Central Coast Council - Expenditure Review

Draft Report | 25 February 2022

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Executive Summary

IPART is conducting a review of the maximum prices that Central Coast Council (CCC) can charge for its water, wastewater, stormwater and other services from 1 July 2022.

In October 2021, IPART appointed the consortium of Frontier Economics, Mott MacDonald and Inxure Strategy Group ('we' or our') to review and make recommendations on the efficiency of CCC's proposed operating and capital expenditure for the 2022-26 determination period.

CCC provides a broad range of services to its community. The scope of this expenditure review is only the services delivered by CCC as a Water Supply Authority (WSA) under the *Water Management Act 2000*. In this report any reference to "CCC" or "Council" with respect to their business plans, systems, expenditure, performance etc refers only to CCC's WSA services, unless specifically stated otherwise.

This report details our draft findings and recommendations. We have based our draft findings on CCC's annual and special information returns, its pricing proposal to IPART dated September 2021, interviews with Water, Wastewater and Stormwater managers and staff, information provided by CCC and responses to subsequent information and document requests. We have also undertaken analysis of the operating expenditure of other water utilities, obtained from the Bureau of Meteorology's National Performance Reports.

A separate report outlines our findings on the costs and benefits of CCC's water and wastewater services being provided as a stand-alone business.

Operating context

CCC provides water supply and wastewater services to around 345,000 people in the Central Coast Local Government Area (LGA) of NSW. The Central Coast region extends north through Summerland Point, south to Mooney Mooney, east to the Tasman Sea and west to the border of Wisemans Ferry. CCC's water, wastewater and stormwater drainage network is managed within a an area of around 1,680 square kilometres.

Core business systems

Strategic plans and asset management systems

We have reviewed CCC's core business systems and practices to determine whether they represent good industry practice. Based on the information provided it is clear that CCC is in the process of preparing and updating long-term strategies, asset management frameworks, processes, systems, and decision-making frameworks. CCC's is moving towards good industry practices to ensure that the customer requirements are met in a collaborative and efficient manner. CCC should continue to develop and sharpen its Asset Management Systems. This will lay the foundation for better asset management and business practices in the future, which improve the services customers receive and the efficiency of delivering them.

While good foundations are being laid by CCC for delivering efficient expenditure plans and governance, the business systems and processes are maturing. This means that data-driven evidence to identify risks, support investment needs and develop efficient solutions may not be

robust and reliance is placed on expert judgement to fill the gaps. The pricing submission (and associated Technical Papers) are informed by the strategies that are currently in place and are the public statement of CCC's direction and intended investment. Therefore, our assessments of CCC's capital investment is based on the systems that are currently in place and not the intended plans.

Following our review, we have made a number of recommendations with regards to CCC strategic business plans and asset management systems and associated processes.

Recommendations for strategic business plans and asset management and planning

- A summary of our recommendations are listed below with further detail provided in chapter 2.
- CCC's strategic plans should clearly demonstrate how its strategy and long-term objectives meet community objectives and expectations.
- We recommend that CCC report its progress against the Asset Management improvement plans (11 Asset Management Strategies and 38 tasks) as detailed in the Asset Management Strategy (November 2021)
- We recommend that CCC develop an endorsed published customer charter with a set of measurable customer outcomes and reporting
- We recommend that the CCC incorporate risk metrics into a dashboard so that it always has a contemporaneous view of its asset-related risks, especially those from its critical assets
- We recommend that CCC links the prioritising framework to determining the optimal level of capital expenditure to ensure that only the investment linked to the regulatory drivers and customer outcomes are funded
- We recommend adopting a more standardised approach to risk and opportunity estimating and a unit cost database that expands upon the networks costing approach into treatment projects
- With respect to gateways, to provide greater transparency and guidance, we recommend that at Gateway 1 CCC documents the minimum requirements to be met through the different stages and the approval responsibilities. These requirements should then be monitored through the project delivery stages by the CCC capex committee.

Core business systems

We were also asked to comment on the overall structure of the CCC's water, wastewater and stormwater business, and any impacts that may have on the efficiency of the planning, delivery and improvement of its services.

Our analysis indicates that:

- Reporting lines not clearly defined between the different areas within CCC
- Given the structure we cannot discount cross subsidisation occurring. A clear link between water business revenue and expenditure is not evident
- A gap in governance documentation relating to a public document that outlines the policy and procedures for how it will work with customers (a Customer Charter).
- CCC provides an array of services, it's not clear how the council prioritises the capital expenditure between these services if there are competing priorities for limited funds.

- The lack of an independent Board to oversee the supply of water services or a Customer Challenge Group.

Capital expenditure review

The purpose of the capital expenditure (capex) review is to assess and make recommendations on the efficient level of capital expenditure over the 2019 and 2022 determination period. Our review focused on 10 capex investments (programs and projects) across a mixture of water, wastewater and stormwater assets. The sample size represents approximately 37% of the value of the proposed capital expenditure for the 2022 determination.

One off adjustment to the capex sample projects

Table 1 shows the outcome of our detailed review of the capex projects using a traffic light assessment – red - not efficient, amber - partially efficient, green – efficient. The assessment is based on the extent that CCC demonstrated a need for the project, that an options assessment was undertaken and that the least cost option was selected. The table also shows our recommended capex adjustment for the project.

Based on our detailed capex assessment we found that:

- There is not a consistent approach to the definition of customer benefits.
- Timescales from project need identification to project initiation are very protracted. This leads to repeat changes in budgets and lack of continuity in strategy and decision making.
- The use of whole life costing is not consistent across treatment and networks which reduces the confidence in the options and benefits. No consideration of impact on maintenance costs from the solutions for the drainage projects for example.
- Optioneering is often limited to a 'do nothing', 'do something' and 'do too much' approach. More exploration of incremental solutions, such as pre-treatment of the raw water during poor water quality events on Mardi and longer-term catchment-based solutions, are not evidenced.
- Most projects are linked to one driver. For example, projects such as Lakedge Drive drainage with CCC driver to increase reliability will also have a growth element with increased capacity to account for catchment changes. There will also be a benefit to the road maintenance program from the works that is not explained in the submission. Being able to differentiate between the contribution to the different drivers will help with capex/opex trade offs and removal of overlaps between budgets.
- Efficiency opportunities from packaging works with suppliers are not assessed in the CCC submission.
- All cost estimates include risks but do not include opportunities. Approach to setting contingency is simplistic and high level (limited use of Monte Carlo techniques for example).
- Deliverability of the projects is constrained by Council management resources (as quoted on Mardi pipeline and Lakedge drainage).

Table 1: Detailed capex review summary ($2021-22)

Project	Need	Best Option	Least Cost	Recommended adjustment
MARDI WTP				-32m
WATER MAIN RENEWAL PROGRAM				-
SEWER MAIN ASSET RENEWAL				-
SEWER RISING MAIN REHABILITATION PROGRAM				-
SPS ELECTRICAL AND CONTROL SWITCHBOARD				-
CHARMHAVEN STP				42.13m
BATEAU BAY STP				1.4m
KINCUMBER STP				1.6m
RIOU STREET				-0.2m
LAKEDGE AVENUE (STAGE 2 AND 3)				-0.41m
TOTAL				12.5m

Source: Mott MacDonald

Efficient capital expenditure

Our proposed efficient capital expenditure is based on our detailed review of capital expenditure, and the application of efficiency factors.

Efficiency adjustment

IPART has advised that it expects continuing efficiency of 0.7% pa by CCC. This means that the efficiency saving in any one year will reflect both the savings for that year and the ongoing savings resulting from efficiencies achieved in previous years.

With regards to catch-up efficiency, based on the systemic issues identified and our professional judgement, we are recommending an efficiency range to be applied to the unsampled capital expenditure to determine the minimum or maximum capital expenditure for CCC. The three areas we consider significant to enable catch up improvement for CCC include:

1. Strengthened project management, asset management and governance in planning phase to develop solutions (efficiency of 5-10% on capex budgets)
2. Risk and opportunity approach increased maturity (efficiency range of 1-3% on capex budgets)

3. Earlier involvement of supply chain for benchmarking, risk allocation, optimal solution and confidence in schedule (efficiency range of 5-8% on capex budgets for projects > $5m).

The percentage ranges used in the three areas above have been used to determine the minimum and maximum capital expenditure range as discussed and presented below.

In applying these adjustments, it is recognised that CCC is catching up to an efficiency achieved by other water asset owners and that efficiencies cannot be achieved from 'day 1' in the 2022-26 determination period and therefore the indicative potential efficiency has been halved.

Our proposed minimum and maximum capital expenditure based on the adjustments noted above is shown in the following tables.

The ranges are designed to provide IPART with discretion to adopt either of the proposed capital expenditure profiles or a mid-point.

Table 2: Summary of proposed minimum efficient capital expenditure ($2021-22, $m)

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
WATER							
CCC PROPOSED	31.96	41.48	29.49	34.74	30.39	19.99	31.03
ADJUSTMENTS							
WTP - MARDI			-6.8	-24.9	-6.7		
TOTAL ADJUSTMENTS			-6.8	-24.9	-6.7		
TOTAL CAPEX AFTER ADJUSTMENTS	31.96	41.48	22.7	9.84	23.69	19.99	31.03
EFFICIENCY ADJUSTMENTS							
CONTINUING %				0.01	0.01	0.02	0.03
CATCH-UP				-1.16	-2.41	-2.06	-3.49
ASSET AND PM IMPROVEMENT				-0.81	-1.77	-1.50	-2.60
RISK AND OPPORTUNITY APPROACH				-0.24	-0.53	-0.45	-0.78
SUPPLY CHAIN INVOLVEMENT >5M				-0.11	-0.11	-0.11	-0.11
TOTAL EFFICIENCY ADJUSTMENTS				0.06	0.30	0.38	0.78
TOTAL WATER CAPEX	**31.96**	**41.48**	**22.7**	**8.62**	**20.98**	**17.56**	**26.75**

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
WASTEWATER							
CCC PROPOSED	22.48	17.17	35.87	34.63	39.11	49.04	37.65
ADJUSTMENTS							
STP MAJOR AUGMENTATION WORKS CHARMHAVEN			-0.58	-1.20	11.20	24.2	7.93
BATEAU BAY				0.70	0.50	0.20	
DEWATERING RENEWAL				1.60			
TOTAL ADJUSTMENTS	0.00	0.00	-0.58	-1.72	9.26	20.27	4.59
TOTAL CAPEX AFTER ADJUSTMENTS	22.48	17.17	35.29	32.91	48.37	69.30	42.23
EFFICIENCY ADJUSTMENTS							
CONTINUING				0.01	0.01	0.02	0.03
CATCH-UP				-2.82	-2.44	-4.13	-3.34
ASSET AND PM IMPROVEMENT				-1.45	-1.15	-2.45	-1.84
RISK AND OPPORTUNITY APPROACH				-0.43	-0.35	-0.74	-0.55
SUPPLY CHAIN INVOLVEMENT >5M				-0.94	-0.94	-0.94	-0.94
TOTAL EFFICIENCY ADJUSTMENTS				0.23	0.68	1.47	1.20
TOTAL WASTEWATER CAPEX	**22.48**	**17.17**	**35.29**	**32.68**	**47.69**	**67.84**	**41.04**

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
STORMWATER							
PROPOSED	9.60	6.15	11.38	8.38	9.51	8.92	9.57
ADJUSTMENTS							
RIOU ST					-0.22		
LAKEDGE				-0.12	-0.08	-0.12	-0.10
TOTAL ADJUSTMENTS	0.00	0.00	0.00	-0.91	-1.22	-0.79	-0.89
TOTAL AFTER ADJUSTMENTS	9.60	6.15	11.38	7.48	8.29	8.13	8.68
EFFICIENCY ADJUSTMENTS							
CONTINUING %				0.01	0.01	0.02	0.03
CATCH-UP				-0.79	-0.92	-0.68	-0.79
ASSET AND PM IMPROVEMENT				-0.61	-0.71	-0.52	-0.61
RISK AND OPPORTUNITY APPROACH				-0.18	-0.21	-0.16	-0.18
SUPPLY CHAIN INVOLVEMENT >5M				0.00	0.00	0.00	0.00
TOTAL EFFICIENCY ADJUSTMENTS				0.05	0.12	0.18	0.25
TOTAL STORMWATER CAPEX	**9.60**	**6.15**	**11.38**	**7.42**	**8.17**	**7.96**	**8.44**

Note 1: Project specific costs sources are detailed in the capital expenditure chapter; Proposed capex data is sourced from SIR Capex 2; For expenditure 3 data on projects >5 million is sourced from Technical-Paper-4-Capital-expenditure-2022-Central-Coast-Council-water-price-review-14-September-2021.
Note 2: Historical years are presented in $m nominal, forecasts are in $2021-22.
Note 3: The adjustment for Mardi WTP in 2021-22 is to reflect out assessment that the project is not prudent and that the costs undertaken by CCC for this financial year should not be included in the RAB.
Source: Mott MacDonald, CCC SIR.

Table 3: Summary of proposed maximum efficient capital expenditure ($2021-22, $m)

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
WATER							
CCC PROPOSED	31.96	41.48	29.49	34.74	30.39	19.99	31.03
ADJUSTMENTS							
WTP - MARDI			-6.80	-24.9	-6.7	0.00	
TOTAL ADJUSTMENTS	0.00	0.00	-6.8	-24.9	-6.7	0	0
TOTAL CAPEX AFTER ADJUSTMENTS	31.96	41.48	22.7	9.84	23.69	19.99	31.0
EFFICIENCY ADJUSTMENTS							
CONTINUING %				0.01	0.01	0.02	0.03
CATCH-UP				-0.6	-1.1	-1.0	-1.6
ASSET AND PM IMPROVEMENT				-0.40	-0.88	-0.75	-1.3
RISK AND OPPORTUNITY APPROACH				-0.08	-0.18	-0.15	-0.26
SUPPLY CHAIN INVOLVEMENT >5M				-0.07	-0.07	-0.07	-0.1
TOTAL EFFICIENCY ADJUSTMENTS				0.1	0.3	0.4	0.8
TOTAL WATER CAPEX	**31.96**	**41.48**	**22.7**	**9.22**	**22.24**	**18.6**	**28.6**

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
WASTEWATER							
CCC PROPOSED	22.48	17.17	35.87	34.63	39.11	49.04	37.65
ADJUSTMENTS							
STP MAJOR AUGMENTATION WORKS CHARMHAVEN			-0.58	-1.20	11.20	24.2	7.93
BATEAU BAY				0.70	0.50	0.20	
DEWATERING RENEWAL				1.60			
TOTAL ADJUSTMENTS	0.00	0.00	-0.58	-0.36	10.42	22.34	6.23
TOTAL CAPEX AFTER ADJUSTMENTS	22.48	17.17	35.29	34.28	49.53	71.37	43.88
EFFICIENCY ADJUSTMENTS							
CONTINUING %				0.01	0.01	0.02	0.03
CATCH-UP				-1.46	-1.28	-2.06	-1.70
ASSET AND PM IMPROVEMENT				-0.72	-0.58	-1.23	-0.92
RISK AND OPPORTUNITY APPROACH				-0.14	-0.12	-0.25	-0.18
SUPPLY CHAIN INVOLVEMENT >5M				-0.59	-0.59	-0.59	-0.59
TOTAL EFFICIENCY ADJUSTMENTS				0.24	0.70	1.52	1.24
TOTAL WASTEWATER CAPEX	**22.48**	**17.17**	**35.29**	**34.04**	**48.84**	**69.87**	**42.64**

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
STORMWATER							
PROPOSED	9.60	6.15	11.38	8.38	9.51	8.92	9.57
ADJUSTMENTS							
RIOU ST					-0.22		
LAKEDGE				-0.12	-0.08	-0.12	-0.10
TOTAL ADJUSTMENTS	0.00	0.00	0.00	-0.48	-0.72	-0.43	-0.46
TOTAL AFTER ADJUSTMENTS	9.60	6.15	11.38	7.90	8.79	8.49	9.11
EFFICIENCY ADJUSTMENTS							
CONTINUING %				0.00	0.00	0.00	0.00
CATCH-UP				-0.4	-0.4	-0.3	-0.4
ASSET AND PM IMPROVEMENT				-0.30	-0.36	-0.26	-0.30
RISK AND OPPORTUNITY APPROACH				-0.06	-0.07	-0.05	-0.06
SUPPLY CHAIN INVOLVEMENT >5M				0.00	0.00	0.00	0.00
TOTAL EFFICIENCY ADJUSTMENTS				0.01	0.01	0.02	0.03
TOTAL STORMWATER CAPEX	**9.60**	**6.15**	**11.38**	**7.85**	**8.66**	**8.31**	**8.85**

Note: Project specific costs sources are detailed in the capital expenditure chapter; Proposed capex data is sourced from SIR Capex 2; For expenditure 3 data on projects >5 million is sourced from Technical-Paper-4-Capital-expenditure-2022-Central-Coast-Council-water-price-review-14-September-2021
Note 2: Historical years are presented in $m nominal, forecasts are in $2021-22.
Note 3: The adjustment for Mardi WTP in 2021-22 is to reflect out assessment that the project is not prudent and that the costs undertaken by CCC for this financial year should not be included in the RAB.
Source: Mott MacDonald, CCC SIR.

Renewals expenditure

From our review of CCC's 2019 pricing submission we have concluded that this submission was not based on a robust and evidenced-based method for forecasting future renewal needs. However, CCC has started to remedy that as evidenced by its recent adoption of improved Asset Management processes (with an Asset Management Plan [AMP]).

Levels of required spending are reported in the AMP to have been estimated by GHD using an age-based assessment of asset condition, noting that detailed condition and risk assessment will need to be progressively implemented.[1] The document did not include a guide to consistent field assessment of the condition of various assets. However, as described in CCC's pricing proposal (Technical Paper 4), CCC has begun to prioritise asset renewal projects using a mix of age, condition and risk for a range of assets. Industry best practice is to move from an asset centric approach based on age/condition to renewals to a customer centric approach based on criticality/potential impact to customers.

This leads us to the conclusion that CCC has not implemented the asset management strategy in its totality. From our review of CCC documents, we consider that a risk and condition-based analysis of asset condition has not been consistently used as the basis of the forecast renewals expenditure. This in part is due to:

- A lack of comprehensive asset condition information for certain asset classes
- Limited analysis by CCC on business and performance risk associated with certain assets

However, given CCC's intention to improve its renewals evaluation by moving more extensively to a risk and condition-based adjustment of remnant asset life, we consider that CCC should be able to enhance future renewal submissions to the benefit of customer service and reducing renewal costs (e.g., by targeting assets that do need to be replaced) over what would be the case if a predominantly age-based approach was used for asset replacements.

Without being presented with additional detailed analysis, we conclude that CCC's proposed asset renewal spending estimates are not supported by a robust and evidenced-based method for forecasting future renewal needs.

Operating expenditure review

CCC's proposal

CCC proposed 2019-20 as the most appropriate year to establish its base operating expenditure (opex). After making adjustments to its actual opex in 2019-20, CCC proposed base expenditure of $106.0m for its water, wastewater and stormwater services.

Recognising a reduction in operational service delivery over the past six years, CCC proposed additional opex on top of base expenditure over the 2022-26 determination period to:

- improve its maintenance regime,
- improve Asset Management and inspection programs,

[1] Op. Cit., AMP section 4.1.3.

- undertake critical asset inspections, cleaning and repair to inform forward planning, manage risk, reduce reactive maintenance requirements and prevent catastrophic asset failure,
- improve bushfire management practices,
- ensure new standards for dam safety are met,
- re-introduce floodplain risk and stormwater quality management,
- reduce regulatory/licence breaches, and
- address an increase in lost time injuries.

CCC refers to this additional opex as 'step changes'. However, we note the majority of this proposed expenditure is to improve performance to meet existing obligations and required service levels (ie, they are not in response to new regulatory obligations or performance requirements).

The proposed step changes significantly increase total proposed opex over the base expenditure. CCC is forecasting a 19% increase (or around $20.2m) in total opex in 2022-23, compared to the base year (**Table 4**). CCC's proposed total opex is $524.6m over a four-year determination period.

Table 4: CCC's proposed opex for the 2022-26 determination period ($2021-22, $m)

	CCC Base Year	2022-23	2023-24	2024-25	2025-26	Total
WATER	48.8	55.9	57.2	61.7	60.1	234.9
WASTEWATER	44.8	53.2	56.1	56.5	55.4	221.1
STORMWATER	12.4	17.1	17.2	17.1	17.2	68.6
TOTAL	**106.0**	**126.2**	**130.5**	**135.3**	**132.7**	**524.6**

Source: CCC SIR

Efficient operating expenditure

We employed a base-step-trend approach to form our assessment of efficient opex for CCC, where:

- we developed a range for base expenditure for water and wastewater from our economic benchmarking, and for stormwater based on maintaining the ratio of CCC's stormwater opex to water and wastewater opex from 2013-14
- we applied IPART's efficiency test to genuine step changes, including the implementation of the *Security of Critical Infrastructure Act 2018, e*nhancing bushfire resilience and meeting new requirements for dam safety (both for water and stormwater dams)
- we applied trend factors, including input price changes, output growth and ongoing improvements in productivity and incorporated these into our modelling of base expenditure and to step changes.

Traditionally, the assessment of base expenditure derives from a recent year of a utility's actual opex. However, in recent times CCC's opex has been affected by significant events including

reduced expenditure arising from concerns over CCC's financial position. We consider that CCC's actual opex has been below a sustainable level, particularly over the past six years. This has contributed to reduced service and performance outcomes and resulted in CCC proposing some expenditure in the 2022-26 determination to 'catch up' on the outcomes of poor asset management and maintenance practices of the past.

In this context, to form our assessment of an efficient and sustainable level of base expenditure we have relied on top-down approaches, including economic benchmarking. This is in line with our Scope of Work from IPART, and in our view a preferred approach compared to assessing efficient recurrent expenditure from CCC's actual expenditure.

Our benchmarking analysis draws on data from the National Performance Report for water utilities across Australia. We applied stochastic frontier analysis to derive an estimate of efficient base opex to service customers on the Central Coast. This estimate is based on:

- the level of opex for a utility with a 75% efficiency score, which means it is at the upper quartile of benchmarked utilities (noting, in its benchmarking of energy networks, the Australian Energy Regulator considers an efficiency score of 75% to be a reasonably efficient benchmark)
- applying a 95% confidence interval to create an upper bound, a lower bound and a midpoint for efficient base opex.

We then increased this efficient base level opex to account for our assessment of the efficient costs of genuine 'steps' and 'trends' (being increases in opex for output growth plus real increases in the cost of inputs less an adjustment for ongoing efficiency or productivity gains).

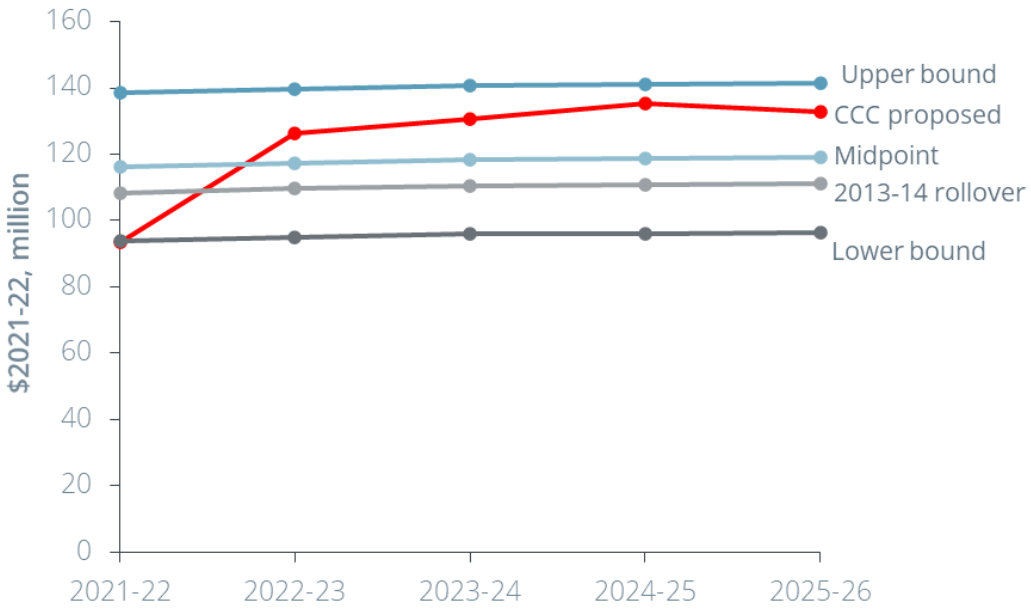
We also applied an alternative top-down approach. This is based on taking CCC's actual opex for 2013-14 and rolling it forward by applying an adjustment for 'trend' (ie, increases for output growth and real increases in the price of inputs, less an ongoing efficiency factor). We consider that actual opex from 2013-14, rolled forward for the above-mentioned trend adjustments, provides a reasonable estimate of CCC's sustainable opex. This is because actual opex was much closer to IPART's allowance in 2013-14, and there was no evidence at the time of significant concern with CCC's (or the former Gosford & Wyong Councils') performance.

Note that as a consequence of our top-down approach we have not needed to form views on many individual elements of CCC's proposal, like the appropriate number of FTE employees, or proposed increases in corporate overheads. Our approach has focussed on an overall 'envelope' of opex that ensures customer only pay for efficient costs. It would be up to CCC to decide how on how to allocate expenditure to different opex categories within this overall envelope.

Our recommended range for efficient opex (water wastewater and stormwater) that incorporates the base, step and trend factors are summarised in **Figure 1** below, along with CCC's proposed opex.

We recommend that IPART set its opex allowance for the 2022-26 determination based on the midpoint of our efficient cost range. The midpoint reflects our best estimate of the costs for a reasonably efficient water utility, and we see no compelling reason to recommend well-above or well-below the midpoint.

Figure 1: Recommended range for efficient opex ($2021-22, $m)



Source: Frontier Economics, CCC

Table 5 below summarises our recommended efficient opex based on the midpoint of the range. Note that trend factors are incorporated into the base and steps.

Table 5: Recommended efficient opex – midpoint of base expenditure ($2021-22, $m)

	2022-23	2023-24	2024-25	2025-26	Total
BASE – WATER	57.1	57.4	57.6	57.9	230.0
BASE – WASTEWATER	49.0	49.2	49.3	49.4	196.9
BASE – STORMWATER	10.4	10.5	10.5	10.5	42.0
EFFICIENT STEP CHANGES	0.8	1.4	1.2	1.2	4.6
RECOMMENDED EFFICIENT OPEX	**117.4**	**118.5**	**118.6**	**119.0**	**473.5**
CCC PROPOSED	126.2	130.5	135.3	132.7	524.6
DIFFERENCE ($)	-8.8	-12.0	-16.6	-13.7	-51.1
DIFFERENCE (%)	-7.0%	-9.2%	-12.3%	-10.3%	-9.7%

Note: Total efficient opex incorporates trend components including 0.7% pa continuing efficiency.

Source: CCC SIR, Frontier Economics.

Our recommended efficient opex, based on economic benchmarking, is around 10% lower over the 2022-26 determination period compared to CCC's proposal.

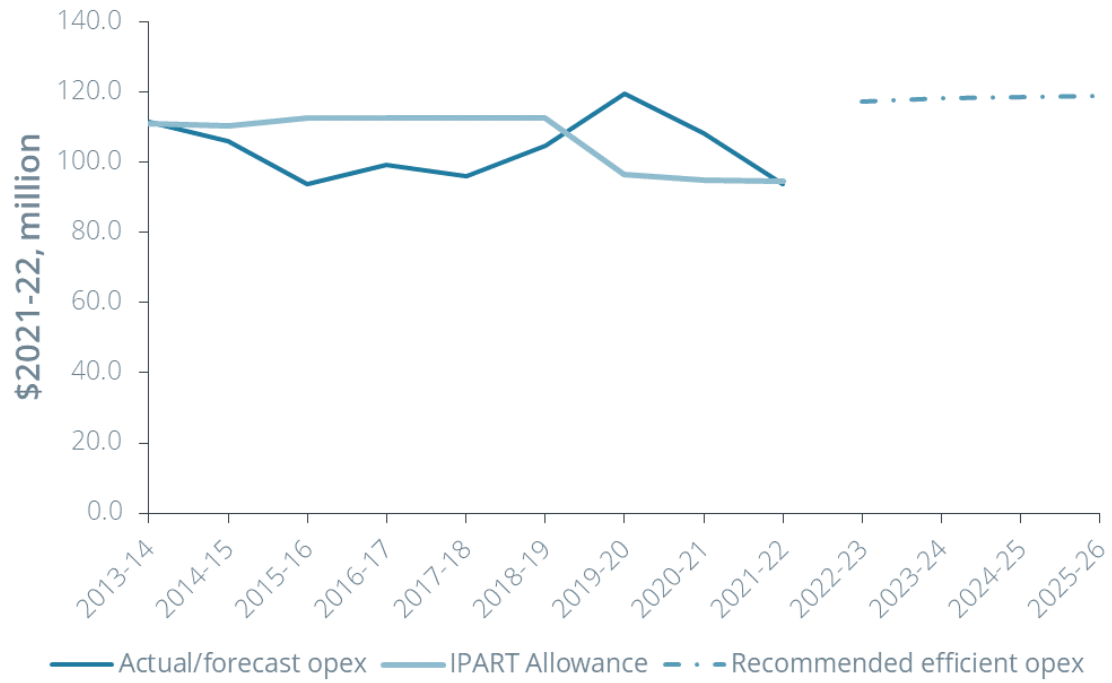
To complement our top-down benchmarking analysis, we undertook detailed analysis of specific elements of CCC's cost proposal. This indicated that, apart from the results of our benchmarking analysis, CCC's efficient opex should be lower than it proposed. For example, we note:

- one instance of CCC double-counting proposed expenditure (related to water resilience), and
- a proportion of proposed stormwater expenditure is excluded as IPART has asked us to consider the efficient cost based on activities currently included in the stormwater charge.

When adjustments for the above two considerations are made to CCC's proposed opex, our recommended efficient opex is around 6% lower. In addition to these adjustments, we observed numerous instances where CCC's proposed expenditure did not incorporate efficiencies. For example, proposed increases in proactive maintenance expenditure were not accompanied by reductions in reactive maintenance costs, including staff overtime. When the potential for these efficiencies and the adjustments noted above are taken into account, we consider our recommended efficient opex based on the midpoint of the benchmarking range reflects a realistic target for CCC.

Our recommended efficient opex is also, in real terms, higher than CCC's actual opex in recent years with the exception of 2019-20 (**Figure 2**).[2]

Figure 2: Historical and recommended efficient opex ($2021-22, $m)



Source: Frontier Economics, SIR

[2] In its pricing proposal, CCC noted that expenditure in 2019-20 was affected by uncontrollable events including bushfire, flooding and COVID-19. CCC also made a number of downward adjustments to actual opex in 2019-20 to establish its base expenditure.

We recognise that there are limitations associated with benchmarking, including not having data to account for different service outcomes, or environmental factors. However, we have undertaken several steps to help mitigate these limitations:

- We have not based our estimated efficient costs on the most efficient utility, but instead a 'reasonably efficient' utility.
- We have cross-checked our benchmarking analysis with rolled forward costs from 2013-14, with our recommended efficient opex being around 7% higher.
- We have provided a range of efficient costs from which IPART can exercise its judgement.

Given our recommendation on efficient opex derived from benchmarking of water utilities in the top quartile of efficiency score, it can be interpreted as 'reasonably efficient' costs for an established water utility with appropriate governance arrangements, business systems and processes in place.

We have not specifically included additional opex for any 'catch-up' expenditure for CCC to rectify past performance issues or additional opex to implement improved systems and processes or to transition to an alternative governance model.

We are mindful that a key driver for catch up expenditure in the 2022-26 determination is CCC historically underspending against the IPART allowance. This underspend amounted to around $60m between 2014-15 and 2018-19, with around $36m in overspend expected in the 2019 determination period. This means customers have paid for some services or activities that were not provided, or not provided to an appropriate standard, and CCC's proposal would mean that customers pay for this again. However, we note our recommended efficient capex does allow CCC some scope to improve its systems and processes. As noted above, we halved potential catch up efficiencies recognising that CCC is still progressing to an efficiency achieved by other water asset owners.

Accountability measures

IPART has flagged that it is looking at ways to hold CCC more accountable so that in the next pricing review, it can assess the extent to which it delivered better quality services and met community expectations.[3] We have both assessed CCC's performance against accountability measures set for the 2019-22 determination and proposed new accountability measures for the 2022-26 determination.

There has been mixed performance against accountability measures IPART set for the 2019-22 determination. While CCC met or outperformed a number of accountability measures, the areas where it underperformed against targets include:

- water quality complaints received
- unplanned water supply interruptions
- wastewater overflows reported to the environmental regulator,
- wastewater odour complaints (except in 2020-21), and

[3] IPART, Review of Central Coast Council water, wastewater and stormwater prices from 1 July 2022, Issues Paper, September 2021, p 14.

- compliance with Environment Protection Licence (EPL) limits.

In some instances, CCC's performance against measures is affected by external events. For example, wastewater overflows can be affected by heavy rainfall. In other cases, like water quality complaints, CCC's performance has been affected by its expenditure which has been below sustainable levels.

In recommending a new set of accountability measures, we have applied a set of principles including that accountability measures drive the right behaviour and align with key services and outcomes. Our new measures include:

- Broadening measures relating to water and wastewater complaints, including water pressure complaints across the CCC area and water quality complaints specific to the Davistown-Saratoga area in response to stakeholder concerns.
- Expanding reporting on unplanned water supply outages to include not just the frequency, but the duration of unplanned outages.
- Reporting on the number of dry weather overflows.
- Various project-specific measures, including in relation to improvements to asset management and wastewater treatment plan operation.

While some of these measures respond to existing or emerging issues, others (for example water pressure and dry weather overflows) we consider are fundamental performance items that should be reported on by a water utility the size of CCC.

1 Introduction

1.1 About this report

In October 2021, IPART appointed the consortium of Frontier Economics, Mott MacDonald and Inxure Strategy Group to review and make recommendations on the efficiency of CCC's proposed operating and capital expenditure for the 2022-26 determination period. This report details our draft findings and recommendations.

CCC provides a broad range of services to its community. The scope of this expenditure review is only the services delivered by CCC as a Water Supply Authority (WSA) under the *Water Management Act 2000*. In this report any reference to "CCC" or "Council" with respect to their business plans, systems, expenditure, performance etc refers only to CCC's WSA services, unless specifically stated otherwise.

1.1.1 Scope of work

This report has been prepared in accordance with the Scope of Work set out in the contract between IPART and Frontier Economics commencing on 27 October 2021. In summary, the scope of work includes:

1. Reviewing CCC's core business systems and processes, including:
    a. The maturity and quality of CCC's strategic business plans
    b. The quality of CCC's asset management system and associated processes, risk management, procurement and cost-estimation processes and systems
    c. The overall structure of CCC's water, wastewater and stormwater business, and any impacts that may have on the efficiency of the planning, delivery and improvement of its services
2. Reviewing CCC's historical and forecast operating expenditure, including investigating and commenting on proposed:
    a. Labour costs and corporate overheads
    b. Stormwater operating costs
    c. Annual trade waste fees and miscellaneous charges
3. Reviewing CCC's historical and forecast capital expenditure including investigating and commenting on proposed:
    a. Renewals expenditure
    b. Stormwater capital expenditure
4. Reviewing CCC's output (accountability) measures, including
    a. CCC's performance against the output measures over the 2019 determination period
    b. Recommending a set of new accountability measures for CCC's proposed operating and capital expenditure program, for the 2022 determination period, directly linked, where possible, to CCC's strategic business plan, customer expectations and health and environmental performance requirements

5. Commenting on efficient costs of a stand-alone business (provided in a separate report), including:
   a. commenting on CCC's efficient costs if its water supply, wastewater and stormwater business was a standalone corporation
   b. discussing how CCC's business systems, processes and business structure may differ from its existing ones and any efficiencies or additional costs arising from being a standalone entity

In undertaking the above tasks, we have been asked to apply IPART's efficiency test (**Box 1**).

Box 1: IPART's efficiency test

The efficiency test examines whether a utility's operating and capital expenditure represents the best and most cost-effective way of delivering monopoly services to customers.

Broadly, the efficiency test considers both how the investment decision is made, and how the investment is executed, having regard to, amongst other matters, the following:

- customer needs, subject to the utility's regulatory requirements
- customer preferences for service levels, including customers' willingness to pay
- trade-offs between operating and capital expenditure, where relevant
- the utility's capacity to deliver planned expenditure
- the utility's expenditure planning and decision-making processes.

The efficiency test is applied to:

- historical capital expenditure, and
- forecast capital and operating expenditure

that is included in the utility's revenue requirement, for the purposes of setting regulated prices.

The efficiency test is based on the information available to the utility at the relevant point in time. That is:

- For forecast operating and capital expenditure, we assess whether the proposed expenditure is efficient given currently available information.
- For historical capital expenditure, we assess whether the actual expenditure was efficient based on the information available to the utility at the time it incurred the expenditure (ie, whether the utility acted prudently in the circumstances prevailing at the time it incurred the expenditure).

Source: IPART.

The findings and recommendations from this report form an important component of IPART's price review process. IPART will consider these recommendations on efficient expenditure when determining maximum prices to apply from 1 July 2022.

1.1.2 Approach to expenditure review

Our Scope of Work requires us to be aware of developments arising from IPART's current review of the regulatory framework applied to water businesses, and how any improvements from this review could be adopted for this expenditure review.

In particular, we have been asked to:

- ensure our approach is proportionate to the nature of CCC, noting that IPART does not require a forensic assessment by line item of CCC's proposed expenditure, but rather benchmarking or another reasonable approach should be considered
- consider recommending an efficient range for opex over each year of the 2022 determination, explaining the basis upon which the upper and lower bound is set and whether the midpoint is a reasonable reflection of relevant uncertainties.

Further to this, we have applied a base-step-trend approach to recommending opex that was flagged by IPART in its discussion paper for the regulatory framework review released in August 2021.

In summary, our Scope of Work asks us to consider different approaches and methodologies compared to previous expenditure reviews. Further detail is provided in the methodology sections of this report.

1.2 Context for this expenditure review

Two relatively recent events provide important context for our expenditure review. In early October 2020, CCC announced it was in a serious financial condition, and faced an immediate and serious liquidity issue. An Administrator was appointed later that month, with further details and a timeline provided on CCC's website.[4]

The Financial Recovery Plan put in place by CCC in June 2021 included a reduced capital works plan, reduction in general expenditure and reductions in staff numbers. This has affected water, wastewater and stormwater expenditure particularly in the final year of the 2019 determination (2021-22).

In July 2021 CCC also announced that it commissioned an independent review of the model governing its water and wastewater operations. This review is exploring opportunities to produce better value and return on investment for the Central Coast community. The scope of the review includes investigating alternative governance models including commercialisation within CCC, corporatisation, joint venture or selling the assets.[5] At the time of preparing this report, we are not aware of any outcomes or recommendations arising from this review.

1.3 CCC's pricing proposal to IPART

CCC submitted a pricing proposal to IPART in September 2021. The pricing proposal and supporting technical papers set out information substantiating proposed prices for the period 1

4 https://www.centralcoast.nsw.gov.au/council/news/financial-recovery-plan

5 https://www.centralcoast.nsw.gov.au/council/news/media-releases/council-reviews-water-and-sewer-operations-model

July 2022 to 30 June 2026 and expenditure for the current determination period from 1 July 2019 to 30 June 2022.

Supporting the pricing proposal was a:

- Special Information Return (SIR) provided to IPART in September 2021 and
- Annual Information Return (AIR) provided to IPART in September 2021.

As outlined in the section below, these were key documents in reaching out draft findings and recommendations in this report.

1.4 Process to prepare this draft report

Frontier Economics, Mott MacDonald and Inxure Strategy Group commenced the expenditure review in early on 27 October 2021. Our process to prepare this draft report involved:

- An initial meeting with CCC and IPART's Secretariat on 3 November 2021
- Provision of an Inception Report to IPART on 5 November 2021
- Following initial review of the pricing proposal and AIR/SIR, we submitted an Information Request to CCC on 5 & 8 November 2021. Documents were provided by CCC over the week until 12 November 2021.
- We held on-line interviews with key CCC staff over the period 22-24 November 2021
- Following the interviews, we requested additional supporting information and documentation over the subsequent few weeks
- We also held follow up discussions on a number of issues with CCC staff between 9-14 November.
- Over late December 2021 and January 2022 we finalised our analysis and prepared this draft report.

We would like to thank CCC for making staff available for the interviews and follow up discussions. We are grateful for the prompt and professional manner in which CCC responded to our requests for information and documentation. This was essential in enabling us to prepare this draft report within tight timeframes.

This draft report was submitted to IPART on 4 February 2022.

1.5 Price base

In this report we present actual values in $nominal and forecast values in $2021-22. We have used CPI indexes provided by IPART.

2 Core business systems & processes

2.1 Purpose and scope

The purpose of this chapter is to document our assessment of CCC's core business systems and processes. Our scope was to review and comment on:

- the maturity and quality of CCC's strategic business plans (including its medium and long-term planning)
- the quality of the CCC's asset management system and associated processes, risk management (including climate change), procurement and cost-estimation processes and systems, having regard to the size of CCC's business and its legislative and regulatory framework
- the overall structure of the CCC's water, wastewater and stormwater business, and any impacts that may have on the efficiency of the planning, delivery and improvement of its services.

2.2 Maturity and quality of CCC's strategic business plans

In this section we summarise our review findings and comment on CCC's strategic plans and whether they represent good industry practice.

2.3 Integrated Planning and Reporting Framework

CCC's Integrated Planning and Reporting (IP&R) Framework promotes integration with community-based objectives and is informed by state-level plans, cascading down through to Council for implementation. CCC's Annual Report forms part of the IP&R Framework as captured in **Figure 3** below.

Figure 3: Integrated Planning and Reporting Framework

Source: Central Coast Council Annual Report 2020-21

2.3.1 Operational Plan for 2020-21

CCC's Operational Plan is structured around the Community Strategic Plan Themes of Belonging, Smart, Green, Responsible and Liveable. Goals and objectives related to service delivery are set out in **Figure 4** below.

Figure 4: CCC's Goals and Objectives: Infrastructure Services

Goals	Objectives
Belonging - Our community spirit is our strength	A4 Enhance community safety within neighbourhoods, public spaces and places
Smart - A growing and competitive region	C2 Revitalise Gosford City Centre, Gosford Waterfront and town centres as key destinations and attractors for businesses, local residents, visitors and tourists
Green - Environmental resources for the future	E2 Improve water quality for beaches, lakes and waterways including minimising pollutants and preventing litter entering our waterways E4 Incorporate renewable energy and energy efficiency in future design and planning, and ensure responsible use of water and other resources
Green - Cherished and protected natural beauty	F1 Protect our rich environmental heritage by conserving beaches, waterways, bushland, wildlife corridors and inland areas, and the diversity of local native species F2 Promote greening and ensure the wellbeing of communities through the protection of local bushland, urban trees, tree canopies and expansion of the Coastal Open Space System (COSS) F4 Address climate change and its impacts through collaborative strategic planning and responsible land management and consider targets and actions
Responsible - Good governance and great partnerships	G4 Serve the community by providing great customer experience, value for money and quality services
Responsible - Delivering essential infrastructure	H1 Solve road and drainage problem areas and partner with the State Government to improve road conditions across the region
Responsible - Balanced and sustainable development	H4 Plan for adequate and sustainable infrastructure to meet future demand for transport, energy, telecommunications and a secure supply of drinking water

Source: CCC Operational Plan

While these objectives and goals have been referenced in the asset management strategy documents, it is not clear how they have been incorporated into the asset management vision for CCC. Further, there are no performance measures linked to these goals which limits their effectiveness in achieving the desired outcomes.

We note that the CCC published an end of term report covering 2018-19 to 2020-21, which forms part of the Integrated Planning and Reporting (IP&R) Framework. The report notes that for the water key performance indicators (KPIs)

- The percentage of stormwater assets rated good or very good increased from 2018: 46.3% to 2022: 88%.[6] CCC notes that this is primarily a result of moves the organisation took to harmonise the drainage condition assessment framework between the two former Council datasets.
- Percentage of water supply assets rated good or very good fell from 2018: 74.3% to 2021: 63.6%.[7] A 10% deterioration in water supply assets is likely to results in increased maintenance or replacement costs for CCC.

Based on the information provided it is not clear how these KPIs have been developed and how they feed back into improving the services provided to customers. Further, based on the information provided CCC only measure the condition of their assets and only report the good end of the scale. It would be beneficial to also rate assets bad to very bad to understand whether

6 https://cdn.centralcoast.nsw.gov.au/sites/default/files/Council/full-report.PDF, see pp 41

7 https://cdn.centralcoast.nsw.gov.au/sites/default/files/Council/full-report.PDF

there are critical assets that impact customer service. For some assets, it is legitimate to let them run to fail in which case their condition does not matter. However, by definition, poor condition critical assets are a risk to customer service and the ability to supply water.

2.3.2 WaterPlan 2050

Gosford City and Wyong Shire Councils (the councils merged to formed CCC in 2016) formally adopted WaterPlan 2050 in July and August 2007. It sets out the strategy to secure and sustain our water supply system over the next 45 years. The strategy seeks to identify medium to long-term changes and improvements that can be introduced over time to:

- achieve a safe, reliable and secure water supply that meets community needs
- ensure the supply and use of water is efficient and affordable
- protect the health of our rivers and creeks as well as the general environment.

We note that the WaterPlan does not identify and evidence any current challenges in asset performance or customer service that warrant change or improvement Further, the WaterPlan does not provide any evidence that customers want these improvements enough to pay for them.

The strategic plan then identifies the following themes to respond to such that community expectations are met:

- Belonging
- Smart
- Green
- Responsible – delivering essential infrastructure
- Liveable.

2.3.3 Other strategic documents

Several other planning documents are used by the Council in determining its expenditure profile including:

- Gosford Water and Sewerage Master Plan Strategy
- Various treatment and network master planning and strategy documents prepared by Wyong Shire Council
- CCC Community Strategic Plan 2018 – 2028
  - Outcomes and strategies identified by the community CCC
- Resourcing Strategy 2018

2.3.4 Work-in-progress strategic documents

Water Security Plan

CCC is undertaking a review of its Water Security Plan (above mentioned WaterPlan 2050) as part of its ongoing planning, risk management activities and regulatory compliance. This is being

undertaken in parallel with the review of the Lower Hunter Water Security Plan (LHWSP) being led by the NSW Department of Planning Industry & Environment (DPIE) in conjunction with Hunter Water Corporation (Hunter Water). The purpose of collaboration is to identify any mutual beneficial options available through greater cooperation between the two regions and improve consistency of water planning practices across joint systems.

