs (e.g. associated with procurement, environmental, geotechnical matters etc), and
- variations in the volume of recycled water used and the price charged.

The RWDC is directly proportional to the expected unfunded costs of the scheme. As a result, the impact of an error in the cost or revenue forecast is symmetrical in its impact. That is a $1 over-estimate of the RWDC has the same effect in magnitude as a $1 under-estimate. Nevertheless, the nature of cost over-runs will likely mean that the expected costs will be greater than the best estimate.

The revenue from recycled water usage charges is also uncertain. If, for example, the price of potable water falls, then the price of recycled water would fall as well. Furthermore, there have been cases whereby customers have willingly disconnected.

The calculation of RWDC at renewal may introduce an additional risk. The RWDC formula requires that existing assets are valued using a MEERA approach.[26] If as part of the renewal of the RWDC assets are recalculated using the MEERA approach then there is the additional risk that there will be a reduction in the asset value that can be recovered.[27]

3.4 Other issues

There are a number of other issues with the regulatory framework which by themselves should not affect the risk of cost-recovery but are nevertheless of interest in that they may distort decisions and/or complicate the analysis.

3.4.1 The definition of ET

The timing of payment of the RWDC

The RWDC formula appears to assume that there is a single profile of ETs that governs the timing of the RWDC and the timing of when recycled water revenue is received. However, there is a difference in when the RWDC is paid and the how the ET is calculated. The RWDC is paid by developers at the time an application is made. This may be some years prior to when a dwelling is completed, consumes recycled-water and therefore contributes to the ET count (in accordance to the definition of an ET).

This issue could be easily addressed by either:

- adjusting the RWDC to reflect the timing of when the developers actually pay the charge, or
- modifying the calculation of the 'L' term in the RWDC-formula to reflect the expected timing of the RWDC calculation.

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[26] Modern Engineering Equivalent Replacement Asset (MERERA) means an asset value calculated on the basis that the Asset is constructed at the time of valuation in accordance with modern engineering practice and the most economically viable technologies, which provides similar utility functions to the existing Asset in service.

[27] See discussion in section 3.4.5 regarding the interpretation of how the renewal calculation is undertaken.

I understand that Sydney Water has in recent RWDC calculations undertaken the former approach; that is, forecasted recycled-water revenue based on the timing when the properties are to be connected, and determined the RWDC based on when the RWDC is forecast to be paid.

The ET for dwellings that are not average residential dwellings

The RWDC is determined per ET, which for any development is a measure of demand in terms of recycled-water consumption.

The framework implies that the RWDC for a dwelling type should be in proportion to the expected recycled water consumption relative to that of the average residential dwelling. For example, a dwelling type that uses half of the recycled water that an average residential dwelling uses would have a RWDC of half that of the average dwelling.

However, this approach may not necessarily be appropriate as it may not align with the driver of costs of providing recycling water. For example, the rationale for a recycled-water scheme may be the cost saving provided to stand-alone residential dwellings (in meeting BASIX requirements). As multi-units do not need RWTs to meet BASIX requirements there may be negligible benefit of a recycled-water scheme to multi-units. Under the ET framework the RWDC for multi-units may be significant with the result that the multi-units may cross-subsidise the RWDC of the stand-alone dwellings.

A further issue with allocating RWDC to non-residential uses based on consumption is that it is difficult to derive a standard recycled-water-consumption per type of development.

3.4.2 Inconsistency of regulation between recycled water and regulated services

Tax arrangements

Recently, IPART moved from a pre-tax weighted average cost of capital (WACC) to a post-tax WACC for pricing purposes. Under the post-tax WACC methodology:

- Sydney Water's ARR for its regulated service includes an allowance for tax, and
- a real post-tax WACC is used to estimate the return on assets in the RAB. The real post-tax WACC is lower than the real pre-tax WACC.

The 2006 Determination (Schedule 2) specifies that the discount rate to be used in calculating the RWDC is the 'real pre-tax rate of return for Sydney Water Corporation' that is stated in Tribunal's reports.

Using a post-tax WACC in place of a pre-tax WACC should not have a material impact on the RWDC that is determined so long as the formula for calculating the RWDC includes an allowance for tax. The tax allowance is reasonably easily estimated as:

- the NPV[28] of the difference between capital expenditure and allowed tax depreciation,

[28] Calculated at the post-tax WACC.

- divided by (1 – tax rate).

Application of developer charges

Developer charges are applied for recycled-water but not for wastewater or water services. The different approach has potential to result in some strange outcomes.

