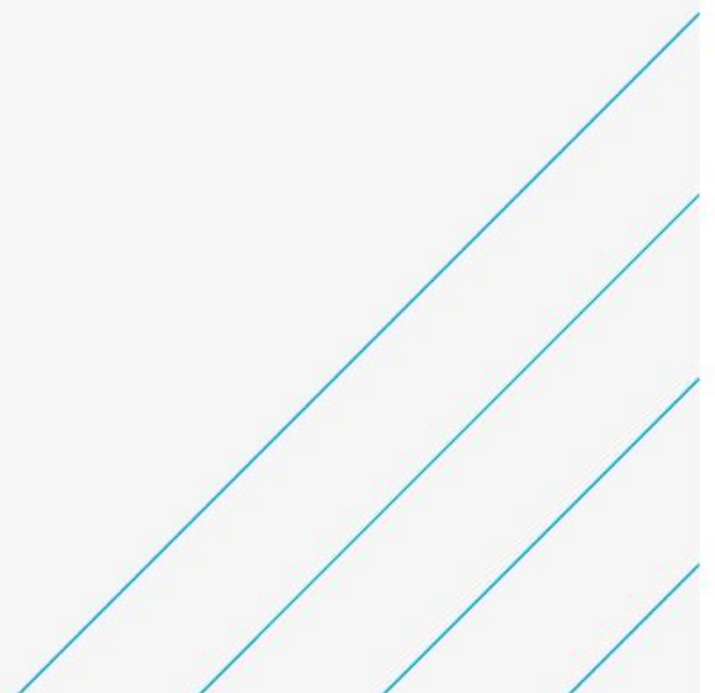


# Sydney Desalination Plant ("SDP") - Expenditure Review

Supplementary Report

Independent Pricing and Regulatory Tribunal ("IPART")

June 2023



# Notice

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This document has 37 pages including the cover.

## Document history

Document title: Supplementary Report

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
1.0	Draft Supplementary Report for IPART's Review	TA/GJ	HG	JC	GJ	23/05/2023
2.0	Supplementary Report	TA/GJ	HG	JC	GJ	24/05/2023
2.1	Supplementary Report - transcription errors corrected	TA/GJ	HG	JC	GJ	25/05/2023
2.2	Supplementary Report – periodic maintenance changes	TA/GJ	HG	JC	GJ	26/05/2023
2.3	Supplementary Report – text correction	TA/GJ	HG	JC	GJ	26/05/2023
2.4	Insurance and remuneration update	TA/GJ	HG	JC	GJ	19/06/2023

## Client signoff

Client	Independent Pricing and Regulatory Tribunal ("IPART")
Project	Sydney Desalination Plant ("SDP") - Expenditure Review
Job number	5218799
Client signature/date	

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# Glossary

Term	Definitions
AEMO	Australian Energy Market Operator
AIR	Annual Information Return
Capex	Capital Expenditure
CPI	Consumer Price Index
DPE	NSW Department of Planning and Environment
DWPS	Drinking Water Pumping Station
ERN	Emergency Response Notice
ESS	Energy Saving Scheme
FTE	Full Time Equivalent
FY	Financial Year
GSWS	Greater Sydney Water Strategy
HR	Human Resources
ICT	Information Communications Technology
IPART	Independent Pricing and Regulatory Tribunal
ISR	Industrial Special Risks
IT	Information Technology
LGCs	Large scale Generation Certificates
MFP	Multi-Factor Productivity
MJA	Marsden Jacob Associates
Mld	Megalitres per Day
NEM	National Electricity Market
NPV	Net Present Value
NSW	New South Wales
O&M	Operating and Maintenance
Opex	Operational Expenditure
p.a.	Per annum
RET	Renewable Energy Target
RERT	Reliability and Reserve Emergency Trader
RFI	Request for Information
RRO	Retailer reliability obligation
SDP	Sydney Desalination Plant Pty Ltd

SIR	Special Information Return
SLIs	Service Level Incentive Scheme
STCs	Small scale Generation Certificates
SWC	Sydney Water Corporation
VWA	Volume weighted average
WEC	Wholesale electricity purchase cost
WSA	Water Supply Agreement

# 1. Introduction

The Independent Pricing and Regulatory Tribunal (“IPART”) of New South Wales (“NSW”) appointed the Atkins/Marsden Jacobs Associates (“MJA”) consortium (altogether the Consultant) to carry out a strategic management and expenditure review of Sydney Desalination Plant’s (“SDP”) operations. The purpose of this review is to inform IPART’s decision on prices for the new Determination period which applies from 1 July 2023 to 30 June 2027.

On 14 April 2023, IPART published its Draft Report<sup>1</sup> along with Consultant’s (Atkins-MJA) Draft Report<sup>2</sup>. The publication of the Draft reports allows stakeholders, including SDP, to respond to IPART’s draft Determination and its Consultant’s recommendation. SDP submitted a response to IPART’s Draft Report on 12 May 2023. Along with its response, SDP provided several appendices, including appendix A which outlines some input and calculation errors. Additionally, SDP responded to Atkins-MJA’s Draft Report (our Draft Report) directly through the word document comments.

In this Supplementary Report, we focused on addressing the comments directed to our Draft Report with consideration to SDP’s formal submission to IPART’s Draft Report.

This Supplementary Report also includes an update to the energy price benchmarking reflecting end of April 2023 energy market data. It provides tables with updated energy price benchmark and energy cost estimation.

## 1.1. Review process

Throughout the expenditure review process, the Atkins-MJA team has engaged with SDP to form a comprehensive view on the pricing proposal and establish clear recommendations. During the development of this Supplementary Report, we have focused on revisiting areas that SDP contested either during the expenditure review or through its response to our and IPART’s Draft Reports.

Upon receipt of SDP’s response to our Draft report and IPART’s Draft Report, we sought to clarify certain points through requesting information from SDP. One of the main elements that was included in SDP’s response is the outlining of input and calculation errors. We have considered SDP’s outline and highlighted any outcomes from our review in this Supplementary Report.

In the period of writing this Report, we have held meetings with IPART Secretariat to discuss outstanding points and provide a progress update. We have also communicated with SDP for the purpose of clarification of comments and information requests.

We note that SDP has been very cooperative, professional and open in their communication and responses to information requests.

## 1.2. How to read this report

In this Supplementary Report, we have divided each issue area into sections. These areas are consistent with our designation in our Draft report. For each area, we established a sub-section that is related to the comment raised by SDP.

For each sub-section (excluding energy price benchmarking) we adhered to the following structure

- Present SDP’s proposal on the issue from its pricing submission to IPART
- Outline our recommendations from our Draft Report and highlight IPART’s Draft decision when applicable
- Present SDP’s response to our Draft Report and, when appropriate, provide SDP’s position stated in the response submission.
- Articulate our final recommendation taking into account SDP’s position

The various sections of this Report include context for each issue raised by SDP. However, to ensure this Report is concise we have avoided repeating the wider explanatory text and conclusions of the previous work. As such, we recommend that the reader also refer to our Draft Report for the wider conclusions and context.

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<sup>1</sup> SDP Review of prices to apply from 1 July 2023 – Draft Report, IPART, April 2023

<sup>2</sup> SDP’s Expenditure Review Draft Report – 2023 Determination, Atkins-MJA, 2 April 2023

## 2. Opex

This section addresses the key issues raised by SDP in response to our Draft Report and IPART's Draft Report, namely:

- Corporate remuneration;
- Land tax and council rates;
- Variable costs; and
- Catch-up and continuing efficiency.

These are addressed below.

### 2.1. Corporate remuneration

In its pricing Submission, SDP proposed a real terms average increase of \$0.75M p.a. (21%) in corporate remuneration expenditure. Approximately half of this proposed increase related to headcount increases and the other half to real terms increases in unit remuneration costs.

In our Draft Report we recommended:

- accepting the increase driven by the appointment of an operations and sustainability coordinator;
- no net increase in opex as the recruitment of a risk manager was likely to be offset by a reduction in professional services fees;
- accepting statutory increases in costs. However, we were not persuaded of the other 'real' cost increases due to higher unit labour costs in the absence of attrition data for example. We recommended accepting half of the non-headcount growth element.

Our recommended pre-efficiency expenditure was an average \$0.56M increase in corporate remuneration expenditure.

In its comments on our Draft Report, SDP stated:

*SDP has experienced significant staff attrition over the past regulatory period. However due to the small size and scope of SDP's corporate team (12 staff), we do not monitor this at scale like businesses with large workforces. However, we consider it best practice, and in the long-term interests of customers to retain staff through benchmark efficient remuneration. Retention of corporate knowledge and highly skilled staff is better achieved through proactively targeting benchmark efficient remuneration than risking valuable staff loss and seeking to remediate the issues this creates after the fact.*

SDP requested that we review our recommendation based on these considerations. It also provided information on attrition rates since FY17, [REDACTED]. This is higher than the typical Australia level which is generally below 10% p.a<sup>4</sup>.

We consider that this data significantly strengthens the view that real terms increases may be justified to aid with retention of staff. We therefore recommend accepting the remainder of the real terms increases in salaries. The only element of SDP's proposed increase that we do not recommend accepting is therefore the cost of the risk manager role due to the approximately equivalent reduction in professional services fees.

To more accurately represent where costs and savings are likely to fall, we have amended our recommended corporate remuneration costs to include SDP's full proposed increase whilst applying the expected savings (estimated to be \$100k p.a.) associated with bringing a risk manager in-house. Our amended recommendations are set out below.

<sup>3</sup> Based on analysis of SDP document "ATK-126-Corporate-Staff\_Numbers (00109179xCE34F)"

<sup>4</sup> An estimated 9.5% of all employed people changed jobs in the year ending February 2022. The equivalent rate for professionals was 8.8% and the NSW all-in figure was 8.3%. See [Job mobility | Australian Bureau of Statistics \(abs.gov.au\)](https://www.abs.gov.au) for further information.



**Table 2-1 Corporate remuneration costs (\$FY23 000s)**

FY ending	Actuals				Projections				
	2019	2020	2021	2022	2023	2024	2025	2026	2027
SDP Submission									
Atkins Draft Report recommendation (pre-efficiency)					4,319	4,440	4,662	4,662	4,662
Atkins Revised recommendation (pre-efficiency)					4,455	4,630	4,958	5,040	5,051
Difference to previous recommendation					137	190	296	378	389

Source: Analysis of AIRSIR

**Table 2-2 Professional services costs (\$FY23 000s)**

FY ending	Actuals				Projections				
	2019	2020	2021	2022	2023	2024	2025	2026	2027
SDP Submission	2,930	2,961	4,374	3,868	5,618	3,552	2,380	4,281	3,827
Atkins Draft Report recommendation (pre-efficiency)					3,296	3,296	3,296	3,296	3,296
Atkins Revised recommendation (pre-efficiency)					3,196	3,196	3,196	3,196	3,196
Difference to previous recommendation					(100)	(100)	(100)	(100)	(100)

Source: Analysis of AIRSIR

## 2.2. Land tax and council rates

In its pricing Submission, SDP proposed an average step change of \$0.52M p.a. based on the expected increase in underlying land valuation. It stated that there is substantial uncertainty over the land valuation.