The outcomes from this project will establish the long-term strategy for water security for the Central Coast. The long-term supply/demand balance will be assessed, as well as an update to Council's Drought Management Plan (DMP). Following approval from Council, the final draft of the Plan is expected to be submitted to DPIE for formal review through December 2021 to March 2022 in conjunction with the LHWSP.

The following indicative implementation plan is noted in the Central Coast Water Security Plan (CCWSP). The delivery plan has been broken down into near (0-2 years), mid (2-5 years) and far (greater than 5 years) term within the following stages of delivery:

- planning and policy
- concept and procurement
- delivery and commissioning
- performance monitoring

We note that a good practice water strategy at a minimum should:

- consider a wide range of demand, climate, population, per capita consumption scenarios
- account for climate change and is adaptive, ie it is not a fixed plan but adjusts to account for uncertainty
- be system-based and account for conjunctive use of resources
- be twin-track, ie it balances the costs and benefits of new water resources with those of demand management measures.

Integrated Water Cycle Management

Integrated Water Cycle Management (IWCM) Strategy is required under the Water Management (General) Regulation to apply for approval of planning and management documents (Strategic Business Plan and Integrated Water Cycle Management Strategy) by 1 July 2024. IWCM Strategy is required to be prepared in accordance with the Department of Planning Industry and Environments (DPIE) NSW Best Practice Management of Water Supply and Sewerage Guidelines. There are two key parts to the IWCM strategy, the first being bulk water resources, with the second treatment and network assets.

The draft CCWSP forms the water resources component of the IWCM strategy, while the remaining treatment and network components are yet to be finalised by CCC.

2.3.5 Our assessment

The process of preparing and updating the water security plan and IWCM demonstrates CCC's willingness to mature as a service provider and evolve to move towards good industry practice to ensure that the growing demand for water is met in a collaborative manner between the councils and government. The outcomes of the water security plan will help CCC develop a strategy for establishing and implementing a sound long-term plan (which should address long-term

investment requirements and water supply issues), as well as refining subsequent strategic planning cycles with the benefit of experience from the Strategy's implementation.

Utilities with a longer-term planning horizon are better able to prioritise and plan for those projects as:

- the long-term strategy promotes efficiency through the focus on key capital drivers, strategic priorities, and measures of performance.
- the long-term strategy allows for more ambitious delivery plans to be put in place, with clear rewards for companies that deliver effectively against their plans and penalties for companies that perform poorly
- it allows for whole of life cycle costs to be taken into account and capex/opex trade-to allow for the most efficient delivery of services.
- it allows of certainty for investors with a view to encouraging appropriate levels of investment.

Given this, we recommend that CCC's strategic plans clearly demonstrate how its strategy and long-term objectives meet community objectives and expectations. The strategic plans should propose measures of success, ideally outcomes, to enable delivery of the benefits from the plan to customers and stakeholders to be monitored and reported.

Whilst CCC is working on developing updated plans and strategies it is important to note that the pricing proposal (and associated Technical Papers) remain the most recent and public confirmation of CCC's direction and intended investment, with the expenditure informed by the strategies that are currently in place. Therefore, our assessments of CCC capital investment is based on the systems that are currently in place and not the intended plans. The updated and finalised plans will impact CCC's expenditure during the upcoming regulatory cycles.

2.4 Asset management system and planning

In addressing this scope our assessment has focused on CCC's:

- asset management system
- risk management framework
- investment planning and governance
- cost estimation, and
- procurement.

CCC has stated that:

> *Council's investment planning processes ensure that investment decisions are aligned to IPART's drivers and strategic direction whilst managing risks to its operations.*
>
> *The Water and Sewer Directorate seeks to align its outcomes within the overall Council community vision and objectives when preparing new strategic planning documents for the Central Coast Community.*
>
> *Council's current strategic planning documents that guide Water and Sewerage capital works programs include:*

- *Asset Management Strategy – supported by Asset Class Management Plans (addressed separately)*
- *Central Coast Water Security Plan (formally WaterPlan 2050)*
- *Development Servicing Plans*
- *Gosford Water and Sewerage Master Plan Strategy*
- *Various treatment and network master planning and strategy documents prepared by Wyong Shire Council*

Council is also commencing the remaining planning studies to support the development of Council's broader Integrated Water Cycle Management (IWCM) Plan in accordance with DPIE regulatory requirements. The CCWSP forms a core pillar of the IWCM, with the remaining elements to include a consolidated treatment and network masterplan, updated long term financial plan and the 30-year Total Asset Management Plan.[8]

2.4.1 Asset management system

In November 2021, a finalised version of the updated Asset Management Strategy for Water and Sewerage assets was issued. This asset management strategy has been prepared by a consultant engaged by CCC following a review of CCC's asset class Asset Management Plans (AMPs), service delivery practices, financial sustainability indicators, asset management maturity and CCC's vision for the future outlined in the Community Strategic Plan 2018-2028.

The Asset Management Plan is to be read with other key planning documents (**Figure 5**).

The finalised Asset Management Strategy has been created when the Asset Management Policy is still in draft form and has not been adopted by Council.

It is not known when this document and the new Asset Management Plans will be adopted by CCC or when the Asset Management Policy will be adopted. Therefore, we are unsure what asset management system has been used to drive CCC's submission to IPART.

[8] W&S Strategic Planning Overview (read me first).pdf

Figure 5: Key planning documentation

Document / System	Content
Water Plan 2050	Outlines the previous autonomous Council's long-term view of sustainable integrated water, sewer and storm water services for the Central Coast
CCC Community Strategic Plan 2030 (Draft)	Outcomes and strategies identified by the community
CCC Community Strategic Plan 2018 – 2028	Outcomes and strategies identified by the community
CCC Resourcing Strategy 2018 (Draft)	Forecasts CCC ability to deliver assets
CCC Long-term Financial Plan 2018-2028 (Draft)	To provide the financial resources needed to achieve the objectives of the Community Strategic Plan
CCC Asset Management Strategy 2021 (Draft)	Assist Council in managing infrastructure services and maintenance
CCC Asset Management Manual	Procedures and Processes that guide the management of assets
CCC Asset Management Policy (Draft)	Assist in asset utilisation to ensure quality services are managed, maintained and renewed in a manner that is sustainable and meets community expectations
CCC Asset Management System (IPS)	Electronic system that contains the asset register, condition ratings and used to model future renewals
CCC Water and Sewer Strategic Business Plan 2019 (Draft)	It gives details and supporting information for Council's Community Strategic Plan, Delivery Program and Operational Plan and Budget
Development Servicing Plans (Water and Sewer)	Details the contributions that are required to be paid by developers in accordance with WMAct 2000
NSW Department of Planning and Environment CCC Regional Plan 2036	Outlines the actions, timeframe and accountabilities for achieving a healthy natural environment, a flourishing economy and well-connected communities
CCC Water and Sewerage Asset Revaluation 2021	As submitted in accordance with LGA requirements
CCC Water and Sewer Network Valuation Report 2021	Assessment and valuation of CCC's WSN assets
CCC Condition Assessment Manual	Details on the process of assessing condition, including photographic examples of various conditions
CCC Risk Management Plan	The identification and management of risks across Council operations
CCC 2021/22 Operational Plan	A one year plan with details of the Delivery Program, identifying the individual projects and activities that will be undertaken. The plan focuses on addressing the serious financial situation advised by Council in October 2020
Geographical Information System (GIS)	Geographical information system that produces maps of assets with Geocortex interface

Source: Central Coast Council (NSW) | 12555861 Water and Sewer Network | Asset Management Plans and Strategy – Nov 2021

Asset Management Objectives

The November 2021 Asset Management Strategy captures and aligns the relevant CCC Objectives from the Community Strategic Plan 2018-2028. These are shown below, with how the Asset Management Plans will meet these relevant CCC Objectives.

Figure 6: How objectives are met in the Asset Management Plan

Theme and Focus Area	Community Strategic Plan Objective	How Objectives are addressed in AM Plan
Belonging - Our community spirit is our strength	A4 Enhance community safety within neighbourhoods, public spaces and places	– Public infrastructure continues to meet our community and business requirements
Smart - A growing and competitive region	C2 Revitalise Gosford City Centre, Gosford Waterfront and town centres as key destinations and attractors for businesses, local residents, visitors and tourists	– Infrastructure is planned for the long-term and without imposing an unfair burden on future generations
Green - Environmental resources for the future	E2 Improve water quality for beaches, lakes and waterways including minimising pollutants and preventing litter entering our waterways E4 Incorporate renewable energy and energy efficiency in future design and planning, and ensure responsible use of water and other resources	– Water use and Water cycle management is sustainable and meets current and future demand – Best practice and innovation are used to deliver value for money
Green - Cherished and protected natural beauty	F1 Protect our rich environmental heritage by conserving beaches, waterways, bushland, wildlife corridors and inland areas, and the diversity of local native species F2 Promote greening and ensure the wellbeing of communities through the protection of local bushland, urban trees, tree canopies and expansion of the Coastal Open Space System (COSS) F4 Address climate change and its impacts through collaborative strategic planning and responsible land management and consider targets and actions	– Water use and Water cycle management is sustainable and meets current and future demand
Responsible - Good governance and great partnerships	G4 Serve the community by providing great customer experience, value for money and quality services	– Best practice and innovation are used to deliver value for money – We embrace the introduction of new technology to help deliver better outcomes for the community – Our limited resources are targeted to where they are needed most – Partnerships and collaboration support the delivery of coordinated, efficient and effective outcomes
Responsible - Delivering essential infrastructure	H1 Solve road and drainage problem areas and partner with the State Government to improve road conditions across the region	– Collaborative planning to address needs associated with projected population growth and a desire to work with different business units to ensure efficiencies and best service for the community with renewal programs incorporating Water and Sewer & Roads and Drainage Infrastructure
Responsible - Balanced and sustainable development	H4 Plan for adequate and sustainable infrastructure to meet future demand for transport, energy, telecommunications and a secure supply of drinking water	– Accurate data is collated and used to help effectively and strategically plan for future community needs – Public infrastructure continues to meet our community and business requirements – Our public infrastructure is maintained for its current purpose and for future generations

Source: Central Coast Council (NSW) | 12555861 Water and Sewer Network | Asset Management Plans and Strategy – Nov 2021

This approach represents standard industry practice, but the Strategy does not demonstrate how the strategy will address the Council objectives, link to measurable targets (KRAs/ KPIs) or track the success.

Customer levels of service

The last community survey related to levels of service was undertaken in 2012, which was prior to the formation of CCC.[9] It would appear CCC has not engaged their customers and community to establish Customer Service Standards, which is good practise and link these as part of the drivers and priorities for improvement.

Table 6: CCC's customer service performance outcomes and targets

	Expectation	Performance Measure Used	Current Performance	Expected Position in 10 Years based on the current budget.
Water Service Objective: Provide water services to all urban release areas.				
Quality	Water Quality			
	Potable water quality - Compliance with health-related criteria of Australian Drinking Water Guidelines – Microbial guideline values in the water supply	100 % compliance	100%	100%
	Potable water quality - Compliance with health-related criteria of Australian Drinking Water Guidelines – Chemical guideline values in the water supply		100%	100%
	Non-potable water quality – meet public standards consistent with use		100%	100%
	Water Quality complaints	Complaints / 1000 customers	8	7
	Confidence levels		High	High
Function	Availability of Supply			
	System coverage	% of serviced urban areas	96	96
	Average unplanned interruptions per 1,000 properties	% compliance	115	115
	Water main breaks per 100 km of main	% compliance	16	14
	Confidence levels		High	High
System Availability	Consumption Restrictions in Droughts (5:10:10 Rule)			
	Average duration	No. months in 10-year period	6	
	Average frequency	No. times in 10-year period	1	
	Confidence levels		High	High
Capacity and Use	Demand Management		100%	100%
	2021 Annual water supplied	Potable Water	30,971 ML	Potable Water Supplied to meet

[9] As documented in Central Coast Council (NSW) Water and Sewer Network Asset Management Plans and Strategy – Nov 2021.

	Expectation	Performance Measure Used	Current Performance	Expected Position in 10 Years based on the current budget.
		Supplied to meet demand		demand
	Confidence levels		High	High
Sewer Service Objective: Provide water services to all urban release areas.				
Quality	Odour			
	Odour complaints per 1000 Properties	% compliance	1.6 per 1000 Properties	1.5 per 1000 Properties
	Confidence levels		High	High
Function	Availability of Service			
	System coverage	% of serviced urban areas	94	94
	Sewage Overflows reported to the environmental regulator per 100 km main – Dry weather conditions	% compliance	2.5	1.5
	Confidence levels		Medium	Medium

Source: Central Coast Council (NSW) 12555861 Water and Sewer Network, Asset Management Plans and Strategy – Nov 2021

The table above are CCC's customer service performance outcomes and targets.[10] These are aligned to current performance measures and not targets. Therefore, it is not clear what the gap is (positive or negative) between the service experienced and what a customer should expect as the minimum level of service for their water and sewerage charges.

Asset Management Maturity

A qualitative, preliminary assessment of CCC's asset management maturity undertaken by CCC's consultant against the Institute of Asset Management (IAM) 39 subject areas of asset management, where the maturity scale range is innocent, aware, developing, competent, optimising, excellent is shown in **Figure 7** below.

As can be seen in this table, CCC's asset management is still in development and transformation across many areas of the Asset Management System.

[10] As documented in Central Coast Council (NSW) Water and Sewer Network Asset Management Plans and Strategy – Nov 2021.

Figure 7: Summary of CCC's asset management maturity

Group	Maturity	Comment/Evidence
Strategy and planning	Developing	The Council is developing this aspect of its AM practices and has identified a means of achieving requirements. The Council does not have an AM Strategy, and its AM objectives are not well defined. The Council undertakes limited demand analysis, strategic planning and AM planning.
AM decision making	Developing	The Council is developing this aspect of its AM practices and has identified a means of achieving requirements. Currently, the Council takes a reactive approach to capital, maintenance and operations decision making but recognises the need (reduce risk to service levels) and benefits (optimised lifecycle costs) of transitioning to a proactive approach.
Lifecycle delivery	Developing	The Council is developing this aspect of its AM practices and has identified a means of achieving requirements. The Council has dedicated teams (but limited in resources) and some processes to deliver lifecycle and AM activities, however this is not consistent across the Council. A consistent approach which aligns AM activity at all levels of the organisation to AM objectives is needed.
Asset information	Developing	The Council is developing this aspect of its AM practices and has identified a means of achieving requirements. The Council has consolidated its water and sewer asset registers following amalgamation (part of phase 1 of AMIS implementation) and has adopted an asset hierarchy. Gaps in asset data still exist and the Council does not have an asset information strategy. Further work is required to improve asset information so that AM decision making can be optimised.
Organisation and people	Developing	The Council is developing this aspect of its AM practices and has identified a means of achieving requirements. The Council has procurement policies and an organisational structure, however, has reduced its resources in recent years. The Council does not have an AM competency framework and has low levels of AM leadership and culture.
Risk and review	Developing	The Council is developing this aspect of its AM practices and has identified a means of achieving requirements. The Council has undertaken risk management for selected asset classes and processes; however this is not consistent across the asset portfolio and Council operations (strategic planning to tactical operations). For example, the Council has completed initial risk and criticality reviews for some asset classes in 2014 and for water/sewer pressure mains in 2020. However, overall, the Council does not have a good understanding of its current asset-related risks to service levels, current criticality of its assets and limited evidence of review mechanisms. A thorough understanding of asset-related risks is needed to inform condition assessments and proactive capital and maintenance works (refer to Section 2.1.2)

Source: Central Coast Council (NSW) | 12555861 | Asset Management Strategy – Water and Sewerage

In the strategy, CCC's consultant notes that that CCC AM maturity presents an ongoing and future risk for customers and Council alike. This is reflected in the Council's key output measures identified by IPART, where the Council has been underperforming in reported sewer overflows, water quality complaints, and Environmental Protection Licence targets. Without appropriate intervention, the Council will face unmanaged and growing risk of service delivery failure.

Asset Management Improvement Plans

The Strategy outlines 11 strategic areas across the asset management system for the Council to improve upon, from Asset Management Plans, Long term financial forecasting, service levels reviews, through to governance and tracking.

Figure 8: Proposed asset management strategies for CCC

No	Strategy	Desired Outcome
1	Develop and annually review Asset Management Plans covering at least 10 years for all major asset classes	Identification of services needed by the community and required funding to optimise 'whole of life' costs.
2	Develop Long-term Financial Plan covering 10 years incorporating asset management plan expenditure projections with a sustainable funding position outcome.	Sustainable funding model to provide Council services.
3	Adopt a Long-Term Financial Plan covering 10 years incorporating asset management plan expenditure projections with a sustainable funding position outcome.	Sustainable funding model to provide Council services.
4	Incorporate Year 1 of Long-term Financial Plan revenue and expenditure projections into annual budgets.	Long-term financial planning drives budget deliberations.
5	Review and update asset management plans and long-term financial plans after adoption of annual budgets. Communicate any consequence of funding decisions on service levels and service risks.	Council and the community are aware of changes to service levels and costs arising from budget decisions.
6	Report Council's financial position at Fair Value in accordance with Australian Accounting Standards, financial sustainability and performance against strategic objectives in Annual Reports.	Financial sustainability information is available for Council and the community.
7	Ensure Council's decisions are made from accurate and current information in asset registers, on service level performance and costs and 'whole of life' costs.	Improved decision making and greater value for money.
8	Report on Council's resources and operational capability to deliver the services needed by the community in the Annual Report.	Services delivery is matched to available resources and operational capabilities.
9	Ensure responsibilities for asset management are identified and incorporated into staff position descriptions.	Responsibility for asset management is defined.
10	Implement an Improvement Plan to realise 'core' maturity for the financial and asset management competencies within 2 years.	Improved financial and asset management capacity within Council.
11	Report to Council by CEO on development and implementation of Asset Management Strategy, AM Plans and Long-term Financial Plans.	Oversight of resource allocation and performance.

Source: Central Coast Council (NSW) | 12555861 | Asset Management Strategy – Water and Sewerage

These strategies are key feature that would provide confidence that the right investment decisions for customers, community and the environment are being taken consistently based on good evidence. Given these strategies are in their early stages of development and their content not adopted by CCC when drafting their IPART submission, it has been assumed the submission has been referenced against the in-placed strategies, tools, information, etc, which CCC has recognised requires significant development.

The strategy outlines the asset management improvement plans and operational step changes which detail a program of tasks to be completed and resources required to bring CCC to a minimum 'core' level of asset maturity and competence. There are 38 asset management improvement plans for the Council to work on over the next few years (see **Appendix E**).

This task list shows a comprehensive awareness from CCC of the scale and complexity of their asset management maturity journey. It also demonstrates the current gap in the Asset Management system which has been used to underpin the current IPART submission.

2.4.2 Our assessment

Asset Management is the process of minimising the whole-of-life cost of delivering services that are either mandated, required by government or required to service a growing population. Whole of life costs are minimised by:

- Specifying new or replacement assets to effectively and efficiently meet future demands and service level requirements
- Planning and delivering renewals and maintenance in a manner that optimises use of available resources and maximises the economic life of the asset

CCC is in the process of preparing and updating asset management frameworks, processes, systems, and decision-making frameworks. CCC's is moving towards good industry practices to ensure that the customer requirements are met in a collaborative and efficient manner. CCC should continue to develop and improve its AMS.

Given that CCC's asset management data, processes, systems, and decision-making are immature and developing, we can conclude that the CCC's current expenditure plans are similarly immature. This means that data-driven evidence to identify risks, support investment needs and develop efficient solutions may not be robust and reliance may have been placed on expert judgement to fill the gaps. The list of 38 improvement tasks in the asset management strategy shows the scale of the improvement journey, implementation of which will extend to 2024.

In **Table 7** below, we provide some reasons why we consider the Council's expenditure plans to be immature, based on the findings of the asset management maturity review.

Table 7: Assessment of CCC's expenditure plans

Reason	Discussion
ASSET MANAGEMENT OBJECTIVES	The maturity assessment observed that CCC's asset management objectives are not well defined. Without clear objectives that link to organisational goals and customer outcomes, expenditure plans will lack focus and CCC will be unable to measure and evidence the benefits of expenditure against expectations. In addition, IPART will be unable to hold CCC to account for delivery of those benefits. We recommend that CCC develop more meaningful and measurable asset management objectives to bring more focus to asset management decisions and plans.
ASSET DECISION-MAKING	The maturity assessment also observed that CCC's approach to capital maintenance and operational decision-making is reactive. This runs the risk that planned expenditure is over-influenced by historic levels of expenditure and CCC is unable to evidence why the future might be different. Given the challenges of climate change, aging assets, and the need to reduce emissions, it is unlikely that a reactive approach will be sufficient to deliver resilient customer service and environmental standards in the future.

ASSET INFORMATION	The maturity assessment shows that there are gaps in data and there is no asset information strategy. Asset information is key to making robust decisions and producing robust investment plans. Improving asset information is a priority improvement action and we recommend that CCC develop information quality metrics to track progress and demonstrate to IPART and other stakeholders that plans are well underpinned with accurate up to date information.
RISK AND REVIEW	The maturity assessment found that CCC does not have a consistent understanding of its asset-related risks to service or criticality of its assets or a risk review process. This is essential for CCC to move from a reactive to a proactive approach and to target investment efficiently at the assets that have the greatest impact on customers, should they fail. We recommend that CCC incorporate risk metrics into a dashboard so that it always has a contemporaneous view of its asset-related risks, especially those from its critical assets.
ORGANISATION AND PEOPLE	The maturity assessment found that CCC has low levels of asset management leadership and culture and there is no asset management competency framework. A strong asset management culture leads to consistent and co-ordinated decision-making aligned around common goals and a breakdown of silos, especially between planning and operations. This leads to more efficient and targeted decisions and a more consistent risk appetite across the organisation.

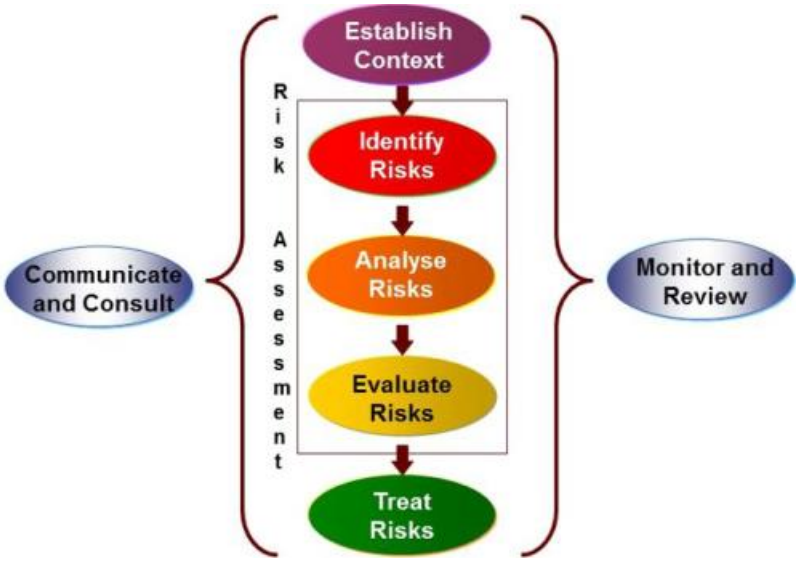
Source: Mott MacDonald

We pick up on some of these points in the sections below.

2.4.3 Risk management framework

CCC has a policy for Enterprise Risk Management (ERM) Framework, approved on 19 April 2021. The Enterprise Risk Management (ERM) Policy communicates CCC's commitment to managing enterprise-wide risks and to establish clear expectations to ensure that all staff are aware of their responsibilities for identifying and managing risk (**Figure 9**).

Figure 9: CCC Enterprise Risk Management Framework 2021



Source: Planning and Delivery – Delivery and Procurement, September 2021

CCC has developed a Risk Management Framework tailored to be directly applicable to its Water and Sewer asset classes (consistent with ISO 31000 – Risk Management) that is linked to CCC's ERM Framework.

The water, sewer and stormwater drainage risk and criticality framework has a process to identify the likelihood of failure (LoF) and consequence of failure (CoF) to establish scores that are applied to individual water, sewer, and stormwater assets. The asset overall risk of failure score is determined as the product of LoF and CoF scores, is shown in **Figure 10** below.

Figure 10: CCC Risk and Criticality Prioritisation Framework

Likelihood	Consequences				
	Insignificant	Minor	Moderate	Major	Catastrophic
Rare	Low - 1	Low - 3	Low - 6	Medium - 10	Medium - 15
Unlikely	Low - 2	Low - 5	Medium - 9	Medium - 14	High - 19
Possible	Low - 4	Medium - 8	Medium - 13	High - 18	High - 22
Likely	Medium - 7	Medium - 12	High - 17	High - 21	Extreme - 24
Almost Certain	Medium - 11	Medium - 16	High - 20	Extreme - 23	Extreme - 25

Risk Rating		
Extreme	Must not fail	Not tolerable; Reduce risk to medium or low. Immediate Corrective Action required
High	Should not fail	Unacceptable; Reduce to medium or low. Prioritised action required
Medium	Plan to repair	Undesirable; Consider opportunity to reduce to low, but otherwise tolerable. Planned action required
Low	Plan to repair	Tolerable; Manage by routine procedures

Source: Council submission to IPART, Technical paper 2

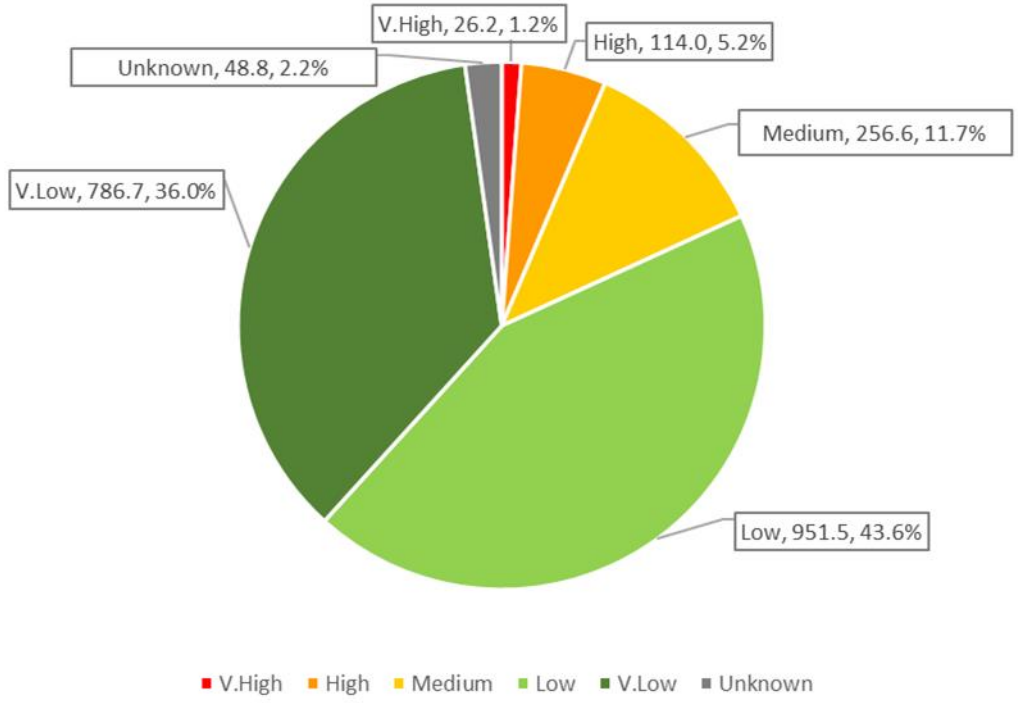
CCC was able to provide following documents, which only demonstrated the approach take covered water supply and sewer pressure pipelines.

- Consequence of Failure (CoF) - Tech Memo - WSP Final.pdf – 18/05/2020
- Likelihood of Failure (LoF) - Tech Memo - WSP Final.pdf – 18/05/2020

- CCC Pressure Main Criticality Analysis - WSP Final.pdf – 17/07/2020
- Water Main Risk review Final_v1.1 – Excel Workbook.

The water supply and sewer pressure pipes overall failure risk score are shown below. The scores are presented as km lengths of pipe and % of overall pipe length in each risk category.

Figure 11: CCC Overall Failure Risk



Source: CCC Pressure Main Criticality Analysis - WSP Final.pdf

There appears to be a disparity between the ERM and the approach taken for the Water supply and Sewer pressure pipelines, given the ERM is a four tear banding and the above is a five tear banding. The figure below shows the banding criteria.

Figure 12: ERM Banding

ERM Risk Rating	Bands range
Extreme	25 -23
High	22 - 17
Medium	16 - 8
Low	7 – 1

WS & SPP Risk Rating	Bands range
Very high	20 - 25
High	15 - 19
Medium	10 - 14
Low	5 - 9
Very low	1 – 4

Source: Planning and Delivery – Delivery and Procurement, September 2021; CCC Pressure Main Criticality Analysis - WSP Final.pdf – 17/07/2020

2.4.4 Our assessment

Risk Management is an essential component of asset management, which, when linked with asset condition and performance assessments, enables an organisation to benefit from

optimised Asset Management decision making. It is a key process for ensuring a disciplined approach for optimising services, maximising customer value and deliver Strategic goals and objectives. CCC's ERM approach to risk management is aligned with good industry practice.

Whilst it is recognised that CCC has developed a risk framework which is specifically for the water, sewer and stormwater assets, it is not clear if the likelihood of failure and consequence of failure for water and sewerage assets are meant to align with the corporate risk management matrix. Given the diverse nature of council's offerings it will be useful to have some explanation provided as to how the two risk management matrix complement each other.

Further, it is noted that there is no financial cost of consequences for the water sewer and stormwater assets, only relative gradings (as shown in the figure below). It is not clear what the Consequence of failure score represents, especially given the ERM has financial ratings along with descriptions for each ERM Risk consequence category (Work, Health & Safety/ Public; Natural Environment; Regulatory/ Compliance; Reputation).

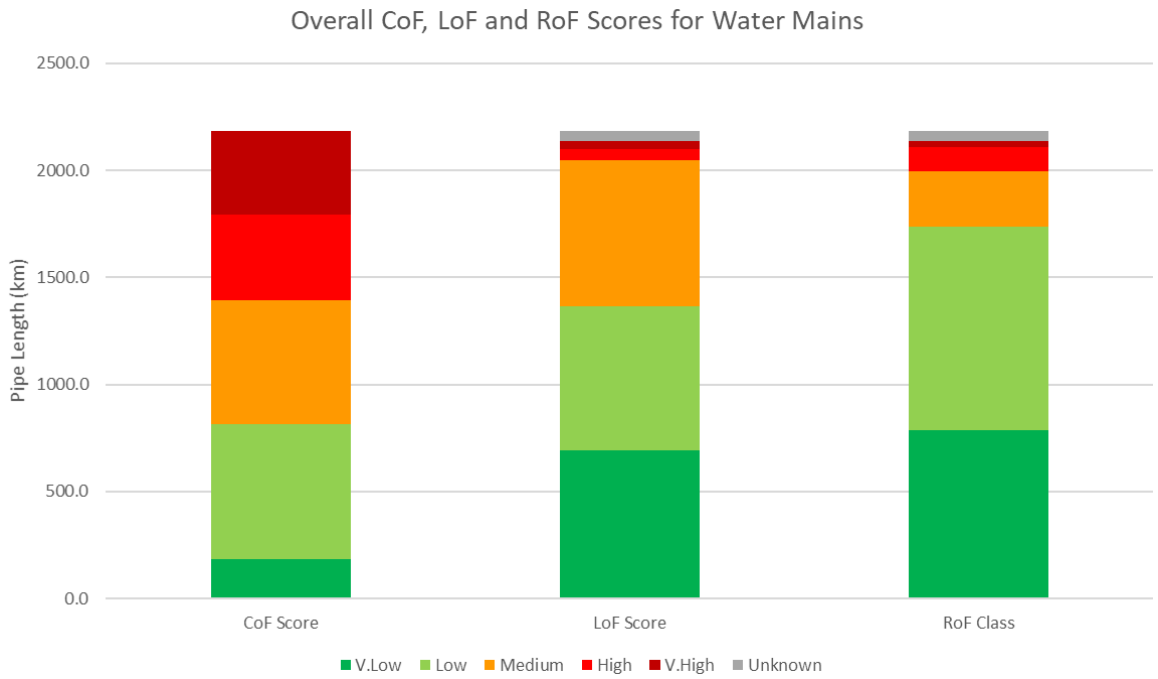
Figure 13: ERM Risk descriptions

ERM Consequential Rating	Financial Rating	WS & SPP Consequence of Failure Score	Range
Catastrophic	>$15M	5	
Major	$2M to $15M	4	
Moderate	$500k to $2M	3	
Minor	$50k to $500k	2	
Insignificant	<$50k	1	

Source: Planning and Delivery – Delivery and Procurement, September 2021; CCC Pressure Main Criticality Analysis - WSP Final.pdf – 17/07/2020

The risk framework developed for the water, sewer and stormwater assets appears to suggest CCC is exposed to a significant level of consequence risk (as shown below).

Figure 14: Risk framework for water, sewer and stormwater assets



Source: CCC

The Very High and High CoF score represents 784.1kms of a Total 2,168.5kms of in use assets, of which 416.8kms cover assets that a 200mm in Dia or smaller. Without fully understanding what these categories represent in $ impacts, currently the framework is suggesting 100mm dia pipe has the same CoF as a 600mm dia pipe.

For the RoF Class score, for Very High Risk, it is represented by 26.1kms of pipe that is 300mm and below only, of which 23.2kms of pipe is 100mm or less. This does not appear representative of the real risks embedded in the network.

We recommend that the risk framework developed for the water, sewer and stormwater assets be re-appraised to ensure risks are truly representative (not taken at face value) and costs are quantified so that they can be captured in any financial appraisal of expenditure.

2.4.5 Investment planning and governance

CCC's capital investment is based on the following criteria

- **Asset Renewals** are assessed and prioritised using the assets age, condition, criticality and failure rate. Council allows an allocation for reactive replacements for run to fail assets which is adjusted accordingly throughout the year.
- **Asset upgrades** are generally driven to meet capacity requirements utilising growth predictions, modelling data and service demand or to meet new or existing regulatory requirements.
- **New asset construction** - New developments and community growth drive the need to create new assets. In some cases, these assets will be constructed by the developer and gifted to CCC as works in kind.

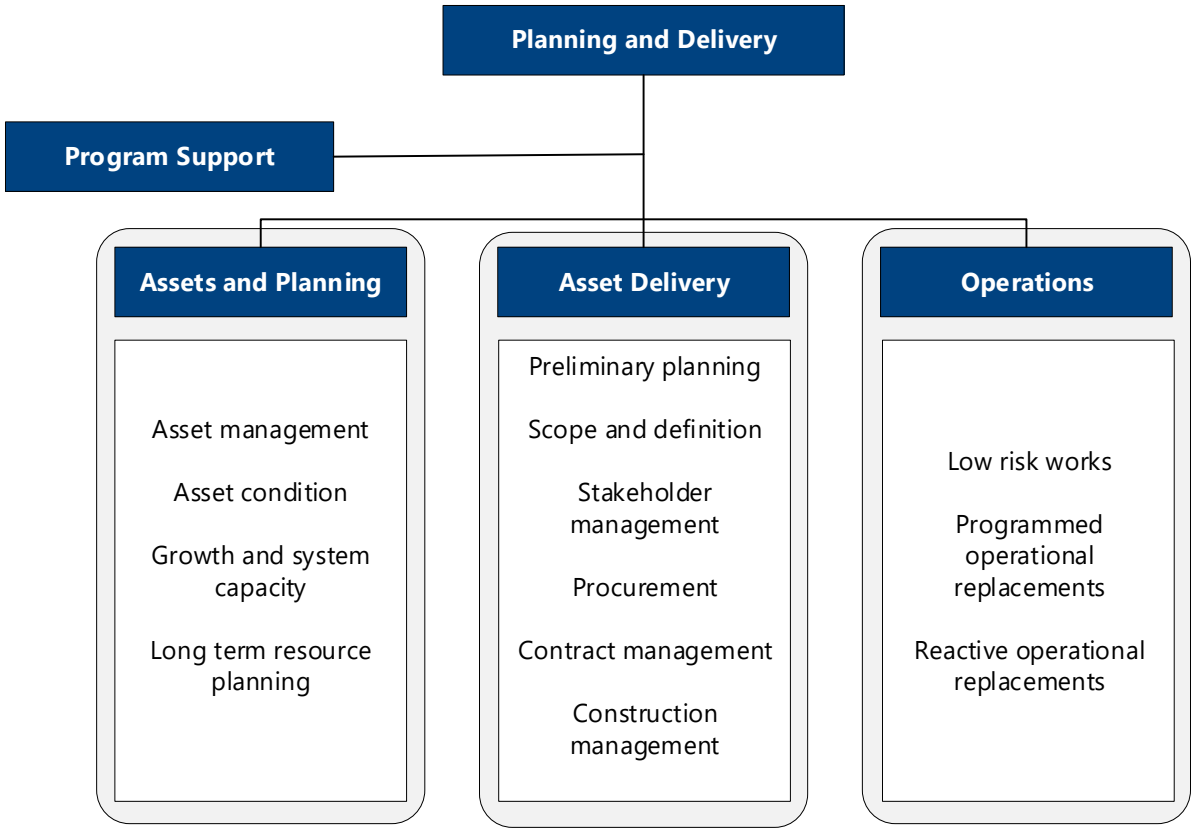
Prioritisation framework

The prioritisation and risk management framework (contained in the Planning and Delivery – Delivery and Procurement Enhancements document September 2021) details the Council's prioritisation framework.

CCC manages its investment portfolio through the compilation and adoption of Annual Operational Plans. Each Directorate within CCC has its own individual framework for managing project and program delivery.

The Water and Sewer Directorate have formed a Project Review team and delivery framework to support its investment prioritisation. This team's purpose is to support the business to ensure only valid and prudent projects are invested in and to ensure projects align with the Strategic Business Plan, IPART allowances and recommendations, Community Strategic Plan (One Coast), Asset Management plans and legislative requirements. The team reviews projects for validity and prioritise (rank) proposed projects for the inclusion to the Capital Works Program, as part of the project initiation process.

Figure 15: Water and Sewer Capital Planning and Delivery – high level functions

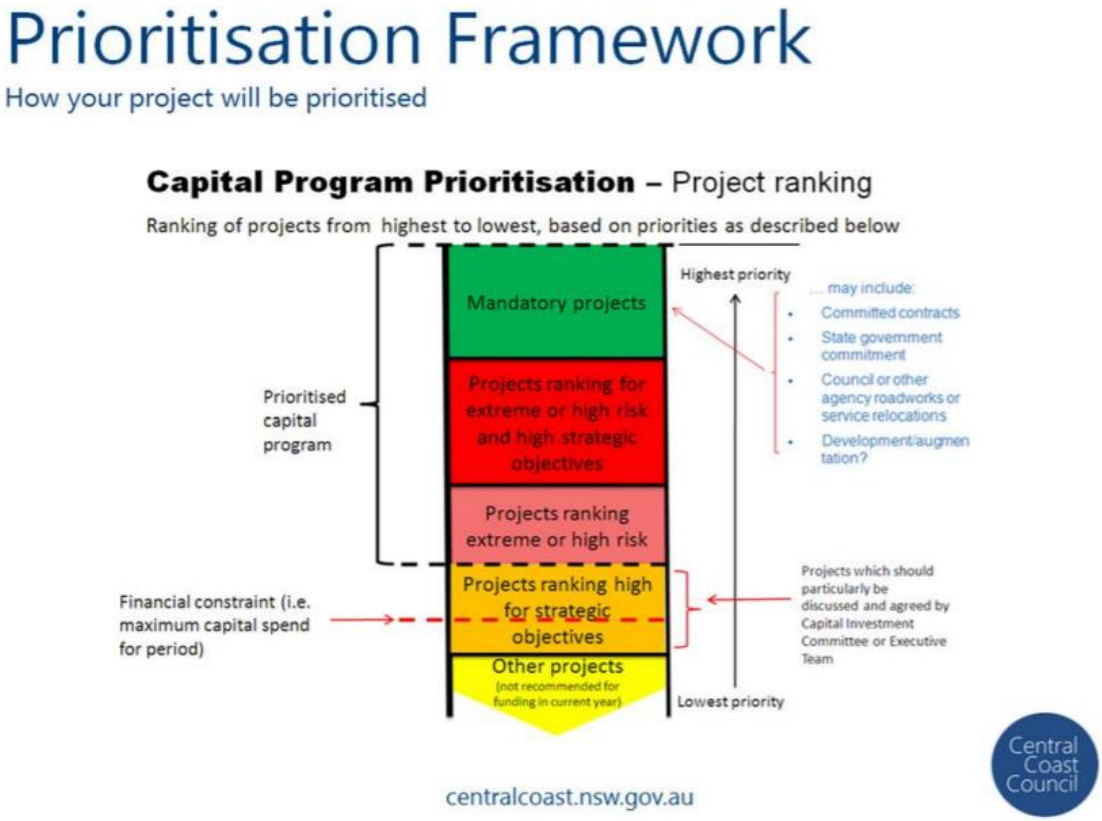


Source: Planning and Delivery – Delivery and Procurement, September 2021

Council's prioritisation framework is presented in

Figure 16 below. This framework defines criticality or consequence of failure using a multicriteria analysis, as well as a likelihood of failure assessment based on age, asset class life and asset condition.

Figure 16: Council Prioritisation Framework



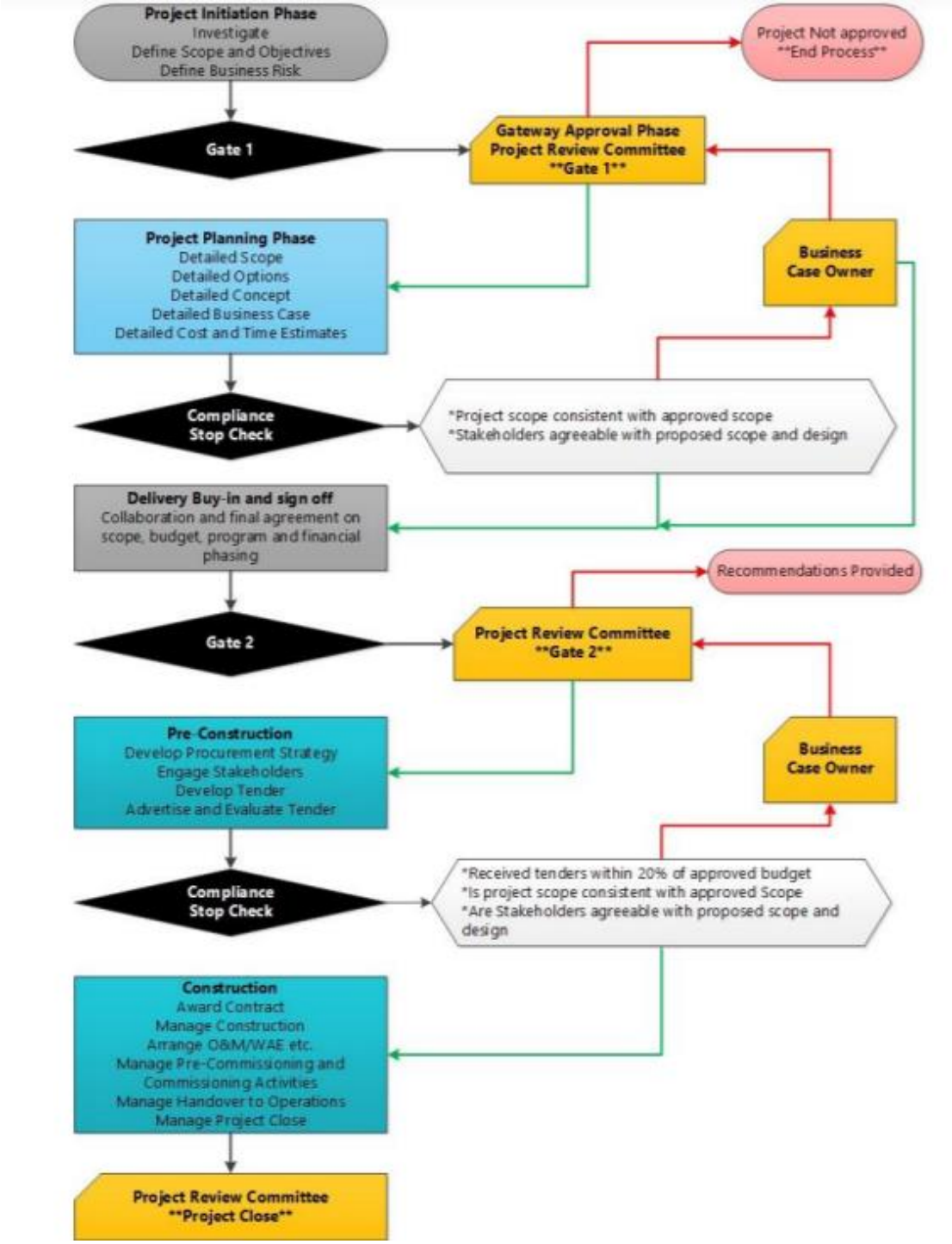
Source: *Planning and Delivery – Delivery and Procurement, September 2021*

Governance

In August 2021, CCC set up a capex committee to ensure that its capital expenditure is in line with CCC's Strategic Plan, financial process and budget.

An investment initiation process governs the commencement of new capital works projects and the transition of major projects from planning to delivery and within key procurement milestones during the delivery process. The process aims to ensure efficient and prudent assessment of capital works, while providing flexibility to reprioritise capital projects as needs and contexts change. Project approval is gated at key stages throughout the planning and delivery phases of major projects (see **Figure 17** below).

Figure 17: Water and Sewer Approval and Gateway Process



Source: Planning and Delivery – Delivery and Procurement, September 2021

A similar process is undertaken for stormwater drainage projects. In line with the stormwater drainage project management framework, a preliminary stage gate approval is required for all new projects identified via strategic planning, engineering investigation or asset inspections. Once a project is recognised and approved, it is assessed against a range of weighted criteria to establish an overall project rating and is then entered into the stormwater drainage capital works database for consideration of inclusion on a future works program.

Additional gate approvals are also required prior to including the project in an adopted forward works program and prior to the commencement of formal project development and design. The project prioritisation, budget and program adoption protocols are designed to ensure stormwater drainage investment is on prudent projects that align with IPART drivers, Community Strategic Plan, Drainage Asset Management Plan and legislative requirements.

2.4.6 Our assessment

Investment governance practices should be transparent so key stakeholders are sufficiently informed about the entity's planning and decision-making processes. A systematic and detailed review of investments proposed, and prioritisation based on need is more likely to lead to efficient investment decisions across the business as the planning processes result in capital investments that are aligned to customer needs and strategic business objectives.