For example, complications would occur if a recycled-water scheme was the lowest cost method of wastewater treatment. In such case it is not practical to apply the avoided cost framework. Presumably in such a situation the 'avoided cost' would simply reflect the cost of the recycled water scheme; that is, the cost of the scheme would be incorporated in the allowable revenue for wastewater services. However, what then happens to any profit that is made on the provision of recycled water? This scenario does not seem to be covered by the regulatory framework.

The situation appears analogous to any situation whereby in providing a regulated service Sydney Water obtains revenue from an unregulated service. Consistent with the principle of cost recovery one option would be that the projected profits from the unregulated service would be used to reduce the cost of the regulated service (i.e. the allowable revenue for wastewater services).

However, this would not necessarily be consistent with the second principle that the RWDC 'reflect variations in the costs of servicing different development areas'. Consistency with this principle would require that the RWDC be negative; that is, provide a rebate.

3.4.3 Issues with recycled-water sales

Recycled water sales are a small source of revenue relative to the capital cost. Nevertheless, there are a number of issues.

Cannibalisation of potable water sales

Sydney Water makes a profit margin on water sales when the price charged by Sydney Water exceeds the marginal cost of providing the water. An implication of Sydney Water introducing a recycled-water scheme is that it will reduce potable-water sales and therefore reduce the profit it earns on sales of potable water. This opportunity cost to Sydney Water is not reflected in the RWDC formula. However, the issue is likely to be immaterial as it only applies to variations to the forecast level of water sales during a regulatory period; that is, it only applies if the impact of the recycled-water scheme is not incorporated into the demand forecast used for determining the expected revenue for potable water. If the recycled-water scheme is anticipated, then, all else being equal, the forecast potable water sales will be lower and the revenue to be obtained from fixed charges would need to be adjusted accordingly.

The availability of recycled water and the costs of topping-up

In some situations potable water is used to top-up or replace the recycled water supplied. This may be as a result of excess demand, a temporary fall in supply or (as is the case in Ropes Crossing) where the recycled water system has yet to be built.

A question arises as to how the cost of the top-up water is determined for calculating the RWDC. Currently the financial cost to Sydney Water is the cost of the bulk water plus the marginal cost of treatment and distribution. However, from a societal perspective the cost (over the long-term) should approximate the long-run marginal cost, which is likely to be

higher. During a drought the marginal cost to society will be higher again. Another consideration is that a competing supplier of recycled water would be paying the retail water price to top-up a recycled-water scheme.

Another potential issue arises during times of water scarcity. Recycled-water customers might expect that having a recycled-water service gives them the right to use the service even when restrictions are being applied. However, where top-us is used this may result in these customers using potable water unrestricted thereby reducing the availability of potable water for other customers.

The possibility exists for potable-water prices and recycled-water prices to be increased during a drought.[29] In the absence of some rebate being provide to recycled-water customers the additional revenue raised from the recycled water would be shared among all Sydney Water customers.

3.4.4 Other issues with the avoided cost framework

Avoided cost framework limited to a 30 year period

As noted earlier, the avoided cost formula is based on a 30 year time period. This results in a risk for Sydney Water that avoided costs past the initial 30-year period might not be captured in the avoided costs framework.

The issue might be mitigated by directly allocating some of the recycled-water scheme assets to wastewater services; in effect, declaring some of the recycled-water scheme assets to be wastewater scheme assets. The risk also might be mitigated if there was explicit recognition of how avoided costs were to be calculated in subsequent periods.

Avoided costs for water

There is an inconsistency in the 2006 IPART Report as to how the avoided or deferred water costs from recycled water should be treated.

The report (p. 35) states [emphasis added]:

> Avoided costs should only be transferred to parties other than direct users of recycled water to the extent that it **leaves those parties no worse off** than they would have been without the recycling scheme.
>
> Therefore, avoided costs should be determined by establishing the total costs of meeting demand and how they would be borne both 'with' and 'without' the recycled water scheme. This requires that both incremental costs and **incremental revenues (or revenue foregone)** be considered under the recycled scheme and under the alternative scenario.

[29] Sydney Water has recently proposed greater flexibility in pricing through a weighted average price cap (WAPC) approach. Under the pricing guidelines for recycled water the recycled water price is linked to the potable water price.

However, there appears to be a mistake in the avoided cost formula (presented in Box 3 on page 8) as it does not include terms for revenue (either incremental revenues or revenue foregone).