In our Draft Report, we found that SDP had not justified that costs will increase above historical rates in real terms and recommended maintaining the FY22 expenditure level plus an adjustment for the outturn increase in land tax seen in FY23 as shared with us by SDP.

In its comments on our Draft Report, SDP stated:

*Atkins' comments in Appendix E of its report indicate that it has not reviewed the evidence presented in [redacted] report when developing its recommendations, "It is not possible for us to comment on a document we cannot review." We provided this report to IPART as part of our September 2022 Proposal. We consider that IPART and Atkins should consider this evidence in their final recommendations and decisions. [redacted] report clearly sets out the justification for increases in land tax above historical rates in real terms. It recommended forecasting unimproved land value based on a [redacted] long-term historical growth rate of [redacted]. Using a long-term historical average to forecast values that fluctuate from year to year is an approach commonly taken by many regulators including IPART to ensure that prices are set in the long-term interests of customers.*

*Even if Atkins and/or IPART did not accept the evidence presented in [redacted] report for [redacted] growth rate and adopted a 0% growth in the land valuation, we would expect a real increase land tax above 2021-22 expenditure levels based on the calculation of land tax using a rolling three-year average of land values included in the most recent land tax assessment notice issued by the NSW government which was provided to Atkins.*

*In addition IPART/Atkins has not reflected Atkins recommendations from this table in the calculations used to set our allowances in IPART's Draft Report.*

We can confirm that we reviewed and took into account the [redacted] document. We can also confirm that the \$196k p.a. real terms increase in land tax from FY22 to FY23 was incorporated in our calculations, hence our recommended pre-efficiency expenditure of \$1.45Mp.a. rather than the \$1.25M FY22 expenditure level.

In its response to IPART's Draft Report SDP has provided an updated forecast for land tax and council rates. This maintains council rates at FY22 levels (in real terms) and replicates the approach used in the 2023 Land Tax Assessment Notice, including the most up to date land values for 2021, 2022 and 2023, before adding a 7.5% p.a. nominal increase in land values.

With the inclusion of the most up to date land value assessment and clear replication of the logic of the assessment notice, we consider the approach taken by SDP to be reasonable and have recommended accepting the updated forecasts. The revised recommendation is summarised below.

**Table 2-3 Land Tax and Council Rates (\$FY23 000s)**

FY ending	Actuals				Projections				
	2019	2020	2021	2022	2023	2024	2025	2026	2027
SDP initial Submission	1,179	1,274	1,266	1,250	1,407	1,572	1,711	1,839	1,977
Atkins Draft Report recommendation (pre-efficiency)					1,446	1,446	1,446	1,446	1,446
Atkins revised recommendation (based on SDP Updated Forecast)						1,494	1,632	1,728	1,800
Difference to previous recommendation						47	186	282	354

Source: Analysis of AIRSIR and SDP document "Appendix E - Land tax and council rate RP3 estimate (CONFIDENTIAL) (00108205-2xCE34F)"

### 2.3. Variable costs

In its pricing Submission, SDP proposed a significant (42%) real terms increase in variable costs and provided a bottom up assessment of these costs, which were summarised in the Submission as follows.

**Table 2-4 Variable costs in SDP’s Pricing Submission (\$FY23/MI)**

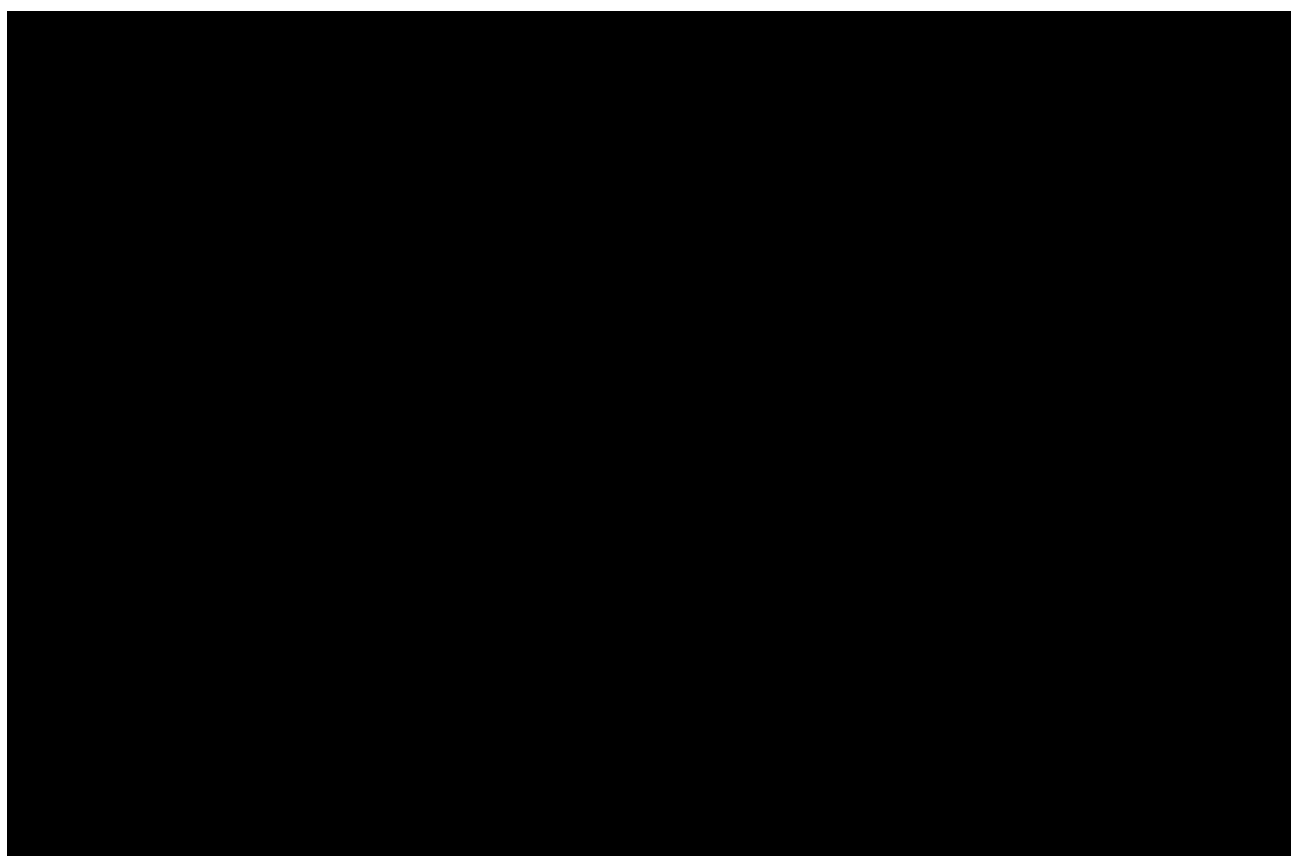
Other Treatment Cost component	2022-23	2023-24	2024-25	2025-26	2026-27
Chemical costs	[REDACTED]				
Other treatment costs	[REDACTED]				
<b>Total variable treatment costs</b>	<b>160.00</b>	<b>219.75</b>	<b>219.75</b>	<b>219.75</b>	<b>219.75</b>

Source: Table 9.13, SDP Pricing Submission

In our Draft Report, we had interpreted that the ‘other treatment costs’ were new costs being transferred from fixed opex and that “chemical costs” could be compared on a like-for-like basis with “Variable costs (chemicals etc)” in the Annual Information Return (AIR). SDP clarified that this was not the case before our Draft Report was issued. As a result, we amended the approach taken to take account of the fact that SDP’s projections were made on a like-for-like basis with the historical costs.

This led to the following recommendation.

**Figure 2-1 – Average unit variable costs from the Draft Report (\$FY23)**



In its comments on our Draft Report, SDP stated:

*There is no discussion on why Atkins has changed its approach from a bottom-up/engineering assessment of SDP's proposed treatment cost, to an approach basing these costs on FY22 data.*

*SDP has provided IPART and Atkins with a revised forecast of treatment costs. SDP's updated forecast reflects Atkins' recommendations in the earlier version of its report, which:*

- *adopts Atkins' approach of using 100% actual, historical water quality data for forecasting chemical dosing rates, rather than SDP's original proposal of using actual (75%), good (5%) and poor (20%) water quality (noting that this does not provide SDP with allowance for inlet water quality risk which is outside SDP control),*
- *adopts Atkins recommendations for alternate chemical options*
- *adopts Atkins view on reverse osmosis membrane aging effects, and reduce the frequency and dose rate assumption accordingly,*
- *includes updated/current chemical unit prices from Veolia's current national tender process (taking advantage of Veolia's scale operating multiple treatment facilities),*
- *adopts Atkins view on other variable costs (OVC), and*
- *adopts Atkins' approach of phasing in the impact of membrane aging on chemical dosing in equal steps from FY24 to FY27.*

*SDP submits that recognising the step change in chemical prices and dosing rates is extremely important in the context of aging membranes and the higher level of service SDP will be required to provide in the 2023-27 regulatory period compared to the past.*

SDP requested that we review and adopt SDP's updated treatment cost forecasts including current chemical prices as summarised in Table 4.2 of its response to IPART with further detail including workings and assumptions provided in an Excel spreadsheet.

The explanation provided above (and by email on 25 February 2023) about the interpretation of SDP's proposed variable costs explains the change in the approach we took between our initial and final draft reports. We also note that use of robust historical outturn costs is generally preferable to bottom-up theoretical cost estimates as it is grounded on actual experience.

We have examined SDP's updated forecast. It is significantly lower than its initial submission. We note SDP's explanation that it has:

- Removed the \$10/MI "other treatment cost" contingency from its submission
- Adopted our initial Draft Report changes to chemical types, membrane age assumptions and dose rates
- Used observed inlet water quality with no allowance for changes or risk
- Projected "other treatment cost" to remain roughly constant [REDACTED]
- Applied a 0.7% efficiency

Subsequent to its comments on our Draft Report, SDP has provided some recent quarterly data on "other treatment costs"<sup>5</sup> which indicates that they represented [REDACTED] of FY22 variable costs. Inferring chemical costs from these data, it appears that SDP's updated projections envisage chemical costs increasing by 13% in FY24 rising to 20% in FY27 (both relative to FY22 levels).