Based on our review, we note the following comments in relation to the investment prioritisation and the governance framework:

- It is not clear to us how the prioritisation framework identifies effectively the optimal level of project selection as CCC has not articulated this in the information provided. We recommend that CCC considers linking the prioritising framework to determining the optimal level of capital expenditure to ensure that only the investment linked to the regulatory drivers and customer outcomes are funded.
- The CCC capex committee is not set up just to review and prioritise water-related capital expenditure but rather reviews all CCC proposed capital expenditure for the different services offered. It is designed to ensure that each business delivers its Operation Plan target and to review new projects for reasonable deliverability milestones. The documents provided do not identify how CCC prioritises competing expenditure needed for the different services. For example, how does CCC prioritise between capital expenditure required for water related services over other services and how are the risks of these decisions managed?
- We have seen no evidence of a mechanism to consolidate and integrate prioritisation across the different asset portfolios in terms of the prioritisation already done at the asset class level; the current strategic direction of the business, current/forecast budgets and the impact on customers.
- The link between the proposed capital expenditure programme and benefits to the community are not identified based on the information provided. To enable CCC to do this requires clear asset management objectives that are measurable (an earlier recommendation) and then ensuring that projects are evaluated on the benefits they deliver to those objectives.
- CCC's prioritisation framework does not detail how the value of the investment may impact on the project delivery model (it only describes how risk impacts the delivery).
- Investment decisions progress through gateways. However, the governance arrangements and approvals required to complete a gateway are not defined. To provide greater transparency and guidance, we recommend that CCC includes in the Planning and Delivery documentations the minimum requirements to be met through the different stages and the approval responsibilities. These requirements should then be monitored through the project delivery stages by the CCC capex committee.
- The performance objectives for the projects are not identified and should be considered when evaluating performance.

2.4.7 Cost estimation

CCC notes that water and sewer project cost estimates utilise a number of cost estimate templates. From low to higher complexity projects, cost estimates include:

- asset revaluation,
- NSW reference rates,
- Rawlinsons construction cost guide,
- consultancy level vs cost estimates,
- budget pricing sought directly from the market,
- quantitative Survey, and
- historical and contemporary project costs.

For stormwater projects the rates are based on completed project construction costs, first principle estimates, quantity surveyor advice, asset revaluation rates and Rawlinsons Construction Cost Guide.

Our assessment

Based on the information provided it is not clear to us whether a cost estimation framework exists for the development of CCC's estimates. We recommend adopting a more standardised approach to risk and opportunity estimating for capital investment which aligns, with industry good practice. This will allow CCC to achieve consistent cost estimation across the capital investment program and to provide greater transparency on the design inputs (preliminary and general items, design fees and contractor margins) and level of contingency required to manage the risk.

We have observed that, in a number of cases, CCC has relied on external consultants to provide an estimate of the project costs which were then not backed up by supplier quotes to determine the best value for money. Given this we recommend that CCC develops a cost database (we note that one exists for networks) which expands upon the networks costing into treatment, to allow internal benchmarking of consultant and contractor cost estimates as this will allow CCC to:

- scrutinise consultant and contractor costs and challenge these costs if needed
- reduce reliance on external sources, and
- deliver projects where costs have been benchmarked to determine their reasonableness.

2.4.8 Procurement

CCC is required to undertake specified procurement in accordance with:

- the Local Government Act 1993 (LGA) [in particular section 55]; and
- the Local Government (General) Regulation 2005 (Regulation) [in particular Part 7 – Tendering]

This legislation applies to all contracts for goods and services, unless a relevant exception applies. One exception is where the estimated expenditure for a contract less than $250,000 (excluding GST).

For expenditure under $250, 000 the Council has a procurement policy that requires:

- For spends under $5000 one written or verbal quotation.
- For spends between $5,001 and $9,999 – one written quotation
- For spends between $10,000 and $49,999 – two written quotations
- For spends between $50,000 and $249,999 – three written quotations

In addition, CCC notes that it has implemented a range of contractor panels and single engagements to achieve time and cost efficiencies in the tendering, contract approval and award phases, to ensure capital works are delivered using the most efficient strategies available and can rapidly engage providers for emergency works. Examples of these are:

- **Water Services and Construction – Water Main Asset Renewal** - Water main asset renewal projects are delivered in accordance with Councils Single supplier arrangement, four-year contract with extension options, for the provision of water main renewal, water service and water meter installations.
- **Sewer Rehabilitation and Construction** - Single supplier arrangement, four-year contract with extension options, for the provision of all sewer main lining, manhole rehabilitation along with the provisions for CCTV inspections, critical sewer and infiltration assessments.
- **Sewer Pump Supply Contract** - Single supplier arrangement, term contract for the supply sewage pumps and associated equipment.
- **SCADA Integration and Control** - Single supplier arrangement, term contract for the provision of PLC modifications, electrical control work, replacements, SCADA services, off site testing, onsite commissioning, design and technical documentation for major upgrades. This contract also has a schedule of rates for day labour and professional services. Equipment is usually free issued by council where installation services are required.
- **Electrical Switchboards -** A SCA manufacturing panel was set up and has two preferred suppliers that manufacture electrical switchboard to council's specifications. Competitive quotations are sorted from each supplier for up to $500,000 of manufacturing work. This contract arrangement is for four years with an option to extend for another two.
- **General Construction Panel -** The General Construction Panel was implemented in 2019 and consists of a panel of 7 contractors who can be engaged to undertake and deliver general construction works in relation to Water and Sewer assets under a standing offer arrangement based on the AS2124 (Construction) Conditions of Contract. General Works means; works of a value greater than $150,000 but less than $1,000,000 ($1M) in total estimated Contract Award value plus any contingency funding (i.e. estimated Contract Award Value + Contingency = General Works estimated value).

2.4.9 Our assessment

With regards to procurement of services, we consider that CCC is not entering into alliances or partnering arrangement to obtain the most efficient outcome. This is particularly evident for procurement of the projects reviewed (for example Lakedge avenue) where industry best practice demonstrates that bundling and packaging of projects are likely to result in efficiency benefits and savings for given programmes of work. Further, CCC has not provided any evidence that it has reviewed what it can do differently in the procurement area to realise these efficiencies.

The procurement process monitors all spend down to $5,000. Whilst this provides a detailed amount of governance, the time it takes to monitor this will detract time away from larger projects with significantly more spend. Possible automation of low value spend could be investigated to continue to enable audit verification whist releasing time for limited resources to spend on larger capital works.

With respect to the panel arrangement, we consider that the single supplier arrangements do not provide effective and efficient way in which to deliver business outcomes. It is important for CCC to continue to test the market and receive competitive prices for these services instead of relying on single contractor to provide the best price.

2.5 Overall structure of CCC water, wastewater and stormwater business

2.5.1 Governance structure

The overall CCC organisational structure is three-tier and is led by the Administrator, Rik Hart and Chief Executive Officer, David Farmer. The third tier managed by the CEO is divided into five divisions and these are Corporate Affairs, Environment and Planning, Community Recreations and Planning, Infrastructure Services and Water and Sewer. The Water and Sewer team (WSPD) is the smallest team and is headed by Jamie Loader. The team is made up of Headworks and Treatment, Planning and Delivery, Network Operations and Maintenance.

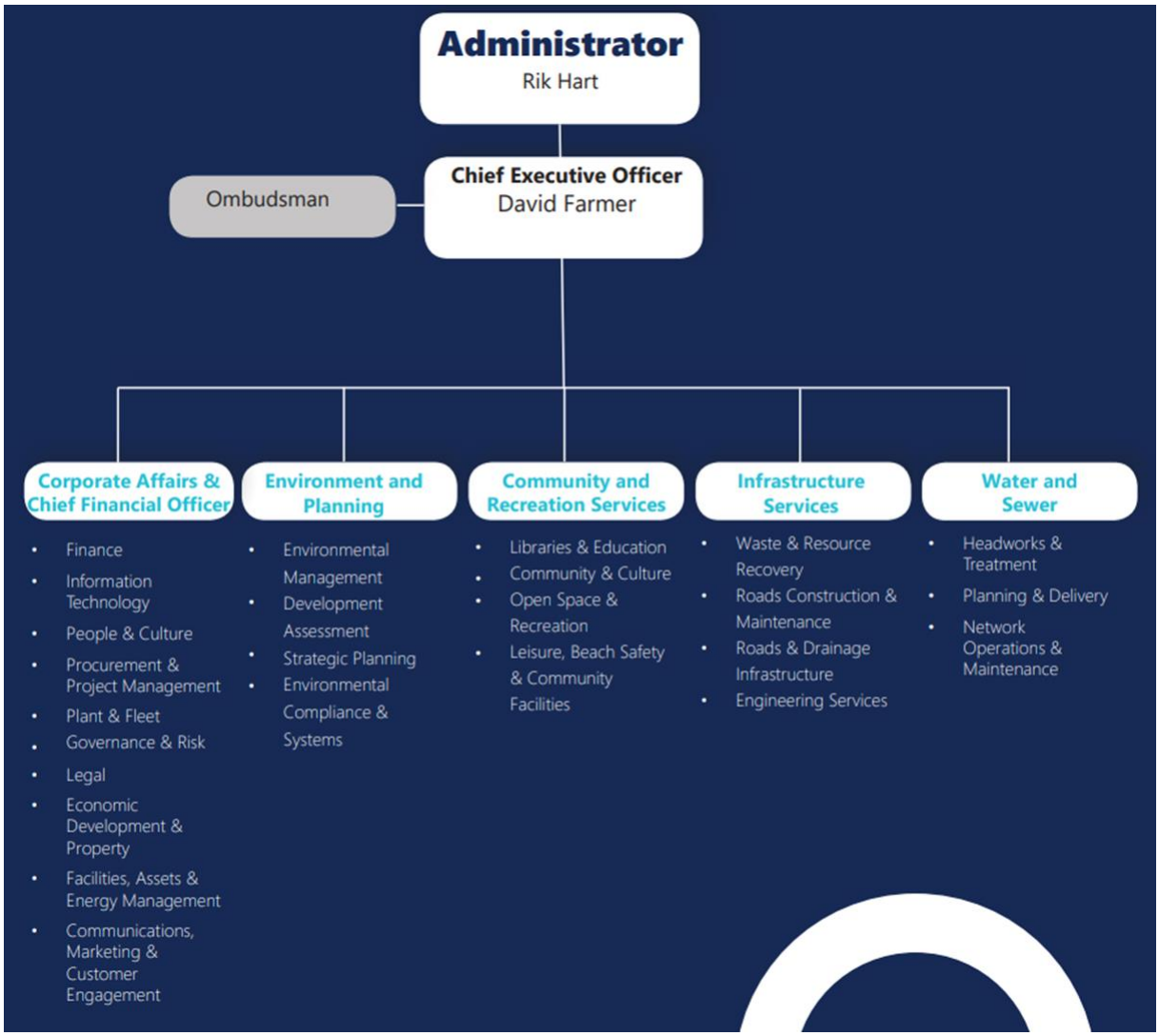
The structure is a relativity simple. For example, from our analysis of the structure, there are no identified WSPD or CCC staff working across other areas of the council. However, as CCC has multiple responsibilities (Corporate Affairs, Community Recreations and Planning etc) information must be shared. For CCC, the accountability lines for the sharing of information and prioritisation of spend across different council areas of responsibility are not clear. For example, the appearance of roadwork mains relocations in the top priority 'mandatory projects' in CCC's prioritisation framework suggests that water and sewerage is treated as a lower priority to other, more visible, infrastructure works.

Within the CCC Capex Committee appointed membership is made up of the Director Infrastructure Service, Director of Water and Sewer, Director Corporate Affairs and Financial Controller. The remainder of the Executive Leadership Team are invited to attend as optional to all meetings. Note, there are identified names for the WSPD team only in the documents provided. Further, as noted earlier the Capex Committee is not for water projects only and oversee the capex associated with all the services provided by CCC.

The CCC corporate governance does not include an independent Board dedicated to overseeing the water supply function. By comparison, stand-alone water utilities have an independent Board with members who have the relevant experience and skills that are responsible for approving strategic plans and risk appetite statements and monitor the organisation's expenditure while ensuring it is compliant with all directives and it is customer focussed. We consider this to represent good industry practice from a governance perspective.

Based on info provided it's not clear how the quality, accountability and governance of the data is managed. For example, there is no evidence of a staff member assigned to the role of "information officer".

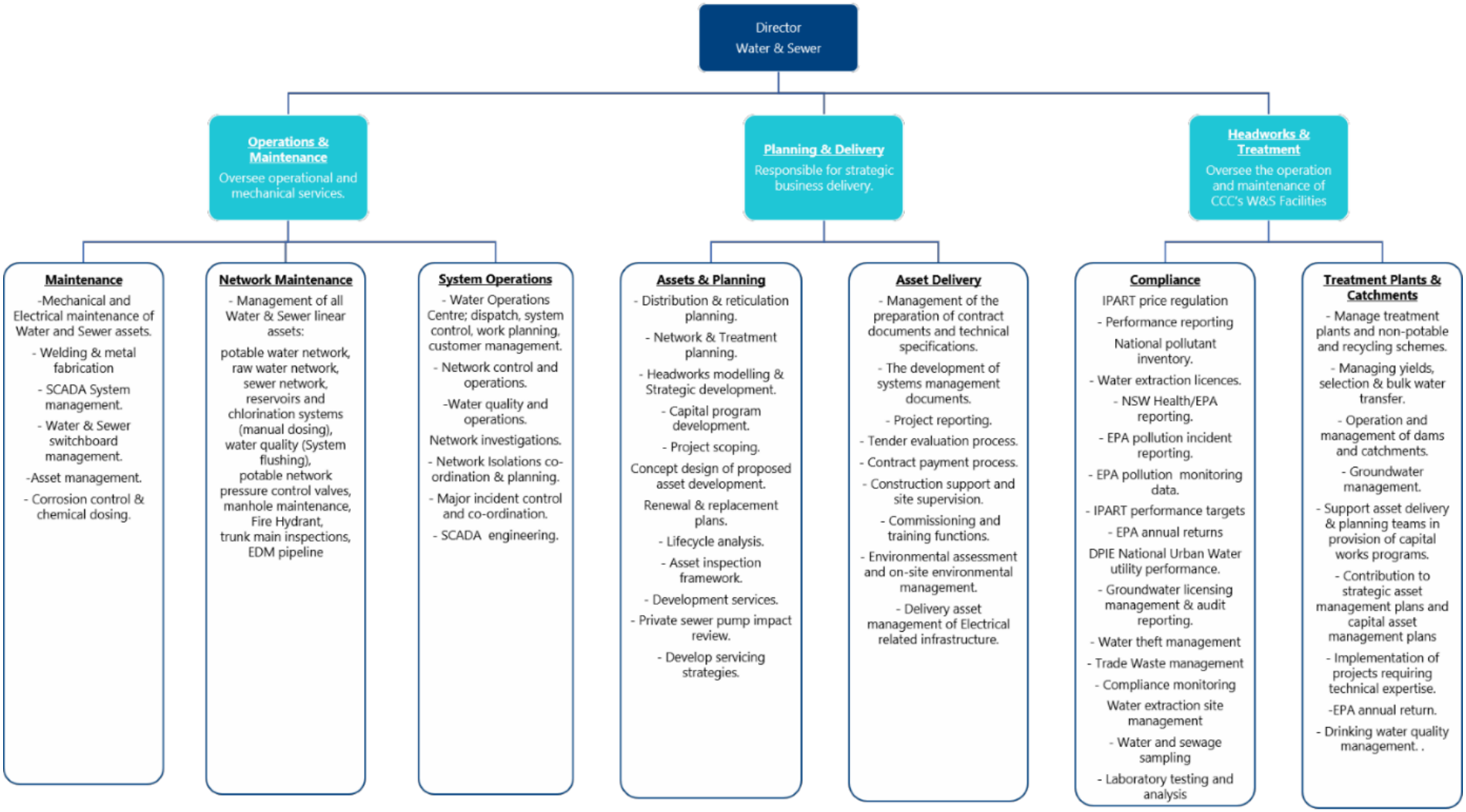
Figure 18: CCC Organisational Structure



Source: CCC Operational Plan 2021-2022

The Water and Sewer Directorate was restructured to achieve operating efficiencies. The current structure is provided below.

Figure 19: CCC Water & Sewer Directorate



Source: Central Coast Council Water and Sewer – Planning and Delivery – Delivery and Procurement

The Water and Sewer Planning and Delivery team (WSPD) is a unit dedicated to the planning and creation of a diverse range of water and sewer assets. It incorporates multiple functions including planning, asset management, design, procurement, construction, water assessment, asset delivery and handover functions to operational teams.

From on our review of capital expenditure projects, we consider that there is a lack of water expertise and staff resourcing at CCC which has resulted in the deliverability of the certain projects being constrained (delivery reliant on the availability of a small number of staff as noted in the Mardi pipeline and Lakedge drainage projects).

CCC uses shared financial services; the water businesses financial processes are not separate from the rest of the business. The council's enterprise resource planning (ERP) platform has internal controls supported by other external processes within IT, finance, procurement, and project management. The sharing of services is evidence of shared management and decisions makers between the water business and the rest of the council. This sharing of decision-making resources may give the opportunity of prioritisation of spend in areas of more concern or more visible to those residing in the council's area. As noted above with respect to road works expenditure being given the highest priority by Council.

Customer Service

CCC have identified necessary changes to the complaints framework for compliance with CCC policy. If approved, the framework will centralise information, provide better governance, standardise responses, improve process and provide quicker turnaround times. CCC have not identified if decision making will be separated.

We note that, CCC does not have a document such as a customer charter describing its policy and procedures on how it will work for and with customers. We consider that the development of such a document would support the governance processes as it will make the workings of Council more transparent to rate payers and water consumers.

Water and Sewer Delivery and Procurement

In September 2021, WSPD undertook an internal review of cost efficiency/ controls and reporting to determine challenges and opportunities for WSPD in achieving its strategic delivery objectives. The review found that staff capability is inconsistent, reporting at program level is underdeveloped, that procurement inefficiency can lead to management cost inefficiency, and there is a low-risk appetite for variance which drives certain behaviours to the detriment of achieving delivery outcomes.

Conclusion

In conclusion, there are a number of governance issues which are likely to lead to inefficient outcomes for CCC's water customers. These include:

- Possible conflicts of interest with shared management roles and decision making around prioritisation of spending. Being part of the wider CCC activities, it shares some functions with others but has autonomy over water-specific activities. It is not well set up to deliver efficient asset management decisions nor to respond to regulation effectively.
- Reporting lines not clearly defined between the different areas within CCC
- Given the structure we cannot discount cross subsidisation occurring. A clear link between water business revenue and expenditure is not evident

- A gap in governance documentation relating to a public document that outlines the policy and procedures for how it will work with customers (a Customer Charter)
- A CCC internal review identified several procurement processes that could be improved. Some of these suggested changes include consistent staffing capability and reporting at program level.
- CCC provides an array of services, it's not clear how the council prioritises the capital expenditure for these services if there are competing priorities for limited funds.
- The lack of an independent Board to oversee the supply of water services.

2.6 Overall conclusion

Effective policies and planning frameworks provide an opportunity for an entity to substantiate that its investment decisions are effective in achieving the desired outcomes in the most efficient manner. They achieve this by presenting an open and robust process, supported by policy, which when followed correctly is more likely to result consideration of needs, risk identification and approvals.

Many of the instruments of the CCC framework are in-development or early roll-out and other legacy processes are being transitioned-out. The result is that there is a lot of inconsistency in how the current frameworks are applied in-practice which is likely to continue over the upcoming regulatory period.

Our findings and recommendations in relation to the core business systems include:

Strategic business plans findings

- While good foundations are being laid by CCC for investment and governance arrangements, the business systems and processes are maturing
- CCC in process of updating a number of its strategic documents including Water Plan and IWCM
- The process of preparing and updating plans demonstrates CCC's willingness to mature as a service provider and evolve to move towards good industry practice
- The pricing submission (and associated Technical Papers) remain the most recent and public confirmation of the Council's direction and intended investment, with the expenditure informed by the strategies that are currently in place. Therefore, our assessments of CCC capital investment is based on the systems that are currently in place and not the intended plans

Recommendations

- We recommend CCC's strategic plans clearly demonstrate how its strategy and long-term objectives meet community objectives and expectations.
- We recommend the strategic plans propose measures of success, ideally outcomes, to enable delivery of the benefits from the plan to customers and stakeholders.

Asset management system findings

- Asset management maturity has been assessed to be weak by consultant engaged by CCC and given this CCC has embarked on a 3-year improvement plan to deliver 38 improvement actions.

- Given the identified deficiencies in AM maturity mean that we have low confidence in the robustness of current expenditure plans. This is because there is:
  - poorly defined asset management objectives leading to a lack of focus for investment planning and lack of ability to hold CCC to account for delivery of outcomes
  - reactive decision-making leading to a short-term view and lack of long-term planning
  - gaps in data and no asset information strategy leading to weak evidence in support of investment decisions and consequent reliance on expert judgement
  - lack of understanding of asset related risks to service and criticality of assets leading to deficiencies in targeting investment efficiently at the most pressing risks to service
  - a lack of asset management leadership and culture in the organisation leading to inconsistent decisions and a lack of focus on water customer and environmental outcomes
- It is not clear how CCC's investment prioritisation process links back to customer outcomes and efficiencies and there are potentially some conflicts with other CCC activities.
- Cost estimation is inconsistent the way it is applied.
- Investment decisions progress through gateways, however the governance arrangements and approvals required to complete a gateway are not defined.
- There are gaps in CCC's procurement policy as they are not taking advantage of alliancing and partnership models that have been shown to deliver efficiencies.

Our recommendations

- We recommend CCC report its progress against the Asset Management improvement plans (11 Asset Management Strategies and 38 tasks) as detailed in the Asset Management Strategy (November 2021).
- We recommend CCC develop an endorsed published customer charter with a set of measurable customer outcomes and reporting.
- We recommend that the CCC incorporate risk metrics into a dashboard so that it always has a contemporaneous view of its asset-related risks, especially those from its critical assets
- We recommend that CCC work towards a strong asset management culture that leads to consistent and co-ordinated decision-making aligned around common goals and a breakdown of silos, especially between planning and operations
- We recommend that CCC considers linking the prioritising framework to determining the optimal level of capital expenditure to ensure that only the investment linked to the regulatory drivers and customer outcomes are funded
- We recommend adopting a more standardised approach to risk and opportunity estimating and a unit cost database that expands upon the networks costing into treatment, With respect to gateways to provide greater transparency and guidance, we recommend that CCC includes in the Planning and Delivery documentations the minimum requirements to be met through the different stages and the approval responsibilities. These requirements should then be monitored through the project delivery stages by the CCC capex committee.

Overall findings for CCC structure

- Possible conflicts of interest with shared management roles and decision making around prioritisation of spending. Being part of the wider CCC activities, it shares some functions with

others but has autonomy over water-specific activities. It is not well set up to deliver efficient asset management decisions nor to respond to regulation effectively.

- Reporting lines not clearly defined between the different areas within CCC.
- Given the structure we cannot discount cross subsidisation occurring. A clear link between water business revenue and expenditure is not evident.
- A gap in governance documentation relating to a public document that outlines the policy and procedures for how it will work with customers.
- A CCC internal review identified several procurement processes that could be improved. Some of these suggested changes include consistent staffing capability and reporting at program level.
- CCC provides an array of services, it's not clear how it prioritises the capital expenditure for these services if there are competing priorities for limited funds.
- The lack of an independent Board to oversee the supply of water services.

3 Operating expenditure

3.1 Methodology

This section outlines our methodology for recommending efficient opex. As noted in section 1.1.2, we have applied a different methodology to make our recommendations compared to previous expenditure reviews. Our methodology is consistent with our Scope of Works and we consider it appropriate for the specific operating context for CCC.

3.1.1 We undertook analysis and benchmarking of CCC's historical opex

To assess the efficiency of CCC's historical opex we analysed the variances between CCC's actual opex and IPART's allowance over the 2019 determination period. We also sought further information on these variances through our information requests and interviews with CCC management.

We were asked to make comment on the level of CCC's opex since 2009. To do this, we employed economic benchmarking. Economic benchmarking is a method to assess the relative opex cost efficiency of CCC over the historical period since 2009, compared to other water utilities.

While there are a range of economic benchmarking techniques, we decided that given data availability stochastic frontier analysis (SFA) is the most appropriate approach.[11] SFA constructs an efficient production frontier from the included observations using statistical methods. We have drawn on data from water utilities across Australia included in the National Performance Report (NPR) dataset.[12]

3.1.2 We applied a base-step-trend approach for CCC's forecast opex

To recommend efficient opex for the 2022 determination period we applied a base-step-trend approach. Under this approach, forecast opex is 'built up' from three components:

1. **Base expenditure** – this is the efficient and sustainable level of recurring expenditure required each year for CCC to meet required service levels for water, wastewater and stormwater
2. **Step changes** – reflects increases in efficient expenditure over the 2022 determination period that are typically the result of new regulatory requirements, major changes in external factors and efficient opex and capex trade-offs, so that past expenditure or trends cannot predict this change in expenditure.
3. **Trend factors**– the predictable (and efficient) change in recurring expenditure over time due to input price changes, output growth and improvements in productivity.

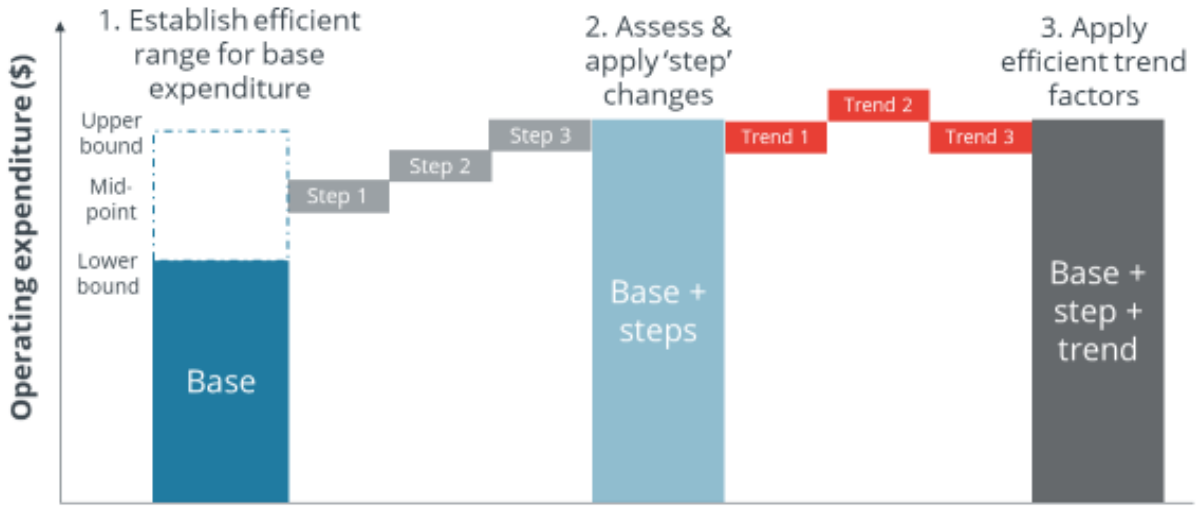
Our base-step-trend approach is shown graphically in **Figure 20** below. A key feature of this is that we have included a range for efficient opex, reflecting the uncertainty associated with data

[11] The Australian Energy Regulator (AER) has relied on SFA models in its recent regulatory reviews for electricity distribution utilities. SFA studies for urban water distribution utilities have also been undertaken on behalf of the Essential Services Commission of Victoria (ESC).

[12] http://www.bom.gov.au/water/npr/

and forecasts. The range includes a midpoint and upper and lower bound estimate. IPART may decide to adopt the midpoint of the efficient opex range or consider other factors and select a point above or below the midpoint.

Figure 20: Our base-step-trend approach



Source: Frontier Economics

The step changes and trend factors would apply to the point within the base expenditure range that IPART adopts. The sections below provide further details.

3.1.3 Establishing an efficient range for base expenditure

We have employed top-down methodologies including opex benchmarking to develop a range for efficient base expenditure, as summarised below.

Economic benchmarking

As noted above, economic benchmarking is a method to assess the relative opex cost efficiency of CCC compared to other water utilities.

We used our historical (SFA) benchmarking as the first approach to establish base expenditure. To do this we drew on our benchmarking analysis to establish efficient level of opex for a utility with a 75% efficiency score (noting the Australian Energy Regulator considers an efficiency score of 75% to be a reasonably efficient benchmark). We then 'rolled forward' this estimate through the 2022-26 determination period, using forecast connection numbers and trend factors including input price changes and a continuing efficiency factor of 0.7% pa. Given the statistical uncertainty inherent in our economic model, we applied a 95% confidence interval around our estimate of efficient base opex. This created an upper bound, lower bound and midpoint estimate of efficient base expenditure. More information is provided in **Appendix B**.

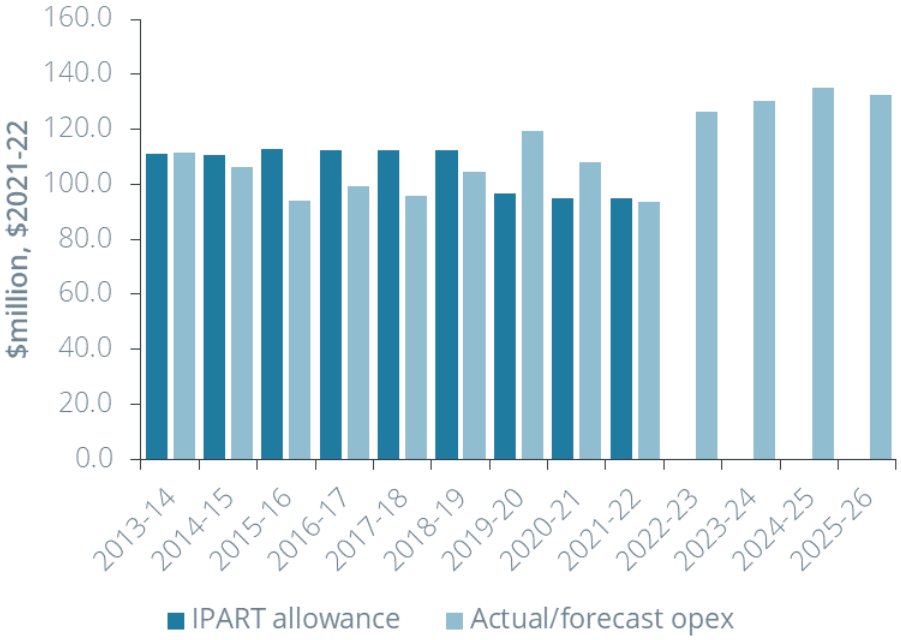
Notably, the NPR dataset we used to undertake the benchmarking includes water and wastewater, but not stormwater. We used the water and wastewater opex from the economic benchmarking to derive efficient stormwater costs. In particular, we applied the ratio of CCC's actual stormwater opex to actual water and wastewater opex from 2013-14 to our economic benchmarking results. We consider that expenditure in 2013-14 and hence the ratio of

stormwater opex to water and wastewater opex in 2013-14, provides a reasonable estimate of CCC's efficient and sustainable opex.

Roll forward of 2013-14 opex

In CCC's pricing proposal, it notes that there has been a reduction in operational service delivery over the past six years.[13] However, in our view, the period before this (2013-14) provides a reasonable estimate of CCC's efficient and sustainable opex. This is because in 2013-14 CCC's actual opex was much closer to IPART's allowance (see **Figure 21**) and there was no evidence of significant concerns with CCC's (or former Gosford & Wyong Councils) performance and service standards.

Figure 21: Actual/forecast opex vs IPART's allowance ($2021-22)



Source: IPART, SIR

As a cross-check to our economic benchmarking, we rolled forward actual opex from 2013-14 to estimate an efficient and sustainable level of opex. To do this we used a 2013-14 as the 'base' year and increased expenditure to allow for efficient 'trend' components. We applied the following three trend factors:

- An input price factor weighted 50% on the Wage Price Index (WPI) and 50% on the Consumer Price Index (CPI). We consider that this reflects an appropriate factor over this period given CCC's historical use of labour and other cost inputs.
- An output growth factor based on the relationship between customer connections and efficient operating expenditure identified as part of our economic benchmarking. We found that customer connections were the only output driver of efficient operating expenditure and

[13] CCC, Pricing Proposal to IPART, September 2021, p 74.

so it is appropriate to apply a trend for CCC's increase in customer connections of this period. Further information on this relationship is contained in the section below and **Appendix B**.

- A productivity factor of 0.7%. This is consistent with IPART's standard approach to applying a measure of long-term productivity improvements to account for movements in the efficient frontier.

This approach effectively provides an estimate of the 'base' level of opex in the 2022 determination period that reflects appropriately adjusted historical opex and that can be considered reasonably efficient.

3.1.4 We undertook a bottom-up assessment of step changes

CCC provided us with business cases for around 30 proposed step changes in support of its pricing proposal to IPART. As noted above, most of these step changes we consider to be for meeting existing obligations and should be considered as part of base opex (ie, already accounted for in the efficient base opex allowance derived from benchmarking analysis).

For 'genuine' step changes, we have undertaken a bottom-up assessment of the relevant business case and applied IPARTs efficiency test outlined in **Box 1**. Note that genuine step changes capture increased opex to:

- meet new regulatory requirements
- address major changes in external factors, and
- meet efficient operating and capital expenditure trade-offs

3.1.5 We assessed three separate trend factors

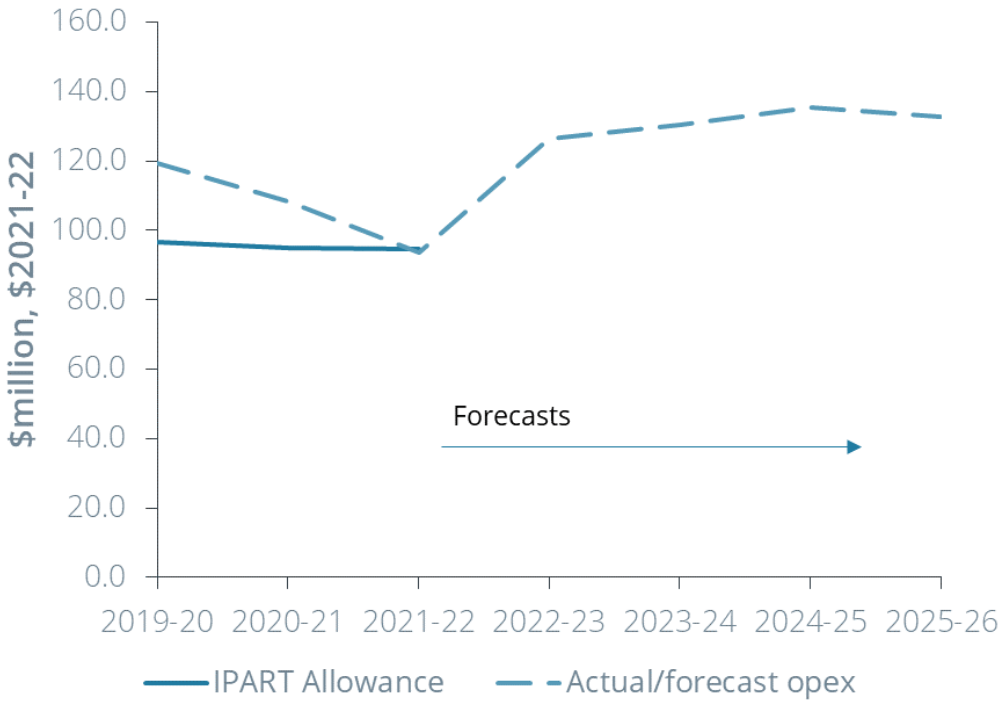
Our recommended forecast opex incorporates the following trends factors:

- A continuing efficiency factor of 0.7% pa (as advised by IPART)
- An output growth factor based on the relationship between forecast customer connections and efficient operating expenditure identified as part of our economic benchmarking. As noted above, further information on this relationship is contained in the section below and in **Appendix B**
- Input price growth factor of 2.0-2.5% based on a weighting of 50% on the forecast Wage Price Index (WPI) and 50% on the forecast Consumer Price Index (CPI). We consider that this reflects an appropriate factor over this period given CCC's historical use of labour and other cost inputs.

3.2 Overview of CCC's historical and forecast opex

Over the 2019 determination period CCC's actual total opex (including water, wastewater and stormwater) exceeded IPART's allowance in 2019-20 and 2020-21 (**Figure 22**). Higher corporate overheads and labour costs were the main contributors to this. In 2021-22, CCC has forecast actual opex to be close to IPART's allowance.

Figure 22: CCC's actual and forecast opex in the 2019 and 2022 determination periods ($2021-22)



Source: SIR Opex CCC

As shown in the figure above, CCC forecast an increase in total opex over the 2022 determination period relative to recent actual opex. More discussion is provided in the sections below.

3.3 Opex between 2009 and 2019

We have been asked to make comment on the level of CCC's opex since 2009, with regard to the impacts on CCC's levels of service, financial performance and the operating costs of comparable utilities.

As noted above, we used SFA to assess CCC's historical opex utilising the NPR dataset. As the number of CCC connected properties is close to the boundary between 'Major' and 'Large' utilities in the dataset, we undertook an SFA analysis for the expanded sample consisting of the 'Major' plus 'Large' urban water distributors. This dataset consisted of 27 utilities in total for both water and wastewater.

Using real opex as the dependent variable in the SFA econometric model, we considered three output variables for the analysis:

- Water supplied;[14]
- Number of connections; and
- Mains length.

[14] For water, NPR variable W11: Total urban water supplied (ML). Data from the 2018 dataset is appended to the 2020 dataset.

We consider both the water and wastewater versions of these variables for the water and wastewater analysis. While further details of our estimation procedure is provided in **Appendix B**, this led to a specification in which the only output driver of opex in the model is the number of customer connections for both the 'major' only sample and the combined 'large' and 'major' samples of water businesses. For wastewater the only output driver of water and wastewater opex in the model is again the number of customer connections for both the 'major' only sample and the combined 'large' and 'major' samples of water businesses.

In the SFA model, opex efficiency scores are calculated in the model relative to the directly estimated efficient frontier. The AER considers an efficiency score of 75% to be a reasonably efficient benchmark, reflecting the upper quartile of efficiency scores.[15] As shown in **Table 8** below, CCC's efficiency scores were relatively high compared to other utilities in the four samples when using the preferred specifications.

Table 8: Estimated efficiency ranks of CCC using SFA

	Estimated efficiency – wastewater	Estimated efficiency – water supply
SAMPLE	**Connections only**	**Connections only**
MAJOR ONLY	71st percentile	84th percentile
LARGE & MAJOR	74th percentile	75th percentile

Source: Frontier Economics analysis of NPR and CCC data for the period 2008-09 to 2019-20

This analysis suggests that CCC's historical opex between 2009 and 2019 (i.e. excluding the 2019 determination period) was relatively efficient. However, it is important to recognise that benchmarking using the NPR dataset involves some limitations and uncertainties including:

- Potential errors in the NPR dataset
- Not being able to account for differences in environmental and network specific factors within the dataset
- Differences in the service quality provided by water utilities in the dataset
- Not being able to account for efficient operating and capital expenditure trade-offs.

3.3.1 Conclusion on opex between 2009-19

At face value, the results of our SFA benchmarking indicate CCC's opex has been relatively efficient over the period 2009 to 2019. However, our benchmarking analysis cannot directly account for service quality outcomes. As shown in **Figure 21**, CCC's opex was significantly below IPART's allowance for much of this historical period and we consider that this has contributed to the relatively poor service and performance outcomes in the 2019-22 determination period, given there is generally a lag between expenditure and outcomes. If we were able to adjust for

[15] AER, Annual Benchmarking Report – Electricity distribution network service providers, November 2021, p. 60.

service quality in our benchmarking, it would show that CCC has been considerably less efficient over the historical period.

3.4 Opex over the 2019-22 determination period

This section focusses on CCC's opex in the 2019-22 determination period.

3.4.1 IPART's findings from the 2019-22 determination

As context for this section, we note that in the 2019-22 determination IPART significantly reduced CCC's opex allowance. IPART's opex allowance was 11.9% (or $36.7 in $2018-19) lower than proposed by CCC over the three-year determination period.[16]

IPART accepted advice from its expenditure consultant that CCC's zero-based budgeting approach was not an appropriate method to establish base expenditure. Instead, IPART considered that CCC's actual expenditure in 2017-18 reflected an appropriate baseline for opex:

> *We consider it appropriate to use 2017-18 expenditure as a baseline. Firstly, the Council's operating expenditure had been fairly stable over the 3-year period from 2014-15 to 2017-18. Secondly, the Council's output measures suggest that service standards had been stable or improving over this period, and indeed over the whole 2013 determination period. Taken together, this suggests a consistent trend in recent years of flat costs and consistent service standards. Thirdly, the nature or scale of the Council's services has not materially changed since 2017-18.*[17]

As shown in **Figure 21** above, CCC's opex in 2017-18 was considerably below IPART's allowance at that time. However, as noted in the quote above, at the time of making the 2019 determination CC's opex and service standard performance were relatively consistent.

3.4.2 CCC's actual opex in the 2019-22 determination period

CCC forecast actual opex over the 2019-22 determination period of $312.2m.

CCC notes that these forecasts incorporate realised efficiency savings from improvements to asset management, leakage management, alignment of the Fixed Asset Register & Technical Asset Register and improvements to work practices relating to Switchboard Arc Flash analysis. Improvements to leakage management was estimated to save $2.0m over the 2019-22 determination period however CCC was not yet able to provide a value for the other savings.[18]

CCC's forecast actual opex over the 2019-22 determination period is around 13% higher than IPART's allowance of $277.0m ($nominal).

As shown in **Figure 23**, CCC's actual opex exceeded IPART's allowance in the first two years of the period, by:

16 IPART, Review of Central Coast Council's water, sewerage and stormwater prices to apply from 1 July 2019, Final Report, May 2019, p 41.

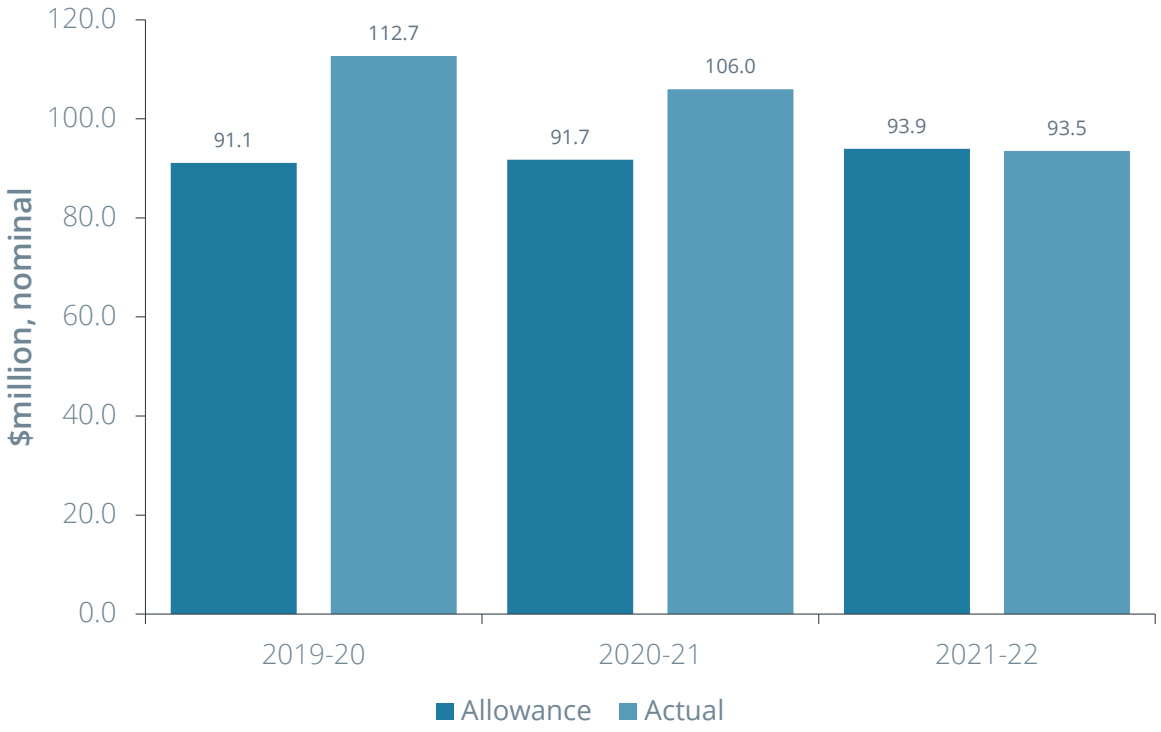
17 IPART, Review of Central Coast Council's water, sewerage and stormwater prices to apply from 1 July 2019, Final Report, May 2019, p 47.

18 CCC, Ongoing efficiency gains, August 2021, pp 10-12.

- $21.5m (24%) in 2019-20
- $14.2m (15%) in 2020-21

In the final year of the 2019-22 determination period where opex is forecast (not actuals), CCC's forecast opex is much lower and close to IPART's allowance. CCC noted that in 2021-22 the reduced opex is due to cuts to expenditure from the recent CCC financial concerns (see section 1.2).[19]

Figure 23: Actual/forecast opex vs IPART allowance in the 2019 determination



Source: SIR

3.4.3 CCC's variance against allowance by type of service

Table 9 shows that the overspend against the IPART allowance is attributed to Water and Wastewater services.

Over the 2019-22 determination period, the total overspend for Water is forecast to be $15.4m, for Wastewater, $14.5m and Stormwater $5.5m. The total overspend against IPART's allowance over the 2019-22 determination period is $35.4m (or around 13%).

[19] CCC, Pricing Proposal to IPART, September 2021, p 72

Table 9: CCC opex variance in the 2019-22 determination ($million, nominal)

	2019-20	2020-21	2021-22	Total
WATER				
ACTUAL/FORECAST	51.6	48.9	42.5	
ALLOWANCE	42.0	42.3	43.4	
VARIANCE	9.6	6.7	-0.9	15.4
WASTEWATER				
ACTUAL/FORECAST	48.2	48.5	41.6	
ALLOWANCE	40.8	41.1	41.9	
VARIANCE	7.5	7.4	-0.3	14.5
STORMWATER				
ACTUAL/FORECAST	12.8	8.5	9.4	
ALLOWANCE	8.3	8.4	8.6	
VARIANCE	4.5	0.2	0.8	5.5
TOTAL				
ACTUAL/FORECAST	112.7	106.0	93.5	
ALLOWANCE	91.1	91.7	93.9	
VARIANCE	21.6	14.2	-0.4	35.4

Source: SIR

CCC's variance against allowance by category of opex

In **Table 10** we compare the variance between actual and CCC's estimate of IPART's allowed opex by opex category, for the two years where the variation is material: 2019-20 and 2020-21.