A further complication is that the report (section 5.5) suggests that the avoided costs might be captured through the developer charges for water services (which are no longer applied). The report (p. 40) states [emphasis retained]:

> […] where water agencies can demonstrate that there is an avoided or deferred cost of potable water supply augmentation due to a recycled water scheme, the present value of the avoided or deferred cost can be recovered in the developer charge for ***water*** services in new developments (rather than through recycled water prices).

Of note, the avoided water costs should generally be trivial. The avoided water benefit of a recycled water plant will be the present value of the water saved. If the potable water price is set to the value of water then the avoided water benefit will equal the potable water revenue foregone.

Treatment of operating costs

Another issue with the avoided cost methodology is that it treats operating costs and capital costs equivalently. In effect, the PV of the difference in operating costs of the *with* and *without* options is turned into a capital value and included in the RAB.

This capitalisation of operating costs is important due to the differences in the taxation of revenue to meet operating costs and capital costs. Additional revenue to meet operating costs does not lead to higher taxable income (as the revenue is matched by the operating cost expense); however, additional revenue from a *return on* capital is not matched by an expense.

Furthermore, Sydney Water advises[30] that they expect that assets created under the avoided cost concept would be excluded from the tax asset base and tax depreciation calculations. The impact of the application of the avoided cost formula would therefore be to increase the PV of the tax liability and — as a result — increase the total pre-tax revenue required by Sydney Water to service the regulated wastewater service.

A related tax liability issue is that the AFOC differs whether a recycled-water scheme is used or not. As AFOC creates a tax liability, differences in the AFOC can result in differences in the tax liability. The net impact would depend on the tax treatment of the avoided cost framework.

Under the current regulatory framework, IPART's notional ARR[31] includes an allowance for tax liability and therefore — from Sydney Water's perspective — the additional tax liability would be offset by an increase in allowable revenue. However, the additional tax allowance would have the consequence of:

- an increase in the taxable income collected by the State, and
- an increase in the prices paid for wastewater services by customers of Sydney Water.

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30 Based on personal correspondence.

31 The ARR forms the basis for prices that Sydney Water may charge for regulated services.

In percentage terms, the impact on prices would be negligible; nevertheless, the result appears to be an unintended and undesirable consequence of a strict application of the avoided cost methodology.

The tax liability issues discussed, could be addressed by adjusting the wording of the avoided cost methodology so that:

- the avoided operating costs are not capitalised, and
- the avoided cost amount includes an allowance for differences in tax liabilities.

3.4.5 Lack of clarity of regulation

Lack of clarity with regards to the calculation of RWDC at renewal

The regulation provides limited details as to how the RWDC should be updated. For example the determination does not specify:

- what values should be updated in recalculating the RWDC, and
- the time-period that should be used.

One possible interpretation is that the review simply recalculates the RWDC as if the information that was available in the present time had been available at the time of the initial DSP. Under this interpretation, the renewed RWDC would (as per the initial DSP) not include data on costs and developments after the 30 period following the initial DSP.

An alternative interpretation is that the review considers all information from the time of the initial DSP to the time 30 years following the time of the review. This interpretation may be viewed as being consistent with the formula in the 2006 Determination (p. 4) (that states 'the forecast period […].is 30 years from the date of calculating the RWDC'.

4. Summary and conclusions

The RWDC is intended to ensure 'involve full recovery of relevant costs' by being a residual charge that ensures cost recovery for the regulated Water Agency. However, there are a number of anomalies with the recycled water framework which mean the RWDC will not be sufficient. These can be summarised as:

- There is no allowance for costs beyond the first 30 year period
- There is no allowance for tax liabilities from AFOC
- There is no allowance for incremental corporate costs
- The specified parameters for recycled-water use by ET forces an incorrect calculation of recycled-water revenue.

Second, as highlighted in this paper, there is significant uncertainty over costs and revenue associated with recycled water. Many of the risks are asymmetric in that the downside risk is greater than the upside risk. The recycled-water framework is vague in terms of how uncertainty should be handled. Ultimately Sydney Water should be expected to achieve a return on investments in recycled-water that are commensurate with the risks and therefore in calculating the RWDC appropriate allowance should be made for these risks.

There are several other anomalies with other elements of the recycled water framework. These include:

- issues with the definition of ET
- the lack of allowance for avoided costs beyond the first 30 period
- inconsistency in regulation for recycled water and regulation for water and wastewater services with regards to developer charges and tax, and
- lack of clarity over how elements of the framework are applied.

Elements of the framework could be modified to address the issues. However, it is appropriate to ask why a detailed regulatory framework is required at all. In other jurisdictions, recycled water is subject to light-handed regulation and cost recovery is ensured through charges for the main (i.e. water and wastewater) services.

5. References

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