We consider that this scale of increase in pre-efficiency chemical costs is reasonable considering the general increase in chemical costs in the recent period. We have therefore recommended accepting SDP's updated pre-efficiency cost forecast as summarised below.

<sup>5</sup> SDP document "ATK-127\_and\_128 (00109309xCE34F)"

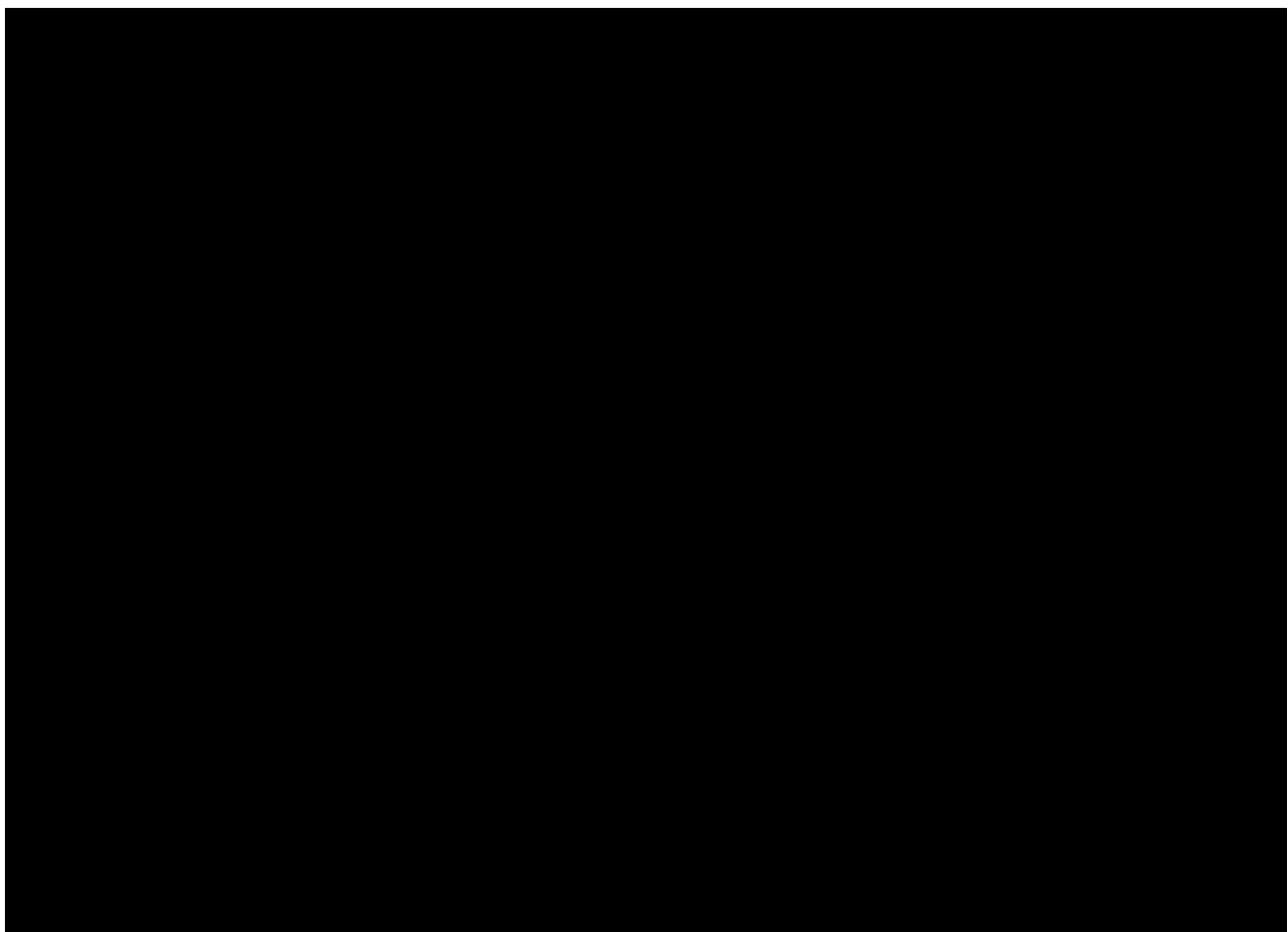
**Table 2-5 Variable opex (\$FY23/MI)**

FY ending	Actuals				Projections				
	2019	2020	2021	2022	2023	2024	2025	2026	2027
SDP initial Submission	91	142	156	155	160	220	219	218	218
Atkins Draft Report recommendation (pre-efficiency)						157	160	162	165
Atkins revised recommendation (based on SDP Updated Forecast)						171	173	176	179
Difference to previous recommendation						13	14	14	14

Source: Analysis of AIRSIR and SDP document "Appendix B - SDP revised treatment cost forecast (CONFIDENTIAL) (00108789-2xCE34F"

The revised recommendation is summarised graphically below.

**Figure 2-2 – Average unit variable costs from the Draft Report (\$FY23)**



## 2.4. Costs in non-production mode

In its pricing Submission, SDP proposed a step change in fixed plant opex of \$1.27M p.a. for the “*additional costs of being available to respond to production requests under Network Operator’s Licence*”<sup>6</sup>. The additional costs were for rotating assets, maintaining pre-treatment to enable outfall discharge and RO train flushing<sup>7</sup>.

In our Draft Report, we reviewed the proposed fixed plant opex and found that SDP had not made a robust justification for the proposed additional fixed plant opex except for the increase in O&M insurance. We considered that (1) the types of activities underlying the proposed \$1.27M step change would be part of the variable costs of production at higher production levels so should not be added as an ongoing fixed cost and (2) were not actually a significant step change relative to the recent operation of the plant during which it has had to respond to produce water over the full range of output levels whilst complying with outfall discharge conditions for example.

However, we recommended an allowance equivalent to \$0.71M p.a. for periods when the plant is in “non-production mode” i.e. when SDP is not providing water to Sydney Water but the Plant is being kept ready to supply water within a day or two’s notice.

During these periods it is envisaged that the Plant will require some activities which are normally classified as “variable” (chemical dosing, sludge disposal, cartridge filters) to enable some water treatment to continue in order to keep things like the dual media filtration pre-treatment in operation and to produce first pass permeate for flushing of the RO membranes every two days etc.

In its comments on our Draft Report, SDP stated:

*The additional costs of keeping the Plant available under our new Operating Rules (\$0.7m pa as recommended by Atkins) are costs incurred at all levels of production when the Plant is not at full capacity (or moving to and from full capacity) not just when the Plant is at zero production. e.g. for maintaining reverse osmosis membranes ready to be operated immediately and complying with EPA licence with bypass flow so the plant can be readily ramped up and down. Additionally this covers the increased costs (chemical and energy) of asset rotation and responding to Sydney Water requests (i.e. changing production).*

*Inclusion of these costs in the fixed O&M allowance is not only more cost-reflective, it would also avoid the need for a separate ‘Sydney Water requested zero production charge’. See further discussion in section 4.3 in our response to IPART’s draft report.*

SDP requested that the \$0.71m allowance be included as part of its fixed O&M allowance to ensure SDP can meet the requirements within its new Licence and consistent with Government’s policy objectives within the Greater Sydney Water Strategy (“GSWS”).

We consider that, as they relate to normally variable activities, the costs of keeping the plant producing small volumes of water to maintain function when this water cannot be sold to Sydney Water are not *in addition* to the variable costs of producing water for sale but are best viewed as a floor on the variable costs which it is difficult to fall below whilst keeping the plant in readiness.

This ‘floor’ to variable costs can be expressed in daily terms as \$1.9k/day. We do not consider that this should be added to fixed opex given it only applies to periods of non-production, but consideration could be given to setting it as a minimum level of variable cost expenditure.

## 2.5. Catch-up efficiency

In our Draft Report, we recommended a catch-up efficiency challenge of 0.5% p.a. cumulating annually. We considered this to be achievable (i) now that SDP and Veolia have the benefit of the plant having been in operation for a number of years (ii) given the opportunities for efficiency we set out and (iii) our view of SDP’s efficiency maturity compared to other sector organisations, noting that this degree of efficiency challenge is at the lower to mid-range of challenges set in other reviews.

<sup>6</sup> Table 9.7 Appendix to SDP Pricing Submission

<sup>7</sup> Page 76 of Appendix to SDP Pricing Submission

In its comments on our Draft Report, SDP stated:

*SDP submits that there is insufficient evidence to justify the catch-up efficiency factor applied to opex. The efficient frontier has not been established for SDP's circumstances, nor SDP's distance from the frontier. There is also inconsistency between this and the previous Determination. Further discussion is provided in our response to IPART's draft report.*

*The catch-up efficiency factors outlined for large, vertically integrated network-retail businesses in the table below are not comparable to SDP's circumstances. We consider that this benchmarking/comparison would require Atkins provide comparators that are stand-alone, privately owned desalination Plants or other businesses with similar scale and scope characteristics.*

SDP requested that the catch up efficiency factors applied to opex be removed.

In its response to IPART's Draft Report, SDP provided additional comments, stating that it considers itself to be an efficient business and that our Draft Report does not identify:

- The "efficiency frontier" for SDP's circumstances.
- SDP's distance from the efficiency frontier.
- The uncertainty related to the specific catch-up efficiencies

It also stated

*In SDP's view it is unreasonable to conclude that SDP is below the cost efficiency frontier and apply significant cumulative catch-up efficiencies growing to around 2% pa in 2026-27 to all opex elements:*

- *based on observed practices and historical cost information that have **not yet been adjusted to reflect our new Operating Rules**, which only come into effect from 1 July 2023; and*
- *without robust evidence on SDP's specific and changing circumstances. An assessment of whether catch-up efficiencies are reasonable **can only be made once the costs of operating under the new regime are incurred** and compared to other comparable benchmark entities. Such an assessment can only be made once SDP's new Network Operator's Licence has come into force (after 1 July 2023) and after operational experience under the new Network Operator's Licence.*

*Further, the limited rationale provided by Atkins regarding the evidence on catch-up efficiencies does not appear to identify any areas that **would impact on insurance**. In 2017, Atkins recommended, and IPART approved, the removal of any catch-up efficiency factor to corporate costs (which included insurance costs)*

We do not agree that catch up efficiencies should only be applied in stable conditions (a rare state of affairs) and with quantitative modelling of the frontier or of benchmark entities. If it were only possible to apply catch-up efficiencies when these conditions are met then they would never be applied even to extremely inefficient companies.