Table 10: CCC opex in the 2019-22 determination ($million, nominal)

	2019-20			2020-21		
	ACTUAL	ALLOWANCE	VARIATION	ACTUAL	ALLOWANCE	VARIATION
EMPLOYEE COSTS	39.2	33.0	*6.2*	37.2	33.8	*3.4*
CONSULTANTS	1.9	0.7	*1.2*	2.7	0.7	*2.0*
HIRE & CONTRACTS	8.3	10.7	*-2.4*	7.1	10.5	*-3.4*
MATERIALS	9.2	8.7	*0.5*	8.3	8.9	*-0.6*
ENERGY	8.9	11.0	*-2.0*	9.2	10.2	*-1.0*
CORPORATE OVERHEADS	28.9	20.2	*8.7*	28.3	20.6	*7.7*
PLANT AND FLEET	7.8	3.8	*3.9*	5.0	3.9	*1.0*
OTHER	8.5	3.1	*5.4*	8.1	3.2	*5.0*
TOTAL	**112.7**	**91.2**	***21.5***	**106.0**	**91.8**	***14.2***

Note: Minor differences between the total allowances between Table 2 and 3 are a result of CCC's rounding.

Source: CCC, SIR.

The main sources for the variation, and the explanation provided by CCC include:

- **Corporate overheads** – CCC submitted that in the financial years prior to 2019-20, corporate overheads allocated to the Water, Wastewater and Stormwater funds had been capped to the IPART corporate overhead allowance. This resulted in more corporate overheads being allocated to the General and Domestic Waste Funds. From 2019-20 the corporate overheads allocated to the Water, Sewer and Stormwater Drainage funds were not capped.
- **Employee (labour) costs** – CCC submitted that the increase in 2019-20 related to other areas of Council performing work on the Water and Sewer assets, increases in employee leave entitlements due to COVID impacts and uncapitalised labour.
- **Other (tipping fee) costs** – CCC submitted that the increase in the 'other' expenditure category relates to tipping fees which in 2019 moved from the Hire and Contracts expenditure category to the 'Other' category.
- **Plant and Fleet** – CCC submitted that their plant and fleet costs are efficient and disagree with IPART's previous decision that established the allowance.

Our assessment of these variances is provided below.

3.4.4 Our assessment of key variances compared to IPART's allowance

Corporate overheads

Corporate overhead are the costs incurred for shared services which support CCC's broader business. Corporate overheads cover several business units that provide shared services to CCC's Water, Wastewater and Stormwater business units. These include Office of the CEO, facilities and asset management, finance, governance and risk, IT, HR, Legal, communications, marketing and customer engagement, procurement, strategic planning etc.

CCC apportions corporate overheads to business units based on opex which includes depreciation as a proxy for the capital works program. There are separate cost centres to enable business units to manage the different services they provide, by accounting for the relevant levels of income and expenditure for the services provided.

Based on the services provided within a cost centre, they will be flagged either as an overhead cost centre or the cost centre will be an overhead receiver, using the following methodology:

- Overhead cost centres will either be a direct or corporate cost centre.
    - Direct overhead cost centres are generally used for capturing management costs, which are distributed to the services and products within that manager's responsibility.
    - Only cost centres which provide services to other Units of Council are considered to be corporate overheads.
        - Not all cost centres within a Unit may be considered to be a corporate overhead.
- Cost centres which are flagged as overhead receivers receive both direct and corporate overheads

CCC noted that in the financial years prior to 2019-20, corporate overheads allocated to Water, Wastewater and Stormwater business units were capped to the IPART corporate overhead allowance. This resulted in more corporate overheads being allocated to the General and Domestic Waste Funds. In 2019-20 the corporate overheads allocated to Water, Wastewater and Stormwater was not capped and equates to around 29.8% of corporate overheads.[20]

We note that another key driver is the increase in total overheads across CCC's broader operations. CCC reported that in 2017-18 total corporate overheads (across all of Council) were around $57m, increasing to around $96m in 2019-20. Key drivers for this increase include CCC's Finance, Information & Technology and Facilities & Asset Management functions. This substantial increase in total overheads has increased the overheads allocated to CCC's Water, Wastewater and Stormwater business units.

While CCC provided information to explain the increase in total overheads, we have not been able to form a firm view on the overall efficiency of this. However, we note that CCC's corporate overheads allocated to Water, Wastewater and Stormwater in the 2019-22 determination are not too dissimilar to levels reported in the 2013-19 determination period. At this time, it was observed that corporate overheads were on a downward trend.[21] We consider that allocation of overheads on the basis of opex is reasonable, however an activity-based costing approach may be more cost-reflective.

[20] CCC, Corporate Overheads paper, June 2021, p 5.

[21] Atkins Cardno, Central Coast Council Expenditure Review Final Report, March 2019, p 61.

As discussed in the following section, our approach to recommending efficient opex applies top-down analysis to establish an efficient 'base' level of expenditure. This means that we do not rely on establishing an efficient level of historical expenditure for individual cost categories such as corporate overheads. However, if such an approach was to be applied, we would need further information to reconcile of total corporate overheads and those allocated to Water, Wastewater and Stormwater to establish an efficient base level of expenditure.

Employee costs

Employee costs are the costs associated with employees who are paid by CCC and on the payroll. It includes costs associated with salaries and wages, overtime, backpay, leave, payroll tax, superannuation and other oncosts. Total employee costs are a function of the number of employees (or FTEs) as well as their rates of pay (including salaries and wages, overtime and other oncosts).

CCC advised that there was there was no significant increase in FTEs in 2019-20. It attributed the variances in employee costs in 2019-20 to:

- other areas of CCC performing work on the Water and Sewer assets
- an increase in ELEs (employee leave entitlements) due to COVID impacts, and
- an increase in uncapitalised labour due to an adjustment for incorrect cost codes.

Employee costs in 2020-21 were impacted by the CCC's financial concerns and external factors. It attributed the variances to:

- Labour costs which have gone down due to the redundancies. There was a reduction of 58 FTEs through voluntary redundancies.
- Oncosts which have gone up and are over the IPART allowance due to an increase in employee Leave entitlements (ELE's) due to COVID-19 and accounting for redundancy payments.

We benchmarked a sample of CCC's wages and salaries to industry standards. This analysis showed that CCC's rates of pay were not out of line with industry standards. However, the number and mix of FTEs has been impacted by CCC's financial concerns and is likely to have had consequences for the levels of service provided by CCC.

As noted for corporate overheads, our approach to recommending efficient opex applies top-down analysis to establish an efficient 'base' level of expenditure. This means that we do not rely on establishing an efficient level of historical expenditure for individual cost categories such as employee costs. However, if such an approach was to be applied, we would expect that further information would need to be provided by CCC to demonstrate an efficient base level of expenditure.

Other (tipping) fees

As noted above, CCC submitted that the increase in the 'other' expenditure category relates to tipping fees which in 2019 moved from the Hire and Contracts expenditure category to the 'Other' category. Although not totally offsetting the increase in 'Other' expenditure, we note there is some offsetting (reduction) in Hire & Contract costs.

Plant & Fleet

CCC has a separate plant and fleet business that is responsible for providing and maintaining all council vehicles. Plant and fleet expenditure is charged to individual business units (such as water, wastewater and stormwater) based on vehicle use.

In its submission to the 2019 determination, CCC forecast that the plant and fleet costs would increase from 2018 because of the council amalgamation and alignment process. IPART's consultants did not consider that the centralised management of plant and fleet across CCC was prudent and commented that it was inefficient.

CCC has maintained its approach to the centralised management of plant and fleet and allocation of costs to individual business units. It submitted that its plant and fleet costs were efficient and maintain that its costs are prudent. It considered that having each of these services delivered by a single business unit under its own funding model, ensures that CCC can optimise economies of scale (where it can procure strategically, with visibility into the needs of multiple other units), remove task and responsibility duplication (same job done by multiple departments) and ensure standardised practices and processes in line with industry norms.

We sought further information from CCC on its plant and fleet costs. CCC provided information that showed many of its plant and fleet vehicles rates had declined between 2019-20 and 2020-21. CCC also advised that it had implemented several initiatives to reduce its fleet costs including:

- standardising/reducing brands and models to improve purchasing leverage and reduce maintenance, repair and administration costs
- improving reporting with GPS to identify assets with low utilisation and assist managers to make more informed decisions on what they request from plant and fleet.
- moving from permanent hire to pool hire to reduce costs to the business units hiring plant items.

However, we would need further information to establish an efficient base level of expenditure for plant and fleet costs.

3.4.5 Conclusion on opex in the 2019-22 determination period

CCC's opex in the 2019-22 determination period has been variable and the final year has been affected by the CCC's financial concerns revealed in late 2020. In the first two years CCC's opex has exceeded IPART's allowance. Based on our discussions with, and information provided by, CCC it has been challenging for us to form a view on whether these individual variances are justified.

However, when we consider the overall level of CCC's opex during the first two years of the determination period, our assessment is that this level of expenditure is reasonable. Related to this is our view that the opex allowances in the 2019-22 period, while set on a reasonable basis given information available at the time, are likely below a sustainable level for CCC to appropriately maintain assets in the long-term interest of customers. This view is based on our forward-looking assessment of efficient opex discussed in the next section.

3.5 Opex in the 2022-26 determination period

3.5.1 CCC's proposal

CCC has proposed 2019-20 as the most appropriate year to establish its base expenditure. As noted above, opex in the 2020-21 financial year expenditure is significantly affected by CCC's financial concerns. To establish base year expenditure CCC made several adjustments to its actual opex in 2019-20, including reductions for labour hire, overtime and uncontrollable events including relating to bushfires and flooding.

After establishing the base expenditure, CCC undertook a review of opex requirements over the 2022 determination period. Recognising a reduction in operational service delivery over the past six years, CCC has proposed additional opex (step changes) over the 2022-26 determination to:

- improve its maintenance regime (including implementing a transition strategy to improve proactive maintenance, increasing mains cleaning, increasing sewer inspections and maintenance and introducing a Sewer Treatment Plant improvement program),
- improve Asset Management and Inspection programs,
- undertake critical asset inspections, cleaning and repair to inform forward planning, manage risk, reduce reactive maintenance requirements and prevent catastrophic asset failure,
- improve bushfire management practices,
- ensure new standards for dam safety are met,
- re-introduce floodplain risk and stormwater quality management,
- reduce regulatory/licence breaches, and
- address an increase in lost time injuries.[22]

CCC's justification for the above increases in opex are set out in around 30 business cases.

As shown in **Table 11**, the CCC's proposed step changes significantly increase its total opex over and above the base year. CCC are forecasting a 19% increase (or around $20.2m) in total opex in 2022-23, compared to the base year. CCC's proposed total opex is $524.6m over the four-year determination period.

Table 11: CCC's proposed opex for the 2022 determination period ($million, $2021-22)

	CCC Base Year	2022-23	2023-24	2024-25	2025-26	Total
WATER	48.8	55.9	57.2	61.7	60.1	234.9
WASTEWATER	44.8	53.2	56.1	56.5	55.4	221.1
STORMWATER	12.4	17.1	17.2	17.1	17.2	68.6
TOTAL	**106.0**	**126.2**	**130.5**	**135.3**	**132.7**	**524.6**

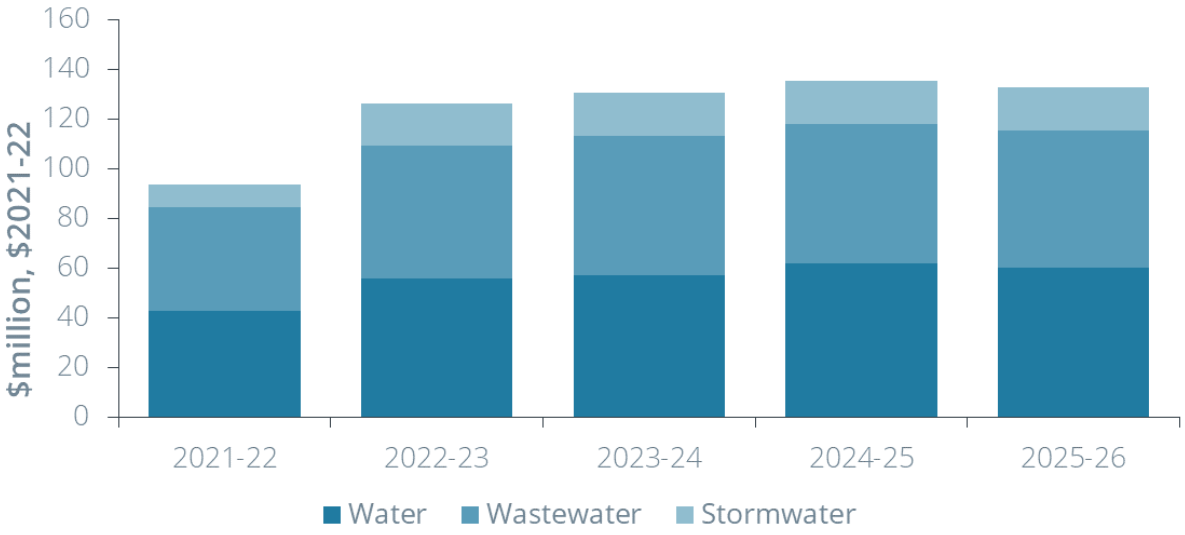
Source: CCC SIR

As discussed in more detail in **Appendix C**, part of the increase in stormwater opex is driven by CCC's proposed 'fund charge', which refers to the CCC's proposal to move services that have historically been funded through other mechanisms (such as general rates and grants), into the remit of the Stormwater Drainage Charge (i.e. a broadening of the stormwater service definition, rather than an increased cost of providing the same services).

22 CCC, Pricing Proposal to IPART, September 2021, p 74; CCC, Pricing Proposal to IPART, September 2021, Technical Paper No. 5, pp 59-61.

In **Figure 24** we compare CCC's proposed opex over the 2022 determination period with its forecast actual opex in 2021-22. CCC's forecast total opex of $126.2 in 2022-23 represents a 35% increase in total opex compared to the final year of the 2019 determination (2021-22). As indicated in the figure, Water, Wastewater and Stormwater functions all contribute to this increase.

Figure 24: CCC's proposed opex over the 2022 determination period



Source: CCC, SIR

Table 12 summarises CCC's actual and proposed opex by opex category to show which categories are driving the proposed increase.

Table 12: CCC's actual and forecast opex by opex category ($million, $2021-22)

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
EMPLOYEE COSTS	41.5	38.0	29.2	43.1	45.9	46.3	46.3
CONSULTANTS	2.0	2.8	1.1	6.7	5.7	8.0	6.1
HIRE & CONTRACTS	8.8	7.2	7.7	16.0	18.0	19.1	18.5
MATERIALS	9.7	8.5	7.3	10.3	10.5	11.1	11.1
ENERGY	9.5	9.4	9.0	9.3	9.3	9.3	9.3
CORPORATE OVERHEADS	30.6	28.9	23.6	25.0	25.0	25.0	25.0
PLANT & FLEET	8.2	5.1	8.2	5.7	5.7	5.7	5.7
OTHER	8.9	8.3	7.5	9.9	10.2	10.7	10.5
TOTAL	**119.3**	**108.1**	**93.6**	**126.1**	**130.4**	**135.1**	**132.6**

Source: CCC SIR

The table above shows that the key drivers of the increase in total opex are:

- **Employee (labour) costs** – CCC forecasts that over the 2022 determination period FTEs will increase by 79, rising to 88.5 in 2025-26. The FTEs are to support various aspects of CCC's transition strategy to improve asset maintenance to a more proactive approach.
- **Consultants** – similar to employee costs, the proposed increase in consultant costs is to support CCC's transition strategy, changes required to satisfy regulatory obligations and maintain service standards.
- **Hire & contracts** - similar to employee costs, the proposed increase in hire and contractor costs is to support CCC's transition strategy, changes required to satisfy regulatory obligations and maintain service standards. Contractors are proposed to support workplace health and safety, sewage treatment plant improvements, catchment management and water resilience and community engagement.
- **Materials** – CCC forecasts increased maintenance expenditure to improved asset maintenance, Mardi Water Treatment Plant improvements and water resilience.
- **Other** – CCC forecasts increased costs associated with removing sludge in CCC's proposed Sewage Treatment Plant improvement program.

3.5.2 Assessment of efficient opex

Base expenditure

As opex is largely recurrent and predictable, assessing opex normally involves examining the actual opex from a recent year in the determination period (the base year). For two key reasons, we consider that using a recent year of CCC's actual expenditure is not the preferred approach to determine base expenditure for this expenditure review.

Firstly, CCC's actual opex has been quite variable in recent years, affected by significant factors including the merger of the former Gosford and Wyong Councils and the CCC's financial concerns. We consider that the variability in CCC's recent opex means there is a risk that using a recent year of actual opex might not provide a reliable estimate of CCC's efficient recurrent opex.

Secondly, our assessment is that most (around 95%) of CCC's proposed 'step changes' are for expenditure to meet *existing* obligations including appropriate maintenance of assets.[23] This suggests that CCC's proposed base expenditure may be insufficient to efficiently meet its existing obligations and service standards.

We consider there is value is taking a 'step back' from the CCC's actual and proposed opex and assess what an efficient and sustainable level of opex should be for CCC. To do this we have used the top-down approaches outlined in section 3.1.3. We developed a range for base opex over the 2022-26 determination period:

- The midpoint of the range reflects our central estimate of CCC's efficient base year opex, derived from our economic benchmarking (based on a water utility with a 75% efficiency score – ie, at the upper quartile of benchmarked utilities)
- The upper and lower bounds of the range reflect a 95 percent confidence interval around the midpoint (i.e. by adding/subtracting two standard errors from the midpoint)
- The 2013-14 opex roll-forward approach came in marginally below the midpoint of the range and provides a useful cross-check on our benchmarking results.

The results of our analysis are provided in **Table 13**, with the full breakdown of costs by service for the above selected points within the range. The overall range for efficient base opex is relatively wide, from a lower bound of around $94m pa to an upper bound of almost $140m pa. The relatively wide range reflects the statistical uncertainty in our estimation, as discussed in **Appendix B**.

While in principle IPART might adopt efficient base expenditure anywhere within this range, we recommend the midpoint of the benchmarking range. This would provide a sustainable increase in the opex allowance for CCC and is near the 2013-14 allowance rolled-forward. We do not recommend the upper or lower bounds.

[23] See Appendix A for more details of our assessment of individual business cases for step changes. These include the costs of stormwater management activities that CCC proposed to transfer from other parts of council to its stormwater service costs to be recovered from customers under IPART's determination.

Table 13: Recommended efficient base operating expenditure, $2021-22)

	2022-23	2023-24	2024-25	2025-26	Total
LOWER BOUND					
WATER	47.7	47.9	48.1	48.3	192.0
WASTEWATER	38.2	38.3	38.4	38.5	153.2
STORMWATER	8.4	8.5	8.5	8.5	33.9
TOTAL	**94.3**	**94.6**	**95.0**	**95.3**	**379.2**
2013-14 ROLL FORWARD					
WATER	56.2	56.4	56.7	56.9	226.2
WASTEWATER	42.8	42.9	43.0	43.1	171.9
STORMWATER	9.7	9.8	9.8	9.8	39.1
TOTAL	**108.7**	**109.1**	**109.5**	**109.9**	**437.3**
MIDPOINT					
WATER	57.1	57.4	57.6	57.9	230.0
WASTEWATER	49.0	49.2	49.3	49.4	196.9
STORMWATER	10.4	10.5	10.5	10.5	42.0
TOTAL	**116.6**	**117.0**	**117.4**	**117.8**	**468.9**
UPPER BOUND					
WATER	66.6	66.9	67.1	67.4	268.0
WASTEWATER	59.9	60.1	60.2	60.4	240.7
STORMWATER	12.4	12.5	12.5	12.6	50.0
TOTAL	**139.0**	**139.4**	**139.9**	**140.4**	**558.7**

Source: Frontier Economics

The lower bound of the range is close to IPART's existing opex allowance. We consider it likely that this level of opex is not sustainable for CCC to meet its ongoing service standards and obligations. As discussed in section 3.4.1, IPART's existing opex allowance was set following a

period where CCC had been underspending against the IPART opex allowance. At the time of IPART's 2019 determination, it was not evident this had impacted service standards, however it is now clear that this level of expenditure has not supported appropriate asset management and maintenance practices and has negatively impacted asset performance. An example of this is the reactive maintenance regime that has been applied to wastewater treatment plants which has resulted in a build-up of solids (grit, rags, etc) that have affected plant performance and compromised downstream processing. As a result of these poor maintenance practices, several plants are unable to perform at design capacity leading to increased energy demand, and increased maintenance and repairs. This has also resulted in reduced quality of the final effluent and discharge volumes above licence limits with a negative impact on the environment.

The upper bound of the range is above CCC's proposed opex for the 2022-26 determination (including both base, step and fund changes). We do not recommend setting base opex at or above CCC's proposed opex as we have identified several reasons why CCC's proposed opex is overstated, including instances of:

- double-counting expenditure (CCC's proposed a step change of $10.0 million for customer communication and water resilience for the 2022 determination period. This included $4.7 million of costs that were already included in its base year),
- broadening the stormwater service definition (e.g. including expenditure associated with services that have historically been funded through other funding mechanisms) - IPART has asked us to consider the costs based on activities currently included in the stormwater charge, and
- not reflecting trade-offs in forecast opex (notably, while there are proposed increases in opex including FTEs to shift from a reactive to a proactive maintenance regime, we would expect corresponding decreases in FTEs that are currently focussed on reactive maintenance and decreases in overtime costs which were not evidence in CCC's forecasts).

Efficient step changes

As noted above, the majority of the step changes proposed by CCC are for expenditure that we consider reflects existing obligations. This should be considered as part of base expenditure and to include this as a step change would result in double counting (as the allowance for undertaking these activities or achieving these outcomes would be implicitly included in the allowance derived from benchmarking analysis).

However, we consider that there are four genuine step changes that reflect new regulatory requirements or emerging risks for CCC. These include:

- Addressing changes resulting from the implementation of the *Security of Critical Infrastructure Act 2018*
- Enhancing bushfire resilience
- Meeting new requirements for dam safety (both for water and stormwater dams).

A summary of our assessment of these step changes is provided in **Table 14** below. Our assessment of the entire suite of step change business cases is provided in **Appendix A.**

Table 14: Assessment of step changes

Step Change	Summary	Assessment
SOCI ACT	CCC is proposing additional expenditure to implement changes resulting from the implementation of the *Security of Critical Infrastructure Act 2018* (SOCI Act)	We consider that additional opex to comply with the SOCI Act is a genuine step change. Our assessment is that CCC's justification and proposed additional employee costs are reasonable, when benchmarked against proposals from other water utilities. We allocated 50% each to water and wastewater.
BUSHFIRE MANAGEMENT	CCC is proposing a step change to develop an overarching Bushfire Management Plan, develop Bushfire Hazard Reduction Plans for critical water and wastewater assets, improve management of Bushfire Management Zones and Fire Trails to align with good practice, and implement developed plans, policies and strategies to mitigate bush fire risk to assets and drinking water catchments.	Our assessment is that some of this proposed expenditure should be included in base expenditure. This is because most of the regulatory requirements cited in the business case appear to be existing requirements (eg, Rural Fires Act1997). We recommend 50% of CCC's proposed step change expenditure, as the 2020 Final Report on the NSW Bushfire Inquiry includes some recommendations (18 and 29) which represent a step change. We allocated 50% each to water and wastewater.
DAM SAFETY – WATER	CCC is proposing a step change to ensure compliance with new regulation and payment of levies to the new regulator. The new regulatory requirements result from the Dams Safety Act 2015 and Dams Safety Regulation 2019, as well as establishment of a new regulator, Dams Safety NSW.	Our assessment is that this is a genuine step, based on new regulatory requirements that apply to CCC. We consider CCC's proposed expenditure is reasonable, including a dedicated dam engineer who drives continuous improvement and efficiencies. We allocated 100% to water.
DAM SAFETY - STORMWATER	CCC is proposing to develop and maintain a Dam Safety Management System and the additional legislative documentation to meet the new requirements of Dams Safety NSW. This includes costs for data telemetry, O&M manuals, dam safety emergency plans, annual reports, and annual levies.	Our assessment is that this is a genuine step, based on new regulatory requirements that apply to CCC. We consider that CCC's proposed consultant expenditure to address the additional regulatory requirements is reasonable. We allocated 100% to stormwater.

Source: Frontier Economics, CCC business cases.

Our recommended step changes are summarised in **Table 15** below. In this table we present our assessment of CCC's 'genuine' step changes (i.e. a subset of CCC's proposed step changes).

Table 15: Recommended efficient step changes ($million, $2021-22)

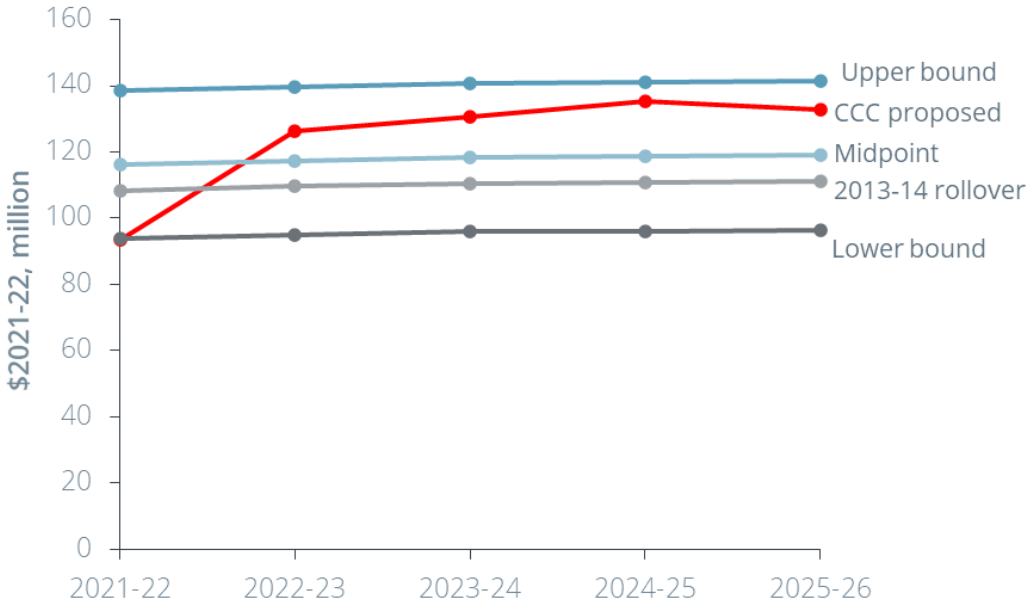
		2022-23	2023-24	2024-25	2025-26	Total
SOCI ACT	CCC proposed	$0.15	$0.85	$0.80	$0.74	$2.53
	Recommended – Water	$0.07	$0.42	$0.39	$0.36	$1.24
	Recommended - Wastewater	$0.07	$0.42	$0.39	$0.36	$1.24
	Variance	-	-	-	-	-
BUSHFIRE MANAGEMENT	CCC proposed	$0.63	$0.63	$0.31	$0.31	$1.88
	Recommended – Water	$0.16	$0.16	$0.07	$0.08	$0.46
	Recommended - Wastewater	$0.16	$0.16	$0.07	$0.08	$0.46
	Variance	$0.32	$0.32	$0.16	$0.16	$0.95
DAM SAFETY – WATER	CCC proposed	$0.29	$0.22	$0.21	$0.23	$0.96
	Recommended	$0.29	$0.22	$0.21	$0.23	$0.93
	Variance	-	-	-	-	-
DAM SAFETY - STORMWATER	CCC proposed	$0.06	$0.06	$0.06	$0.11	$0.27
	Recommended	$0.05	$0.05	$0.05	$0.10	$0.26
	Variance	-	-	-	-	-
TOTAL	CCC proposed	$1.12	$1.76	$1.37	$1.38	$5.64
	Recommended	$0.80	$1.43	$1.19	$1.19	$4.62
	Variance	$0.32	$0.34	$0.18	$0.19	$1.02

Note: Numbers may not add due to rounding
Source: CCC SIR, Frontier Economics

3.5.3 Recommended efficient opex

Our recommended range for efficient opex is provided in **Figure 25** below.

Figure 25: Recommended range for efficient opex ($2021-22)



Source: Frontier Economics, CCC

We recommend that IPART set its opex allowance for the 2022-26 determination based on the midpoint of our range. The midpoint reflects our best estimate of the efficient opex costs for CCC based on our benchmarking analysis and is based on the costs for a reasonably efficient water utility.

Table 16 summarises efficient opex based on the midpoint of our range, with our trend adjustments incorporated into base expenditure and step changes.

Our recommended total efficient opex represents around a 10% reduction to the total opex proposed by CCC over the 2022-26 determination period, but a 24% increase relative to the average allowance from the 2019 determination.

As noted above, there are several reasons why we consider CCC's proposal is overstated, including double-counting expenditure and some proposed stormwater expenditure being recovered through general rates. When these two adjustments are made to CCC's proposed opex, our recommended efficient opex would be around 6% lower.

Furthermore, we observed numerous instances where CCC's proposed expenditure did not incorporate efficiencies. For example, proposed increases in proactive maintenance expenditure were not accompanied by reductions in reactive maintenance costs, including staff overtime. When the potential for these efficiencies and the adjustments noted above are taken into account, we consider our recommended efficient opex based on the midpoint of the benchmarking range reflects a realistic target for CCC.

Table 16: Recommended efficient opex – midpoint of range ($2021-22, $m)

	2022-23	2023-24	2024-25	2025-26	Total
BASE – WATER	57.1	57.4	57.6	57.9	230.0
STEP CHANGE - WATER	0.5	0.8	0.7	0.7	2.6
SUBTOTAL - WATER	**57.7**	**58.2**	**58.3**	**58.5**	**232.6**
BASE – WASTEWATER	49.0	49.2	49.3	49.4	196.9
STEP CHANGE - WASTEWATER	0.2	0.6	0.5	0.4	1.7
SUBTOTAL – WASTEWATER	**49.3**	**49.7**	**49.8**	**49.9**	**198.6**
BASE – STORMWATER	10.4	10.5	10.5	10.5	42.0
STEP CHANGE - STORMWATER	0.1	0.1	0.1	0.1	0.3
SUBSTOTAL – STORMWATER	**10.5**	**10.5**	**10.6**	**10.6**	**42.2**
TOTAL EFFICIENT OPEX	**117.4**	**118.5**	**118.6**	**119.0**	**473.5**
CCC PROPOSED	126.2	130.5	135.3	132.7	524.6
DIFFERENCE ($)	-8.8	-12.0	-16.6	-13.7	-51.1
DIFFERENCE (%)	-7.0%	-9.2%	-12.3%	-10.3%	-9.7%

Note: Total efficient opex incorporates trend component, numbers may not add due to rounding.

Source: CCC SIR, Frontier Economics

3.6 Conclusions

In recent times CCC's opex has been affected by significant events including the merger of the former Gosford & Wyong Councils, a period of underspending against the IPART allowance and more recently CCC's financial concerns. We consider that actual opex has not consistently been at a sustainable level over this period, and we are now seeing negative impacts of this on service and performance. Expenditure that is below a sustainable level will result in higher costs and poorer service outcomes over the longer term, which is not in the long-term interest of customers.

In this context we have taken a different approach to recommend efficient opex over the 2022-26 determination period. We have relied heavily on top-down approaches including economic benchmarking to form a view on opex for a reasonably efficient water utility serving the Central Coast.

We have reviewed all aspects of CCC's proposed opex, including its proposed base expenditure and step changes. However, as a consequence of our top-down approach we have not needed to form views on individual elements of CCC's proposal, like the number of FTE employees, or proposed increases in corporate overheads. Our approach has focussed on an overall 'envelope' of opex that ensures customer only pay for efficient costs. It is up to CCC to decide how on how to allocate expenditure to different opex categories within this overall envelope.

We recognise that there are limitations associated with economic benchmarking, including not having data to account for different service outcomes, or environmental factors. However, we have undertaken several steps to help mitigate these limitations:

- We have not based our estimated efficient costs on the most efficient utility, but instead a 'reasonably efficient' utility.
- We have cross-checked our benchmarking analysis with rolled forward costs from 2013-14, with our recommended efficient opex being around 7% higher.
- We have provided a range of efficient costs from which IPART can exercise its judgement.

Given our recommendation on efficient opex derived from benchmarking of water utilities in the top quartile of efficiency score, it can be interpreted as 'reasonably efficient' costs for an established water utility with appropriate governance arrangements, business systems and processes in place.

We have not specifically allowed additional opex for any 'catch-up' expenditure for CCC to rectify past performance issues or additional opex to implement improved systems and processes or to transition to an alternative governance model.

We are mindful that a key driver for catch up expenditure in the 2022-26 determination is CCC historically underspending against the IPART allowance. This underspend amounted to around $60m between 2014-15 and 2018-19, with around $36m in overspend expected in the 2019 determination period.[24] This means customers have paid for some services that were not provided, or not provided to an appropriate standard, and CCC's proposal is asking customers to pay for this again.

Importantly, our recommended efficient capex discussed in the next section allows some scope for CCC to improve its asset management systems and processes.

[24] Based on data reported in the AIR/SIR.

4 Capital expenditure

4.1 Methodology

We undertook the following steps in making our assessment of CCC's capital expenditure:

- Desktop review of information provided by CCC including AIR/SIR and documentation relating to individual projects or programs
- Selection of a sample of projects for past and future for review
- Interviews with key CCC staff to discuss key issues in relation to the capital projects selected review and the broader capital program
- Provided an assessment on the efficiency of the CCC capex program based on the information provided and drawing on our professional experience and judgement.

4.1.1 Past capex (FY2019-22 determination period)

For past capex we compared CCC's actual capital expenditure over the 2019 determination period to the allowances set by IPART at the 2019 determination to identify the key areas of difference.

We then targeted our sample review to projects where:

- CCC has significantly overspent its allowed capital expenditure,
- significant capital expenditure has been repeatedly deferred and reproposed, and
- there is evidence of underperformance, such as service targets or mandatory requirements not being met.

4.1.2 Forecast capex (2022-26 determination period)

We agreed with IPART a selection of 10 capex projects to review in detail. In assessing each of the projects we considered whether the project:

- is appropriate in relation to key drivers and obligations (imposed by regulators and or customer service expectations)
- is consistent with CCC's longer-term expenditure and strategic plans
- is supported by appropriate credible option and cost benefit analysis, which outlines the outcomes it will achieve and why it is the preferred approach
- is consistent with good industry practice asset management, which appropriately considers risk, asset condition and system-wide needs
- is deliverable by CCC and or its contractors within the proposed timeframe, taking into CCC's performance and approach to capital delivery
- reflect efficient project costs, considering comparable or benchmark industry rates.

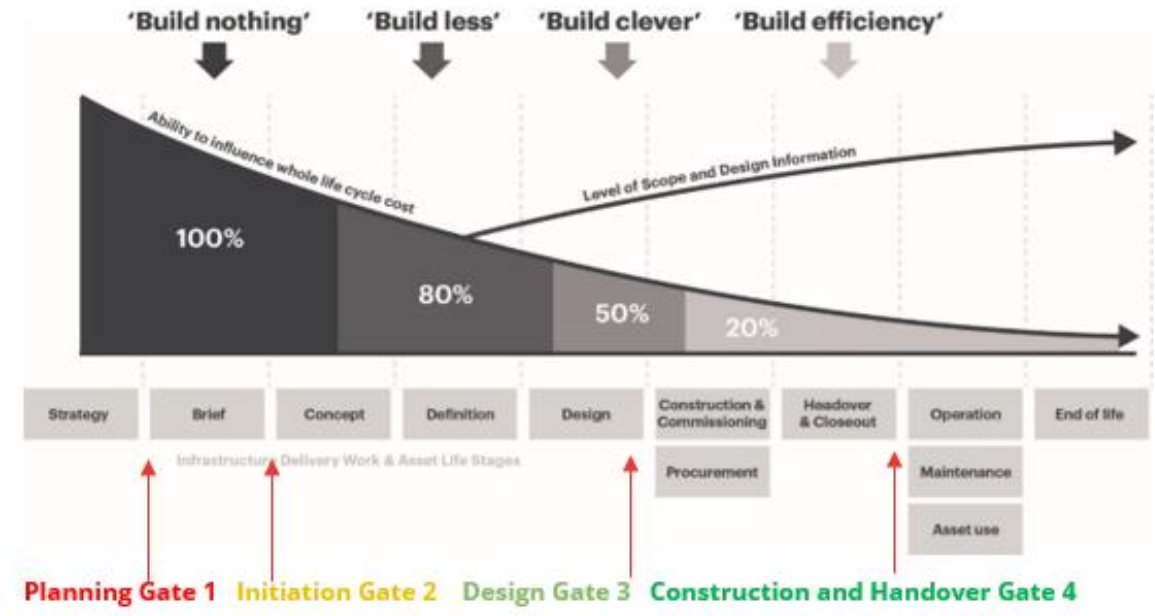
Our approach to the assessment of capex efficiencies has been to review the status of the project and the history of the gateways it is has passed. **Figure 26** below illustrates that potential efficiency opportunity through the project lifecycle and the relevant Central Coast gateways below.

At each stage we review whether the project has demonstrated

- Is the project needed?
- Is the project efficient – best option?
- Is the project efficient – least cost?

We have also assessed options for driving efficiency through the project reduces as the project progresses through the gateways. For example, if we are reviewing a project at Gateway 1 or 2, we will consider whether there may be more opportunity for efficiency based on the evidence of the options analysis compared to a project at Gateway 3 where procurement is imminent, and the history of gateway approvals is robust.

Figure 26: Central Coast Council gateways



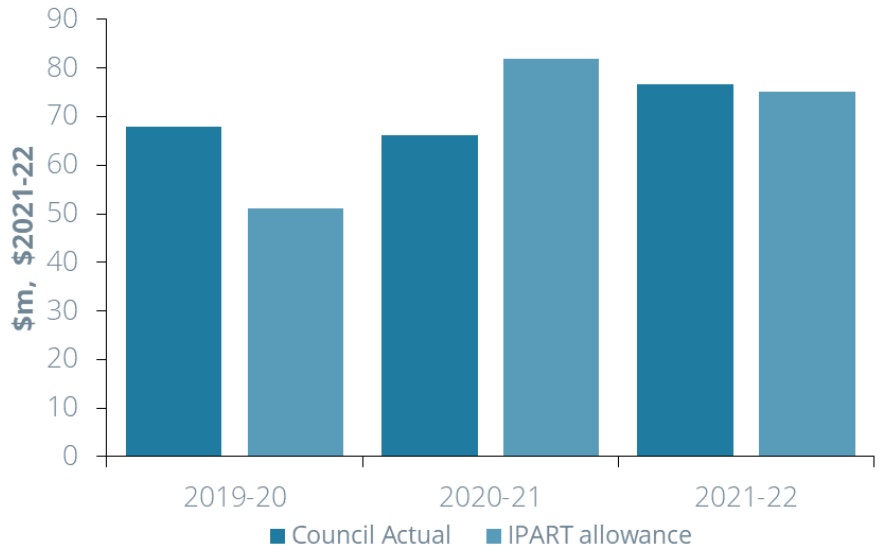
Source: Central Coast Council

4.2 Summary of past and proposed capex

CCC has proposed spending $205.6 million (nominal) during the FY2019-2022 determination period which is approximately $1.88 million (0.9%) more than that approved by IPART. The variation between actual capex and IPART approved capex is largely related to the bringing forward of $45.5m for the delivery of the Mardi to Warnervale pipeline within the 2019 determination period as opposed to 2022 determination period.

In addition, the subsequent reorganisation of other parts of the capital program (particularly stormwater) have resulted in a changed expenditure profile, over that set out in the 2019 determination as noted in **Figure 27** below.

Figure 27: CCC capital expenditure for 2019 determination ($2021-22, $m)



Source: AIR SIR 2019-20 Unprotected May 2021 Update 2

CCC capex by service for the 2019 determination period compared to IPART's approved expenditure is shown in **Table 17** below.

The information provided by CCC shows that the main reasons for the expenditure profile over the 2019 period is due to:

- Bringing forward the expenditure related to the Mardi to Warnervale pipeline.
- A reduction in sewer and stormwater expenditure in 2020-21 due to requirements to reduce CCC's overall expenditure, including water/sewer/stormwater drainage capital expenditure. This typically impacted projects that had not yet proceeded to contract award or transitioned from the design to construction phases.
- An increase in forecast sewer and stormwater drainage expenditure in 2021-22 to recover previous program slippages because of the reductions through 2020-21.

Table 17: CCC actual vs IPART allowance ($m, nominal)

	2019-20 Actual	2020-21 Actual	2021-22 Projection	Total
CCC WATER EXPENDITURE	32.0	41.5	29.5	102.9
IPART ALLOWANCE	14.1	44.0	38.5	96.7
VARIATION	17.9	-2.6	-9.0	6.3
%	56%	-6%	-31%	6.1%
CCC WASTEWATER EXPENDITURE	22.48	17.17	35.87	75.52
IPART ALLOWANCE	24.37	26.31	27.58	78.26
VARIATION	-1.88	-9.15	8.23	-2.74
%	-8%	-35%	30%	-3.50%
CCC STORMWATER EXPENDITURE	9.60	6.15	11.38	27.13
IPART ALLOWANCE	9.75	9.90	9.15	28.80
VARIATION	-0.15	-3.75	2.23	-1.67
%	-2%	-61%	20%	-6.14%
TOTAL EXPENDITURE	64.04	64.80	76.74	205.58
IPART ALLOWANCE	48.22	80.26	75.22	203.70
VARIATION	15.82	-15.46	2.16	1.88
%	25%	-24%	2%	0.91%

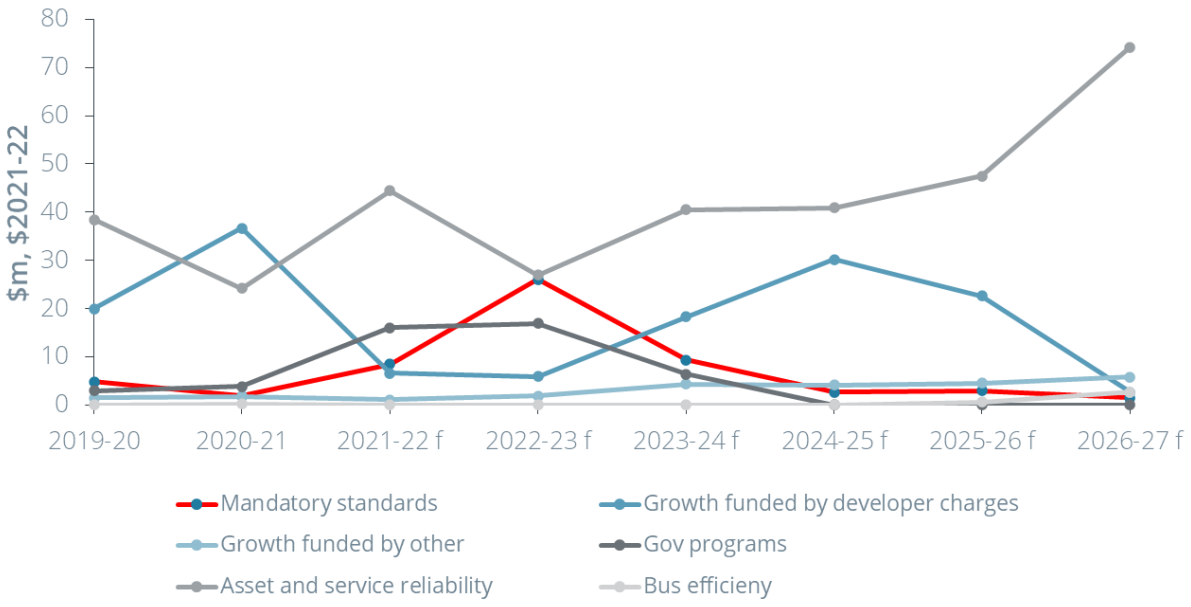
Note: IPART allowances have been revised for updated CPI as advised by IPART.
Source: AIR SIR 2019-20 Unprotected May 2021 Update 2 adjusted for updated CPI data provided by IPART.

IPART classifies investment drivers for CCC as follows:

1. Growth – new customers or increased requirements
2. Mandatory standards – both existing and cost of compliance for new standards
3. Business efficiency – to drive opex savings
4. Asset and service reliability – increase reliability
5. Discretionary standards – spending for which the decisions are under CCC control and for discretionary purposes
6. Government programs – driven by Government requirements

Figure 28 shows the actual and forecast capex by the relevant drivers. The most significant driver is the asset and reliability driver (approximately 48%) followed by growth funded by developer charges (approximately 24%) and government programs (approximately 13%).

Figure 28: CCC capex by driver actual and forecast ($2021-22, $m)



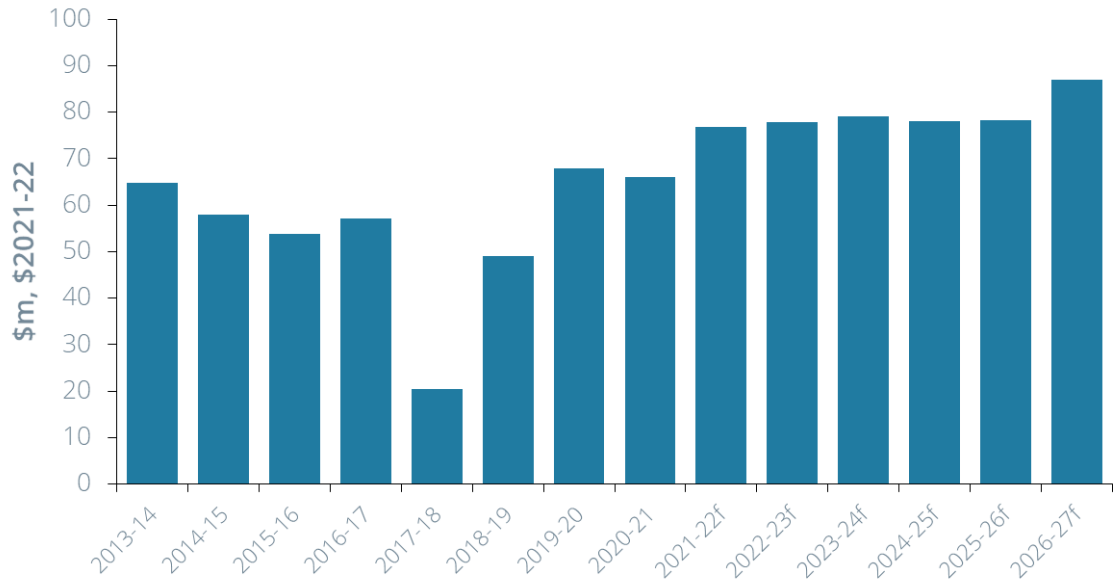
Source: AIR SIR 2019-20 Unprotected May 2021 Update 2

CCC noted that the expenditure on asset and service reliability fall sharply (between 2021-22) and then increases again in the future years largely due to uncertainty on funding allocations and the pressure to reduce spend within CCC to meet IPART expectations. As a result of this the water, sewer and stormwater drainage businesses have imposed an annual capital expenditure limit.

This has seen the need to defer projects to later in the 2022 determination and into subsequent determinations. CCC acknowledges that asset condition and risk will fluctuate over the determination period which will require annual reprioritisation and a likely increase in reactive and emergency renewals for failing assets.

CCC's forecast capex for the 2022 determination period is shown in **Figure 29** below.

Figure 29: CCC actual and forecast capex ($2021-22, $m)



Source: AIR SIR 2019-20 Unprotected May 2021 Update 2

As highlighted above, there is a 14% increase in the average annual capex in the 2022 determination compared to the 2019 determination. This is made up of $116m on water assets, $160m on sewer assets and $36m on stormwater assets. The forecast capex is inclusive of a portion of projects that were required to be deferred from the forecast 2019 determination period due to financial constraints faced by CCC in the FY2019-22 determination period.

The largest capital projects proposed by CCC include:

- Mardi Water Treatment Plant upgrade, to address water quality risks and treatment plant capacity, at a total cost of $33.6 million.
- Wastewater infrastructure projects in the Gosford CBD to address growth, at a cost of $17.3 million.
- Water mains renewals, to address water main breaks, at a cost of $15.8 million.
- Wastewater treatment plant upgrades (Charmhaven, Bateau Bay and Gwandalan), to manage ongoing growth, at a total cost of about $35.1 million.

4.3 Historical capex review (including detailed projects)

One key change in the 2019-22 determination period compared to IPART's approved expenditure for that period was the acceleration of the Mardi to Warnervale pipeline which was delivered in three years between 2019-20 and 2021-21rather than over the 5 years between 2019-20 and 2023-24. The project was delivered at a cost of $45.8 million against that budgeted of $59.5 million.

The principal reasons for this acceleration include:

- A more streamlined direct project team compared to that originally envisaged minimising consultant's costs, dual roles for team members and single point design consultant through-out construction phase, resulting in savings of approximately $2.9 million

- A project specific procurement strategy was prepared which identified key delivery characteristics of this project that allowed the preferred tenderer engaged on schedule
- Savings of approximately $3.9 million realised from contract contingency estimate
- Savings of approximately $4.7 million contingency allocation delegated to Project Control Group at Tender Award
- The increase in availability of staff with the appropriate skills, because of the delay of other major capital projects (such as Mardi WTP upgrade)

In the 2019 determination IPART raised concerns regarding the delivery timing of the Review of Environmental Factors (REF), and that timely onboarding of resources would impact on the delivery of the project within the timeframe identified in the Business Case.

In response to these concerns, CCC notes that:

1. A dedicated project team with the skills and experience to deliver a project of this size was employed. They used a variety of different sources to ensure they got the right recruits.
2. The REF documentation only needed updating, which required significantly less time than a full revision.

4.3.1 Our analysis

In our assessment of the historic capex for this project, based on limited project detail made available to us, we consider:

- The Gate 2 Business Case budget for the construction contract of $39.5m is generous for the scope of works allowing for inherent efficiency when bid in a competitive tender environment. We consider this on the basis of assessment when benchmarking the comparative rates per mere against other projects. This project is principally 9km of DN750 within a rural area, with two significant crossings. We would expect a metre rate for this installation to be in the order of $1500-2500 when compared against wider industry benchmarks. The cost for this project as delivered is more in the order of $4000 / metre which we do not consider efficient.
- The tender assessment of only two quotations prohibits reasonable market testing for the range of costs (for this value of project we would expect to see at least 3 quotes, in keeping with CCCs procurement governance processes). We understand that more quotes than received were sought however for a project of this scale, a minimum of three quotes allows for a true reflection of the market range of prices. Client costs inclusive of contingency of more than 50% of the anticipated contract value for this scale of project are 20-30% higher than industry standard.
- Efficiencies in project delivery have been generated against the Gate 2 estimate through reduction of over conservative costs contingencies. As such, they don't represent efficiency gains, only more accurate contingency budgets.

Our analysis of efficiency for the Mardi to Warnervale pipeline is based on the limited information provided to us by CCC and have used industry benchmarks to assess proportions of cost. We do not have sufficient information to recommend specific adjustments to the project expenditure but consider that our findings in relation to internal inefficiencies have been addressed by the efficiency recommendations which we make later in this chapter.

4.4 Proposed capex review (including detailed projects)

The following table tabulates the ten capital projects for which we have undertaken a detailed, bottom up, assessment.

Table 18: Capex projects subject to detailed review ($m $2021-22)

	Program	Driver	Service	Total 4-year
1	Water Treatment Plant – Major Upgrade Mardi	Existing mandatory standards	Water	$33,568,600
2	Water Mains Asset Renewal Program	Asset and service reliability	Water	$15,750,000
3	Sewer Main Asset Renewal Program- Regional Wide	Asset and service reliability	Wastewater	$11,750,000
4	Sewer rising Main rehabilitation Program	Asset and service reliability	Wastewater	$10,000,000
5	SPS electrical and control switchboard replacement program	Asset and service reliability	Sewer Pump	$8,000,000
6	STP major Augmentation Works – Charmhaven	Asset and service reliability	WWTP	$16,260,000
7	STP process improvements – Bateau Bay	Asset and service reliability	WWTP	$7,800,000
8	STP sludge mechanical Dewatering Renewal – Kincumber	Asset and service reliability	WWTP	$3,377,073
9	Riou Street, Albany street, to Brisbane water – Drainage	Growth	Stormwater	$3,808,000
10	Lakedge Ave from Jean Drive to Shannon Parade and Aloha Drive to Platypus Drive – drainage upgrade	Asset and service reliability	Stormwater	$8,100,000

Source: CCC Technical Paper 4 Capital Expenditure

The sample:

- Includes a mixture of water, wastewater and stormwater assets.
- Includes a mixture of programs and projects.
- Represents approximately 37.8% of the value of the proposed capital expenditure for the 2022-26 determination.

4.4.1 Overall capex projects review summary

This section provides a summary of our capex review with the detailed analysis provided in **Appendix D**.

Project 1: Water Treatment Plant – Major Upgrade Mardi

Table 19: Proposed expenditure – Water Treatment Plant Mardi upgrade ($m)

	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
MWTP Stage 3 Upgrade Proposed Expenditure	0.95	2.24	1.50	6.80	26.00	8.0

Source: Mardi Water Treatment Plant Upgrade – IPART Supporting Business Case – November 2021.

From the Gate 2 business case, the intended outcome of the project is to "Increase capacity over a greater range of raw water quality scenarios (including Blue Green Algae), improve treated water quality and security of supply."

Reasons for variations between actual and forecast expenditures

A summary for the increasing value of the capex value for the project as it has progressed through the various design and business case development stages from $11.8m in the original options assessment report through to a 2021 business case estimate of $47.8m.

Additional information that identifies any proactive planning by the utility for change of project scope or process development as a result of the project

The business plan has been reviewed and challenged by IPART during the previous determination. Updated business plans have been provided.

In addition, a Project Control group has been set up where issues are escalated that need to be discussed by senior management. The Group is made up of Technical advisors that have continued on the course of the project that allows for efficiencies in decision making.

Assessment of the project procurement approach, outcomes and contribution to the utility's capital program drivers

The project has progressed through various options assessment and preliminary design stages with external consultants. After gate 2, the project is to be delivered as a design development and construction contract with a design and construct delivery contractor.

The investment drivers for the project are linked back to the follow:

- Existing Mandatory Standards – 70% - this is related to the current water quality challenges prohibiting the plant to operate reliably at full output capacity.
- Asset service reliability – 30% - the need for Mardi to operate reliably as part of the regional supply strategy and provide both the catchment demand and that of the regional supply agreement.

An assessment of the project's efficiency.

Based upon the in documents assessed and the further project insight gained from the interview undertaken on 23 November 2021, the project need is not efficient. This is based on the following:

- Unsubstantiated demand forecasting.
- Existing production capacity to meet the required peak demand.
- Scenario planning is for a very unlikely event.
- No consideration for abstraction license review.

In terms of the project scope, again this could only be classified as partially efficient based on the following:

- Solution provided at full output capacity – poorly defined need.
- Various options for catchment-based, pre-treatment, network storage and parallel solutions not sufficiently investigated.

Regarding the project costs, there are a number of shortfalls within the investigation process through to the proposed procurement approach which again we would recommend as only partly efficient. There are:

- Lack of challenge of both investigation costs, increased project capital cost and generation of efficiencies.
- Poorly defined capital efficiencies.
- Proposed procurement model increasing CAPEX value significantly.

Is the project needed?	
Is the project efficient – best option?	
Is the project efficient – least cost	

Key: Red – Not efficient, Amber - Partially efficient, Green – Efficient

Project 2: Sewer Pump Station Electrical and Control Switchboard Replacement Program

The planned project budget, program and outputs

Table 20: Preliminary expenditure – Sewer Pump Station Electrical and Control Switchboard Replacement Program ($m)

	2018-19	2019-20	2020-21	2021-22
SPS Switchboard Replacement Program	1.375	1.0	0.823	1.5

Source: Sewer Pump Station Electrical and Control Switchboard Replacement Program

The actual or forecast project costs, program and outputs (appropriate to the stage in the project)

We understand from the feedback provided during the interview (held on the 23rd November 2021 between Council & Mott MacDonald), that the project is being delivered to program and cost.

Reasons for variations between actual and forecast expenditures

No variation experienced.

Assessment of the project procurement approach, outcomes and contribution to the utility's capital program drivers

Most of the work scope under this project is undertaken by panel subcontractors which have been appointed by assessment on quality and commercial criteria. Quotations have been sought by CCC from these preferred suppliers for a package of works which contains multiple sites that have been grouped by similar scope and complexity.

The project outcomes look to improve the service reliability of the asset, remove WHS issues related to the asset age and condition and additionally provide enhance control and monitoring.

An assessment of the project's efficiency.

Through assessment of the provided documentation listed above and the supporting understanding gained from the interview held with the CCC project team on the 23rd November 2021, our recommendation for this project is that it is needed and is efficient. This recommendation based upon the following considerations and assessment:

- The need for the asset replacement is established through a systematic and efficient approach.
- Condition assessment undertaken with scoring to determine priority of sites.
- Standardisation of replacement assets generated efficiencies.
- Replaced assets provide an enhancement on OPEX against the original without significant increase in CAPEX.
- Efficient procurement model and costs.

Is the project needed?	
Is the project efficient – best option?	
Is the project efficient – least cost	

Key: Red – Not efficient, Amber - Partially efficient, Green – Efficient

Project 3: Water Mains Asset Renewal Program

The planned project budget, program and outputs

The investment program profile for Water mains renewals does not align to target Technical Paper Appendix - Forecast Major Projects budget total.

Table 21: Proposed expenditure - Water Mains Asset Renewal Program ($2021-22)

	2022-23	2023-24	2024-25	2025-26	Total
IPART JULY 2021 PROPOSED [1]	2.0	6.4	5.2	5.5	19.10
ADJUSTED PROPOSED [2]	0.75	6.4	5.2	5.5	18.35
IPART (WHAT DATE) PROJECTED PROGRAM [3]	0.75	5.0	5.0	5.0	15.75
ADJUSTMENT RECOMMENDED	0	0	0	0	0
BUDGET RECOMMENDATION	0.75	5.0	5.0	5.0	15.75

Note:
1. Technical-Paper-4-Capital-expenditure-2022-Central-Coast-Council-water-price-review-14-September-2021.PDF – page 64
2. A reduction to $750k in 2022-23 year - page 64
3. Water Mains IPART Projection – Excel - Water Mains Asset Renewal Program - Region Wide – Output measure: Water Main breaks

Adjustment to output measure

Table 22: Adjustment to output or activity measure - Water Mains Asset Renewal Program

Output or activity measure	Current	2022-23	2023-24	2024-25	2025-26
WATER QUALITY COMPLAINTS PER 1,000 PROPERTIES	8	7	7	7	7
AVERAGE FREQUENCY OF UNPLANNED INTERRUPTIONS PER 1,000 PROPERTIES	**115**	**115**	**100**	**100**	**80**
WATER MAIN BREAKS PER 100KM OF MAINS	**16**	**12**	**12**	**10**	**10**
COMPLIANCE WITH AUSTRALIAN DRINKING WATER GUIDELINES – MICROBIAL GUIDELINE VALUES (%)	100	100	100	100	100
COMPLIANCE WITH AUSTRALIAN DRINKING WATER GUIDELINES – CHEMICAL GUIDELINE VALUES (%)	100	100	100	100	100
REAL LOSSES: SERVICE CONNECTIONS: L/ CS/ DAY	**68**	**61**	**61**	**61**	**61**

Note: Bold = adjusted or new measure

The actual or forecast project costs, program and outputs (appropriate to the stage in the project)

No variation to expenditure.

Reasons for adjustment to output measure

Adjustment to the output is to promote targeted planned investment systems and decision making, culture of value for money investment and continuous improvement.

Additional information that identifies any proactive planning by the utility for change of project scope or process development as a result of the project

Foundation work has commenced on reviewing likelihood of failure and consequence of failure. This has not yet led to greater transition from reactive to proactive maintenance through investigating/ planning/ scoping and cost estimating one year and project delivery the following.

Assessment of the project procurement approach, outcomes and contribution to the utility's capital program drivers

CCC delivers this program using a single supplier, however council has not used any insights or learning from their supplier such as the impact from known complexities from Acid Sulphate soils/ dewatering/ rock have not been adopted in Council's assessment for future expenditure.

CCC starts defining and evaluating replacements scopes at the beginning of the financial year, for delivery in that financial year, starting at the top of the priority list. This planning activity covers "appropriate levels of planning, performing due diligence investigations prior to construction. Consideration of risks: Including Safety, community impact, environmental, heritage."

The Principal Contractor will provide rehabilitation options assessment including cost estimates in accordance with the schedule of rates contract. Several operational and regulatory drivers influence the rehabilitation strategy which includes DPIE and EPA Pollution Reduction Programs (PRP).

The consequence of a lack of planning beyond the immediate year ahead is is that there is a high level of uncertainty and complexities on scopes, budgets, outcome benefits, urgency, etc. This uncertainty would be reduced if a 2-5 year program look ahead was produced and complexities had time to be resolved further in advance of works commencement.

An assessment of the project's efficiency.

Our recommendation for this program is that it is needed, but that the efficiency of the program is not evidenced and needs improving in line with CCC's Asset Management Improvement Plan. This recommendation based upon the following considerations and assessment:

- Continuity of investment in sustaining the asset base for the benefit of customers is needed
- Council has improved Main breaks but there are lessons learnt from historical investment that we do not see evidenced in the future investments
- No planning on prioritised/ targeted assets
- Forecast projections have been based on 2014 unit rates uplifted to 2017 figures
- The budget is top down rather than built up from customer service needs
- No relationship between the top down budget and target output performance

The cost estimates in the assessment are likely to significantly underestimate the true cost of the forward program. This underestimate is balanced by the opportunities for efficiencies and improvements in targeting investment resulting from the maturing asset management systems.

Therefore, our recommendation is that the budget is not adjusted but that accountability measures are strengthened to ensure that the investment made is efficient given the likelihood for cost overruns.

Is the project needed?	
Is the project efficient – best option?	
Is the project efficient – least cost	

Key: Red – Not efficient, Amber - Partially efficient, Green – Efficient

Project 4: Sewer Main Asset Renewal Program - Region Wide

The planned project budget, program and outputs ($M)

The investment program profile for Sewer mains renewals does not line to target Technical Paper Appendix - Forecast Major Projects budget total.

Table 23: Proposed expenditure **-** Sewer Main Asset Renewal Program ($m, $2021-22)

	2022-23	2023-24	2024-25	2025-26	Total
SEWER BAU RENEWALS – SEWER MAINS					
PROPOSED [1]	4.5	8.7	9.2	9.6	32
SEWAGE OVERFLOWS – SEWER MAINS [2]	2.1	5.8	10.4	8.7	27
SEWER MAIN BREAKS AND CHOKES [3]	2.8	4.9	4.6	4.7	17
SEWER GRAVITY REHABILITATION PROGRAM[4]					
SEWER GRAVITY MAIN RELINING PROGRAM - ENVIRONMENTAL COMPLIANCE	0	0.950	0.950	0.950	2.85
SEWER MAIN ASSET RENEWAL PROGRAM - REGION WIDE	**2.75**	**3.0**	**3.0**	**3.0**	**11.75**

1. Technical-Paper-4-Capital-expenditure-2022-Central-Coast-Council-water-price-review-14-September-2021.PDF – page 74
2. Technical-Paper-2-Service-levels--2022-Central-Coast-Council-water-price-review-10-September-2021.PDF – page 102
3. Technical-Paper-2-Service-levels--2022-Central-Coast-Council-water-price-review-10-September-2021.PDF – page 103
4. Sewer gravity main rehabilitation program IPART forecast – excel

The actual or forecast project costs, program and outputs (appropriate to the stage in the project)

No proposed adjustment to expenditure as expenditure levels need to be maintained, but Council have poorly demonstrated effectiveness of pass expenditure. Estimates develop Council are course and are potential more than 10% under-valued.

Table 24: Target budget profile - Sewer Main Asset Renewal Program ($2021-22)

	2022-23	2023-24	2024-25	2025-26	Total
TARGET BUDGET PROFILE	2.750	3.0	3.0	3.0	11.75

CCC should ensure their expenditure has an impact on their output performance and we recommend IPART monitor these.

Table 25: Adjustment to Output or activity measure - Sewer Mains Asset Renewal Program

Output or activity measure	Current	2022-23	2023-24	2024-25	2025-26
WASTEWATER OVERFLOWS PER 100KM OF MAIN	**30**	**26**	**26**	**26**	**26**
WASTEWATER OVERFLOWS REPORTED ENVIRONMENTAL REGULATOR PER 100KM OF MAIN	**1.5**	**1.3**	**1.2**	**1.1**	**1.0**
WATER ODOUR COMPLAINTS PER 1,000 PROPERTIES	**1.5**	**1.3**	**1.3**	**1.3**	**1.3**
WASTEWATER MAIN BREAKS AND CHOKES PER 100KM OF MAIN	**34**	**32**	**30**	**30**	**30**
COMPLIANCE WITH EPL CONCENTRATION LOAD LIMITS	Yes	Yes	Yes	Yes	Yes

Note: Bold = adjusted or new measure

Reasons for variations to output measures

To promote targeted planned investment systems and decision making, culture of value for money investment and continuous improvement.

Additional information that identifies any proactive planning by the utility for change of project scope or process development as a result of the project

Foundation work has commenced on reviewing likelihood of failure and consequence of failure. This has not yet led to greater transition from reactive to proactive maintenance through investigating/ planning/ scoping and cost estimating one year and project delivery the following.

Assessment of the project procurement approach, outcomes and contribution to the utility's capital program drivers

Council deliveries this program using a single supplier. They have adopted, a simplified version of the 2019 rates and uplifted these by CPI. Council evaluates several operational and regulatory drivers influence the rehabilitation strategy which includes DPIE and EPA Pollution Reduction Programs (PRP).

CCC starts defining and evaluating replacements scopes at the beginning of the financial year, for delivery in that financial year, starting at the top of the priority list. This planning activity covers "appropriate levels of planning, performing due diligence investigations prior to construction. Consideration of risks: Including Safety, community impact, environmental, heritage."

The Principal Contractor provide rehabilitation options assessment including cost estimates in accordance with the schedule of rates contract, based on CCTV they have undertaken.

The consequence of a lack of planning beyond the immediate year ahead is is that there is a high level of uncertainty and complexities on scopes, budgets, outcome benefits, urgency, etc. This uncertainty would be reduced if a 2-5 year program look ahead was produced and complexities had time to be resolved further in advance of works commencement.

An assessment of the project's efficiency.

Our recommendation for this program is that it is needed, but that the efficiency of the program is not evidenced and needs improving in line with CCC's Asset Management Improvement Plan. This recommendation based upon the following considerations and assessment:

- Continuity investment in sustaining the asset base with benefits to customers is needed
- No planning on priority targeted assets or reflection on reasons for historic improvements
- No relationship evident to the EPA improvement requirements or Historic overflows
- Course estimations based on single contractor rate (2019, and uplifted)
- Top down forecast budget has no foundation reasoning
- No relationship between the top down budget and target output performance

Is the project needed?	
Is the project efficient – best option?	
Is the project efficient – least cost	

Project 5: Sewer Rising Main Rehabilitation Program

The planned project budget, program and outputs

The investment program profile for Sewer Rising mains renewals does not line to target Technical Paper Appendix - Forecast Major Projects budget total.

Table 26: Proposed expenditure – Sewer Rising Main Rehab Program ($2021-22)

	2022-23	2023-24	2024-25	2025-26	Total
PROPOSED [1]	4.5	8.7	9.2	9.6	32
SEWAGE OVERFLOWS – SEWER MAINS [2]	2.1	5.8	10.4	8.7	27
SEWER RISING MAIN RENEWALS PROGRAM [3]					
SEWER RISING MAIN REHABILITATION PROGRAM	0.0	2.96	3.52	3.52	10

Note:
1. Technical-Paper-4-Capital-expenditure-2022-Central-Coast-Council-water-price-review-14-September-2021.PDF – page 74. Includes sewers and rising mains plus manholes
2. Technical-Paper-2-Service-levels--2022-Central-Coast-Council-water-price-review-10-September-2021.PDF – page 102
3. Sewer rising main renewals CAPEX forecast - IPART 2023-27_Final

The actual or forecast project costs, program and outputs (appropriate to the stage in the project)

No Variation to expenditure**.** The program covers five nominated High Risk rising mains, which each have their own coarse Cost estimate sheet based on 2014 unit rates. This is likely to underestimate delivery costs.

Table 27: Target budget profile - Sewer Rising Main Rehab Program ($2021-22)

	2022-23	2023-24	2024-25	2025-26	Total
TARGET BUDGET PROFILE	0.0	2.96	3.52	3.52	10

Reasons for variations between actual and forecast expenditures

CCC has developed high level budget estimates for five projects to be delivered in this 2022-26 determination period for a combined value of $11.442m plus a further $2.161m (three projects) in 2027.

Adjustment to the output is to promote targeted planned investment systems and decision making, culture of value for money investment and continuous improvement. Accountability measures are recommended that these five projects are delivered within this IPART period for the budget proposed.

Additional information that identifies any proactive planning by the utility for change of project scope or process development as a result of the project

Foundation work has commenced on reviewing likelihood of failure and consequence of failure. This has not yet led to greater transition from reactive to proactive maintenance through investigating/ planning/ scoping and cost estimating one year and project delivery the following.

Assessment of the project procurement approach, outcomes and contribution to the utility's capital program drivers

CCC does not have a defined delivery partner for this program. CCC plan to use either the water mains delivery partner or one of their approved suppliers.

There is minimal information on drivers, scope and complexity, but council does have the first year of the coming period to catch up and develop fully formed Business Cases.

An assessment of the project's efficiency.

Our recommendation for this program is that it is needed, but that the efficiency of the program is not evidenced and needs improving in line with CCC's Asset Management Improvement Plan. This recommendation based upon the following considerations and assessment:

- Investments to sustain the asset base is needed, targeting the high risk to customer service rising mains
- No planning on priority targeted assets, or case for the urgency or justification for complete rising main replacement
- Reasonable level of cost estimations, but has been based on 2014 unit rates uplifted to 2021 figures
- No relationship between the budget and output target performance

Is the project needed?	
Is the project efficient – best option?	
Is the project efficient – least cost	

Project 6: Charmhaven STP major Augmentation Works

The planned project budget, program and outputs

Table 28: Proposed expenditure – Charmhaven STP major Augmentation Works ($2021-22, $m)

	2022-23	2023-24	2024-25	2025-26	Total
CAPACITY UPGRADE	4.5	7.7	4.1	-	16.3

Source: CCC Technical Paper 4 Capital Expenditure (September 2021)

This planned project aims to increase Charmhaven STP's capacity for an escalated service population forecast, address aging assets that are impacting the plant's performance, and to meet compliance with mandatory licenses.

The actual or forecast project costs, program and outputs (appropriate to the stage in the project)

Due to significant scope and cost escalation, the project is just approaching Gateway 2.

Table 29: Revised expenditure – Charmhaven STP major Augmentation Works ($2021-22, $m)

	2021-22	2022-23	2023-24	2024-25	2025-26	Total
CAPACITY UPGRADE	0.62	3.3	18	28.3	7.93	59.05

Source: Jacobs IPART Submission - Charmhaven STP (November 2021)

Reasons for variations between actual and forecast expenditures

The large budget variation is due to significant population growth (well above that in 2018 Capacity Assessment forecasts). Interim solutions proposed in 2018 were not implemented which resulted in further deterioration of effluent quality and non-compliance with license requirements.

Additional information that identifies any proactive planning by the utility for change of project scope or process development as a result of the project

The Jacobs IPART Submission based on the business case has revised the cost profile proposed in GHD's 2021 Capacity Assessment. This project scope escalation has been reviewed by CCC and a constructability workshop (23rd September 2021) was conducted with GHD and CCC to assess interim upgrades and future capacity of this upgrade.

Assessment of the project procurement approach, outcomes and contribution to the utility's capital program drivers

The project is approaching Gate 2, with concept designs to be completed next where project delivery routes (and options) will be defined. From the cost estimate it appears as though the delivery will be through a D&C mechanism. It follows a tight timeline to uphold before construction in 2023-24.

An assessment of the project's efficiency.

We concur that this project is needed and is efficient within cost profiles (although the option selected is unlikely to be the final preferred option and is not OPEX efficient or best practice). We recommend CCC assess alternative longer-term solutions in an options assessment as they reach Gateway 2, the current option will most likely provide capacity to 2035 only with an inefficient process solution.

Is the project needed?	
Is the project efficient – best option?	
Is the project efficient – least cost	

Project 7: Bateau Bay STP process improvements

The planned project budget, program and outputs

Table 30: Proposed expenditure – Bateau Bay STP process improvements ($2021-22, $m)

	2022-23	2023-24	2024-25	2025-26	Total
BBSTP UPGRADE	3.3	2.5	2.0	-	7.8

Source: July 2021 Technical paper 4 Capital Expenditure

This project's intended outcome is to increase Bateau Bay's capacity to a 2031 design horizon by completing refurbish works on aging assets and optimising the performances of existing processing units due to concerns over odour and compliance (particularly during wet weather events).

The actual or forecast project costs, program and outputs (appropriate to the stage in the project)

Table 31: Recommendation - Bateau Bay STP process improvements ($2021-22, $m)

	2022-23	2023-24	2024-25	2025-26	Total
PROPOSED	3.3	2.5	2.0	-	7.8
ADJUSTMENT	0.7	0.5	0.2	-	1.4
OUR RECOMMENDATION	4.0	3.0	2.2	-	9.2

Reasons for variations between actual and forecast expenditures

We understand from the cost estimates that the forecast project costs have not been escalated to 2021. Our assessment of the cost estimates completed by CCC and Hunter H2O show that they are low compared to similar previous upgrades we have been involved in. Different aspects of Bateau Bay are within Gateway 3 (main delivery items) or approaching Gateway 4 (refurbishment items), with major milestones occurring in 2022-23, thus the adjustments as seen.

Additional information that identifies any proactive planning by the utility for change of project scope or process development as a result of the project

A detailed options assessment was completed in May 2021 without major changes in the project scope since the capacity assessment conducted in 2018. The plant only aims to upgrade towards a 2031 horizon, where it will then undergo major renewal works.

Assessment of the project procurement approach, outcomes and contribution to the utility's capital program drivers

Through our interview with CCC, it is known that a contract was awarded to commence concept optioneering and design and to complete procurement workshops for the upgrade. The project's procurement and delivery process will also be developed in the next design phases in Gateway 3.

Its outcome aims to address both asset reliability and ensure wastewater compliance within the EPL.

An assessment of the project's efficiency.

We agree that this project is needed but we recommend reviewing its proposed budget and the preferred upgrade option (due to ongoing risk of non – compliance with the current preferred option). It was noted in the interview that there was another option that was strongly considered, we realised this option as a lower risk process solution and recommend it be reviewed against the current option further. We also recommend a Masterplan for Bateau Bay to ensure any decisions on this upgrade can be made with the most efficient expenditure in the long term (post 2030).

Is the project needed?	
Is the project efficient – best option?	
Is the project efficient – least cost	

Project 8: Kincumber STP sludge mechanical Dewatering Renewal

The planned project budget, program and outputs

Table 32: Proposed expenditure **–** Kincumber STP sludge mechanical Dewatering Renewal ($2021-22, $m)

	2022-23	2023-24	2024-25	2025-26	Total
KSTP UPGRADE	3.4	-	-	-	3.4

Source: July 2021 Technical paper 4 Capital Expenditure

This project's planned outcome is to upgrade its dewatering facility, of which major components are at end of asset life and impacting the plant's dewatering capacity / resilience. Concerns from EPA of service redundancy (and biosolids product quality) prompted the proposed upgrade.

The actual or forecast project costs, program and outputs (appropriate to the stage in the project)

Table 33: Recommendation - Kincumber STP ($2021-22, $m)

	2022-23	2023-24	2024-25	2025-26	Total
BBSTP UPGRADE	3.4	-	-	-	3.4
ADJUSTMENT	1.6	-	-	-	1.6
OUR RECOMMENDATION	5.0	-	-	-	5.0

Reasons for variations between actual and forecast expenditures

We understand from the feedback provided during the interview (24th November 2021) between Council & Mott MacDonald), that the project is highly developed and currently completing advanced design which will progress into Gateway 4 in 2022-23, hence cost profile spanning within that period only. The direct cost breakdown for this project is low overall compared to previous projects of similar scale we have been involved in.

Additional information that identifies any proactive planning by the utility for change of project scope or process development as a result of the project

Kincumber's scope has been defined since its 2020 Options Assessment of which it is within Gateway 3 and is approaching Gateway 4. Changes in project scope are unlikely as Kincumber's upgrade is set for completion within 2 years and the project is well developed. A project manager has been employed to deliver all WWTP projects.

Assessment of the project procurement approach, outcomes and contribution to the utility's capital program drivers

A high level Multi Criteria Assessment was completed for all options considered in this dewatering upgrade with most likely a Design and Construct approach to project delivery. Considering the 3 STP upgrades all involved dewatering facilities, we recommend CCC investigate the potential for procurement of dewatering systems for all 3 STP projects to see if there is operational and cost efficiency with a common contractor.

An assessment of the project's efficiency.

We agree that the project need is required however we are concerned that the budget may be low though the preferred option is of the least cost. We recommend CCC implement a biosolids strategy to address and avoid future non-compliance risks associated with the proposed Belt Filter Presses, this will ensure the current option is the most efficient option.

Is the project needed?	
Is the project efficient – best option?	
Is the project efficient – least cost	

Project 9: Riou Street, Albany street to Brisbane water Drainage

The planned project budget, program and outputs

The Project objective is to increase the drainage system capacity and water quality outcomes to support the increased growth and densification of Gosford CBD – which is prioritised in the NSW Government Central Coast Regional Plan as the number one regional priority.

Table 34: Proposed expenditure – Riou Street Drainage Upgrade ($2021-22, $m)

	2022-23	2023-24	2024-25	2025-26	Total
RIOU STREET DRAINAGE UPGRADE	-	0.9	1.4	1.5	3.8

Source: July 2021 Technical paper 4 Capital Expenditure

The actual or forecast project costs, program and outputs (appropriate to the stage in the project)

The project is has passed Gateway 1 (Project Initiation) and is due to commence design in 2022 under the Drainage Design Program Budget. However, the design cost allowance is still within the 2023-2024 budget. The cost build up has been reviewed and is reasonable.

Reasons for variations between actual and forecast expenditures

Table 35: Recommendation - Riou Street Drainage Upgrade ($2021-22, $m)

	2022-23	2023-24	2024-25	2025-26	Total
PROPOSED	-	0.9	1.4	1.5	3.8
ADJUSTMENT	-	-0.22			
OUR RECOMMENDATION	-	0.684	1.4	1.5	3.6

Additional information that identifies any proactive planning by the utility for change of project scope or process development as a result of the project

No evidence provided. It is early in the project development.

Assessment of the project procurement approach, outcomes and contribution to the utility's capital program drivers

Procurement is under lump sum for each element of the Gosford drainage improvements, of which Riou Street is one. CCC should investigate options for efficiencies in alternative contract forms such as target cost for the package as a whole.

An assessment of the project's efficiency.

The project need has been justified by CCC. The early stage of the project means that the best option and whether that is the least cost is unclear. The early investigations into the property acquisition requirements, utility interfaces and other complexities will add certainty to the project. It is agreed with CCC that this should commence in FY 2021-22.

Our assessment of efficiency

Is the project needed?	
Is the project efficient – best option?	
Is the project efficient – least cost	

Project 10: Lakedge Ave – drainage upgrades

The planned project budget, program and outputs

Stage 2 and 3 of drainage improvements to Lakedge Ave to alleviate flooding to properties, transport disruption and complaints consistent with Asset and Service Reliability driver.

The actual or forecast project costs, program and outputs (appropriate to the stage in the project)

Table 36: Recommendation - Lakedge Ave – drainage upgrades ($2021-22, $m)

	2022-23	2023-24	2024-25	2025-26	Total
PROPOSED	2.3	1.5	2.3	2.0	8.1
ADJUSTMENT	-5%	-5%	-5%	-5%	
OUR RECOMMENDATION	2.185	1.425	$2.185	$1.9	7.7

Reasons for variations between actual and forecast expenditures

CCC proposes to deliver both projects under separate lump sum contracts. The pricing has been developed using a cost database and has been assessed as reasonable. However, if the two projects were combined into one tender event we forecast that there would be an efficiency of 5%.

Additional information that identifies any proactive planning by the utility for change of project scope or process development as a result of the project

Lessons learnt from Stage 1 are being captured and focus on ground condition investigations. Improvements to road condition as a result of the project are not evidenced as being recognised under other budgets.

Assessment of the project procurement approach, outcomes and contribution to the utility's capital program drivers

Agreed that the project is needed. Advanced stage of design and the costing is reasonable for each Stage. The projects deliver a relatively small amount of the overall target drainage network replacement output relative to cost and we suggest the output measure is reviewed or costs are recognised in other budgets (such as roads maintenance). We recommend that Stage 2 and 3

will benefit from a combined tender event to save CCC internal costs and gain efficiencies from the supply chain

An assessment of the project's efficiency.

Is the project needed?	
Is the project efficient – best option?	
Is the project efficient – least cost	

4.5 Assessment of systemic issues

Based upon the sample of 10 projects we have identified the following systemic issues.

4.5.1 Clarity on benefits to customers

There is not a consistent approach to the definition of customer benefits. The link to customer output targets is not explicit in the 3 maintenance projects. The drainage projects at Lakedge Avenue are a significant proportion at 18% of Council budget to return 4% of their output. With the drainage projects it is recommended that the output measure is changed from length of new drainage installed to a reduction in customer complaints associated with surface water flooding.

4.5.2 Protracted timescales from initiation to delivery

Timescales from project need identification to project initiation are very protracted. This leads to repeat changes in budgets and lack of continuity in strategy and decision making. A prime example is the Mardi Treatment works which has been in the planning stage for 6 years. Charmhaven Sewage Treatment Plant's upgrade has only progressed to concept designs after 3 years of planning, but aims to progress from Gateway 2 (concept design) to 4 (delivery) within a year, displaying inefficient timeframes across the project lifespan.

After the July 2021 submission external consultant reports were provided as part of justification to support the efficiency of the capital expenditure. In some cases these reports provide substantial increases in the costs and changes to the project scope (for example Charmhaven). This does not give confidence in a rigorous governance process being followed by CCC.

4.5.3 Cost estimating on non-rolling program works.

There is little evidence of contractor market engagement and benchmarking for the pricing of projects such as Mardi WTW and Kincumber STP. Pricing is reliant upon design consultants' past project experiences and unit cost databases. This reduces the potential for insights and efficiencies from the supply chain as well as confidence in the budgets.

4.5.4 Lack of site-based master plans or overarching strategies

The sewage treatment projects will benefit from a site master plan and ideally a wastewater resource strategy (particularly in relation to the combined outfalls). This combined planning would enable a better forward look at the project development and optioneering. The projects

proposed have a limited future benefit and a longer term view would make the investment more efficient and reliable for service growth.

We note that the biosolids strategy may link to community measures in the future. The strategy will likely change as a result due to communication complaint risk due to odours, noise, traffic and emerging contaminants (PFAS et al) which would affect the trucking distances with respect to ongoing operation of biosolids reuse facilities.

4.5.5 Whole life costing approach is limited

The use of whole life costing is not consistent across treatment and networks which reduces the confidence in the options and benefits. No consideration of impact on maintenance costs from the solutions for the drainage projects for example.

4.5.6 Optioneering is course

Optioneering is often limited to a 'do nothing', 'do something' and 'do too much' approach. More exploration of incremental solutions, such as pre-treatment of the raw water during poor water quality events on Mardi and longer-term catchment based solutions, are not evidenced.

4.5.7 Interface between funding streams

Most projects are linked to one driver. In reality projects such as Lakedge Drive drainage with CCC driver to increase reliability will also have a growth element with increased capacity to account for catchment changes. There will also be a benefit to the road maintenance program from the works that is not explained in the submission. Being able to differentiate between the contribution to the different drivers will help with capex/opex trade offs and removal of overlaps between budgets.

4.5.8 Packaging of works for efficiencies

Efficiency opportunities for packaging works with suppliers from project 6,7 and 8 on Wastewater Treatment and 9 and 10 on drainage improvements are not assessed in the CCC submission.

4.5.9 Risk and Opportunity approach is overly simplistic and only focuses on downside

All cost estimates include risks but do not include opportunities. The approach to setting contingency is simplistic and high level (limited use of Monte Carlo techniques for example).

4.5.10 Profiling spend to align to CCC management resources rather than efficiency

Deliverability of the projects is constrained by CCC management resources (as quoted on Mardi pipeline and Lakedge drainage). A fix of bringing in external PM resource would enable significant efficiencies through packaging or acceleration of work.

4.5.11 Procurement approach with balance of risk on the suppliers

Discussions with CCC about the approach to procurement of the sample projects have demonstrated a reliance on lump sum pricing and default position to pass on risk to the supply chain. An example was provision of plant and materials during a global shipping crisis where the contractors were asked to make an allowance within their lump sum price when it may be more cost effective for the client to manage this risk with their buying power. A greater degree of collaboration and partnership with suppliers on risk ownership in project delivery typically results in a lower outturn cost.

4.5.12 Deliverability of the projects

A number of capital expenditure projects have forecasted large expenditure in the 2021-22 year. For example, $6.8m spend forecast in 2021-22 on a project when during the interview we were informed that there was still significant work needed to complete the procurement process.

The systemic themes above can be categorised into:

1. A need to improve Project Initiation assessments to include customer benefits and a more systematic application of risk and opportunity costs. The use of whole life costing to demonstrate reactive and planned maintenance reduction or other operational benefits should be included across all asset types. This will also drive an assessment of the potential for operational solutions as well as capex solutions. At this stage the contribution of the water program to other areas such as roads will help in more accurate cross subsidies.
2. A move towards setting targets for outcome measures (especially related to customer service) rather than output measures will help in the clarity of purpose and enable projects to be prioritised and progress through the governance phases in a more timely manner.
3. Strengthening of the Project Planning team to enable projects to be progress at pace with rigorous governance and challenge. There are inefficiencies resulting from lack of clarity in the scope of studies and use of consultants on projects where the objectives and customer benefits are unclear.
4. Earlier involvement of the supply chain and seeking benchmarking with other Councils will improve the cost confidence and efficiency of the delivery.
5. Packaging of similar projects for procurement will lead to efficiencies. A small proportion of these savings can be spent on resources to manage the increased Council workload.

4.6 Efficient capital expenditure

Our proposed efficient capital expenditure is based on our detailed review of capital expenditure, extrapolation of our detailed review and the application of an efficiency factor.

IPART in its determinations refers to two types of efficiencies:

- Catch-up efficiency refers to the efficiency improvement needed for the business to catch-up to the production frontier, and is often applied to the first year of the regulatory period.
- Continuous efficiency refers to the expectation that the frontier itself will be continually moving as a result of ongoing innovations and cost savings due to technological change. Continuous efficiency is typically applied on a per annum basis, meaning it is compounding in nature.

IPART has advised that it expects continual efficiency of 0.7% pa by CCC. This means that the efficiency saving in any one year will reflect both the savings for that year and the ongoing savings resulting from efficiencies achieved in previous years.

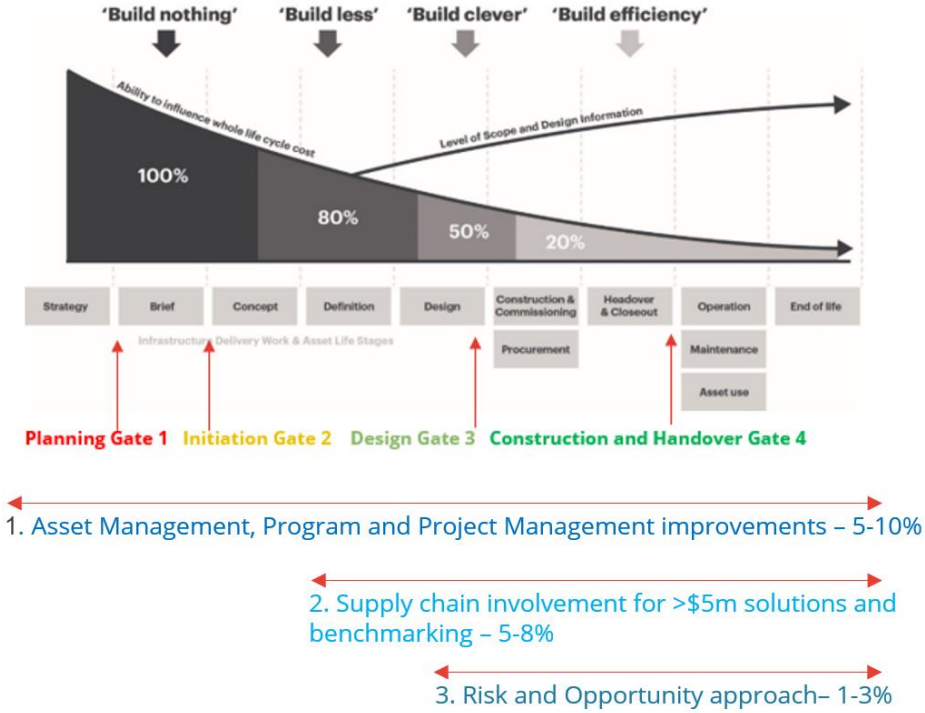
With regards to catch-up efficiency, With regards to catch-up efficiency, **Table 37** and **Figure 30** below provide an extrapolation (based on our professional judgement following work with a number of water utilities) of the efficiency opportunity across the whole programme. It is recognised that CCC is catching up to an efficiency achieved by other water asset owners and that efficiencies cannot be achieved from day 1 in the new determination period and therefore the indicative potential efficiency has been halved.

Table 37: Systemic issue extrapolation

Efficiency	Impact	Scale of program affected	Overall potential capex impact (over 4 years)
STRENGTHENED PROJECT MANAGEMENT, ASSET MANAGEMENT AND GOVERNANCE IN PLANNING PHASE TO DEVELOP SOLUTIONS	Efficiencies of 5-10% on capex budgets	Whole capex program ($313m)	$15.6m-31.2m
RISK AND OPPORTUNITY APPROACH INCREASED MATURITY	Efficiencies of 1-3% on capex budgets	Whole capex program (313m)	$3.1m-9.4m
EARLIER INVOLVEMENT OF SUPPLY CHAIN FOR BENCHMARKING, RISK ALLOCATION, OPTIMAL SOLUTION AND CONFIDENCE IN SCHEDULE	Efficiencies of 5%-8% on capex budgets	Large projects (>$5m) (based on the capex list in Technical Paper 4)	$7.3m-11.6m
INDICATIVE POTENTIAL EFFICIENCIES			$26m-52.3m
50% EFFICIENCY IMPLEMENTATION BY CCC OVER THE DETERMINATION PERIOD			$13m-26.1m

Source: Mott MacDonald

Figure 30: Catch-up efficiency



Source: Mott MacDonald

Our proposed capital expenditure based on the adjustments noted above is shown in the following tables.