As set out our Draft Report, and summarised above, we consider that there is reasonable scope for catch-up efficiency and have benchmarked against the efficiencies applied to other utilities. Efficient utilities have a strong focus on efficiency which we did not find in our review of SDP. Specific areas in which we believe SDP could make efficiency improvements include:

- Efficiency plans: we have seen limited evidence of or detailed plans for efficiency improvements suggesting that there may be significant 'low hanging fruit' for efficiency with increased management focus;
- Enabling efficiency: we have recommended additional expenditure for a new operations and sustainability coordinator and spend-to-save capex which should help to enable significant efficiencies;
- Operating efficiency: having operated the plant across a range of volumes for a number of years, SDP and Veolia should now be in a better position to optimise operations and make efficiencies; and
- Energy audits: SDP has not yet carried out initiatives such as energy audits which would be expected to identify savings.

The level of catch-up efficiency we have recommended is at the lower (i.e. least challenging) end of those we have previously recommended and seen achieved. This partially reflects the fact that SDP is also dealing with a change in operating rules. However, we consider it very achievable especially given the limited efficiency focus currently in place. We have not therefore, recommended any change to the level of catch-up efficiency.

## 2.6. Continuing efficiency

In its initial pricing submission, SDP applied a “continuing efficiency factor” of 0.3% p.a. from FY24 for controllable corporate costs and FY25 for O&M costs. SDP has explained that the O&M efficiency starts in FY25 to allow a year to adjust to the new operating rules.

In our Draft Report, we recommended a continuing efficiency of 0.7% p.a. cumulating over the Determination period.

In its response to IPART’s Draft Report, SDP stated that:

*neither Atkins nor IPART has responded to SDP’s proposal for a 0.3% p.a. continuing efficiency factor which we consider to be more appropriate for the reasons set out in SDP’s pricing submission*

and referenced Section 9.1.3.1 of the Appendix to its initial pricing submission. This text sets out SDP’s view that gross output estimates of multi-factor productivity (MFP) would be preferable to value-added estimates and references a paper comparing the two approaches<sup>8</sup>.

It is not the task of this assignment to carry out a detailed review of gross versus value-added MFP approaches. However, we would note that, whilst both have their merits, we understand that the value-added approach has a longer data set and is consistent with the Determinations applied by IPART to other regulated entities in recent years.

We have not therefore recommended a change to the level of continuing efficiency applied.

## 2.7. Application of efficiency adjustments to all costs

In its initial pricing submission, SDP’s proposed “continuing efficiency factor” was applied only to “controllable” corporate costs and O&M costs.

In our Draft Report, we recommended applying to the catch-up and continuing efficiencies to all costs.

In its comments on IPART’s Draft Report, SDP requested IPART:

*The continuing efficiency factor should only be applied to SDP’s controllable costs.*

*exclude the continuing efficiency factor from land tax and council rates, given that the continuing efficiency factor should only apply to controllable costs.*

*exclude the continuing efficiency factor from energy volumes given these are already incorporated into energy volumes.*

It is worth remembering that our recommended expenditure levels are not designed to give detailed line by line budgets for SDP but rather an overall envelope of efficient expenditure.

Given that the continuing efficiency factor is derived from MFP modelling and SDP does not have significant pass-through type costs we do not consider there is a strong case to applying it to only a subset of SDP’s costs. Similarly, the catch-up efficiency factors benchmarked against are largely whole company (or whole Determination) challenges<sup>9</sup>.

We therefore consider it reasonable to apply these efficiencies to all rather than a subset of expenditure.

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<sup>8</sup> A Comparison of Gross Output and Value-Added Methods of Productivity Estimation, Australian Government Productivity Commission, November 2003 [RM.QXD \(pc.gov.au\)](#)

<sup>9</sup> With the exclusion of pass through costs like bulk/recycled water and electricity charges (which we have not recommended catch-up efficiencies for)



## 2.8. Revised recommended opex

### 2.8.1. Updated insurance quote

In its Draft Report, IPART requested that SDP obtain a further quote from its insurance broker for ISR insurance tailored to the draft decisions. As part of its Response to IPART’s Draft Report, SDP presented revised projections incorporating BI insurance for a range of plausible scenarios including force majeure and non-force majeure events.

In preparing our recommended opex, we have also updated our recommended insurance costs. These are based on SDP’s revised projections and [REDACTED] consistent with our Draft Report.

The amended recommendations are summarised below.

**Table 2-6 Updated corporate insurance costs (\$FY23 000s)**

FY ending	Actuals				Projections				
	2019	2020	2021	2022	2023	2024	2025	2026	2027
<b>CORPORATE INSURANCE</b>									
SDP initial Submission	3,058	3,602	3,965	4,302	5,411	4,860	5,478	5,896	6,116
Atkins Draft Report recommendation (pre-efficiency)						4,860	5,155	5,416	5,656
SDP revised projections						[REDACTED]			
Atkins revised recommendation						5,786	6,134	6,425	6,684
Difference to previous recommendation						926	979	1,009	1,028
<b>O&amp;M INSURANCE</b>									
SDP initial Submission	407	415	459	540	537	597	654	683	698
Atkins Draft Report recommendation (pre-efficiency)						597	654	683	698
SDP revised projections						[REDACTED]			
Atkins revised recommendation						962	1,078	1,131	1,145
Difference to previous recommendation						366	424	448	447

Source: Analysis of AIRSIR and SDP document “Insurance reconciliation for IPART - 26 May 2023”

## 2.8.2. Fixed opex

The changes between the previous and revised recommended pre-efficiency expenditure are summarised below.

**Table 2-7 - Summary of changes to recommended pre-efficiency fixed opex expenditure (\$FY23 000's)**

	2024	2025	2026	2027	2028
Corporate Remuneration	190	296	378	389	370
Professional services	(100)	(100)	(100)	(100)	(100)
Land Tax and Council Rates	47	186	282	354	430
Corporate insurance	926	979	1,009	1,028	799
O&M insurance	366	424	448	447	445
<b>Total</b>	<b>1,429</b>	<b>1,785</b>	<b>2,017</b>	<b>2,118</b>	<b>1,944</b>

Analysis of SDP's AIRSIR

Note: these figures do not take account of the catch-up and continuing efficiency, set out below.

Table 2-7 summarises the revised recommended fixed operating expenditure taking account of the scope adjustments set out in our Draft Final report and the changes set out above. Catch-up and continuing efficiency are then applied as summarised in Table 2-8 to derive the efficient operating expenditure for the next Determination period.

**Table 2-8 - Revised recommended fixed opex expenditure taking account of the recommended scope adjustments (\$FY23 000's)**

	2022 (latest actuals)	2024	2025	2026	2027	2028
Corporate						
Remuneration (excluding employee provisions)	4,051	4,630	4,958	5,040	5,051	5,032
Professional fees	3,868	3,196	3,196	3,196	3,196	3,196
Insurance	4,302	5,786	6,134	6,425	6,684	6,684
Council rates & Land tax	1,250	1,494	1,632	1,728	1,800	1,876
Other	620	1,794	1,648	1,849	1,638	1,840
<b>Corporate total</b>	<b>14,091</b>	<b>16,900</b>	<b>17,569</b>	<b>18,239</b>	<b>18,370</b>	<b>18,628</b>
<i>Adjustment to SDP proposal</i>		508	1,296	(742)	(428)	588
Pipeline						
Routine asset maintenance	-	516	487	487	487	487
Labour and other fixed costs	174	-	-	-	-	-
Professional fees	-	-	-	-	-	-
Other	-	-	-	-	-	-
<b>Pipeline total</b>	<b>174</b>	<b>516</b>	<b>487</b>	<b>487</b>	<b>487</b>	<b>487</b>
<i>Adjustment to SDP proposal</i>	-	-	1	3	4	6
Plant fixed						
Routine asset maintenance						
DWPS charges (excluding insurance)						
Standby charges						
Labour and other fixed costs						
Insurance - O&M						
Restart charges- O&M						
Other						
Veolia efficiency saving						
<b>Plant fixed total</b>	<b>17,430</b>	<b>17,856</b>	<b>17,972</b>	<b>18,025</b>	<b>18,039</b>	<b>18,039</b>
<i>Adjustment to SDP proposal</i>		(3,368)	(3,826)	(5,070)	(2,654)	(5,322)
<b>TOTAL</b>	<b>31,695</b>	<b>35,272</b>	<b>36,027</b>	<b>36,751</b>	<b>36,896</b>	<b>37,154</b>
Previous Recommended Total	31,695	33,843	34,243	34,734	34,778	35,210
<i>Change</i>		1,429	1,785	2,017	2,118	1,944

Analysis of SDP's AIRSIR

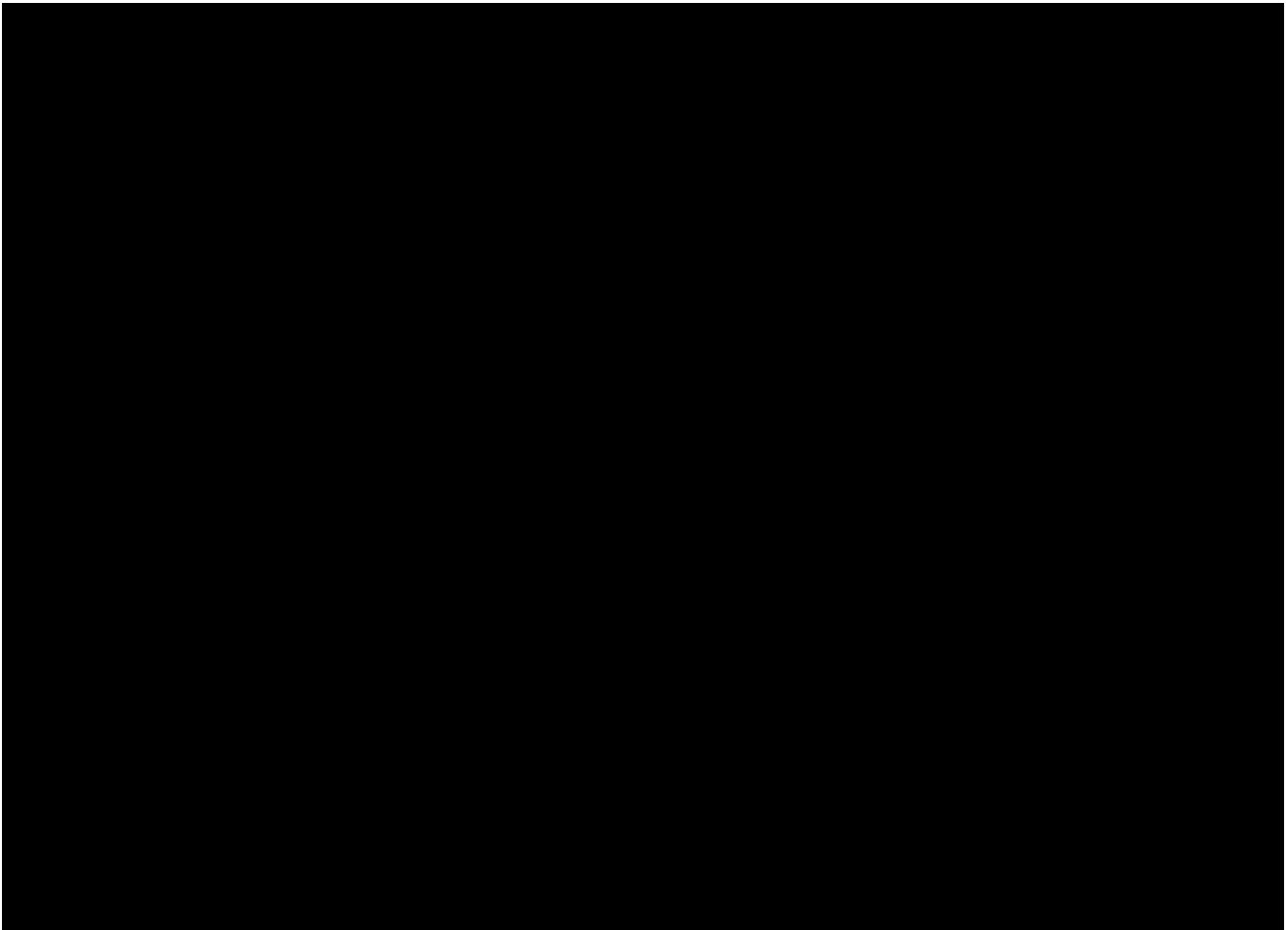
Note: these figures do not take account of the catch-up and continuing efficiency, set out below.

**Table 2-9 - Revised recommended efficient fixed opex (after catch-up and continuing efficiencies) (\$FY23 000's)**

	2024	2025	2026	2027	2028
SDP Initial Proposal					
Corporate	16,392	16,273	18,980	18,798	18,039
Pipeline	516	485	484	482	481
Plant fixed	21,224	21,798	23,096	20,693	23,361
Adjustment					
Corporate	508	1,296	(742)	(428)	588
Pipeline	-	1	3	4	6
Plant fixed	(3,368)	(3,826)	(5,070)	(2,654)	(5,322)
Pre-efficiency recommendations					
Corporate	16,900	17,569	18,239	18,370	18,628
Pipeline	516	487	487	487	487
Plant fixed	17,856	17,972	18,025	18,039	18,039
Efficiency adjustment					
Catch-up efficiency (%)	0.50%	1.00%	1.49%	1.99%	2.48%
Catch-up efficiency (\$)	(176)	(359)	(549)	(732)	(920)
Continuing efficiency (%) -	0.70%	1.40%	2.09%	2.77%	3.45%
Continuing efficiency (\$) -	(246)	(498)	(755)	(1,002)	(1,251)
Recommended opex (post-efficiency)					
<b>Corporate</b>	<b>16,698</b>	<b>17,151</b>	<b>17,592</b>	<b>17,507</b>	<b>17,540</b>
<b>Pipeline</b>	<b>509</b>	<b>475</b>	<b>470</b>	<b>464</b>	<b>458</b>
<b>Plant fixed</b>	<b>17,643</b>	<b>17,545</b>	<b>17,386</b>	<b>17,191</b>	<b>16,985</b>
<b>TOTAL</b>	<b>34,850</b>	<b>35,170</b>	<b>35,447</b>	<b>35,162</b>	<b>34,984</b>
Previous Recommended Total	33,438	33,428	33,502	33,143	33,153
<i>Change</i>	1,412	1,742	1,946	2,018	1,831

Source: Analysis of SDP's AIRSIR

Figure 2-3 - Summary of recommended fixed opex (after catch-up and continuing efficiency)



### 2.8.3. Variable opex (excluding energy)

Recommended efficient variable opex is summarised in Table 2-9 and Table 2-10 below. As set out above, we consider that the recommended non-production expenditure acts as a floor to the variable costs and have not therefore added it to the costs of production for the non-zero production levels set out below.

**Table 2-10 - Recommended efficient variable opex (after catch-up and continuing efficiency)**

FY\$23 \$/MI	2024	2025	2026	2027	2028
SDP Proposal					
Total variable cost \$/MI	219.75	219.09	218.43	217.78	217.12
Adjustment					
Total variable cost \$/MI	(49.02)	(45.61)	(42.19)	(38.78)	(38.13)
Pre-efficiency recommendations					
Total variable cost \$/MI	170.73	173.48	176.24	178.99	178.99
Efficiency adjustment					
Catch-up efficiency (%)	0.00%	0.00%	0.00%	0.00%	0.00%
Catch-up efficiency (\$/MI)	-	-	-	-	-
Continuing efficiency (%)	0.70%	1.40%	2.09%	2.77%	3.45%
Continuing efficiency (\$/MI)	(1.20)	(2.42)	(3.68)	(4.96)	(6.18)
Recommended (post-efficiency) opex					
<b>Total variable cost \$/MI</b>	<b>169.53</b>	<b>171.06</b>	<b>172.56</b>	<b>174.03</b>	<b>172.82</b>

Source: Analysis of SDP's AIRSIR and SDP response to IPART's Draft Report "Appendix B - SDP revised treatment cost forecast (CONFIDENTIAL) (00108789-2xCE34F)"

Note: as SDP did not provide an estimate for FY28 we have assumed it remains at the same level (pre-efficiency) as FY27.

**Table 2-11 - Recommended efficient variable opex by production level (after catch-up and continuing efficiency) (\$FY23 '000s)**

	2024	2025	2026	2027	2028
SDP Initial Proposal					
Average production (Mld)					
0	-	-	-	-	-
50	4,021	3,998	3,986	3,974	3,973
125	10,054	9,996	9,966	9,936	9,933
250	20,107	19,992	19,932	19,872	19,867
Adjustment					
Average production (Mld)					
0	709	709	709	709	709
50	(919)	(876)	(837)	(798)	(811)
125	(2,297)	(2,191)	(2,093)	(1,996)	(2,027)
250	(4,595)	(4,382)	(4,186)	(3,992)	(4,054)
Recommended (post-efficiency) opex					
<b>Average production (Mld)</b>					
<b>0</b>	709	709	709	709	709
<b>50</b>	3,102	3,122	3,149	3,176	3,163
<b>125</b>	7,756	7,805	7,873	7,940	7,906
<b>250</b>	15,512	15,610	15,746	15,881	15,813

Analysis of SDP's AIRSIR

Note: the SDP proposal figures are inferred from SDP's proposed unit cost applied as they are not available in this form.

Note 2: there are 366 days in FY24 and FY28 which has been factored into these recommendations

### 2.8.4. Total opex (excluding energy)

Bringing together the variable and fixed opex, SDP’s Pricing Submission proposed a 30% real terms average increase in opex at full production. This was made up of a 26% increase in fixed opex and 41% increase in variable opex.

We have recommended an average 13% real terms increase in opex at full production. This is made up of an 13% increase in average fixed costs and 11% increase in variable opex.

The proposed and recommended combined fixed and variable opex are summarised below.

**Table 2-12 - Revised recommended efficient combined fixed and variable opex by production level (after catch-up and continuing efficiency) (\$FY23 ‘000s)**

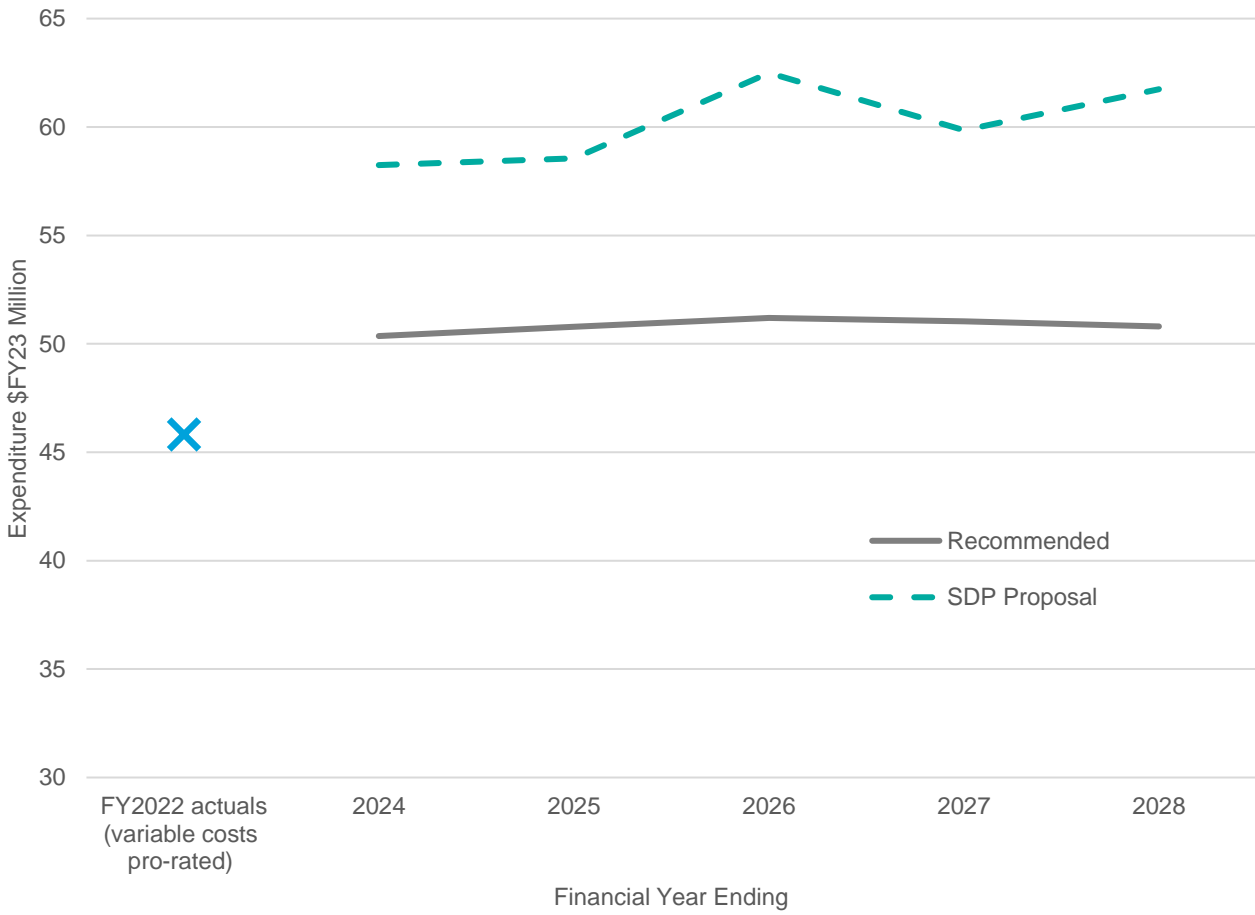
	2022 actuals	2024	2025	2026	2027	2028
SDP Initial Proposal						
Average production (Mld)						
0	31,695	38,132	38,555	42,560	39,973	41,881
50	34,521	42,153	42,554	46,547	43,948	45,855
125	38,760	48,185	48,551	52,526	49,909	51,815
250	45,824	58,239	58,547	62,492	59,846	61,748
Adjustment						
Average production (Mld)						
0		(2,573)	(2,676)	(6,404)	(4,103)	(6,189)
50		(4,201)	(4,261)	(7,950)	(5,610)	(7,709)
125		(5,580)	(5,576)	(9,206)	(6,808)	(8,925)
250		(7,877)	(7,767)	(11,298)	(8,803)	(10,952)
Recommended (post-efficiency) opex						
<b>Average production (Mld)</b>						
<b>0</b>	31,695	<b>35,559</b>	<b>35,880</b>	<b>36,157</b>	<b>35,871</b>	<b>35,693</b>
<b>50</b>	34,521	<b>37,952</b>	<b>38,292</b>	<b>38,597</b>	<b>38,338</b>	<b>38,146</b>
<b>125</b>	38,760	<b>42,606</b>	<b>42,975</b>	<b>43,321</b>	<b>43,102</b>	<b>42,890</b>
<b>250</b>	45,824	<b>50,362</b>	<b>50,780</b>	<b>51,194</b>	<b>51,042</b>	<b>50,796</b>
Change since the previous recommendation						
Average production (Mld)						
0		1,412	1,742	1,946	2,018	1,831
50		1,655	1,988	2,194	2,269	2,081
125		2,020	2,356	2,567	2,646	2,456
250		2,629	2,970	3,188	3,274	3,081