Table 38: Summary of proposed minimum efficient capital expenditure ($2021-22, $m)

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
WATER							
CCC PROPOSED	31.96	41.48	29.49	34.74	30.39	19.99	31.03
ADJUSTMENTS							
WTP - MARDI			-6.8	-24.9	-6.7		
TOTAL ADJUSTMENTS			-6.8	-24.9	-6.7		
TOTAL CAPEX AFTER ADJUSTMENTS	31.96	41.48	22.7	9.84	23.69	19.99	31.03
EFFICIENCY ADJUSTMENTS							
CONTINUING %				0.01	0.01	0.02	0.03
CATCH-UP				-1.16	-2.41	-2.06	-3.49
ASSET AND PM IMPROVEMENT				-0.81	-1.77	-1.50	-2.60
RISK AND OPPORTUNITY APPROACH				-0.24	-0.53	-0.45	-0.78
SUPPLY CHAIN INVOLVEMENT >5M				-0.11	-0.11	-0.11	-0.11
TOTAL EFFICIENCY ADJUSTMENTS				0.06	0.30	0.38	0.78
TOTAL WATER CAPEX	**31.96**	**41.48**	**22.7**	**8.62**	**20.98**	**17.56**	**26.75**

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
WASTEWATER							
CCC PROPOSED	22.48	17.17	35.87	34.63	39.11	49.04	37.65
ADJUSTMENTS							
STP MAJOR AUGMENTATION WORKS CHARMHAVEN			-0.58	-1.20	11.20	24.2	7.93
BATEAU BAY				0.70	0.50	0.20	
DEWATERING RENEWAL				1.60			
TOTAL ADJUSTMENTS	0.00	0.00	-0.58	-1.72	9.26	20.27	4.59
TOTAL CAPEX AFTER ADJUSTMENTS	22.48	17.17	35.29	32.91	48.37	69.30	42.23
EFFICIENCY ADJUSTMENTS							
CONTINUING				0.01	0.01	0.02	0.03
CATCH-UP				-2.82	-2.44	-4.13	-3.34
ASSET AND PM IMPROVEMENT				-1.45	-1.15	-2.45	-1.84
RISK AND OPPORTUNITY APPROACH				-0.43	-0.35	-0.74	-0.55
SUPPLY CHAIN INVOLVEMENT >5M				-0.94	-0.94	-0.94	-0.94
TOTAL EFFICIENCY ADJUSTMENTS				0.23	0.68	1.47	1.20
TOTAL WASTEWATER CAPEX	**22.48**	**17.17**	**35.29**	**32.68**	**47.69**	**67.84**	**41.04**

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
STORMWATER							
PROPOSED	9.60	6.15	11.38	8.38	9.51	8.92	9.57
ADJUSTMENTS							
RIOU ST					-0.22		
LAKEDGE				-0.12	-0.08	-0.12	-0.10
TOTAL ADJUSTMENTS	0.00	0.00	0.00	-0.91	-1.22	-0.79	-0.89
TOTAL AFTER ADJUSTMENTS	9.60	6.15	11.38	7.48	8.29	8.13	8.68
EFFICIENCY ADJUSTMENTS							
CONTINUING %				0.01	0.01	0.02	0.03
CATCH-UP				-0.79	-0.92	-0.68	-0.79
ASSET AND PM IMPROVEMENT				-0.61	-0.71	-0.52	-0.61
RISK AND OPPORTUNITY APPROACH				-0.18	-0.21	-0.16	-0.18
SUPPLY CHAIN INVOLVEMENT >5M				0.00	0.00	0.00	0.00
TOTAL EFFICIENCY ADJUSTMENTS				0.05	0.12	0.18	0.25
TOTAL STORMWATER CAPEX	**9.60**	**6.15**	**11.38**	**7.42**	**8.17**	**7.96**	**8.44**

Note 1: Project specific costs sources are detailed in the capital expenditure chapter; Proposed capex data is sourced from SIR Capex 2; For expenditure 3 data on projects >5 million is sourced from Technical-Paper-4-Capital-expenditure-2022-Central-Coast-Council-water-price-review-14-September-2021.
Note 2: Historical years are presented in $m nominal, forecasts are in $2021-22.
Note 3: The adjustment for Mardi WTP in 2021-22 is to reflect out assessment that the project is not prudent and that the costs undertaken by CCC for this financial year should not be included in the RAB.
Source: Mott MacDonald, CCC SIR.

Table 39: Summary of proposed maximum efficient capital expenditure ($2021-22, $m)

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
WATER							
CCC PROPOSED	31.96	41.48	29.49	34.74	30.39	19.99	31.03
ADJUSTMENTS							
WTP - MARDI			-6.80	-24.9	-6.7	0.00	
TOTAL ADJUSTMENTS	0.00	0.00	-6.8	-24.9	-6.7	0	0
TOTAL CAPEX AFTER ADJUSTMENTS	31.96	41.48	22.7	9.84	23.69	19.99	31.0
EFFICIENCY ADJUSTMENTS							
CONTINUING %				0.01	0.01	0.02	0.03
CATCH-UP				-0.6	-1.1	-1.0	-1.6
ASSET AND PM IMPROVEMENT				-0.40	-0.88	-0.75	-1.3
RISK AND OPPORTUNITY APPROACH				-0.08	-0.18	-0.15	-0.26
SUPPLY CHAIN INVOLVEMENT >5M				-0.07	-0.07	-0.07	-0.1
TOTAL EFFICIENCY ADJUSTMENTS				0.1	0.3	0.4	0.8
TOTAL WATER CAPEX	**31.96**	**41.48**	**22.7**	**9.22**	**22.24**	**18.6**	**28.6**

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
WASTEWATER							
CCC PROPOSED	22.48	17.17	35.87	34.63	39.11	49.04	37.65
ADJUSTMENTS							
STP MAJOR AUGMENTATION WORKS CHARMHAVEN			-0.58	-1.20	11.20	24.2	7.93
BATEAU BAY				0.70	0.50	0.20	
DEWATERING RENEWAL				1.60			
TOTAL ADJUSTMENTS	0.00	0.00	-0.58	-0.36	10.42	22.34	6.23
TOTAL CAPEX AFTER ADJUSTMENTS	22.48	17.17	35.29	34.28	49.53	71.37	43.88
EFFICIENCY ADJUSTMENTS							
CONTINUING %				0.01	0.01	0.02	0.03
CATCH-UP				-1.46	-1.28	-2.06	-1.70
ASSET AND PM IMPROVEMENT				-0.72	-0.58	-1.23	-0.92
RISK AND OPPORTUNITY APPROACH				-0.14	-0.12	-0.25	-0.18
SUPPLY CHAIN INVOLVEMENT >5M				-0.59	-0.59	-0.59	-0.59
TOTAL EFFICIENCY ADJUSTMENTS				0.24	0.70	1.52	1.24
TOTAL WASTEWATER CAPEX	**22.48**	**17.17**	**35.29**	**34.04**	**48.84**	**69.87**	**42.64**

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
STORMWATER							
PROPOSED	9.60	6.15	11.38	8.38	9.51	8.92	9.57
ADJUSTMENTS							
RIOU ST					-0.22		
LAKEDGE				-0.12	-0.08	-0.12	-0.10
TOTAL ADJUSTMENTS	0.00	0.00	0.00	-0.48	-0.72	-0.43	-0.46
TOTAL AFTER ADJUSTMENTS	9.60	6.15	11.38	7.90	8.79	8.49	9.11
EFFICIENCY ADJUSTMENTS							
CONTINUING %				0.00	0.00	0.00	0.00
CATCH-UP				-0.4	-0.4	-0.3	-0.4
ASSET AND PM IMPROVEMENT				-0.30	-0.36	-0.26	-0.30
RISK AND OPPORTUNITY APPROACH				-0.06	-0.07	-0.05	-0.06
SUPPLY CHAIN INVOLVEMENT >5M				0.00	0.00	0.00	0.00
TOTAL EFFICIENCY ADJUSTMENTS				0.01	0.01	0.02	0.03
TOTAL STORMWATER CAPEX	**9.60**	**6.15**	**11.38**	**7.85**	**8.66**	**8.31**	**8.85**

Note: Project specific costs sources are detailed in the capital expenditure chapter; Proposed capex data is sourced from SIR Capex 2; For expenditure 3 data on projects >5 million is sourced from Technical-Paper-4-Capital-expenditure-2022-Central-Coast-Council-water-price-review-14-September-2021
Note 2: Historical years are presented in $m nominal, forecasts are in $2021-22.
Note 3: The adjustment for Mardi WTP in 2021-22 is to reflect out assessment that the project is not prudent and that the costs undertaken by CCC for this financial year should not be included in the RAB.
Source: Mott MacDonald, CCC SIR.

It will be IPART's decision to adopt either of the proposed capital expenditure profiles or a mid-point to apply to CCC.

4.7 Assessment of asset renewal expenditure

Renewal expenditure (including replacement) is major work which does not increase the design capacity of an asset but restores its original service capability. Work which would allow an increase in the original service potential of an asset is an upgrade or new capital expenditure[25]. The consequences of insufficient asset renewals and refurbishment may have serious consequences for the quality of service delivery, while an excessive spending allowance may have an adverse financial impact on consumers.

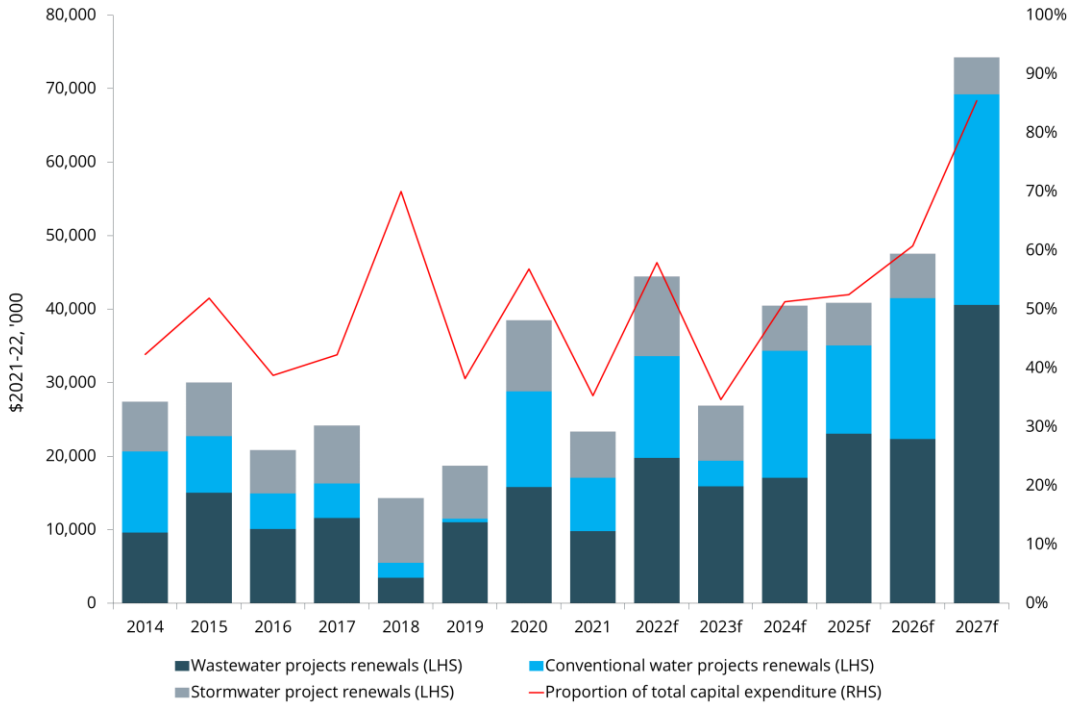
We have sourced our forecast renewal expenditure and historical comparison from Council's Special Information Return (SIR) provided to IPART on 1 September 2021. This data is consistent with and supports Council's 2022 regulatory submission. The available breakdown of capital expenditure in the SIR does not allow for specific identification and hence separation of "renewals and replacements". Instead, a number of categories labelled "asset service reliability" in the forecasts, plus additional historical projects that include the words "replacement" or "renewal", were identified by us as being used by Council to describe asset renewal activity. The somewhat more inclusive categorisation made possible by the detailed historical line-item descriptions may have led to Councils' proposed renewals spending to be relatively under-reported.[26]

Given the above identification problem, and as shown in **Figure 31**, asset renewal activity in real terms was relatively steady between 2014 and 2021, averaging $25 million a year and amounting to almost half of all capital expenditure). However, future asset renewals are forecast to increase sharply during 2022 – 2027 to reach $74 million in the final forecast year.

[25] In keeping with good industry practice nomenclature.

[26] Our confidence is in any case only as good as the accuracy of the reported data, as it has not been audited by us.

Figure 31: Asset renewal expenditure ($2021-22) (forecast from 2022 onwards)



Source: IPART SIR (Capex 2) and our analysis

The largest category of forecast renewals spending is wastewater projects and programs, distributed evenly between Gosford and Wyong, and increasing massively in 2027. This spending is largely directed to sewer mains and pumping stations. The next largest category is conventional water projects and programs, in which the biggest single item is water mains. Over 30 per cent of forecast asset reliability and renewals spending (a total of $86 million out of $275 million over six years in real terms) is on sewer mains and water mains. Other notable forecast renewals spending items include sewer pump stations and wastewater treatment plant.

The age profile of CCC's assets generally points to a spike in asset replacements over the next decade. However, a risk and condition-based assessment of asset condition would be necessary to estimate the efficient level of actually-required spending. CCC adopted a lifecycle asset management strategy (AMP) only recently in December 2021[27]. This document estimated an average amount of $25 million a year will be needed to sustain the current level of service at the lowest lifecycle cost. This expenditure amount is similar to historical renewal spending levels, but much lower than CCC forecast in its 2022 regulatory determination submission).

From our review of CCC's previous submission (2019) we have concluded that the previous submission was not based on a robust and evidenced based method for forecasting future renewal needs. However, Council has started to remedy that as evidenced by its recent adoption of the AMP. Levels of required spending are reported in the AMP to have been estimated by GHD[28] using an age-based assessment of asset condition, noting that detailed condition and risk assessment will need to be progressively implemented. The document did not include a guide to consistent field assessment of the condition of various assets. However, as described in the 2022

[27] GHD Pty Ltd (2021) Asset Management Plans and Strategy – Water Mains, for Central Coast Council, 21 November.

[28] Op. Cit., AMP section 4.1.3.

regulatory submission (Technical Paper 4), Council has begun to prioritise asset renewal projects using a mix of age, condition and risk for a range of assets.

This leads us to the conclusion that CCC may not have yet fully implemented the asset management strategy in its totality. From our review of CCC documents, we consider that a risk and condition-based analysis of asset condition has not been consistently used as the basis of the forecast renewals expenditure. This in part is due to:

- A lack of comprehensive asset condition information for certain asset classes
- Limited analysis by Council on business and performance risk associated with certain assets

However, given CCC's intention to improve its renewals evaluation by moving more extensively to a risk and condition-based adjustment of remnant asset life, we consider that CCC should be able to enhance future renewal submissions to the benefit of customer service and reducing renewal costs (e.g., by targeting assets that do need to be replaced) over what would be the case if a predominantly age based approach was used for asset replacements.

The AMP projects capital renewal and replacement expenditure averaging less than $10 million a year between 2022 and 2027[29]. This is much less than Council's proposed expenditure, which was ostensibly developed on the basis of asset age, condition analysis and failure risk analysis.

Without being presented with additional detailed analysis, we conclude that CCC's proposed asset renewal spending estimates are not supported by a robust and evidenced based method for forecasting future renewal needs.

4.8 Assessment of stormwater expenditure

The IPART 2019 pricing determination raised the following concerns:

- What High level benchmarking has been against other Water Supply Authorities and Councils
- Modelled various stormwater drainage definitions to analyse the impact of transitioning to a 'trunk drainage' approach.
- What Investigation has been done of alternate funding source

CCCs response is

'Given Council's financial position and the risks, administrative complexities and potential to confuse its customers – Council does not consider it the right time to pursue a major structural change in the way it charges its customers for stormwater drainage. While no changes are proposed within the 2022 IPART Determination period, Council will pursue resolution of the above matters to coincide with commencement of the following IPART Determination. This will mitigate any impact on service levels, support stable revenue forecasting and financial planning, and ensure Council can continue to provide a consistent, stable and prudent stormwater drainage service to customers.' Infrastructure Services: Asset Management Plan – Stormwater Drainage – Version 1.0 Sept 2021

The Stormwater Drainage CAPEX Program has been based on a consistent allocation of stormwater drainage revenue - on average approximately $8.8million per annum -with increases on a year to year basis where Development Contributions are available to support

[29] Op. Cit., Figure 4.12.

Growth driven projects. Projects totalling $36,383,210 in the upcoming 4 year determination period have been identified including $1,161,464 in contributions.

Based on the sample of Riou Street (Growth) and Lakedge Avenue (Asset Service and Reliability), there is a CCC unit cost database for these projects that is comparable to our own contractor supplied costs. The extrapolation of our comments on these two sample projects are that the remaining sections of the programme be reviewed to check any overlap with budgets in road improvement programs and that the procurement strategy take into account opportunities for treating the projects as packages of work by bundling projects to gain efficiencies from the supply chain and internal costs. During the upcoming determination period CCC has committed to put in place a trunk drainage approach to inform the investment planning in the following IPART Determination.

5 Trade waste and miscellaneous charges

This section provides an overview of our assessment of CCC's proposed trade waste and miscellaneous charges, where:

- Trade waste prices are levied on commercial and industrial customers for wastewater in which the concentrations of pollutants exceed a domestic equivalent.
- Miscellaneous and ancillary prices are one-off prices levied on a small number of customers.

Revenue collected from these charges account for a small proportion of revenue for CCC, however, they can be significant for a small number of customers.

5.1 Methodology

IPART request us to investigate and comment on CCC's proposed:

- Annual and licence-related liquid trade waste fees. This excludes CCC's proposed excess mass charges and other volume or concentration-based waste charges.
- Charges for miscellaneous services

As part of our review, we have sought to:

- Assess and seek to understand CCC's basis for setting these proposed charges (including how it has determined the efficient costs of these services and the relationship between these efficient costs and proposed charges), its methodology for allocating council overheads and shared costs to these services, and the reasons for any proposed material increases in the 2022 determination period
- Benchmark of compare CCC's proposed fees and charges to those of other comparable water utilities (such as Hunter Water and other local water utilities)
- Of the miscellaneous service fees and charges, focus our attention on those that:
  - Generate the largest shares of revenue
  - Appear out of alignment with fees and charges of other comparable water utilities and/or
  - Are subject to large increases under CCC's proposal

5.2 CCC's proposed trade waste charges

The CCC classifies its trade waste customers in classifications 1, 2, 3 and S depending on the risk the discharge poses to the environment and to the treatment. This classification accounts for factors such as water usage, containment discharge levels, business activity, capacity of the treatment pants and the extent of on-site treatment required. In particular:

- **Category 1** -activities requiring nil or minimal pre-treatment equipment where effluent is well defined (e.g. cakes and bakeries). Low risk.

- **Category 2** – activities requiring prescribed pre-treatment equipment where effluent is well characterised (e.g. large retail outlets, restaurants, large pubs, shopping centres, mechanical workshops). Medium risk.
- **Category 3**- activities of an industrial nature, where large volumes of LTW (over 20kg per day) are discharged to the sewerage system (e.g. food manufacturing, metal processing, oil refinery, chemical production). High risk.
- **Category S** – liquid trade waste discharge directly to the treatment plant via a tanker (e.g. septic systems, commercial sewerage, portable toilet waste). High risk.

As shown in **Table 40,** compared to the 2021-22 charges, CCC's proposed administrative trade waste charges would increase by between 17-41% (excluding the Category S application fee, which would decline by 2.6%). While not the focus of this review, we note that there are comparatively much smaller increases in proposed trade waste usage charges.

Table 40: Comparison of CCC's proposed and existing application and annual trade waste fees ($/year, $2021-22))

Charge	2021-22 charge	Proposed 2022-23 charge	% change
Application fee			
Category 1	99.76	133.67	34.0%
Category 2	126.28	169.20	34.0%
Category 3	2,274.52	2,667.08	17.3%
Category S	173.64	169.20	-2.6%
Annual trade waste fee			
Category 1	99.77	140.44	40.8%
Category 2	362.11	437.25	20.8%
Category 3	1,399.70	1,641.28	17.3%
Category S	157.86	205.16	30.0%

Source: CCC (2021), Technical Paper 9 Pricing of other services, 2022 Central Coast Council Water price review, Table 4.

As part of its submission, CCC noted that the reason fees have increased is that the methodology used to calculate the trade waste fees has changed to better align with IPART's pricing principles. While CCC's annual trade waste fees for the 2019 determination only recovered direct labour costs, the charges proposed by CCC as part of this submission reflect:

- The cost of direct labour, transport, equipment
- An allowance for overheads (assumed to be 16% of total costs including labour, transport and equipment)

- An appropriate CPI multiplier to be applied each year

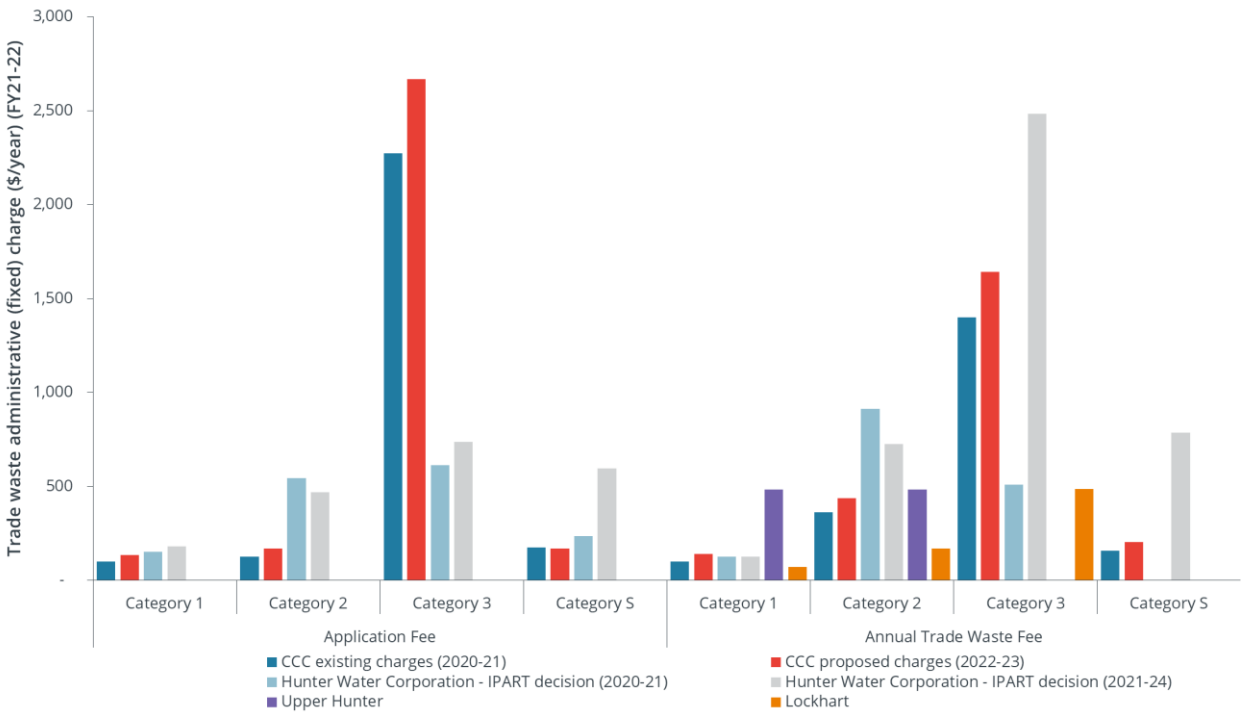
5.2.1 Assessment of CCC's proposed trade waste charges

Information provided by CCC as part of this review indicates that, on average, across the trade waste charges, the driver of the increased charges is the change in methodology adopted by the CCC (to include an allowance for transport, equipment and overheads).

The exceptions relate to Category 1 and Category S of the annual trade waste fees. In these cases, while the methodology change remains the primary driver of cost increases, in addition CCC's charges include increased required inspection time (from 15 mins and 0.5 hours to 20 mins and 2 hours respectively).

As shown in **Figure 32**, apart from the Category 3 trade waste charges, CCC's charges are below similar charges levied or proposed by Hunter Water. The annual trade waste fee appears to be within the broad range of those levied by other councils (Upper Hunter and Lockhart have been selected as two broad bookends).

Figure 32: Comparison of trade waste administrative (fixed) charges across comparable water utilities ($/year, $2021-22)



Source: CCC (2021), Technical Paper 9 Pricing of other services, 2022 Central Coast Council Water price review, Table 4; IPART (2020), Review of prices for Hunter Water Corporation from 1 July 2020 Final Report, p. 311; NSW Government (2020), LWU performance monitoring data and reports, date accessed December 2021, available at <https://www.industry.nsw.gov.au /water/water-utilities/lwu-performance-monitoring-data>.

Note: Hunter Water's category of charges are minor, moderate, major and tanker. Given the assumptions around the type of customer and waste, we have assumed that minor corresponds to Category 1, Moderate corresponds to Category 2 and so on.

While Category 3 Application Fees are significantly higher than similar charges levied by Hunter Water, we note that the existing charge was deemed to be efficient by Marsden Jacob Associates as part of a detailed review of CCC's trade waste charges[30] and the proposed increase appears reasonable, given the move towards a more cost-reflective charge (that includes transport, equipment and overheads).

We note that for most of the charges (except for those discussed above), the increases in the charges seem to be driven by a move towards cost reflective pricing and they are broadly in line with charges levied by comparable water utilities.

In our view CCC has not provided sufficient evidence to justify the increased time requirement associated with Category 1 and Category 2 Annual Trade Waste fees. However, on balance, given the charges are broadly in line with, or below, charges levied by comparable water utilities, as shown in **Table 41** we recommend adopting CCC's proposed trade waste charges.

Table 41: CCC's proposed and recommended application and annual trade waste fees for 2022-23 ($/year, $2021-22)

Charge	Proposed 2022-23 charge	Recommended	Variance
Application fee			
Category 1	133.67	133.67	-
Category 2	169.20	169.20	-
Category 3	2,667.08	2,667.08	-
Category S	169.20	169.20	-
Annual trade waste fee			
Category 1	140.44	140.44	-
Category 2	437.25	437.25	-
Category 3	1,641.28	1,641.28	-
Category S	205.16	205.16	-

Source: CCC (2021), Technical Paper 9 Pricing of other services, 2022 Central Coast Council Water price review, Table 4; Frontier Economics

5.3 CCC's proposed miscellaneous and ancillary charges

CCC's submission notes that the cost basis for miscellaneous and ancillary charges per service aligns to IPART's pricing principles of full cost recovery for the services provided and includes:

30 Marsden Jacob Associates (2019), Review of proposed prices for Central Coast Council trade waste and miscellaneous services

- on costs (inclusion of payroll tax, superannuation) and
- corporate overheads.

In cases where services are provided by an external contractor (e.g. minor construction and plumbing services are often provided by Council's contract plumber), the cost is determined by the cost the provider charges Council and includes materials cost and labour.

Across the 85 miscellaneous and ancillary charges levied by CCC, CCC has proposed increase of between -33% and 208%. **Table 42** compares CCC's proposed charges for the top ten miscellaneous charges or where CCC has proposed a large change in the existing charge. These charges represent around 70% of CCC's expected revenue from miscellaneous charges. As shown in **Table 42** of these ten charges, the average proposed increase is 50% with some charges (i.e. *miscellaneous charge 12b. Standpipe hire - annual fees*) proposed to increase by over 200%.

Table 42: Comparison of CCC's top ten proposed and existing miscellaneous and ancillary charges ($2021-22)

Miscellaneous & ancillary charge	Summary	Unit	Current charge (2020-21)	Proposed charge (2022-23)	% change	Estimated revenue
1b. Conveyancing Certificate Statement of Outstanding Charges (s360 Certificate) – online request (online form on council website)	Relates to the issuing of a statement of outstanding rates and charges.	Each	27.80	27.31	-2%	273,100
2b. Property sewerage line and drainage diagram - online request (online form on council website)	Relates to the issuing of a copy of a diagram showing the location of the property service line and drainage for a property.	Each	18.89	25.67	36%	128,350
3a. Provision of service location diagrams - water and sewer location plans	Relates to the provision of a service location diagram of sewer and/or water mains in relation to a property's boundaries.	Each	22.24	21.84	-2%	77,360
10c. Water service connection - short and long service (20mm)	Relates to the connection of water service (20mm).	Each	1,457.47	1,470.99	1%	529,556
12b. Standpipe hire - annual fees (65mm)	Relates to the annual hire of a metered standpipe (65mm).	Each	866.11	2,672.00	209%	248,496
13. Standpipe water usage	Relates to the volumetric charge associated with the hire of a metered standpipe.	$/kL	2.10	2.20	5%	110,000

15b. Inspection of new water and sewer assets (incl. encasements and new junctions) + linear asset	Relates to the inspection of water and sewer works carried out by private developers for compliance with the Council's standards.	$/m	6.52	16.30	150%	376,563
21a. Water or sewer engineering plan and technical assessment – small projects[31]	Relates to the reviewing of plans related to water and sewer works.	Each	303.81	487.95	61%	73,193
22c. Section 307 certificate – single residential development and dual occupancy	For the provision of a Section 307 Certificate which states that a development complies with the Water Management Act 2000	Each	151.90	152.63	0%	68,684
23. Section 305 application	For the provision of a Section 307 Certificate which states that a development complies with the Water Management Act 2000.	Each	NA	60.32	NA	180,960

Source: CCC (2021), Technical Paper 9 – Pricing of other services 2022 Central Coast Council water price review, Table 8

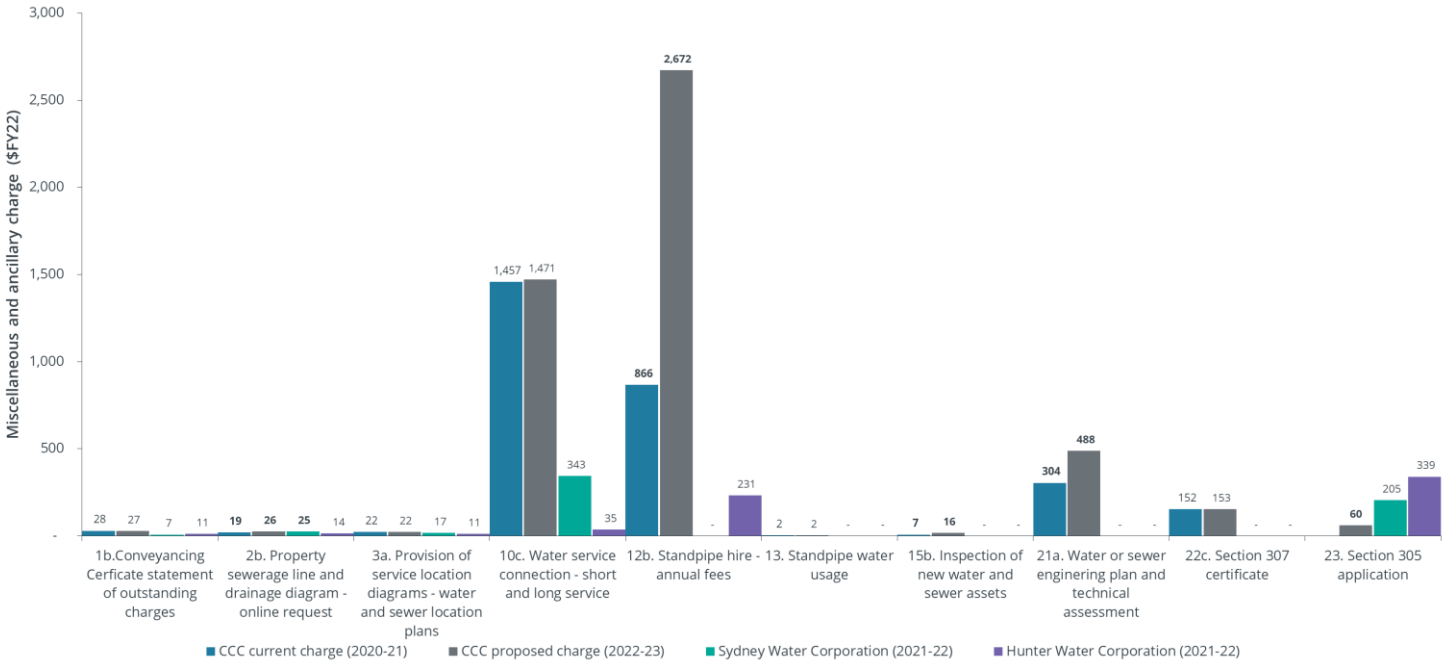
[31] Relocations, private SPS and/or development </10 lots or extension to properties outside areas

5.3.1 Assessment of CCC's proposed miscellaneous and ancillary charges

As shown in **Figure 33**, CCC's proposed miscellaneous and ancillary charges appear to be, on average, higher than similar charges levied by Sydney Water and Hunter Water. The most material difference is around the *water service connection* and *standpipe hire* charges, which are responsible for 25% of the miscellaneous charge revenue.

CCC's submission indicated that the increase in charges is due to adopting IPART's miscellaneous charge methodology, which includes an allocation of overheads to each charge (which were previously not included in CCC's charges).

Figure 33: Comparison CCC's top ten proposed and existing miscellaneous and ancillary charges ($2021-22)



Source: CCC (2021), Technical Paper 9 – Pricing of other services 2022 Central Coast Council water price review, Table 8; IPART (2020), Review of prices for Hunter Water Corporation from 1 July 2020 Final Report, pp. 316-318; IPART (2020), Review of prices for Sydney Water from 1 July 2020. Final Report, p. 319.
Note: In some cases, we were unable to identify the corresponding charge levied by Sydney Water and Hunter Water to compare with Central Coast charges. These charges have been included as charges of zero for the purposes of this chart.
Note: we have assumed that Sydney Water's Service No. 33a -Development Requirements Application – complying development charge and Hunter Water's development assessment application is comparable to CCC's Section 305 application charge.

To better enable benchmarking against similar charges levied by Hunter Water and Sydney Water we sought further information around the drivers of the cost increases of these ten charges. However, in our view, it is not clear what is driving the cost increases from the evidence provided and as such, CCC has not provided sufficient evidence to justify the proposed increases in the charges.

As such, as shown in **Table 43**, we recommend:

- The increase be limited to CPI for existing charges where CCC has proposed a significant increase (i.e. 2b, 12b, 15b and 21a);

- Accepting the proposed charge for existing charges where CCC has proposed a small increase (i.e. 10c, 13) or a reduced charge (i.e. 1b, 3a, 22c).
- Accepting the proposed charge for the new charge (Section 305 application) given it appears to be lower than similar charges levied by comparable water utilities.[32]

For all charges between FY2023-2026 we recommend adjusting the FY22-23 charge by CPI.

Table 43: Comparison of CCC's top ten proposed and existing miscellaneous and ancillary charges ($2021-22)

Miscellaneous & ancillary charge	Proposed charge (2022-23)	Recommendation (2022-23)	Variance (%)
1b. Conveyancing Certificate Statement of Outstanding Charges (s360 Certificate) – online request (online form on council website)	27.31	27.31	-
2b. Property sewerage line and drainage diagram - online request (online form on council website)	25.67	18.89	-26%
3a. Provision of service location diagrams - water and sewer location plans	21.84	21.84	-
10c. Water service connection - short and long service (20mm)	1,470.99	1,470.99	-
12b. Standpipe hire - annual fees (65mm)	2,672.00	866.1	-68%
13. Standpipe water usage	2.20	2.20	-
15b. Inspection of new water and sewer assets (incl. encasements and new junctions) + linear asset	16.30	6.52	-60%
21a. Water or sewer engineering plan and technical assessment – small projects	487.95	303.81	-38%

[32] We have assumed that Sydney Water's Service No. 33a -Development Requirements Application – complying development charge and Hunter Water's development assessment application is comparable to CCC's Section 305 application charge.

22c. Section 307 certificate – single residential development and dual occupancy	152.63	152.63	-
23. Section 305 application	60.32	60.32	-

Source: CCC (2021), Technical Paper 9 – Pricing of other services 2022 Central Coast Council water price review, Table 8; Frontier Economics

5.3.2 Conclusions

As part of its submission, CCC has proposed to:

- Increase admirative trade waste charges by between 17% and 41% (excluding the Category S application fee, which would decline by 2.6%).
- Increase the ten charges responsible for around 70% of CCC's expected revenue on average by 50% with some charges (i.e. *miscellaneous charge 12b. Standpipe hire - annual fees*) proposed to increase by over 200%.

In both cases, CCC's submission noted that the reason for the increased charges was to better align with IPART's pricing principles.

In relation to the proposed changes to the trade waste charges, we note that for most of the charges, the increases in the charges seem to be driven by a move towards cost reflective pricing and they are broadly in line with charges levied by comparable water utilities.

While, in our view CCC has not provided sufficient evidence to justify the increased time requirement associated with Category 1 and Category 2 Annual Trade Waste fees, on balance, given the charges are broadly in line with, or below, charges levied by comparable water utilities, we recommend adopting CCC's proposed trade waste charges.

However, in relation to the proposed changes to miscellaneous and ancillary charges, in our view, CCC has not provided sufficient evidence to justify the proposed increases in the charges. CCC's proposed miscellaneous charges appear to be, on average, higher than similar charges levied by Sydney Water and Hunter Water.

As such, we recommend:

- The increase be limited to CPI for existing charges where CCC has proposed a significant increase (i.e. 2b, 12b, 15b and 21a);
- Accepting the proposed charge for existing charges where CCC has proposed a small increase (i.e. 10c, 13) or a reduced charge (i.e. 1b, 3a, 22c).
- Accepting the proposed charge for the new charge (Section 305 application) given it appears to be lower than similar charges levied by comparable water utilities.[33]

[33] We have assumed that Sydney Water's Service No. 33a -Development Requirements Application – complying development charge and Hunter Water's development assessment application is comparable to CCC's Section 305 application charge.

6 Accountability measures

In IPART's Issues Paper for the review of CCC's prices from 1 July 2022, it noted that it was considering setting performance measures so, in its next review, IPART can assess the extent to which CCC has delivered better quality services and met community expectations.

IPART noted that these performance measures may include:

- how many complaints CCC receives about its water services from households and businesses (e.g. complaints about dirty drinking water),
- how many preventable service interruptions to their water supply are experienced by households or businesses, and
- how many events that pose health risks (such as wastewater overflows) occur.[34]

This section sets out CCC's performance against accountability measures in the 2019 determination, as well as our recommended accountability measures for the 2022 determination.

6.1 Methodology

Our methodology to review accountability measures involves:

- reviewing CCC's performance against the accountability measures in the 2019-22 determination period and assessing the reasons where measures have not been achieved.
- recommending a new of new accountability measures, drawing on CCC's recent performance and proposed measures, our recommended expenditure in the 2022-26 determination period, CCC's strategic business plan, customer expectations and health and environmental performance requirements.

The sections below detail our draft findings and recommendations.

6.2 CCC performance over the 2019-22 determination

6.2.1 Water performance

CCC's performance against water accountability measures over the 2019-22 determination period is summarised in **Table 44** below.

As shown in **Table 44** the frequency of water quality complaints and unplanned interruptions exceeded IPART's targets during the 2019-22 determination period. CCC's water main breaks per 100km of main has outperformed IPART's target.

[34] IPART, Review of Central Coast Council water, wastewater and stormwater prices from 1 July 2022, Issues Paper, September 2021, p 14.

Table 44: CCC water performance over the 2019 determination period

Output measure		2019-20	2020-21	2021-22
Water quality complaints per 1,000 properties	Target	9	8	8
	Actual	**11.7**	**9**	**9**
Average frequency of unplanned interruptions per 1,000 properties	Target	115	115	115
	Actual	**127.9**	**114.2**	**115**
Water main breaks per 100km of main	Target	16	16	16
	Actual	**12**	**10.21**	**12**
Compliance with Australian Drinking Water Guidelines – microbial values (%)	Target	100	100	100
	Actual	**100**	**100**	**100**
Compliance with Australian Drinking Water Guidelines – chemical values (%)	Target	100	100	100
	Actual	**100**	**99.7**	**100**

Source: CCC, IPART.

At the time these targets were set at the commencement of the 2019 determination period, IPART's expenditure consultants noted that CCC's performance on these measures had been stable or marginally improving between 2013-14 and 2017-18.[35] Underperformance against targets is therefore a more recent trend. Further information is provided below.

Water quality complaints

Water quality complaints relate to the colour, taste and/or odour of water. The number of water quality complaints per 1,000 properties have exceeded, or are forecast to exceed, the targets set by IPART over the 2019-22 determination (**Figure 34**). In 2019-20, according to the NSW Department of Planning, Industry & Environment, CCC's water quality complaints per 1,000 properties (11.7) was well above the weighted median of local water utilities in NSW (3.2).[36]

CCC notes that relatively poor performance was driven by several factors including lower expenditure allowances in the 2019-22 determination, reduced operational expenditure due to CCC's financial concerns, ageing infrastructure and a lack of fully integrated workflows.[37] Poor water quality was discussed at IPART's public hearing, where CCC outlined that this often occurs where there are dead-end mains that don't naturally flush leading to a build-up of sediment and dirty water. This is particularly a problem in the Davistown-Saratoga area and has led to an increase in complaints.[38]

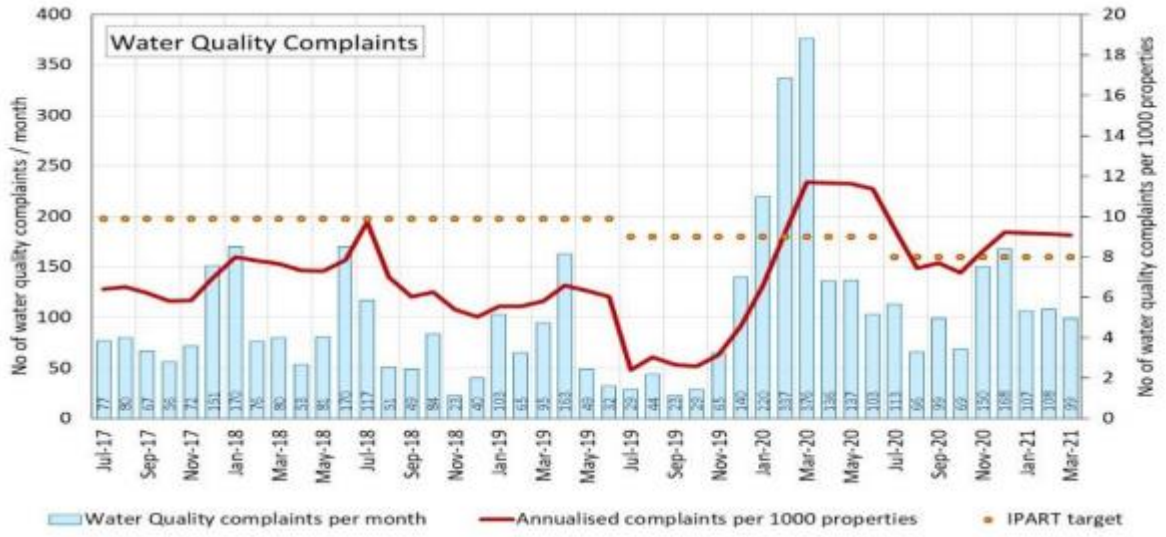
35 Atkins Cardno, Central Coast Council Expenditure Review Final Report, March 2019, pp 36-37.

36 See https://www.industry.nsw.gov.au/water/water-utilities/lwu-performance-monitoring-data

37 CCC pricing Proposal to IPART, Technical Paper 5 – Operating expenditure, September 2021, pp 19-20.

38 IPART, Review of Central Coast Council's water prices, Public hearing transcript – Session A, 26 October 2021, p 16

Figure 34: Monthly water quality complaints per 1,000 properties



Source: CCC pricing proposal, p 41.

Our assessment supports CCC's view that poor maintenance practices, including a focus on short-term cost reductions, has been a key driver for poor water quality performance. To rectify this situation, CCC are proposing to change their business model so that all maintenance and inspections schedules are further aligned to Asset Management Plans and specific asset class and maintenance plans.

CCC is seeking capital and operational expenditure for systematic main cleaning and pigging, reservoir internal coating, chlorination and mixing process enhancement, catchment minor asset renewals, pump station capacity upgrade and water treatment and plant pre-treatment train upgrades.[39]

Unplanned water supply outages

CCC submitted that the most common water supply interruptions are caused by mains breaks, major leaks and emergency repairs due to issues including tree roots damaging pipes, and infrastructure damage by third parties.[40]

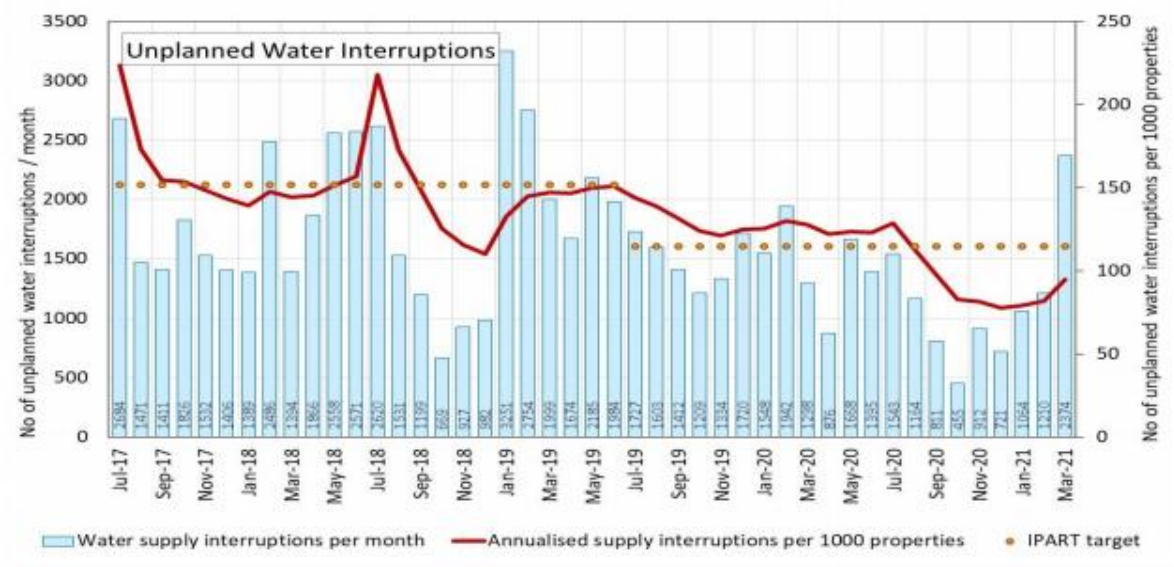
After a downward trend in unplanned outages per 1,000 properties since July 2017, resulting in marginally compliant years with output measures in 2017-18 and 2018-19, unplanned outages exceeded IPART's target in 2019-20 (**Figure 35** and **Table 44**). As with water quality complaints, we consider that the key driver for unplanned outages is CCC's poor maintenance practices in recent years.

CCC considers that its capital works program over the forthcoming determination period will reduce main breaks and significantly reduce the number of unplanned water supply outages.

[39] CCC Pricing proposal to IPART, September 2021, p 41.

[40] CCC Pricing proposal to IPART, September 2021, p 42.

Figure 35: Unplanned water supply outages

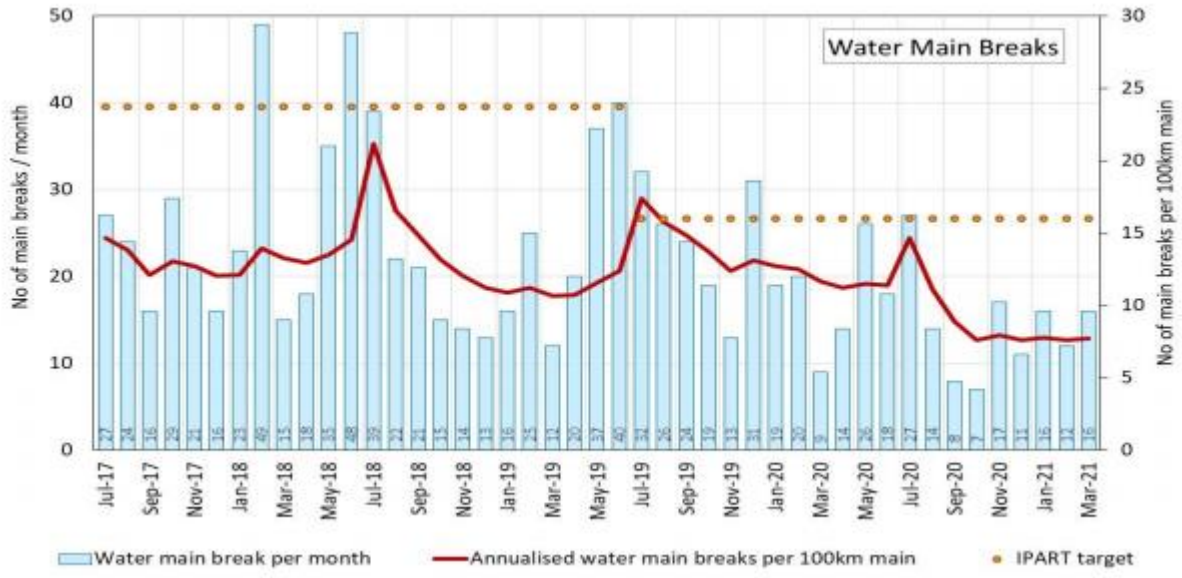


Source: CCC pricing proposal, p 42.

Water main breaks

Water main breaks per 100km of mains has been improving over several years (**Figure 36**). CCC is currently achieving the target set in the 2019 determination of 16 water main breaks per 100km. CCC considers that this outperformance is due to its renewals program, and it intends to further capex in the 2022 determination period to minimise water main breaks.

Figure 36: Water main breaks per 100km of main



Source: CCC pricing proposal, p 43.

Compliance with ADWG

IPART established water quality output measures of 100% compliance with ADWG microbial and chemical guideline values in the 2019 determination period. CCC considers that, overall, results

demonstrate that it continues to deliver safe drinking water to customers. It notes that three instances of elevated metal concentration were due to sample contamination upon collection.[41]

6.2.2 Wastewater performance

CCC's performance against wastewater accountability measures over the 2019 determination period is summarised in **Table 45** below.

Table 45 shows that CCC outperformed against targets for wastewater overflows and wastewater main breaks and chokes per 100km of main. CCC did not meet targets for wastewater overflows reported to the environmental regulator, odour complaints (except in 2020-21) and compliance with Environment Protection Licence limits. At the commencement of the 2019 determination period, IPART's expenditure consultant noted that performance had been fairly stable between 2013-14 and 2017-18 for odour complaints, sewer main breaks and chokes, and total wastewater overflows. At this time reported wastewater overflows showed no discernible trend.[42]

Table 45: CCC wastewater performance over the 2019 determination period

Output measure		2019-20	2020-21	2021-22
Wastewater overflows per 100km of main	Target	32	30	28
	Actual	**31**	**27.5**	**28**
Wastewater overflows reported to the environmental regulator, per 100km of main	Target	1.6	1.5	1.4
	Actual	**2.9**	**2.5**	**2.5**
Wastewater odour complaints per 1,000 properties	Target	1.7	1.7	1.5
	Actual	**2.2**	**1.6**	**1.6**
Wastewater main breaks and chokes per 100km of mains	Target	35.6	34	32
	Actual	**32.8**	**30.5**	**32**
Compliance with EPL concentration, load limits	Target	Yes	Yes	Yes
	Actual	**No**	**No**	

Source: CCC, IPART.

Wastewater overflows

Wastewater overflows can cause significant damage to the environment and pose public health risks. CCC must report such incidents to the EPA. CCC submits that the performance of the wastewater system is influenced by many factors including soil type, pipe material, tree roots, disposed solids, topography, settlement behaviour of soil, electricity outages, sewerage

41 CCC Pricing proposal to IPART, September 2021, p 44.

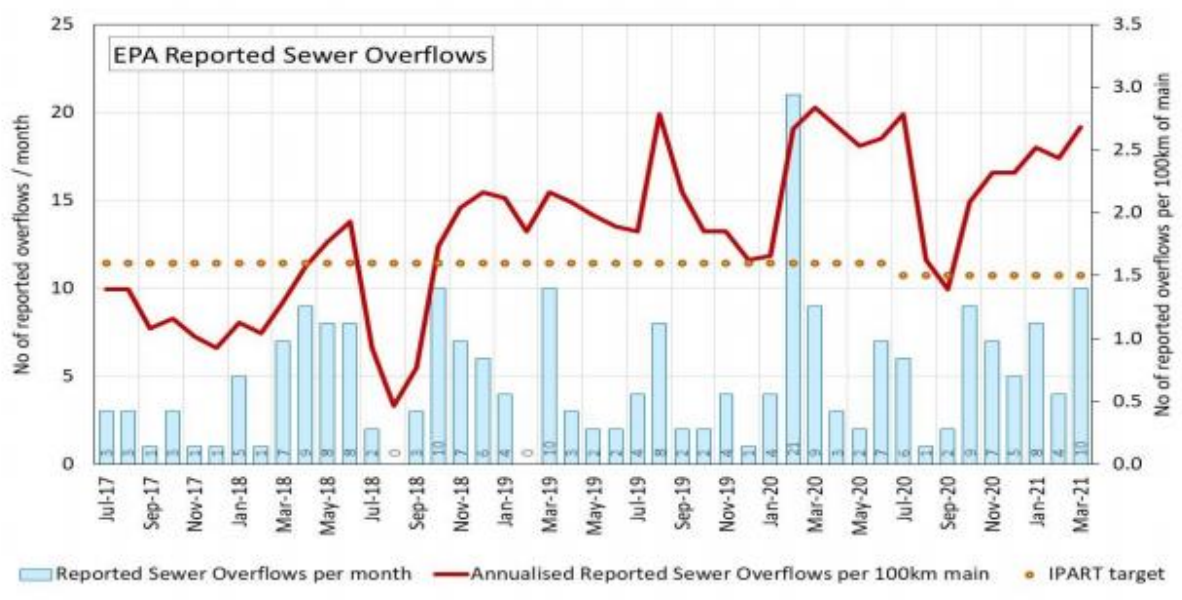
42 Atkins Cardno, Central Coast Council Expenditure Review Final Report, March 2019, p 37.

configuration, management of trade waste, volume of sewage, rainfall and overall weather conditions.[43]

CCC's wastewater overflows per 100km of main has outperformed IPART's target over the 2019 determination period. However, the number of reported overflows to the EPA has underperformed against IPART's target (**Table 45** and **Figure 37**). CCC noted that there has been a significant increase in wastewater overflows reported to the EPA over the past few years. In line with this, there has also been an increase in wastewater service complaints over the same period. CCC submitted that the rate of complaints per 1,000 properties is 2.5 times higher than its nearest comparable water business.[44]

CCC submitted that to rectify the decline in performance and to meet accountability measures it requires additional expenditure on sewer network overflow monitoring, SCADA upgrades, sewer pump station emergency overflow prevention, rising main rehabilitation, vacuum system renewals, rising main asset management, manhole rebuilds, pump station renewals and refurbishments, sewer main coating, sewer rising main renewals, cathodic protection, leaking manhole detection and management, and other similar measures.[45]

Figure 37: Wastewater overflows reported to the EPA



Source: CCC pricing proposal, p 46.

Wastewater odour complaints

CCC is expected to meet its wastewater odour complaints target in one out of three years in the 2019-22 determination period (2020-21). CCC notes that odour complaints are very common and result from degradation of sulphur dioxide in the sewerage network system.

43

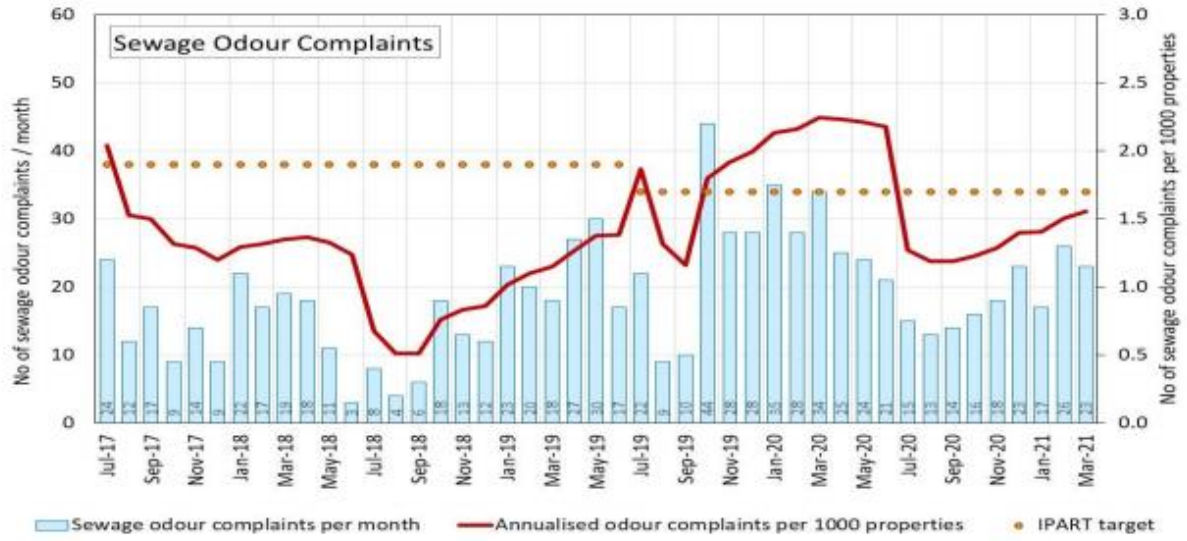
44 CCC Pricing proposal to IPART, September 2021, p 27.

45 CCC Pricing proposal to IPART, September 2021, p 47.

CCC further notes that the intensity of odours depends on factors including weather conditions, wind speed, shock influent loads, equipment failure, age of sewage in the network, pump station operations, asset conditions and the presence of blockages and chokes.[46]

Wastewater odour complaints by month, and per 1000 properties, is shown in **Figure 38**. This number can fluctuate substantially from month to month, highlighting the need to actively investigate and manage the network for the vectors responsible.

Figure 38: Wastewater odour complaints



Source: CCC pricing proposal, p 48.

We consider that the relatively poor performance against wastewater odour targets relates to poor management and maintenance of CCC's sewage treatment plants (STP). For example, the build-up of debris in grit chambers, aerators, digestors and sludge lagoons are contributing to increased odour and negative environmental impacts.

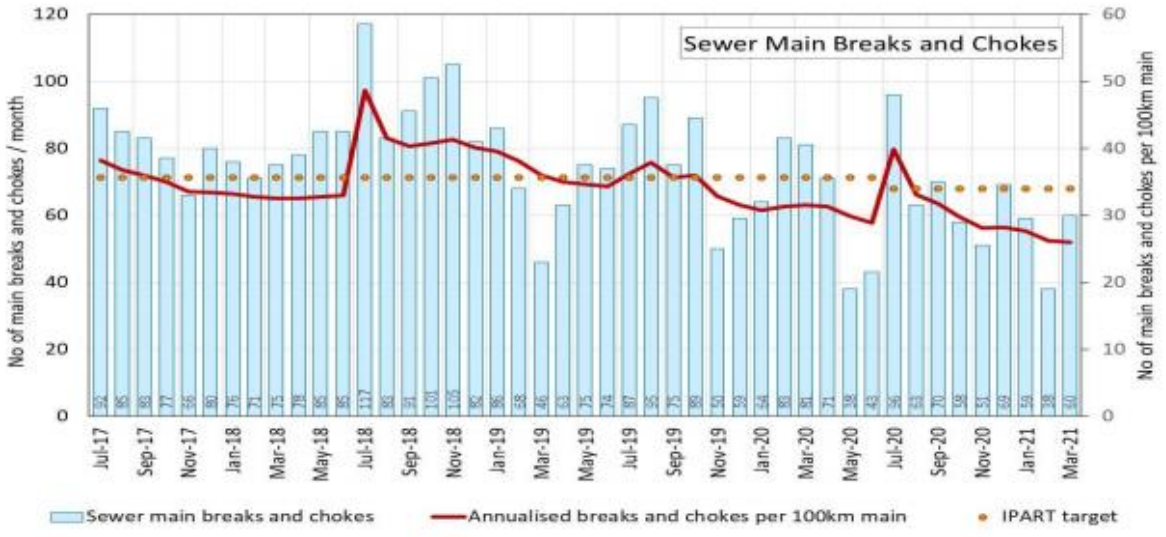
To rectify this underperformance, CCC proposes investing in a STP plant odour control program, STP treatment process improvements, Kincumber Mountain vent stack renewal, sewer odour vent replacements, and Wyong odour control augmentation.

Wastewater mains breaks and chokes

CCC has outperformed IPART's targets for wastewater main breaks and chokes per 100km of mains. As shown in **Figure 39**, there has been a favourable trend towards meeting the performance accountability measure since August 2019. CCC notes that its investment in main and asset renewals programs appears to have played a favourable role in this result.

46 CCC Pricing proposal to IPART, September 2021, p 47.

Figure 39: Wastewater main breaks and chokes



Source: CCC pricing proposal, p 45.

EPL concentration Load Limits

NSW EPA has issued three Environment Protection Licences (EPLs) for the operation of eight Council STP premises, including the associated sewer reticulation system:

- EPL 1802 – STPs: Kincumber, Woy Woy - Treated Effluent Outfall: Winney Bay
- EPL 1942 – STP: Bateau Bay - Treated Effluent Outfall: Wonga Point
- EPL 2647 – STPs: Mannering Park, Gwandalan, Wyong South, Charmhaven Toukley - Treated Effluent Outfall: Norah Head

Pollutant load and concentration limits, and maximum daily volume of treated effluent discharged to the ocean outfalls are specified in the EPL.

CCC submits that non-compliance with daily discharge volume limits occurs for each EPL following major storm events. EPL 2647 daily discharge volume limit is regularly challenged by the balancing of flow between five STPs, with increased demand due to population growth in the sewage catchment. Non-compliance with EPL conditions, including administrative non-compliances, are reported to the EPA on an annual basis.

Table 46 shows CCC's reported non-compliances of EPL 1802, EPL 1942 and EPL 2642 from 2016 to 2020.

Table 46: CCC reported EPL non-compliances

Reporting Year	EPL	Non-compliance
2018	2647	Maximum pH Annual load of total nitrogen
2019	1802	Annual load of total suspended solids Annual load of total oil and grease 3DGM concentration of daily discharge volume limits
	2647	Annual load of total nitrogen
2020	1802	Annual load of total suspended solids Annual load of total oil and grease 90th percentile concentration of total suspended solids
	2647	Annual load of total nitrogen

Source: *CCC pricing proposal, p 50.*

6.2.3 Stormwater drainage performance

For the 2019-22 determination, IPART introduced a new accountability measure for assessing low-impact stormwater drainage applications. IPART established an output measure to assess the percentage of low-impact assessments that are completed within 15 working days of receiving a complete application.

CCC noted in its pricing proposal that 12 applications and seven enquiries have been received through its customer request module. CCC noted that:

- For the 12 applications, an average turnaround time of 13 days was achieved.
- For the seven enquiries, an average turnaround time of 10 days was achieved.

While the average turnaround time reported by CCC is within the 15 day benchmark established by IPART, we note that CCC did not report the percentage of assessments that were completed within 15 days.

6.2.4 Additional accountability measures

In the 2019 determination, IPART included additional accountability measures which are summarised in **Table 47** below.

Table 47: Additional accountability measures for the 2019-22 determination

Accountability measure	Output
WATER	
PROJECT MILESTONE: MANGROVE CREEK SPILLWAY DAM UPGRADES	Mangrove Creek Spillway Dam Upgrade project to be 100% complete by 30 June 2024
PROJECT MILESTONE: MARDI TO WARNERVALE TRUNK MAIN	Mardi to Warnervale Trunk Main project to be >75% complete by 30 June 2024
CUSTOMER SERVICE: SUPPLY INTERRUPTIONS	1. Total customer minutes lost to unplanned supply interruptions. 2. Total customer minutes lost to planned supply interruptions.
WASTEWATER	
PROJECT MILESTONE: CHARMHAVEN STP	Charmhaven STP upgrades to be 100% complete by 30 June 2024

Source: IPART, Review of Central Coast Council's water, sewerage and stormwater prices - to apply from 1 July 2019, Final Report, May 2019, p 199.

The following provides our assessment of CCC's performance against the accountability measures noted in the table above.

- Mangrove Spillway Dam – Project investigations completed, and upgrade not required.
- Mardi to Warnervale – Project completed.
- Charmhaven STP – Investigations ongoing

CCC noted that it currently cannot report on an output measure relating to planned water supply interruptions. It noted it can obtain a baseline over the next determination period to allow adoption of this output measure in a future determination period.

6.3 Recommended accountability measures for the 2022 determination

This section provides our recommended accountability measures for CCC for the 2022-26 determination period. We have retained the accountability measures that IPART established in the 2019-22 determination period and included some additional measures which we consider will improve the ability for IPART to assess the extent that CCC has provided quality services and met community expectations.

In developing new accountability measures we have had regard to appropriate principles which are set out in **Box 2**.

Box 2: Design principles for accountability measures

1. The number and nature of metrics should not be too onerous as to limit performance or affect transparency
2. Metrics should align with key outcomes or services
3. Definitions and methods of measures should be agreed to enable fair comparison
4. Both common and bespoke performance measures can be used
5. Metrics should have the potential to support SMART objective setting
6. All measures should drive the right behaviours and perverse incentives avoided
7. Use of *well-established* measures which have several years of existing data will allow effective trending
8. Metrics should cover *current* performance and risk to *future* performance

Source: Mott MacDonald & Frontier Economics

CCC's accountability measures are largely adopted from its national performance reporting requirements. This offers some advantages and aligns with several principles in the box above as it enables comparison with other utilities, is based on relatively consistent definitions, allows for assessing trends over time etc. A limitation of some measures is that performance can be affected by external factors including the weather.

We note that IPART conducts a customer satisfaction survey to understand how satisfied customers are with their water providers.[47] In NSW, these include Sydney Water, Hunter Water and Central Coast Council. This survey provides insights on high level questions including:

- How customers rate their water/wastewater provider on delivering value for money
- How customers rate trust for their water/wastewater
- How customers rate their water/wastewater provider's reputation in the community
- How customers rate their satisfaction with their water/wastewater provider overall

IPART has not yet collected enough data on CCC to draw accurate conclusions about its performance, having only surveyed its customers in 2020-21. However, future surveys may provide this information for CCC and allow comparison with other utilities in NSW and Victoria given the Essential Services Commission uses the same survey.

In IPART's 2019 determination, it noted that for the 2022-26 determination, should seek to develop accountability measures that closely relate to the outputs it plans to deliver through its capital program. Further, its capital program, in turn, should be based on an understanding of customer preferences and willingness to pay for different levels of service.

We note willingness to pay (WTP) surveys have been completed for some of the major investments but we have not seen evidence of them being used to determine preferences to pay for improvements to service levels on measures such as pressure, bursts and water quality.

47 https://www.ipart.nsw.gov.au/sites/default/files/cm9_documents/Fact-Sheet-Customer-satisfaction-results-for-2020-21-29-June-2021.PDF

6.3.1 Recommended Water accountability measures

We have made recommendations on the following accountability measures for CCC's water supply services in the 2022-26 determination:

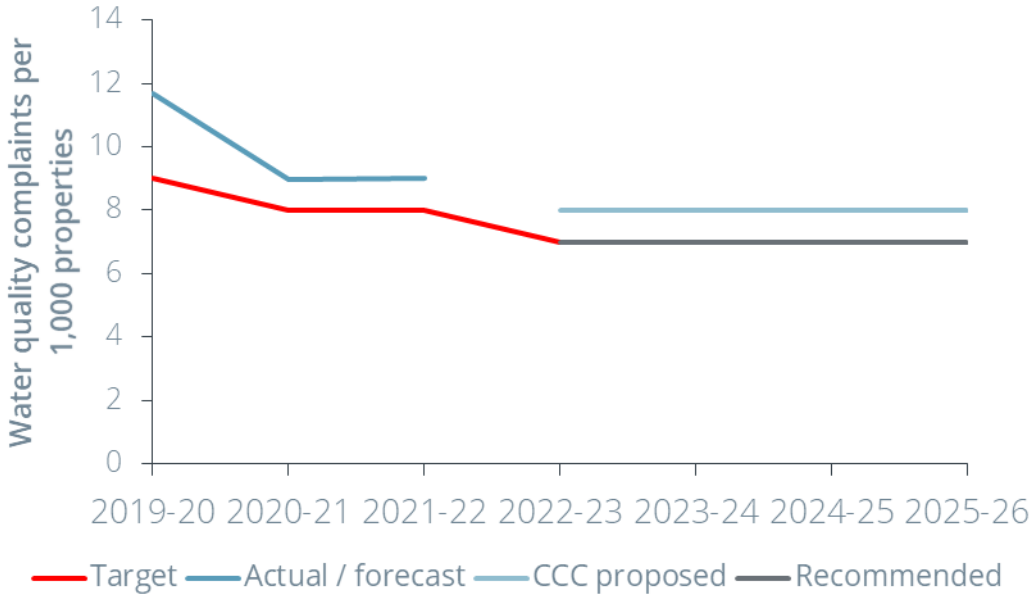
- Water quality complaints per 1,000 properties
- Water quality complaints per 1,000 properties (in Davistown/Saratoga) – new measure
- Water pressure complaints per 1,000 properties – new measure
- Total water complaints per 1,000 properties - new measure
- Average frequency of unplanned interruptions per 1,000 properties
- Number of unplanned water interruption that lasts more than five continuous hours per 1,000 properties – new measure
- Compliance with Australian Drinking Water Guidelines – microbial guideline values in the water supply & chemical guideline values
- Real losses service connections - l/CS/day

These measures are discussed below.

Water quality complaints per 1,000 properties

CCC proposed a target of 8 water quality complaints per 1,000 properties each year over the 2022-26 determination period. This was based on IPART's target of 8 in 2021-22 and represents an improvement on CCC's recent performance.

Figure 40: Recommended accountability measure: water quality complaints per 1,000 properties



Source: SIR, Frontier Economics, Mott MacDonald.

We recommend that target be set at 7 over the 2022 determination (**Figure 40**). We consider that CCC should start to see some improvements in complaints based on its capex and opex

initiatives. A target of 7 is also consistent with IPART's target for 2022-23 from the 2019 determination.

Total water quality complaints per 1,000 properties in Davistown and Saratoga region

As noted above, water quality has been a key concern for residents in the Davistown/Saratoga area of the Central Coast and was discussed at IPART's public forum. We are proposing that CCC also report on total water quality complaints per 1,000 properties received from this area. This would allow IPART and other stakeholders to understand trends in this particular part of CCC's network.

We are not proposing a target for this measure, but rather CCC starts to report actual complaints received. This would provide a baseline from which future targets could be set and trends observed. In line with the principles set out in Box 2, we may need to work with CCC to clearly define the Davistown/Saratoga area in order to report on this measure.

Total water pressure complaints per 1,000 properties

CCC does not currently have any accountability measures related to water pressure and we note that a 12-metre head at the customer boundary is low compared to industry standards. The purpose of proposing this accountability measure is to understand if water pressure is an issue for customers. We are not proposing a target for this measure, but rather CCC starts to report actual water pressure complaints received to provide a baseline from for a future target.

Total water quality complaints per 1,000 properties

We also propose a new accountability measure that tracks total complaints (not just water quality complaints). This would provide a broader indication of CCC's customer service, capturing items including billing complaints. CCC already reports against this metric as part of the NPR dataset and so should not involve any additional costs for CCC to collect the data.

We recommend setting a target of:

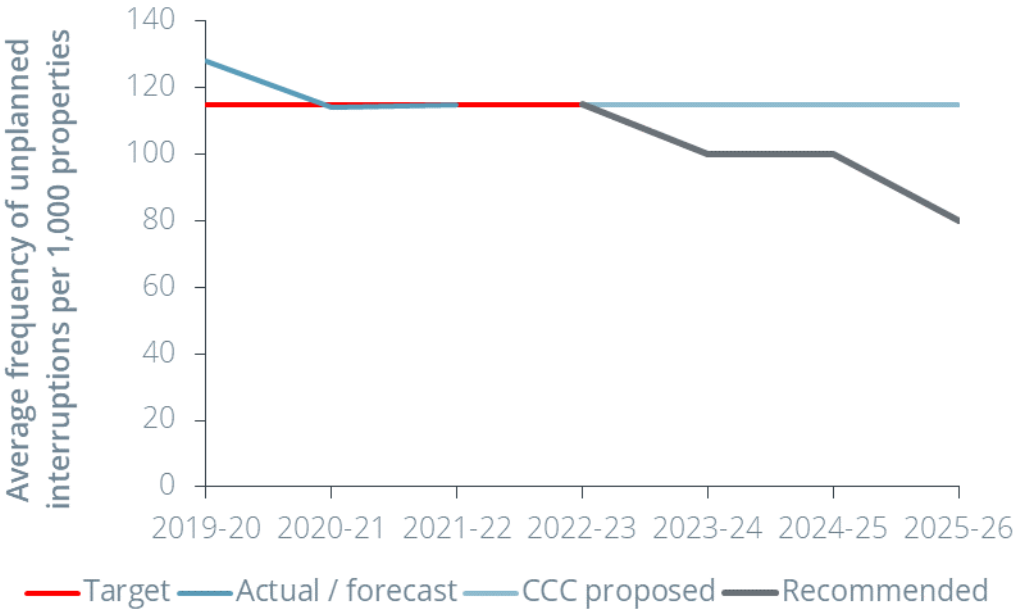
- 9 complaints per 1,000 properties in 2022-23 and 2023-24, and
- 8 complaints per 1,000 properties in 2024-25 and 2025-26

The initial target of 9 complaints is based on CCC's average performance in 2019-20 and 2018-19 as reported in DPIE's local water utilities annual report. This falls in 2024-25 in line with the fall in our proposed target for water quality complaints in the same year.

Average frequency of unplanned interruptions per 1,000 properties

While CCC considers that its capital works program over the forthcoming determination period will reduce main breaks and significantly reduce the number of unplanned water supply outages, this has not been reflected in its proposed target of 115 unplanned interruptions per 1,000 properties each year over the 2022-26 determination period. This proposal is similar to CCC's recent performance. We expect that CCC should see improvement in unplanned interruptions by are recommending a target that commences as at 115 unplanned interruptions per 1,000 properties, falling to 100 in 2023-24 and again to 80 in 2025-26 as set out in the figure below.

Figure 41: Recommended accountability measure: average frequency of unplanned interruptions per 1,000 properties



Source: SIR, Frontier Economics, Mott MacDonald.

Number of unplanned water interruption that lasts more than five continuous hours per 1,000 properties

While CCC report on the number of unplanned water interruptions, a key consideration of service performance is how long these interruptions take to resolve. We are proposing a new measure that tracks how unplanned water interruptions that exceed five continuous hours. We note Hunter water reports on a similar measure under its Operating Licence with IPART.[48] We have not proposed a specific target and instead recommend that CCC commence reporting on this measure to establish a baseline.

Water main breaks per 100km of mains

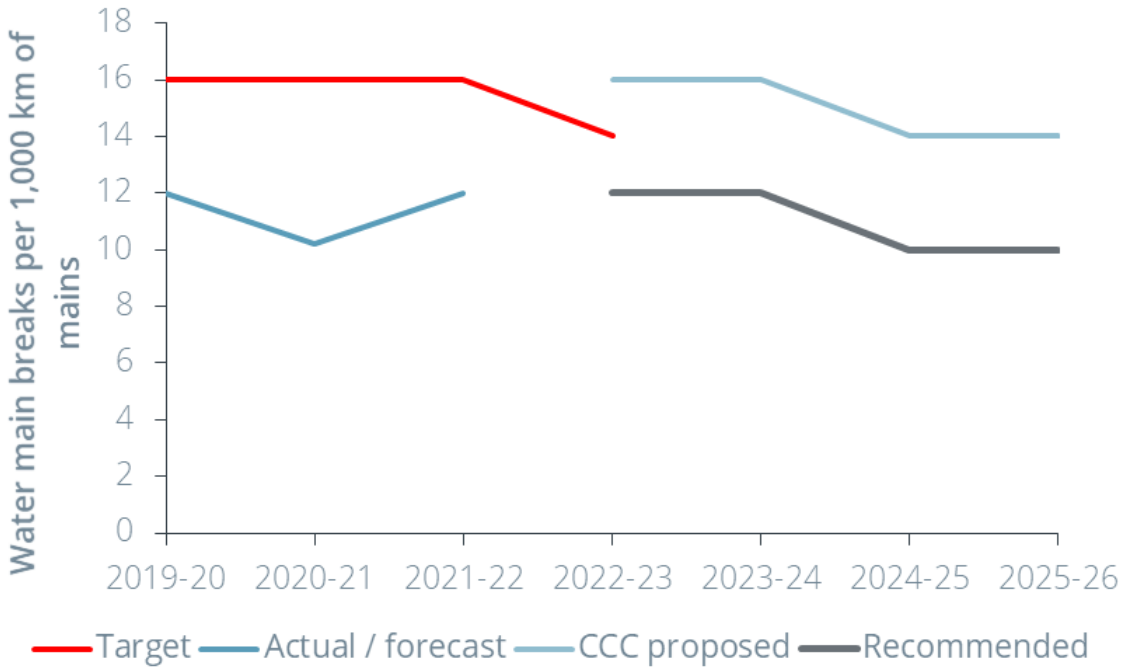
CCC proposed a target of 16 breaks per 100km of main for the first two years of the 2022-26 determination, and 14 for the final two years with a proposed increase in funding. This is despite outperforming IPART's target of 16 in each year of the 2019-22 determination period.

As noted above, CCC considers that its outperformance is due to its renewals program, and it intends further capex in the 2022 determination period to minimise water main breaks.

We consider that CCC's performance over the past three years warrants a lower target than proposed by CCC. We recommend a target of 12 in 2022-23 and 2023-24, falling to 10 for the final two years of the determination period as summarised in the figure below.

48 https://www.ipart.nsw.gov.au/sites/default/files/documents/reporting-manual-hunter-water-operating-licence-2017-2022-%E2%80%93-july-2018.pdf

Figure 42: Water main breaks per 100km of mains



Source: SIR, Frontier Economics, Mott MacDonald.

Compliance with Australian Drinking Water Guidelines

We support CCC's proposed targets of 100% compliance with Australian Drinking Water Guidelines - microbial guideline values in the water supply and chemical guideline values in the water supply. Given the importance of these measures the targets should remain at 100%.

Real losses: service connections

As discussed in our review of capital expenditure in section 5 we are proposing this new measure from the National Performance Report. The intent is to promote targeted planned investment systems and decision making, a culture of value for money investment and continuous improvement. With current performance of 68/l/CS/day, we are proposing a target of 61 over the 2022 determination.

6.3.2 Recommended Wastewater accountability measures

We have made recommendations on the following accountability measures for CCC's wastewater services:

- Wastewater overflows per 100km of main
- Wastewater overflows reported to the environmental regulator, per 100km of main
- Wastewater overflows per 100km of main under dry weather conditions - new measure
- Wastewater odour complaints per 1,000 properties
- Total wastewater service complaints per 1,000 properties - new measure
- Wastewater main break and chokes per 100km of main
- Compliance with EPL concentration, load limits

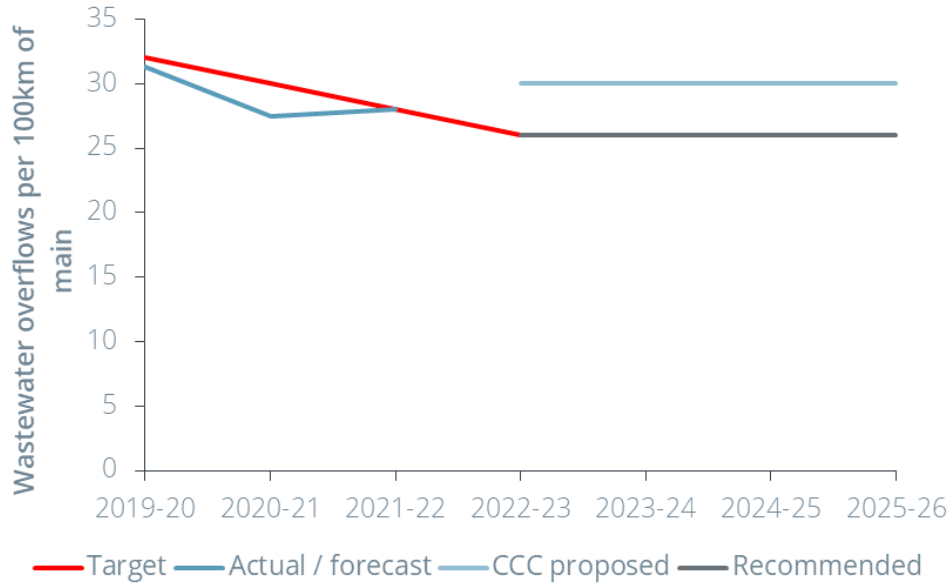
These measures are discussed below.

Wastewater overflows per 100km of main

CCC proposed a target of 30 wastewater overflows per 100km of main for the 2022-26 determination period. This was based on IPART's existing target for 2020-21. CCC outperformed IPART's target in 2020-21 and forecasts to outperform the same target in 2021-22.

We expect that CCC can continue its recent performance, with further improvement throughout the next determination period. We recommend a target of 26 through the 2022-26 determination period. This is in line with IPART's target from the 2019-22 determination, as shown below.

Figure 43: Wastewater overflows per 100km of main



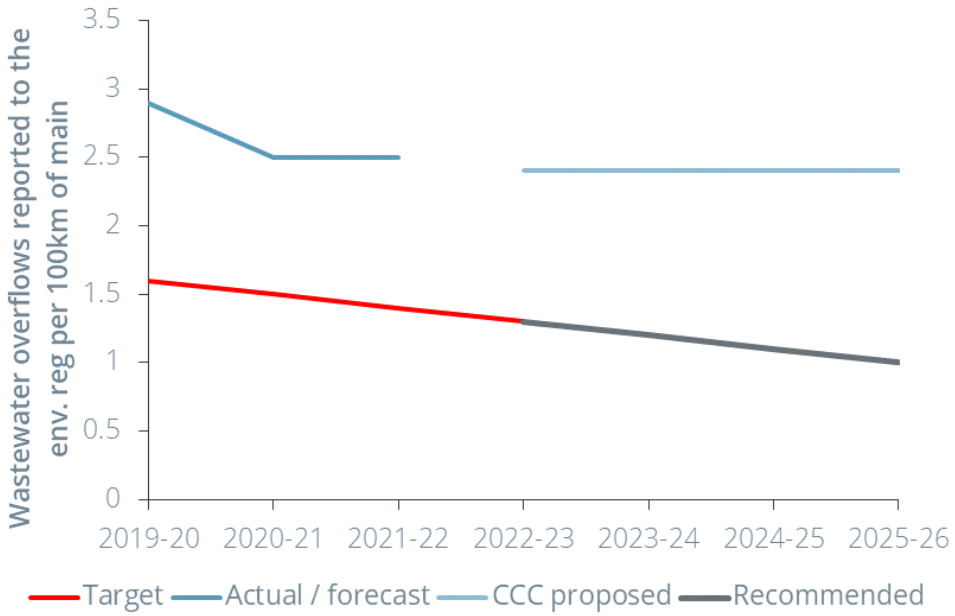
Source: SIR, Frontier Economics, Mott MacDonald.

Wastewater overflows reported to the environmental regulator, per 100km of main

CCC proposed a target of 2.4 incidents reported to the regulator per 100km based on its recent performance. CCC's recent has recently underperformed against IPART's target (i.e. events have exceeded IPART target.

In line with increased expenditure in the 2022-26 determination period, we consider that CCC could achieve a level of performance in line the trend from IPART's previous target. We recommend setting the target at 1.3 in 2022-23 falling to 1.0 in 2025-26.

Figure 44: Wastewater overflows reported to the regulator, per 100km of main



Source: SIR, Frontier Economics, Mott MacDonald.

Wastewater overflows per 100km of main (dry weather conditions)

CCC proposed an aspirational target of 1.5 overflow incidents reported to the regulator in dry weather conditions.

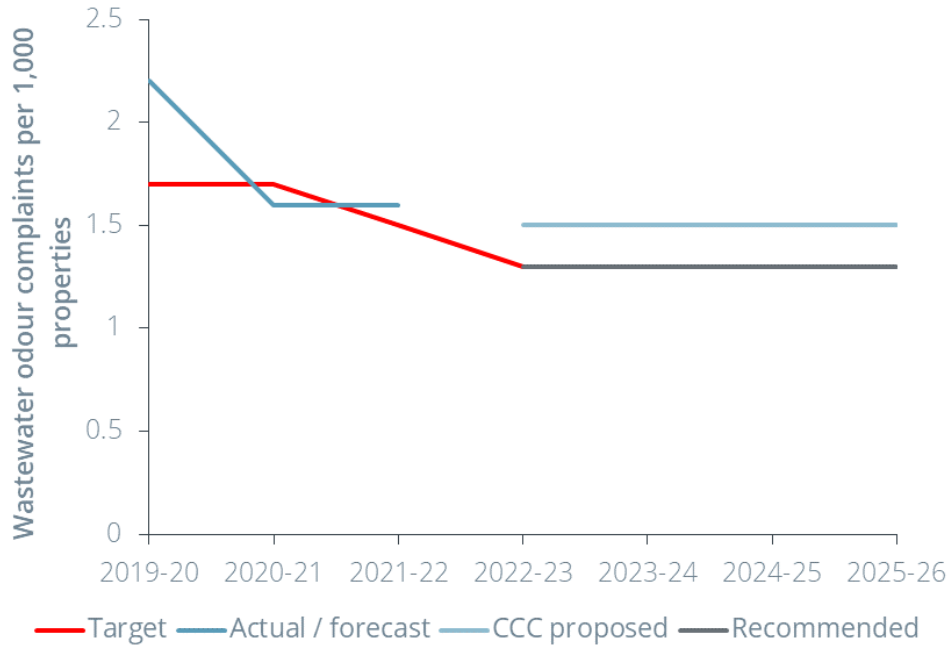
While we support an additional accountability measure for dry weather conditions, we recommend that reporting cover all such events, not just those reported to the regulator. Furthermore, given the significant environmental impacts associated with dry weather overflows we are recommending that the aspirational target be set at zero.

Wastewater odour complaints per 1,000 properties

CCC proposed that it could meet an aspirational target of 1.5 odour complaints per 1,000 properties. This is marginally below its recent performance of 1.6 odour complaints per 1,000 properties.

We expect to see improvements in odour complaints over the 2022-26 determination period, particularly as proposed cleaning and other improvements to wastewater treatment plants are undertaken. Our recommended target is 1.3 across the determination period as set out below.

Figure 45: Wastewater odour complaints per 1,000 properties



Source: SIR, Frontier Economics, Mott MacDonald.

Total wastewater service complaints

We propose a new accountability measure that tracks total wastewater service complaints (not just odour). This would provide a broader indication of CCC's wastewater service, including chokes and odour, but excluding billing. CCC already reports against this metric as part of the NPR dataset. We recommend a target of 4.1 complaints per 1,000 properties based on CCC's average performance in 2019-20 and 2018-19 as reported in DPIE's local water utilities annual report.

Wastewater main breaks and chokes per 100km of mains

CCC proposed a target of 34 main breaks and chokes over the 2022-26 determination period based on IPART's target for 2020-21.

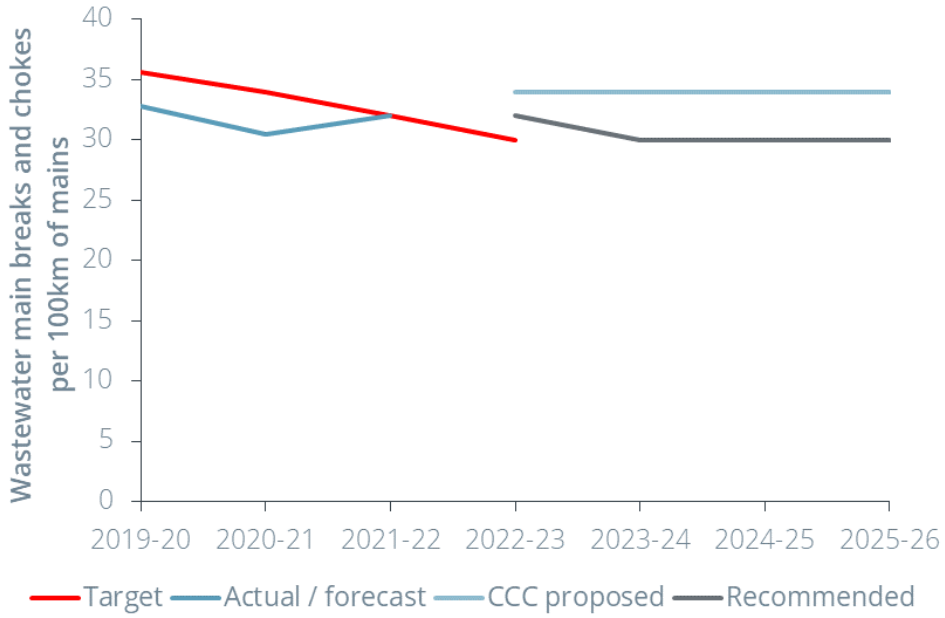
CCC noted that there has been a steady downward trend in main breaks since July 2018 with asset renewals contributing to this result. CCC's proposal is based on current funding, but with additional funding an aspirational level of 30 may be achieved.[49]

Based on our recommended opex and capex over the 2022-26 determination period, we consider that CCC should be able to achieve a more challenging target. We are recommending a target commencing at 32 and falling to 30 in 2023-24. We consider this is reasonable when considered against the national median of 18 for utilities with greater than 10,000 connected properties.[50]

Figure 46: Wastewater main breaks and chokes per 100km of mains

[49] CCC Pricing proposal to IPART, September 2021, p 46.

[50] See Local Water Utilities (LWU) performance monitoring data and reports, 2019-20, Breaks and chokes per 100km, https://www.industry.nsw.gov.au/water/water-utilities/lwu-performance-monitoring-data



Source: SIR, Frontier Economics

EPL concentration load limits

We support CCC's proposal to meet EPL concentration load limits over the 2022-26 determination period.

6.3.3 Recommended Stormwater accountability measures

We have made recommendations on the following accountability measures for CCC's stormwater services:

- Low impact application processing
- Length of stormwater drainage infrastructure per annum (proposed by CCC)
- Stormwater drainage maintenance requests received per annum (proposed by CCC)

Low impact application processing

As noted above, in the 2019-22 determination IPART introduced a new accountability measure for assessing low-impact stormwater drainage applications. IPART established an output measure to assess the percentage of low-impact assessments that are completed within 15 working days of receiving a complete application.

CCC have proposed to retain the 15-day benchmark in the 2022-26 determination period, although it reported that its average turnaround time has been 13 days. We expect further efficiencies can be achieved over the 2022-26 determination period and therefore we recommend that the target be set at 12 days and that CCC could achieve this target at least 90% of the time. In addition to reporting the average time, CCC should also report the percentage of applications that were completed within the target.

Length of stormwater drainage infrastructure per annum

CCC have proposed an accountability measure for the length of stormwater drainage infrastructure per annum. The new measure will report on the length of assets renewed, refurbished and upgraded each year. CCC proposed 5.4km in 2022-23 and noted that this varies each year based on the number of capital projects. We support CCC's proposed measure.

Stormwater drainage maintenance requests received per annum

CCC have proposed an accountability measure for stormwater drainage maintenance requests received per annum. It proposed 2,545 based on 2019 determination average to establish a baseline. We support CCC's proposed measure.

6.3.4 Recommended project accountability measures

In addition to the water, wastewater and stormwater accountability measures discussed above, we are also proposing several project-based accountability measures. These are summarised below:

- CCC report on its progress against the Asset Management improvement plans (11 Asset Management Strategies and 38 tasks) as detailed in the Asset Management Strategy (November 2021)
- Charmhaven STP - Finalisation of project scope and budgeting by July 2022 (Gateway 1) - CHSTP's upgrade is still approaching Gateway 2 in its preconceptual stage. There is a tight timeline to uphold to ensure the contract is awarded by mid to late 2023 for construction in 2023-24.
- Kincumber STP biosolids – this STP currently produces biosolids of roughly 14% solids, a measure that is considered unsafe by the NSW EPA Biosolids Guidelines. We recommend a target greater than 15% in the 2022-26 determination
- Bateau Bay STP odour – a recommended target of 1.5 odour complaints per 1,000 properties to meet GHD's CCC Asset Management Plan (Water and Sewer Networks) targets in 10 years' time.

6.3.5 Conclusions

IPART has flagged that it is looking at ways to hold CCC more accountable so that in the next pricing review, it can assess the extent to which it delivered better quality services and met community expectations.[51] We have both assessed CCC's performance against accountability measures set for the 2019-22 determination and proposed new accountability measures for the 2022-26 determination.

In proposing new measures, we have applied a set of principles including that accountability measures drive the right behaviour, align with key services and outcomes and not be too onerous. Our new measures include:

- Broadening measures relating to water and wastewater complaints, including water pressure complaints and water quality complaints specific to the Davistown-Saratoga area in response to stakeholder concerns

[51] IPART, Review of Central Coast Council water, wastewater and stormwater prices from 1 July 2022, Issues Paper, September 2021, p 14.

- Expanding reporting on unplanned water supply outages to include not just the frequency, but the duration of unplanned outages
- Reporting on the number of dry weather overflows
- Various project-specific measures, including in relation to improvements to asset management and wastewater treatment plan operation

While some of these measures respond to existing or emerging issues, others (for example water pressure and dry weather overflows) we consider are fundamental performance items that should be reported on by a water utility the size of CCC.

Our recommended measures and targets for water, wastewater, stormwater and project-specific are summarised in the tables below.