Analysis of SDP’s AIRSIR

Note: variable costs have been pro-rated for FY22



**Figure 2-4 - Summary of recommended fixed and variable opex at full production (after catch-up and continuing efficiency)**



Analysis of SDP's AIRSIR  
 Note: excludes energy costs  
 Note 2: truncated y-axis

# 3. Energy

## 3.1. Energy volumes

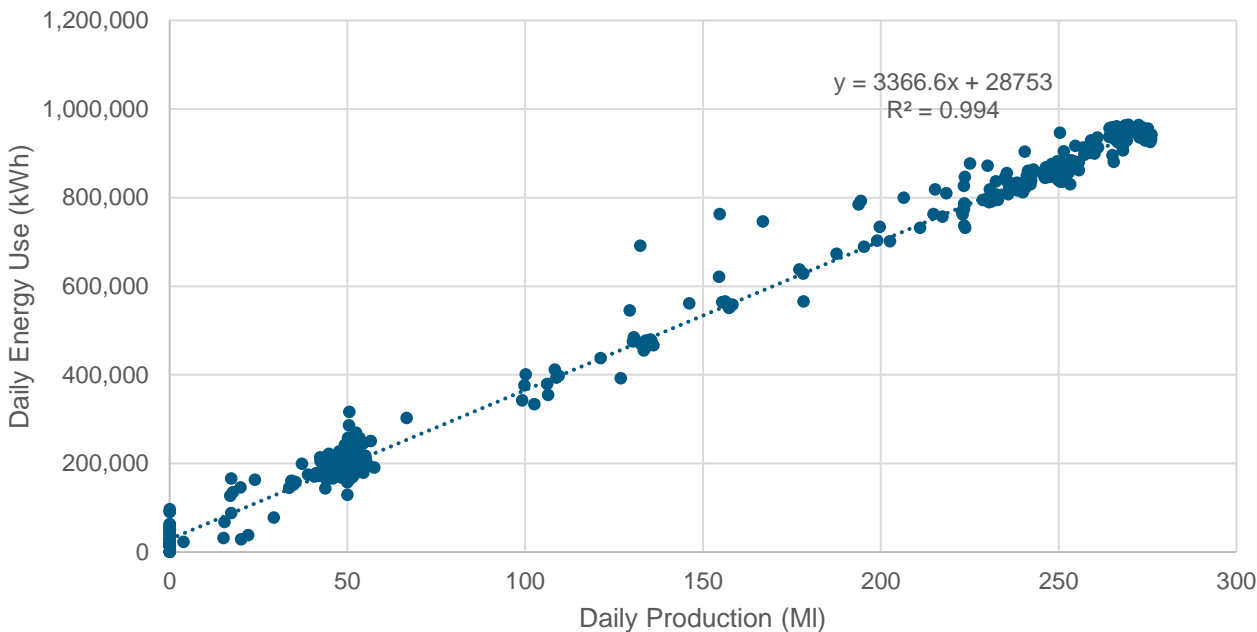
In our Draft Report, we recommended a fixed energy use allowance of 28.8 MWh/d and a variable allowance of 3.466 MWh/MI, having added an allowance of 0.1 MWh/MI to account for pump degradation, and some small pressure increase above when the pump throttling valve is fully open as membrane age at lowest sea water temperatures. The recommendations were based on analysis of daily production and energy use data for 2020-2022.

In its comments on IPART's Draft Report, SDP stated:

- *the draft decision is based on a line-of-best-fit using energy consumption from the 2017-23 regulatory period. SDP's concern is that the energy use during the 2017-23 regulatory period was based on the Plant's emergency response role, where only the three most efficient Reverse Osmosis (RO) trains were preferentially used on a temporary basis until the Plant was expected to shut down.<sup>44</sup> With the Plant now set to operate on a flexible full-time basis this is not a sustainable approach. To meet good industry practice, **we will need to undertake normal asset rotation among the Plant's 13 RO trains. In the absence of additional capital investment, this will increase the Plant's energy use during the 2023 Determination period relative to historical energy usage.***
- *Atkins recommendation is also below SDP's proposed benchmark energy volumes, because Atkins considers the design of the Plant (that relies on operational valve throttling to adjust pressure to the membranes) means that aging membranes will not have as great an effect on energy consumption as SDP proposed. SDP submits that **this view only applies to RO trains without trimmed impellers.** However, as noted above three out of 13 (23%) of the Plant's RO trains operate on trimmed impellers, which do not adjust pressure via operational valve throttling.*

We have considered these statements. However, it is clear that they do not affect our view of efficiency energy use. The recommendation is based on analysis of energy use across the full range of production levels as can be seen below.

Figure 3-1 – Relationship between power use and water production



Source: ATK-001\_1 Jul 2017 to 31 Oct 2022 Energy and Production Data

Using a best fit line against the full range of outputs captures the preferential use of the three most efficient trains (those with trimmed impellers) at lower output levels, which all other things equal, holds down the costs at the low end of production and increases the 'slope' or variable allowance. In other words, the effect is, by definition, already built into the recommendations. Furthermore, we have recommended accepting the ongoing efficiency capex which should allow for further trimming of impellers and energy savings which we have not built into our energy use recommendations.

We consider that no change in our recommendations is required.

## 3.2. Energy price benchmark

### 3.2.1. Overview

This section updates and replaces estimated SDP benchmark electricity prices for the forthcoming regulatory period to reflect changes in wholesale market conditions contained in our Draft Report, attached to IPART's Draft Report dated April 2023<sup>10</sup>. Our Draft Report used wholesale market data from March 2023 while this report incorporates market data to the end of April 2023. The detailed approach and methodology for estimating benchmark prices is set out in Appendix B and C to our Draft Report.

IPART's draft decision is to continue setting SDP's energy cost allowance based on an efficient market-based benchmark of efficient energy costs, as done in prior 2012 and 2017 price determinations for SDP<sup>11</sup>. IPART also accepted the proposed methodology and the components of the benchmark retailer's cost stack, including the cost of complying with the greenhouse gas reduction plan (GGRP).

There have been significant changes in market conditions and associated unit prices since mid-March 2023 when the benchmark estimates were finalised. The benchmark price estimates therefore include an update of market futures data for the regulatory period for the two key traded components, swap contracts and Large Generation Certificates ("LGCs"). The MJA market modelling of spot prices and swap prices employed in the latter two regulatory years was also reviewed, as market announcements may affect assumptions in the market modelling.

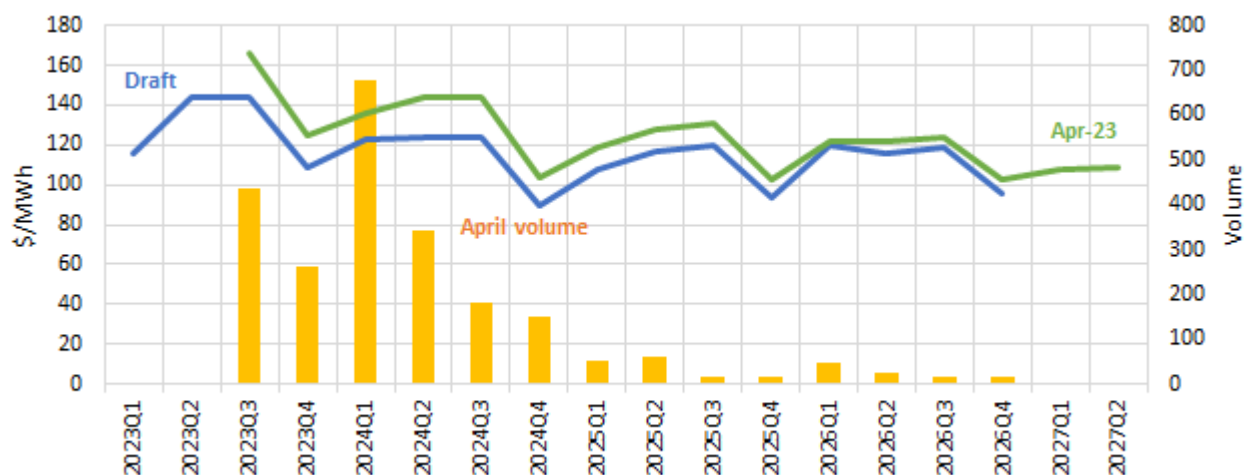
The update in ASX swap contract data is depicted in Figure 3-2 below. This compares to the price data used in the draft report (blue line) with updated data (green line). Trading data over April for future contract periods are also shown (yellow bars).

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<sup>10</sup> See *Sydney Desalination Plant ("SDP") Expenditure Review, Consultant Report, Independent Pricing and Regulatory Tribunal ("IPART")*, dated 23 April 2023, Atkins and Marsden Jacob Associates.

<sup>11</sup> See pages 43-44 of IPART's April 2023 Draft Report.

Figure 3-2 – Update in swap contract trading



For April traded contracts, there has been a significant increase in forward prices, especially over the first half of the benchmark price period. This increase is in the order of \$18/MWh in FY24 and \$14/MWh in FY25. This increase flows through into benchmark energy prices for these two periods.

In our Draft Report, we were obliged to model FY27 as swap contracts for the latter half of this year were not available. We also decided to use modelled prices for the third year (FY26) of the regulatory period rather than refer to the lightly traded market offers for that period.

Forward contract offers are now available for the whole of the regulatory period. There have, however, been no executed trades for FY27, and FY26 traded volumes remain low. Therefore, for the latter two years of the regulatory period we continue to apply modelled forward contract prices and associated modelled forward wholesale market simulations.

We have re-examined these simulated future wholesale market prices to determine whether there are any significant changes in underlying forecast market conditions for FY26 and FY27 since March 2023.<sup>12</sup> The most significant announcement has been the further delay of Snowy 2.0. However, because this and other pumped hydro projects will not enter the market until after the current regulatory period, there is no impact on the current modelling for the energy price benchmark.

Since our Draft Report, there has been an increase in the price of LGCs. This is 60 cents in FY24 and of the order of \$2-3/MWh in the final three years. Accordingly, the LGC component of benchmark prices has been updated to reflect changed market conditions.

The components and the form of the benchmark price remain the same as in the April 2023 report. This includes a two-part pricing structure with a fixed daily charge and a variable energy-related charge.

<sup>12</sup> To avoid ambiguity, we clarify modelling assumptions that new gas plant in NSW includes Tallawarra B commencing 1 January 2024, and Kurri Kurri commencing 1 December 2024.

### 3.2.2. Updated tables

The updated benchmark electricity prices are provided in the following tables.

Table 3-1 below updates and replaces Table 4-13 in our Draft Report.

**Table 3-1 - Benchmark electricity prices (\$FY23)**

Price component	Unit	2024	2025	2026	2027
Fixed charge	\$ per day	11,108	11,143	11,090	11,117
Variable charge	\$/MWh	175	152	179	158
Fixed daily energy	MWh/day	28.80	28.80	28.80	28.80
Fixed charge inc fixed daily energy	\$ per day	16,151	15,533	16,248	15,667

Table 3-1 provides total benchmark electricity prices for the two-part tariff for the four-year period, split between fixed and variable components. The top two rows in Table 3-1 give the estimated electricity benchmark rates. For converting the benchmark electricity price to an electricity price per ML (fixed and variable), the fixed charge should be inclusive of the energy consumption when the plant is in non-production mode. This is calculated with the assumed minimum daily volumes of 28.8 MWh/day for the regulatory period.

Table 3-2 provides the benchmark efficient retailer cost stack for SDP demand on a unitised basis, decomposing the prices in the previous table into the various cost components. This updates and replaces Table 4-14 in our Draft Report. Alongside the changes to variable and daily fixed energy components discussed above, further changes are made to reflect changes in LGC prices since our Draft Report.

**Table 3-2 Estimated retailer cost stack for SDP benchmark price**

Component	Group	Unit	FY2024	FY2025	FY2026	FY2027
Energy	Energy	\$/MWh	\$123.03	\$102.24	\$133.40	\$117.72
Energy losses	Energy	\$/MWh	\$0.21	\$0.17	\$0.23	\$0.20
Swap contract premium	Energy	\$/day	\$10,936	\$10,971	\$10,919	\$10,945
LGCs	Green	\$/MWh	\$8.71	\$8.75	\$7.49	\$6.14
GGRP	Green	\$/MWh	\$25.27	\$23.32	\$19.49	\$15.58
STCs	Green	\$/MWh	\$10.83	\$10.83	\$10.83	\$10.83
ESS (NSW Energy Saving Scheme)	Green	\$/MWh	\$3.17	\$3.34	\$3.50	\$3.66
Ancillary Services	Other	\$/MWh	\$0.36	\$0.36	\$0.36	\$0.36
Market fees (AEMO)	Other	\$/MWh	\$1.17	\$1.17	\$1.17	\$1.17
Metering and Data Costs	Other	\$/day	\$6.99	\$6.99	\$6.99	\$6.99
Fixed cost ex retail margin	Total	\$/day	\$10,943	\$10,978	\$10,926	\$10,952
Variable cost ex retail margin	Total	\$/MWh	\$172.75	\$150.17	\$176.47	\$155.66
Fixed cost inc retail margin	Total	\$/day	\$11,108	\$11,143	\$11,090	\$11,117
Variable cost inc retail margin	Total	\$/MWh	\$175.34	\$152.42	\$179.12	\$157.99

Table 3-3 updates and replaces Table 4-15 of our Draft Report, excluding IPART’s energy efficiency decision. The table illustrates the fixed cost of electricity contracting and fixed energy use of around \$5.8 million p.a., and the linear increase in costs with the assumed volume of water production/energy consumption.

**Table 3-3 Estimated annual cost of energy by production mode (\$FY23 Million)**

Operating phase	Measure	2024	2025	2026	2027
High 250 (ML/d)	Energy Use (GWh p.a.)	314.1	313.7	313.7	313.7
	Cost (\$m)	59.1	51.9	60.2	53.6
Medium 125 (ML/d)	Energy Use (GWh p.a.)	162.1	161.9	161.9	161.9
	Cost (\$m)	32.5	28.7	33.1	29.6
Low 50 (ML/d)	Energy Use (GWh p.a.)	70.9	70.8	70.8	70.8
	Cost (\$m)	16.5	14.9	16.7	15.2
Non-production 0 (ML/d)	Energy Use (GWh p.a.)	10.5	10.5	10.5	10.5
	Cost (\$m)	5.9	5.7	5.9	5.7

## 4. Capex

### 4.1. Periodic maintenance – bunds and tanks

In its pricing Submission, SDP proposed \$23.41M for periodic maintenance capex. One of the line items included in this capex is the inspection and repair of concrete tanks and bunds at a cost of \$0.28M over the next Determination as well as another \$0.74M in FY28.

In our Draft Report, we recommended that the proposed \$0.28M is removed and adjusted for in the periodic maintenance for the next Determination period. Our recommendation was based on the view that concrete tanks and bunds are typically done when there is known to be a damage to the asset as bunds and tanks are typically designed for the life of the plant.

In its comments on our Draft Report, SDP stated:

*Atkins drafting suggests that SDP should wait until there is damage to lining on concrete chemical storage tanks and chemical bunds before SDP invests in these assets. This is not prudent because this could result in chemical spill from a tank and/or bund and allow chemical to spill outside the bund, thus potentially causing environmental in breach of its Licence. The concrete tanks and chemical bunds are designed to contain a chemical spill with protective coatings – the coatings have a design life far less than the life of the plant. SDP’s approach (consistent with industry best practice) is to be proactive not reactive to managing high risk storage tanks and bunds that are used to contain chemicals to prevent chemical spills. This capital project will enable SDP to identify any potential risks and act before there is an issue to prevent an environmental incident.*

Based on this comment, we asked SDP to provide further details on how the cost was developed and inspections associated. SDP explained that this capex is associated with inspection and repairs of the water holding tanks and lamella thickener structures. These items were flagged by the Operator’s predictive model, which suggests interventions on these assets. Based on our experience and best industry practices, repairs to concrete tanks and bunds are typically done when routine asset inspections indicate the need for repairs. However, noting that any expenditure will be reviewed ex-post, and given that there is uncertainty over the need for these assets to be repaired over the next Determination period, we have recommended allowing for this capex item per SDP’s RP3 Project by Year shared with Atkins-MJA<sup>13</sup>.

Table 4-1 below shows the new recommendation regarding this capex item highlighting the change in recommended adjustment due to the modification.

**Table 4-1 – Plant – Periodic Maintenance Capex Adjustment Modification Summary (\$FY23 Million)**

Description	2023	2024	2025	2026	2027	2028	Future Determination (FY24-FY27)
SDP initial Submission	5.01	6.91	5.52	5.80	5.02	5.86	23.24
Atkins Draft Report recommendation (pre-efficiency)	5.01	6.23	5.00	3.94	3.38	4.69	18.56
Atkins revised recommendation (pre-efficiency)	5.01	6.23	5.00	4.14	3.44	5.36	18.81
Difference to previous recommendation	-	-	-	0.20	0.06	0.067	0.25

<sup>13</sup> ATK-14\_Projects by Year shared in response to RFI #14, SDP, 1 December 2022

## 4.2. Catch-up efficiency

In our Draft Report, we recommended a phased catch-up efficiency challenge from 2024 reaching a cumulative 7% by 2027. The challenge was applied based on our review of SDP’s capex program and the potential opportunities to increase efficiencies in the following areas:

- **Procurement:** As SDP evolves its operation to a more continuous production, we view that there is an opportunity for efficiency through a more aggressive approach to procurement and gaining greater insight into the overall capex program.
- **Cost Estimation:** We consider that SDP estimation of capital project costs to be conservative. This can lead to low efficiency drive as it is easier to deliver within agreed funds. Business cases for various periodic maintenance and Plant specific projects demonstrated that SDP might be able to save as it gains better visibility of the market.

Our Draft recommendation regarding catch-up efficiency was based on our understanding of other desalination Independent Water Projects (IWP’s) and utilities which we sought to benchmark SDP against. We also presented catch-up efficiencies from previous Determination in New South Wales for capex

In its comments on our Draft Report, SDP stated:

*SDP submits that there is insufficient evidence to justify the catch-up efficiency factor applied to capex. The efficient frontier has not been established for SDP’s circumstances, nor SDP’s distance from the frontier. Further discussion is provided in our response to IPART’s draft report.*

The recommendation was based on the clearly stated areas (estimation and procurement) where SDP can gain efficiencies. This was determined through our review of SDP’s proposal, business cases, and understanding of the desalination and utilities industry. In our Draft Report, we presented the below table containing catch-up efficiency for various similar utilities companies in NSW. The catch-up efficiencies were determined to be achievable during the Determination review.

**Table 4-2 – Capital expenditure: catch-up efficiency in previous Determinations**

Utility % in year (cumulative)	Start year	Year 1	Year 2	Year 3	Year 4
Sydney Water	2013	1.30	4.40	9.60	12.00
Hunter Water	2016	0.00	0.00	0.00	0.00
Sydney Water	2017	2.90	5.80	7.20	8.60
Central Coast Council	2020	3.25	7.50	10.75	13
WaterNSW- Greater Sydney	2020	2.07	5.13	7.70	9.26

We maintain the view that our assessment of the capex program indicated limited evidence of efficiency drive and therefore significant opportunities for SDP to improve efficiency in the cost estimation and procurement areas. SDP has not demonstrated its efficiencies in those two areas. Therefore, based on catch-up efficiencies applied in previous Determinations and performance of companies compared with SDP, we have established the cumulative 7% catch-up efficiency challenge. We view that this challenge is achievable and reasonable, acknowledging that most water utilities reviewed in previous Determinations have been recommended similar catch-up efficiency.



### 4.3. Revised recommended capex

The below table demonstrate our revised recommended efficient capex for SDP over the next Determination period.

**Table 4-3 – Revised Capex Cost Summary (\$FY23 Million)**

	2023	2024	2025	2026	2027	2028	Future Determination (FY24-FY27)
<b>SDP Proposal (post-efficiency challenge)</b>							
Plant – Specific Projects	5.19	5.81	3.24	2.89	3.20	1.29	15.14
Plant – Membrane Replacement	2.28	8.44	10.29	9.26	7.71	8.21	35.70
Plant – Periodic Maintenance	5.01	6.91	5.52	5.80	5.02	5.86	23.24
Pumping Station	0.04	2.51	2.48	-	-	-	4.99
Pipeline	0.11	0.33	0.80	0.33	0.33	0.33	1.80
Corporate	0.14	0.02	0.07	0.03	0.02	0.02	0.13
<b>Adjustments</b>							
Plant – Specific Projects	0.007	(0.11)	(0.05)	(0.05)	(0.04)	0.02	(0.25)
Plant – Membrane Replacement	(2.28)	1.19	(10.29)	(9.26)	(7.71)	(8.21)	(26.07)
Plant – Periodic Maintenance	-	(0.67)	(0.52)	(1.66)	(1.57)	(0.51)	(4.43)
Pumping Station	-	0.01	0.01	-	-	-	0.02
Pipeline	-	(0.22)	(0.39)	(0.32)	(0.32)	(0.33)	(1.26)
Corporate	-	0.00	0.00	0.00	0.00	0.00	0.00
<b>Pre-efficiency recommendations</b>							
Plant – Specific Projects	5.20	5.71	3.18	2.84	3.16	1.31	14.89
Plant – Membrane Replacement	-	9.63	-	-	-	-	9.63
Plant – Periodic Maintenance	5.01	6.23	5.00	4.14	3.44	5.36	18.81
Pumping Station	0.04	2.51	2.50	-	-	-	5.01
Pipeline	0.11	0.11	0.41	0.01	0.01	-	0.54
Corporate	0.14	0.02	0.07	0.03	0.02	0.02	0.14

	2023	2024	2025	2026	2027	2028	Future Determination (FY24-FY27)
<b>Efficiency adjustment</b>							
Catch-up efficiency (%)	0.00%	1.5%	4.0%	6.0%	7.0%	7.0%	
Catch-up efficiency (\$)	-	(0.36)	(0.45)	(0.42)	(0.46)	(0.47)	(1.69)
Continuing efficiency (%)	0.00%	0.70%	1.40%	2.09%	2.77%	3.45%	
Continuing efficiency (\$)	-	(0.17)	(0.16)	(0.15)	(0.18)	(0.23)	(0.66)
<b>Recommended capex (post-efficiency)</b>							
Plant – Specific Projects	5.20	5.58	3.01	2.61	2.85	1.17	14.06
Plant – Membrane Replacement	-	9.42	-	-	-	-	9.42
Plant – Periodic Maintenance	5.01	6.10	4.73	3.80	3.11	4.80	17.74
Pumping Station	0.04	2.46	2.36	-	-	-	4.82
Pipeline	0.11	0.11	0.39	0.01	0.01	-	0.51
Corporate	0.14	0.02	0.06	0.02	0.02	0.02	0.13
<b>TOTAL</b>	<b>10.50</b>	<b>23.69</b>	<b>10.55</b>	<b>6.45</b>	<b>5.99</b>	<b>5.99</b>	<b>46.67</b>
<i>Previous Recommended Total</i>	<i>10.50</i>	<i>23.69</i>	<i>10.55</i>	<i>6.27</i>	<i>5.93</i>	<i>5.39</i>	<i>46.44</i>
<i>Change</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>0.18</i>	<i>0.06</i>	<i>0.60</i>	<i>0.23</i>

Source: Atkins Summary

Note: "adjustments" includes the adjustment from post-efficiency to pre-efficiency where appropriate i.e. where we have recommended accepting SDP's proposed expenditure and SDP have incorporated efficiency to that cost line as set out in **Error! Reference source not found.** above. This is why there is a positive adjustment to pumping station capex.

## 5. Asset lives

### 5.1. Pipeline

In its pricing Submission, SDP proposed to reduce the asset life of the pipeline from 120 years to 100 years. The proposal was supported by on a technical opinion<sup>14</sup> from SDP's consultant, KBR, which highlighted the following main points:

- The initial design basis<sup>15</sup> provided 100 years as the pipeline asset life and because it is the intention of the design, all elements of the pipeline were designed to sustain it for 100 years.
- Because a section of the pipeline is undersea, it presents an aggressive marine environment for the pipeline. SDP argues that its pipeline is different from Sydney Water's network.
- The pipeline should not be averaged using the land-based section as it should be treated as a singular asset.

In our Draft Report, we presented two options for consideration:

**Option 1 – 116 years:** takes into account the 2017 Determination Review consultant's recommendation<sup>16</sup> to use a weighted average method using 100 years for the pipeline section undersea and 140 years for the inland section.

**Option 2 – 100 years:** uses the assigned asset life in the basis of design.

IPART accepted Option 1 in its Draft Decision.

In its comments on our Draft Report, SDP stated:

*SDP agrees with this point [“We note that review of different assets or services should be treated separately as conditions, purpose, and design of infrastructure assets present varying conclusions.”] and there is detailed explanation within the KBR expert report of how and why Sydney Water's portfolio of pipeline assets is materially different to SDP's single point-to-point pipeline asset.*

*We also note the nature, purpose and design of Broken Hill Pipeline is more comparable to SDP's pipeline than to Sydney Water's portfolio of pipeline assets, which previous SDP Determinations have been anchored on.*

*[Referring to Table 6-2 of our Draft report] This section does not acknowledge the regulatory precedent in the comments, given the section above notes option 1 is consistent with other Determinations/precedent.*

Our view remains that, in the case of SDP's pipeline, there are two reasonable approaches in determining the asset life. IPART's Draft Decision accepted Option 1 using the method from the 2017 Determination Review to assign the asset life. The 2017 Determination Review provided that the “WSAA Code paragraph 1.2.6 states that ‘distribution systems shall be designed for a nominal asset life of **at least** [emphasised] 100 years and table 1.2 refers to **typical** [emphasised] asset design lives of 100 years for pipelines.” Additionally, the 2017 Determination Review aimed at establishing that the asset life stated in the Basis of Design does not necessarily reflect the economic life of the asset.

We do not fully agree with SDP's assertion that SDP's pipeline is necessarily more comparable to the Broken Hill pipeline than Sydney Water Company's portfolio of pipeline assets. The two pipelines are in different geographies, and it is reasonable to expect that Sydney Water Company has pipeline sections that are comparable to SDP's pipeline.

It is difficult to establish an asset life for long-life assets such as pipelines with confidence, especially in a (semi) marine environment. Therefore, we have maintained our approach in presenting both options for IPART to determine the option that reflects SDP's level of service for its customers.

<sup>14</sup> Sydney Desalination Plant Pipeline Design Life – Technical Memorandum, KBR, 16 Aug. 2022

<sup>15</sup> Basis of Design Report – Work as Constructed (WDA-BoD-REP-001), Water Delivery Alliance, 01 Dec. 2009

<sup>16</sup> Consultant Report – 2017 Expenditure Review, Atkins Cardno, 21 Mar. 2017

## 5.2. Membrane

In its pricing Submission, SDP initially proposed 4.5 years for the asset life of reverse osmosis membranes. During the review, SDP indicated that this was an error and amended its proposed asset life to 8 years.

In our Draft Report, we recommended that the asset life be calculated by estimating the economic life of membranes using SDP's representative average production (68.4%). The membranes economic life was calculated for the first and second passes then weight-averaged to determine the asset life for the plant's membranes. This provided a membrane asset life of 11 years.

In its comments on our Draft Report, SDP stated:

*SDP submits that a maximum 8 year asset life for membranes [REDACTED] (as established based on Atkins advice in the 2017 Determination) remains the correct approach for the purposes of setting the regulatory depreciation allowance.*

*[REDACTED] and the 8 year design life has not changed since the 2017 Determination. Membranes cannot be expected to have an economic life greater than their warranted design life without evidence that this is likely to be the case.*

*Further discussion is provided in our response to IPART's draft report and Determination.*

In its response to IPART's Draft Report, SDP adds that the 2017 Determination Consultant (Atkins-Cardno) recommended 8 year asset life for the membrane based on the [REDACTED]<sup>17</sup>.

Our view is that the approach of calculating asset life for membranes used in our Draft Report provides a more reliable estimate of the economic life of the membranes than previously used, specifically under SDP's operating conditions. In the existence of other data, warranty periods are not considered to be reflective of the useful asset life<sup>18</sup>. We consider that a more accurate membrane asset life depends on an estimation of useful economic life of the membranes under representative operating conditions.

Therefore, we consider that our improved estimation using SDP's operating scenarios under representative average production to be appropriate. Hence, we maintain our recommendation of 11 years for membranes asset life.

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<sup>17</sup> Consultant Report – 2017 Expenditure Review, Atkins Cardno, 21 Mar. 2017

<sup>18</sup> For example, a car may be warrantied for 3 years, but the average useful economic life of a car is much longer

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