Table 48: Recommended accountability measures for water services

	2022-23	2023-24	2024-25	2025-26
WATER QUALITY COMPLAINTS PER 1,000 PROPERTIES	7	7	7	7
WATER QUALITY COMPLAINTS PER 1,000 PROPERTIES (DAVISTOWN & SARATOGA)	-	-	-	-
WATER PRESSURE COMPLAINTS PER 1,000 PROPERTIES	-	-	-	-
TOTAL WATER COMPLAINTS PER 1,000 PROPERTIES	9	9	8	8
AVERAGE FREQUENCY OF UNPLANNED INTERRUPTIONS PER 1,000 PROPERTIES	115	115	100	100
NUMBER OF UNPLANNED WATER INTERRUPTION THAT LASTS MORE THAN FIVE CONTINUOUS HOURS PER 1,000 PROPERTIES	-	-	-	-
COMPLIANCE WITH ADWG – MICROBIAL GUIDELINE VALUES	100%	100%	100%	100%
COMPLIANCE WITH ADWG – CHEMICAL GUIDELINE VALUES	100%	100%	100%	100%
REAL LOSSES: SERVICE CONNECTIONS: L/ CS/ DAY	61	61	61	61

Source: Frontier Economics & Mott MacDonald

Table 49: Recommended accountability measures for wastewater services

	2022-23	2023-24	2024-25	2025-26
WASTEWATER OVERFLOWS PER 100KM OF MAIN	28	26	26	26
WASTEWATER OVERFLOWS REPORTED TO THE ENVIRONMENTAL REGULATOR PER 100KM OF MAIN	1.3	1.2	1.1	1.0
WASTEWATER OVERFLOWS PER 100KM OF MAIN (DRY WEATHER)	0	0	0	0
WASTEWATER ODOUR COMPLAINTS PER 1,000 PROPERTIES	1.3	1.3	1.3	1.3
TOTAL WASTEWATER COMPLAINTS PER 1,000 PROPERTIES	4.1	4.1	4.1	4.1
WASTEWATER MAIN BREAKS AND CHOKES PER 100KM OF MAINS	32	30	30	30
COMPLIANCE WITH EPL CONCENTRATION, LOAD LIMITS	Yes	Yes	Yes	Yes

Source: Frontier Economics & Mott MacDonald

Table 50: Recommended accountability measures for stormwater services

	2022-23	2023-24	2024-25	2025-26
LOW IMPACT APPLICATION PROCESSING (PERCENTAGE OF LOW IMPACT APPLICATIONS COMPLETED WITHIN 12 WORKING DAYS)	90%	90%	90%	90%
LENGTH OF STORMWATER DRAINAGE INFRASTRUCTURE PER ANNUM	5.4km	6.3km	5.9km	6.2km
STORMWATER DRAINAGE MAINTENANCE REQUESTS RECEIVED PER ANNUM	2,545	2,545	2,545	2,545

Source: Frontier Economics

Table 51: Recommended project-specific accountability measures

Item	Target/Measure
ASSET MANAGEMENT	CCC report its progress against the Asset Management improvement plans (11 Asset Management Strategies and 38 tasks) as detailed in the Asset Management Strategy (November 2021)
CHARMHAVEN STP	Finalisation of project scope and budgeting by July 2022 – Gateway 1
KINCUMBER STP BIOSOLIDS	>15% Dry Solids Content each year of the 2022-26 determination
BATEAU BAY STP	1.5 odour complaints per 1,000 properties

Source: Mott MacDonald

A Further information on CCC's proposed 'step' changes

Table 52 below provides information on each of CCC's proposed step changes.

We have classified each of the step changes into one of the following categories:

- Operational improvement to meet existing requirement: these are step changes that we would expect to be included in 'base' expenditure under our 'base-step-trend' approach. They involve activities that an efficient business would undertake as part of its ongoing activities.
- New regulatory requirement: these are step changes that are driven by a new regulatory requirement (such as new legislation or regulation) that are not included in our 'base' expenditure under our 'base-step-trend' approach. They involve new activities that were not undertaken historically by an efficient business.
- Major external factor: these are step changes that are driven by new major external factors outside of an efficient business's control. They involve activities that a business is not capable of undertaking under 'base' or 'trend' expenditure allowances such as output, price or productivity growth.
- Operating and capital expenditure trade-offs: these are step changes where additional operating expenditure is proposed to offset a corresponding reduction in capital expenditure.

Table 52: CCC proposed 'step' changes

Expenditure category	Title	Description	Our classification
Planning & delivery	Customer communication and water resilience	CCC is proposing a step change to improve customer communications and undertake further water conservation activities. Customer engagement: CCC is currently ranked second last or last out of 38 surveyed utilities on customer satisfaction, value for money and trust on IPART and WSAA surveys. It is proposing activities to improved customer communication methods, enhanced website functionality and customer research. These have been informed by best practices implemented by other high performing water utilities and existing customer perceptions data. Water conservation: CCC currently lacks a formal water conservation plan that is backed by an efficient level of water conservation (ELWC) model, has an incomplete drought preparedness strategy and has recognised risk and uncertainty within its preferred water supply portfolio that will influence the final required timing of major augmentations. This step change involves developing and implementing of an ongoing water conservation program backed by an ELWC model, completing preparedness activities for Council's Drought Management Plan, undertaking planning investigations associated with Council's next supply augmentations and long-term planning tools to de-risk yield assumptions.	Operational improvement to meet existing requirements
Planning & delivery	Asset condition assessment	CCC is proposing a step change to transition towards industry standard asset management practices. The project scope involves asset condition assessments of linear assets, discrete assets, building assets and sewerage smoke system testing to support the efficient short, medium, and long-term water and wastewater assets lifecycle management.	Operational improvement to meet existing requirements

Planning and delivery	Asset management improvements	CCC is proposing a step change to transition CCC towards industry standard asset management practices. The project scope involves: • Detailed assessment of the Council's asset management maturity to identify gaps between its current state and desired future state (transition toward industry good and where possible / value for money best practice asset management). • Implementation of asset level improvements recommended in the improvement program to reach the Council's desired future state. • Implementation of asset management system (AM System) level improvements recommended in the improvement program to reach the Council's desired future state.	Operational improvement to meet existing requirements
Planning and delivery	Strategic planning	CCC is proposing a step change to be adopted to consider future demand, address existing mandatory standards and drive business efficiency. The project scope involves: • sewage treatment plants (STP) strategic planning to meet regulatory requirements • business efficiency projects to reduce current operational costs and achieve ongoing efficiencies in line with the IPART 2019 Determination recommendation, and • odour and corrosion planning strategies to meet regulatory EPL requirements and IPART output measure targets for odour and corrosion with the STP broader catchments.	Operational improvement to meet existing requirements

Planning and delivery	Other additional FTEs	CCC is proposing additional expenditure to deliver its proposed capital expenditure program and implement changes resulting from the implementation of the *Security of Critical Infrastructure Act 2018* (SOCI Act)	Additional FTEs to deliver capital program – Operational improvement to meet existing requirements SOCI Act - New regulatory requirement
Treatment plants & catchments	Outfall water quality and benthic process monitoring project	CCC is proposing additional expenditure to undertake monitoring of water quality and benthic community structure of the intertidal and subtidal zones of the three ocean outfalls that it operates for disposal of secondary-treated effluent. Council is currently unable to demonstrate that it is not polluting the marine receiving water, as required under s120 of the *Protection of the Environment Operations Act 1997* (POEO Act).	Operational improvement to meet existing requirements
Treatment plants & catchments	Quality database	CCC commenced a project to develop a centralised Water and Sewer Quality Database with data analysis and reporting capabilities in July - August 2021 at an estimated capital cost of up to $250,000. This proposed step change includes an annual licence fee of up to $65,000 and wages and associated costs to employ a full-time staff member to manage, enhance and maintain this database.	Operational improvement to meet existing requirements

Treatment plants & catchments	Rebuilding Quality Systems	CCC s proposing a step change to rebuild and maintain quality systems. This step change involves: • a full-time position to manage the Water and Sewer Quality Management System, • a marginal increase in budget for Consultants and Contractors to deliver mandatory reviews, revisions and audits of the documents, processes and services, and • a marginal increase and realignment of budget for laboratory Materials and external laboratory service providing contractors.	Operational improvement to meet existing requirements
Treatment plants & catchments	Sewerage Treatment Plant (STP) Improvement Program	CCC is proposing a step change to implement a different management regime for its eight Sewage Treatment Plants (STPs). It submitted that this change is required to avoid further environmental and service impacts, as well as an escalation of costs compounded by inefficient practices. CCC is proposing a change in approach to process, data and people. This includes initial clean outs of each STP before establishing a schedule of ongoing planned clean outs,	Operational improvement to meet existing requirements
Treatment plants & catchments	Bushfire management	CCC is proposing a step change to develop an overarching Bushfire Management Plan, develop Bushfire Hazard Reduction Plans for critical water and wastewater assets, improve management of Bushfire Management Zones and Fire Trails to align with good practice, implement developed plans, policies and strategies to mitigate bush fire risk to assets and drinking water catchments.	Major change in external factor

Treatment plants & catchments	Catchment management	CCC is proposing a step change to undertake proactive management of drinking water systems. The project scope involves additional monitoring within the Wyong River and Ourimbah Creek catchments, an additional groundwater monitoring program, weir and fishway maintenance, water quality monitoring buoy maintenance, hydrometric flow gauging, and permanent Catchment Management Officer FTEs.	Operational improvement to meet existing requirements
Treatment plants & catchments	Dam safety	CCC is proposing a step change to ensure compliance with new regulation and payment of levies to the new regulator. The new regulatory requirements result from the Dams Safety Act 2015 and Dams Safety Regulation 2019, as well as establishment of a new regulator, Dams Safety NSW.	New regulatory requirement
Treatment plants & catchments	Mardi Water Treatment Plant (MWTP)	CCC is proposing additional capital expenditure to upgrade the Mardi Water Treatment Plant. This step change involves augmenting operating expenditure for additional chemical and other processes required to operate the upgraded plant.	Operational improvement to meet existing requirements
Treatment plants & catchments	WTP improvements	CCC submitted that will not meet the Australian Drinking Water Guidelines (ADWG) and requirements for the Local Government State Award 2020. It is proposing a step change to adopt a risk-based management approach at its WTPS to improves its process, improve the skill base and number of resources undertake data collection and management to support evidence-based interventions	Operational improvement to meet existing requirements
Network operations and maintenance	Workshop improvements	CCC is proposing a step change to consolidate the number of workspaces and improve the function of existing workspaces for field staff. It submitted that these changes are needed to address existing safety risks and to bring workplaces up to standards.	Operational improvement to meet existing requirements

Network operations and maintenance	Odour septicity corrosion	CCC is proposing a step change to transition towards a proactive maintenance approach to the network odour, septicity & corrosion management assets in alignment with good practice. It involves: • Chemical storage compliance review and gap assessment to understand level of compliance to chemical storage standard. • Following the gap assessment, undertaking a risk-based remediation program of works. • Development and implementation of an odour bed refurbishment schedule. • Optimisation of chemical consumption during wet weather events.	Operational improvement to meet existing requirements
Network operations and maintenance	Maintenance Services (Field) Transition to Preventative Maintenance	CCC is proposing a step change as part of its broader transition from a reactive to proactive maintenance approach. This step changes involves resourcing a small field team to commence preventative maintenance tasks across the water and sewer pumping and treatment infrastructure. It is complementary to NOM planning transition below.	Operational improvement to meet existing requirements
Network operations and maintenance	W&S Operations - Transition to Preventative Maintenance	CCC is proposing a step change to develop its strategic maintenance capability. It is involves building a maintenance planning team focused on asset performance and reliability. This will transform the way CCC undertakes asset maintenance, transitioning into a proactive approach of reliability centred maintenance coupled with more effective procurement and management of maintenance contracts as well as development of operational contingency plans to improve efficiency in responding to asset failures.	Operational improvement to meet existing requirements

Network operations and maintenance	Proactive WHS and Training	CCC is proposing a step change to complement current practices regarding Work Health & Safety and Learning & Development. It involves: • Two additional FTEs (one Safety Specialist, and one Training Specialist) • A program of proactive safety management leadership, complimentary to Council's current Safety Management System and support functions. • A gap assessment of current staff competencies and qualifications against the National Water Package and development of a competency-based training package • External WHS skills training not already provided by council • Funding for recertification as per equipment standards.	Operational improvement to meet existing requirements
Network operations and maintenance	Consolidated SCADA	CCC is proposing a step change to rationalise SCADA software code so that pump station alarms are contained to a parent alarm. This will allow staff to better triage alarms. Also, changes to the software code allow for greater change management with only pre-approved staff able to change operational settings at individual pump stations.	Operational improvement to meet existing requirements
Network operations and maintenance	ARC Flash	CCC is proposing a step change to identify and mitigate the risks of arc flash events from its water and wastewater electrical switchboards. It submitted that the regulatory driver is to comply with IEEE 1584:2018 which has been adopted as the de-facto standard in the absence of a relevant Australian Standard.	Operational improvement to meet existing requirements
Network operations and maintenance	Mains cleaning	CCC is proposing a step change to implement a program of detailed water mains cleaning so that it can provide quality water to its customers. It involves procuring a water mains cleaning contract, pigging of trunk mains (internal labour) and management of FTEs and contracts.	Operational improvement to meet existing requirements

Network operations and maintenance	Sewer civil inspection and maintenance	CCC is proposing a step change is to carry out a suite of proactive field-based inspections, maintenance and repairs of various network sewer assets. The step change is driven by environmental requirements, improved levels of service (improved service reliability, reduced odour issues), and long-term efficiency (through improved asset performance).	Operational improvement to meet existing requirements
Network operations and maintenance	Water civil inspection and maintenance	CCC is proposing a step change to undertake planned maintenance and inspection of civil assets (including valves, air valves (AVs) pressure reducing valves (PRVs), and hydrants) to minimise the likelihood and number of unplanned failures and decrease the duration of impacts from failures.	Operational improvement to meet existing requirements
Roads and drainage infrastructure	Critical Stormwater Drainage Assets Inspections	CCC is proposing a step change to support delivery of a prudent condition inspection program for a prioritised list of critical Stormwater Drainage assets – which have a high consequence of failure in relation to public safety, financial sustainability, operational response and customers impact. This would allow for proactive inspection and condition assessment to be conducted utilising specialist equipment such as CCTV and Quickview cameras or specialist consultants where required.	Operational improvement to meet existing requirement
Roads and drainage infrastructure	Declared Stormwater Dam Safety Compliance	CCC is proposing a step change to develop and maintain a Dam Safety Management System and the additional legislative documentation to meet th enew requirements of Dams Safety NSW. The new regulatory requirements result from the Dams Safety Act 2015 and Dams Safety Regulation 2019, as well as establishment of a new regulator, Dams Safety NSW.	New regulatory requirement
Road construction and maintenance	Critical Stormwater Drainage Assets Inspections	CCC is proposing a step change to support the delivery of maintenance and repair actions (such as clearing, maintenance or repair) of critical stormwater drainage infrastructure to support their ongoing function and/or address high risk issues.	Operational improvement to meet existing requirement

Source: Business cases and further information provided to IPART and Frontier Economics.

B Benchmarking CCC opex

Introduction

In this note we seek to estimate the efficiency of CCC rate in the urban water distribution and wastewater collection industries. The dataset used for this analysis is the data on urban water utilities in the NPR dataset, along with data provided by CCC for years prior to the merger. This dataset is described in more detail below.

Estimation approach used

We apply the SFA method to estimate cost functions and derive efficiency scores of water distributors It makes an allowance for inefficiency. And a time trend is included to capture the shift in the frontier over time. This approach was used by Economic Insights to estimate the productivity growth rate for the Victorian urban water distribution businesses in a study commissioned by the ESC in 2017.[52]

In view of the above considerations, we decided that the most appropriate approach for the task at hand is the SFA approach. A description of the SFA approach can be provided below. We used the Stata statistical software package to estimate the SFA models.

Stochastic frontier analysis (SFA)

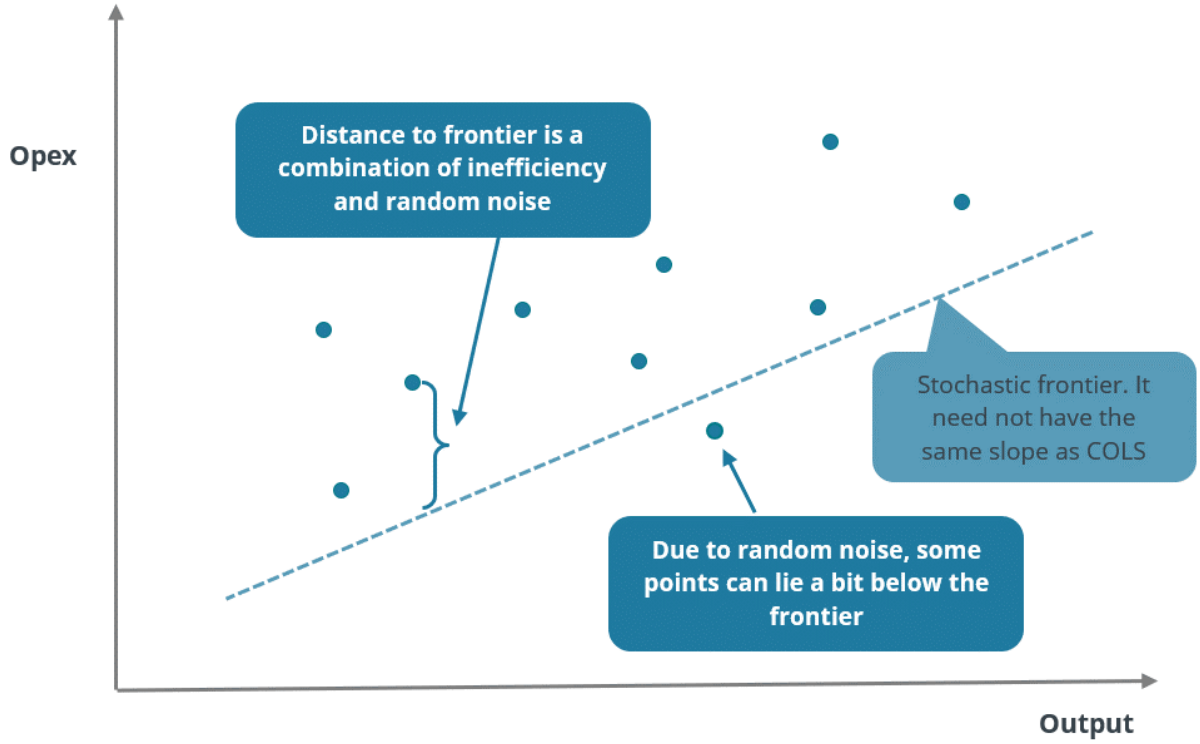
Stochastic frontier analysis (SFA) is a more sophisticated econometric approach to estimating efficiency. Instead of interpreting the residual term in equation (1) above as representing only inefficiency, this term is now interpreted as a combination of an inefficiency component as well as random noise. This is illustrated in **Figure 47** below. Note that because allowance is made for a random noise term in the model, it is possible that some observations lie slightly below the frontier cost line.

Estimating a model that decomposes the residual term in this way requires additional statistical assumptions and a more advanced estimation technique than least squares estimation. It also requires a larger sample to achieve reliable results. However, if the assumptions underlying the model are satisfied, the estimates of the inefficiency terms and the productivity growth rate are likely to be more precise than when using the least squares and COLS methods.

The Australian Energy Regulator (AER) has relied on SFA models in its recent regulatory reviews for electricity distribution utilities. SFA studies for urban water distribution utilities have also been undertaken on behalf of the Essential Services Commission of Victoria (ESC).

[52] Economic Insights (2017), *Victorian Urban Water Utility Benchmarking*, Report prepared for the Essential Services Commission.

Figure 47: Stochastic frontier analysis (SFA)



Source: Frontier Economics

Description of data used in the analysis

The NPR database provides data for 85 water utilities for the period 2002-03 through to 2019-20. While some of these businesses are, at least in part, bulk water utilities, the vast majority are urban water distribution utilities. After removing pure play bulk water utilities, the NPR database provides data on the activities of 76 water distribution utilities and 75 wastewater collection utilites.[53]

We noted in earlier sections that the NPR data for the bulk supply businesses exhibits substantial shortcomings in terms of data quality. In our opinion this precluded the use of this dataset to obtain reliable estimates of productivity growth for bulk water suppliers. While there are also shortcomings associated with the quality of data for the water distribution businesses, these data issues do not seem as severe as for the bulk water supply businesses. Moreover, using a much larger sample mitigates the problem to some extent when using the SFA model, since the SFA model allows for random errors. This allows data errors to be considered as statistical noise that contributes to the imprecision of estimates but does not invalidate the estimates of the model parameters.[54]

53 This includes SA Water and Water Corporation – Perth.

54 This holds if the data errors are in the dependent variable (opex in the present case). If there were sizable errors in the data for other variables used in the model, we would have a so-called errors-in-variables issue, which would result in statistically inconsistent estimates.

With the larger number of utilities in the urban water distribution sample, statistical techniques such as SFA become feasible, whereas using such techniques on the bulk water supply sample consisting of only five utilities would produces very unreliable results.

Measures of inputs and outputs used

Following the approach used by Economics Insights in its 2017 for the ESC, we treat real opex as the dependent variable (i.e., the input) in the SFA model. To obtain real opex, we deflated the nominal operating costs in the NPR dataset using an equally weighted combination of the CPI and the EGWWS WPI, in line with the approach used by Economic Insights.[55]

We considered three output variables for the analysis:

- Water supplied;[56]
- Number of connections; and
- Mains length.

We consider both the water and wastewater versions of these variables for the water and wastewater analysis.

Results from SFA models

The NPR database allocates the businesses into categories based on the number of connections:

- Small – 10,000 to 20,000 connected properties;
- Medium – 20,000 to 50,000 connected properties;
- Large – 50,000 to 100,000 connected properties; and
- Major – more than 100,000 connected properties.

When estimating SFA models for different combinations of size categories for the urban water distributors, we found that the estimates for the productivity growth rate (frontier shift) were sensitive to the size category. This could, in part, be due to scale economies. To find a suitable subsample to use as a benchmark for CCC, we note that CCC is classed as a major utility with more than 100,000 connected properties. However, as the number of connected properties (around 130,000) is close to the boundary between Major and Large we prefer to focus on the combined sample of Large and Major businesses. Hence, we undertook an SFA analysis for the expanded sample consisting of the 'major' plus 'large' urban water distributors, consisting of 27 utilities in total for both water and wastewater.

The estimation was carried out in two stages. First an SFA model was fitted using all the data for a given subsample. We then removed any 'outlier' utilities and re-estimated the model. The criterion chosen for identifying an outlier utility was whether one or more of its residuals was at

55 Economic Insights (2017), *op cit.*

56 For water, NPR variable W11: Total urban water supplied (ML). Data from the 2018 dataset is appended to the 2020 dataset.

least 0.25 in absolute terms, implying that in one or more years the utility's real opex was at least 25% higher or lower than was predicted by the model.[57,58]

After removing outlier utilities, the sample sizes of the samples used in the SFA estimations were 117 for the 'major' sample, and 194 for the 'major' plus 'large' sample of water businesses. Sample sizes for wastewater were 142 and 197 for the 'major' and the 'major' plus 'large' samples.

The preferred outputs selected for inclusion in the final model specification were selected via an iterative process. Starting with a constant and a time trend, we successively added output variables to the model if that improved the fit of the model to the data, as assessed by a commonly used statistical criterion known as the Bayesian Information Criterion (BIC).[59]

This selection procedure led to a specification in which the only output driver of opex in the model is the number of customer connections for both the 'major' only sample and the combined 'large' and 'major' samples of water businesses. For wastewater the only output driver of opex in the model is again the number of customer connections for both the 'major' only sample and the combined 'large' and 'major' samples of water businesses.

Table 53: Estimated efficiency of CCC using SFA

	Estimated efficiency – wastewater		Estimated efficiency – water supply	
Sample	**Connections only**	**All drivers of opex**	**Connections only**	**All drivers of opex**
Major only	88.1%	87.8%	71.2%	69.7%
Large & major	77.5%	77.2%	65.1%	71.6%

Source: Frontier Economics analysis of NPR and CCC data for the period 2008-09 to 2019-20

Table 53 presents the estimates of the technical efficiency of CCC by the four different SFA models discussed above (two different samples and different specifications for each sample) both water supply and wastewater. The table shows that, over the period 2008-09 to 2018-19, the opex of CCC was relatively efficient.[60]

As shown in **Table 54** below, CCC's efficiency scores were relatively high compared to other utilities in the four samples when using the preferred specifications. However, as shown in **Figure 21**, CCC's opex spend was significantly below IPART's allowance for much of this historical period. We consider that this has contributed to the relatively poor service outcomes in the 2019-22 determination period, given there is often a lag between the action and service outcome.

57 This filter was not applied to CCC.

58 The prediction includes the predicted technical efficiency of the utility.

59 We also carried out a selection procedure in the reverse direction, starting with all output variables in the model and successively removing variables if they were insignificant or had the wrong sign. This yielded the same specifications as the forward approach.

60 No opex data for FY2020 was supplied by CCC or found in the NPR dataset.

If we were able to adjust for service quality in our benchmarking, it would show that CCC has been considerably less efficient over the historical period than it appears at face value.

Table 54: Estimated efficiency ranks of CCC using SFA

	Estimated efficiency – wastewater	Estimated efficiency – water supply
Sample	**Connections only**	**Connections only**
Major only	71st percentile	84th percentile
Large & major	74th percentile	75th percentile

Source: Frontier Economics analysis of NPR and CCC data for the period 2008-09 to 2019-20

To determine the efficient level of opex over the 2022-26 determination period, we evaluated the fitted models using forecast connection numbers. The confidence intervals of the estimates were generated using Stata, this was straightforward as the estimates were linear combinations of coefficient estimates.

C Stormwater

IPART has asked us to consider the efficient costs of stormwater services based on activities currently included in the stormwater charge. Some of CCC's proposed stormwater expenditure is outside the scope of the stormwater drainage charge. This section provides an overview of these services and our high-level assessment of CCC's proposed opex.

Overview of stormwater services outside the scope of this review

As shown in **Table 55**, the stormwater services that CCC currently funds through drainage charges levied in its capacity as a Water Supply Authority (i.e., the subject of this review) are those related to stormwater drainage network management (such as operating expenditure associated with roads and drainage infrastructure, construction and maintenance).

The expenditure associated with the provision of CCC's other stormwater services are funded through other mechanisms such as general rates revenue and grants. This includes expenditure related to:

- Urban channels
- Flood planning
- Stormwater quality management.

Table 55: CCC's stormwater services by funding mechanism

Financial year	Stormwater Drainage Network Management [61]	Urban Channels	Flood Planning[62]		Stormwater quality management[63]	
2007-2016			Stormwater Drainage Charge and grants (Gosford Council)	General rates and grants (Wyong Council)	Stormwater Drainage Charge (Gosford Council)	Stormwater levy, general rates sublimation and grants (Wyong Council))
2017	Stormwater Drainage Charge and grants	General rates subsidisation and grants			Stormwater levy, general rates sublimation and grants	
2018						
2019						
2020						
2021						
2022						
2023						
2024						
2025						

Source: Frontier Economics based on advice from IPART and CCC

Overview of CCC's proposed opex

As shown in **Figure 48**, the majority of CCC's proposed stormwater-related 'step' changes are related to stormwater services that have historically been outside the scope of the stormwater drainage charge ($15.45 million over the determination, compared to $3.57 million) (i.e. a broadening of the stormwater service definition, rather than an increased cost of providing the same services). We note that if the expenditure associated with the additional stormwater services is excluded, CCC's proposed expenditure is similar to their actual expenditure in FY19-20.

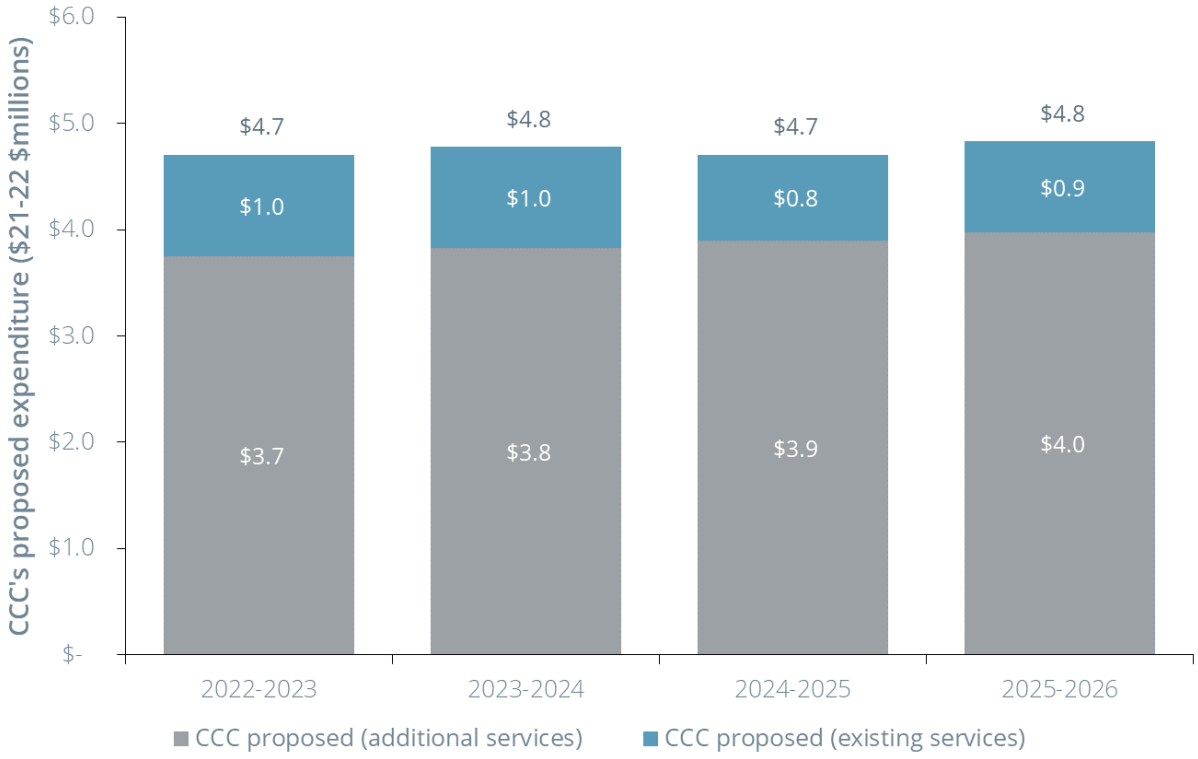
61 i.e. asset planning, capital works and maintenance. This includes conventional stormwater drainage assets such as Drainage Pits, Drainage Pipes, Box Culverts, Headwalls, Concrete Channels, Detention Basins and Levees.

62 This includes telemetered rainfall and water level recorders

63 Stormwater Quality Improvement Device's (SQID's)

As part of this review, in some instances, we were unable to reconcile information provided by CCC as of their business cases with information provided in the SIR. For the purposes of this high-level assessment of services that remain outside the scope of the stormwater drainage charge, we have focused on information provided as part of the CCC's business cases.

Figure 48: Comparison of CCC's proposed step and fund changes ($21-22, $millions)



Source: Frontier Economics based on information provided by CCC

Assessment of efficient opex

Our assessment was limited by the fact that, given the services are outside the scope of the stormwater drainage charge, the historical expenditure provided as part of this review, did not capture expenditure associated with these services.

To help inform our assessment we have drawn upon:

- Our review of CCC's business cases to support the proposed expenditure
- Our economic benchmarking based on a water utility with a 75% efficiency score (**Appendix B**).
- Our bottom-up assessment of some of CCC's proposed stormwater-related capex. As discussed in section 4, our recommendation involved a reduction in CCC's proposed stormwater capex of 3% across the determination period, driven by assumed improvements associated with catch-up and continuous efficiency.

Box 3: Our assessment of CCC's stormwater business cases outside the stormwater drainage charge

As part of our assessment of expenditure outside the scope of the stormwater drainage charge, we undertook a high-level review of 3 business cases provided by CCC covering:

- Water sensitive urban design
- Urban channel maintenance
- Flood strategy and planning

We consider that the options analysis present in the business cases are, on the whole, fairly high level and do not involve quantification of the benefits. In some cases, given the information provided, it was difficult to identify the drivers of the additional expenditure.

In addition, we consider that across many of the business cases, CCC's has combined assessment of changing the funding mechanisms with the option or solution to manage the identified issue, rather than identifying the most efficient method of delivering a service. For example, in the water sensitivity urban design business case, CCC assessed two options – *do nothing* and *improved slightly*- where:

- the *do-nothing* option combines funding the option via rates (which caps the amount that can be funded) and not increasing expenditure
- *Improve slightly*- services are moved into the remit of the stormwater drainage charge. As a result, assets are managed and maintained to the required benchmark of legislative requirements and industry standards.

As such, it is not clear whether the option identified as part of the business case is the most efficient, and/or the least cost, method of delivering the identified service. In our view, there is benefit in providing further evidence to justify the proposed option and associated costs.

Source: Frontier Economics

Our assessment of CCC's proposed expenditure associated with these other stormwater services is shown in **Table 56**. We have proposed a range of efficient costs, where:

- The lower bound includes an adjustment consistent with our benchmarking analysis - a reduction of 16% on average over the determination.
- The upper bound includes an adjustment consistent with our assessment of efficient stormwater-related capex – a reduction of 3% on average over the determination.

While our review of these services does not involve establishing a base, step trend (as per our assessment of opex in section 3), as an aside, our assessment is that CCC's proposed 'step changes' are for expenditure to meet *existing* obligations, rather than a new obligation.

Table 56: Stormwater CCC proposed 'step' changes that currently lie outside the scope of the Stormwater Drainage Charge

Title	Description	Our classification	CCC proposed expenditure	Assessment of expenditure – lower bound	Assessment of expenditure – upper bound	Difference (%)
Water Sensitive Urban Design Maintenance – fund change and step change	CCC is proposing a step change to introduce WSUD operations into the scope of the Stormwater Drainage Charge (it is currently funded through a combination of general rates and grants). CCC note that the baseline level of expenditure was assessed as being prudent and within the scope of the Water Authority in prior IPART Determinations. In addition, the proposed step change also includes additional revenue to deliver a harmonised, higher level of service across the Region.	Operational improvement to meet existing requirement	'Step change': $1.3m 'Fund change': $5.9m	$6.0m	$6.9m	-3% to -16%

Urban Channel Maintenance – fund change and step change	CCC is proposing a step change to introduce Urban Channel Maintenance operations into the scope of the Stormwater Drainage Charge (it is currently funded through a combination of general rates and grants). This proposed change will support delivery of the following Urban Channel Maintenance program, including maintaining priority stormwater trunk drainage open channels to ensure effective flow of water, whilst mitigating potential riparian and downstream water quality impacts that may be associated with clearing of open channel stormwater drains.	Operational improvement to meet existing requirement	'Step change': $1.5m 'Fund change': $1.2m	$2.3m	$2.6m	-3% to -16%
Flood strategy and planning – fund change and step change	CCC is proposing a step change to introduce flood strategy and planning operations into the scope of the Stormwater Drainage Charge (it is currently funded through a combination of the stormwater levy, general rates and grants). The proposed step change also includes an expanded consultant program to update old flood studies and address gaps in Council's Flood Planning information.	Operational improvement to meet existing requirement	'Step change': $1.2m 'Fund change': $4.4m	$4.7m	$5.5m	-3% to -16%

Source: Frontier Economics based on CCC Business Cases

Note: totals may not add due to rounding

Conclusion

As part of this review, IPART has asked us to consider the efficient costs of stormwater services based on activities currently included in the stormwater drainage charge. As some of CCC's proposed stormwater expenditure is outside the scope of the stormwater drainage charge, we have undertaken a high-level assessment of the opex associated with these 'other' stormwater services.

The majority of CCC's proposed stormwater-related 'step' changes are related to stormwater services that have historically been outside the scope of the stormwater drainage charge ($15.5 million over the determination, compared to $3.6 million).

As part of our assessment of CCC's proposed opex associated with these other stormwater services, we have proposed a range of efficient opex, where:

- The lower bound includes an adjustment consistent with our benchmarking analysis - a reduction of 16% on average over the determination.
- The upper bound includes an adjustment consistent with our assessment of efficient stormwater-related capex – a reduction of 3% on average over the determination.

We note that, as part of this review, in some instances, we were unable to reconcile information provided by CCC as of their business cases with information provided in the SIR. We recommend reconciling the information sources as part of any subsequent review of these stormwater services.

D Capital expenditure

In this appendix we provide our detailed analysis of each of the 10 capex projects reviewed. We have noted where the data for each of the projects has been gathered from and have assumed that the information provided by the CCC is accurate and up to date.

Water Treatment Plant – Major Upgrade Mardi

Project overview

Mardi WTP provides up to 160 ML/d of treated water to approximately 150,000 people across the Wyong region. As part of the Central Coast water supply strategy, it is intended to increasingly use Mardi WTP to supply water to the neighbouring Gosford region water supply system in the south and provide capacity to up to 30 ML/day to the Hunter Water supply zone in the north.

Mardi WTP had traditionally relied on and benefitted from bulk sedimentation occurring within Mardi Dam prior to treatment. However, since 2011 Mardi Dam has experienced increased mixing and reduced detention times, resulting in an increased treatment challenge for the direct filtration process used at Mardi WTP. This has come about due to a change of the originally intended use of the Mardi dam, where it is now essentially being used as a large balance tank for river extractions and transfers to the larger Mangrove Creek dam. This results in short-circuiting and rapid mixing within the dam.

Treated water from Mardi WTP complies with Australian Drinking Water Guidelines (ADWG); however, several key risks have been identified by a risk assessment undertaken by City Water Technology which include:

- Short-circuiting and increased mixing within the Mardi dam leads to lower raw water quality which in turn has coincided with increased demand periods; and
- Periodic changes to raw water composition including high Dissolved Organic Carbon concentrations when algal bloom conditions are present.

Both factors lead to increased treatment difficulty, final water quality risk and reduced production capacity at Mardi WTP. This in turn reduces the efficiency of the plant through the increased formation of disinfection by-products and increases the potential public health risk when insufficient chlorine residual is present within the distributed water network.

The plant has been extensively investigated with several studies, options assessments, concept, and preliminary design reports being produced to determine the most appropriate solution to manage the issues at the plant. Whilst it is not stated within the options reports, we understand from feedback provided during the interview with Council on the 23rd November 2021, that the operation of Mardi Dam is being investigated. Both it's current operation (inflows and outflows) of the dam and nutrient balancing within the catchment are being investigated. We have not been provided with any technical reports to provide further assessment on scope or method employed.

The options analysis, which concluded with a report in 2015, proposed an inclined plate settler clarification process. This was deemed to be the most efficient solution based upon the available water quality envelope at the time. At this state the anticipated capital cost of the project was $11.8M inclusive of 30% contingency. Two key point should be noted, the first, that the need to achieve an output capacity of 160 MLD (mega litres per day) was not challenged or investigated.

The second is that the ultimate design solution of the Dissolved Air Flotation plant (DAF), was not deemed to be as capable to perform under more variable water quality conditions.

This inclined plate settler solution was progressed to a concept design during 2016 / 17 to develop the more detailed project requirements for the Stage 3 Upgrade to Mardi WTP. The estimate for the more detailed scope increased the estimated capital cost of the project from $11.8M to $20.3M. A risk / cost analysis was conducted, by Hunter H20, at this stage on the engineering cost estimate of $21.5M. As a result of this analysis, a P90 estimate was calculated at $20.3M inclusive of 33% total contingency.

During 2019, Mardi Dam experienced a significant algal bloom event which prompted the redesign of the proposed clarification solution by Council. A preliminary design report, issued in June 2021, provided details of the new DAF clarification process including the wider upgrades required to plant with this new solution. The estimate for the proposed solution increased the capital budget by a further $20M, with a P90 estimate value of $40.4M.

Key assumptions and status

Documents reviewed:

- Business Case - Mardi Water Tr_Plant Stage 3 Upgrade - Gate 2
- Asset Management Plan – Water Treatment Plants – November 2021
- Mardi Water Treatment Plant Upgrade – IPART Supporting Business Case – November 2021
- Mardi WTP Stage 3 Upgrade – Preliminary Design Report – June 2021
- Mardi WTP Stage 3 Upgrade – Concept Design Report – April 2017
- Mardi WTP – Investigation & Options Analysis Report – August 2015
- Central Coast Water Demand Summary

Table 57: Investment drivers – Mardi upgrade

Driver	Justification
EXISTING MANDATORY STANDARDS – 70%	Due to the ongoing challenges of the influent raw water quality to the plant from Mardi Dam, the plant cannot treat flows to its name plate output capacity of 160 MLD during these events and achieve existing standards set out in the Australian Drinking Water Guidelines. From the interview, we understand this capacity can drop down to 80-90MLD.
ASSET AND SERVICE RELIABILITY – 30%	As Mardi WTP features as part of an overall regional supply strategy, there is a need for this plant to meet the catchment supply demand with additional capacity required to provide up to 30 MLD to Hunter Water as part of its regional supply commitments. Forecast Peak Day Demand is calculated to be 160MLD (see 'Recommendations' regarding commentary on likelihood of this Peak Day Demand event occurring).

Source: Mott MacDonald.

Table 58: Proposed expenditure – Mardi upgrade

	2018-19	2019-20	2020-21	2021-22	2022-23
MWTP Stage 3 Upgrade Proposed Expenditure	0.95	2.24	1.50	6.80	26.00

Note: The profile presented in this table is not consistent to the one presented in Technical Paper 4. We have presented this as this is the latest profile provided by CCC.

Source: Mardi Water Treatment Plant Upgrade – IPART Supporting Business Case – November 2021.

Intended Outcome

From the Gate 2 business case, the intended outcome of the project is to "Increase capacity over a greater range of raw water quality scenarios (including Blue Green Algae), improve treated water quality and security of supply."

Project Status

The project is at request for tender (RFT) stage for a lump sum D&C tender, with the proposed detailed design development and construction contract anticipated to start in February 2022.

Procurement and project delivery process

Feedback during the interview between Mott MacDonald and Council held on Monday 22nd November 2021, Council advise indicates that due current market appetite towards risk and the ongoing COVID-19 crisis causing supply chain issues, the tendered value of the project is likely to increase by another 35% based on the business case value. The current business case estimate is $45.75M which includes the cost of investigation works and additional project works which have been included for overall project batch efficiencies.

Project need

As described earlier in the report, the plant has a name plate capacity of 160 MLD. However, since the change in raw water quality from the mid-2000s, the plant has been unable to achieve this output. The Mardi WTP is part of a regional supply strategy meaning that in addition to the catchment demand, the plant must also be capable of providing an additional 30 MLD to Hunter Water. In its current condition the plant will be unable to achieve this output and treat flows to the required Australian Water Guidelines.

During the interviews held on 22nd November 2021, the project need, in relation to demand forecasting, was discussed and the supplementary document 'Central Coast Water Demand Summary' was issued. The demand summary document sets out the basis of how average and peak day demand has been established for the central coast supply area. There are a number of course assumptions within this document, due to more accurate analytical data not being available, such as the lack of zone metering limits the ability to verify calculated supply volumes originally derived from reservoir levels. The simulated models account for standard application of peaking factors and adjusted factors based on historical trend data. From the analysis undertaken a peak 160 MLD has been established from the simulated model. The data used for this simulation is based upon a historical 7-day peak observed in 2018.

Demand across the supply area is balanced between Mardi & Somersby WTP's. It is established in other reports that Mardi must be able to provide 100 MLD to support catchment demand if Somersby WTP is out of service. It is also worth noting that whilst the 30MLD, which forms part of

the regional supply strategy with Hunter Water is accounted for as demand, this same volume could be imported into the Central Coast supply area from Hunter Water should this be required and to date has not been required. Therefore, the combined production capacity between Somersby and Mardi WTP's, on completion of the upgrade works, is 260MLD for a PDD of 160MLD, not accounting for imported or exported volumes.

The customer need for the project relates to security of supply and treatment resilience during poor raw water quality occurrences. The customer willingness to pay is not discussed within the business case however the drivers for the project relate, for the most part, to the plant failing to meet existing mandatory standards.

Assessment of efficiency

A detailed investigation and options analysis report was produced in 2015, undertaken by Hunter H2O. The report describes the assessment of the existing plant with a risk vs current mitigation analysis. It is not clear if any optimisation of the existing plant was trialled before commitment to investigate alternative process technologies which would more adequately perform against the raw water quality envelope.

Within the options assessment, various treatment technologies were investigated for the proposed clarification process, a summary of these is provided in **Table 59** below.

Do nothing has not been considered based on the assessment of the information provided by Council.

During the interview, it was also mentioned that a catchment-based approach, with the development of a water model for the Mardi Dam and localised catchment was assessed but discounted on the basis that sufficient information and the maturity of the complexity model was not sufficient to provide the required level of certainty of any solution proposed. It was therefore seen as a least risk solution to progress a treatment based solution at Mardi WTP. In addition to this, CCC has limited scope to influence local farming practice which may ultimately contribute to the poor water quality experienced within the Mardi Dam.

Table 59: Options assessment – Mardi upgrade

Options	Comments
Traditional Sedimentation Tank	Not recommended for further consideration. Most likely suitable however opportunity to considerably reduce footprint with inclined plates so disregard traditional sed tank in preference for inclined plate process in further options development. Not likely to achieve any better performance than inclined plates but will be a bigger footprint and as such a higher CAPEX.
Radial Upflow Clarifier	Not recommended for clarification purpose.
Reactivator Clarifier	Not recommended for further consideration. Advantages over traditional sed tanks are reduced footprint and the considerable cost savings. Larger CAPEX and OPEX compared to Inclined plates. This option would be the second preferred options behind inclined plates.
Inclined Plates Settler	Recommended for further consideration.
Dissolved Air Flotation Clarifier	Not recommended for further consideration. Whilst a small footprint is possible, will require significant operation costs.
Ballasted Settling	Not recommended for further consideration. Not significantly proven in Australia. Whilst a small footprint is possible, will require significant operation costs.

Source: Table 6-1: Clarification Options Advantages and Disadvantages, Mardi WTP – Investigation & Options Analysis Report – August 2015.

Scope of the preferred option

The current preferred option is described in detail within the Mardi WTP Stage 3 Upgrade – Preliminary Design Report. The solution taken forward, which includes a DAF clarification process within various chemical dosing and sludge management process upgrades also being provided, has been established as a robust solution given the raw water quality challenges. This solution does come at a 300% increase on the original CAPEX estimate established in the options report from 2015 and significantly greater OPEX.

The development of CAPEX estimates throughout the evolution of this project have been heavily reliant upon the broader experience of Hunter H2O, due to CCC having not delivered a project of this size and complexity in recent times. It is not clear from the information provided how larger subcontract element of scope were market tested during the three phases of estimate production (options analysis, concept design, preliminary design). This potentially has led to some of the significant jumps which have occurred between the phases of estimation where the total CAPEX value of the project has increased by 100% at each stage. The opportunity for wider market testing or ECI inputs to provide input to the solution and estimate validation also does not appear to have been taken. It is also not clear on the rigour to which governance has been

applied to approving investigation budgets at all stages of the process. This is particularly apparent in the more recent investigations carried out on the project, where $3.6M has been spent, only to return $3.2M in CAPEX efficiencies on a project budget which has doubled since the previous estimate.

Table 60: Development of Capex estimates – Mardi upgrade

	Capex value	Comment
2015	$11.8M	Original estimate derived from the options assessment for an inclined plate settler solution. Inclusive of 30% contingency.
2016	$20.8M	P90 estimate of the concept design stage cost for the inclined plate settler solution. Inclusive of 33% contingency
2019	$40.4M	P90 estimate of the revised DAF filtration plat solution from the preliminary design report.
2021	$47.75M	Current business case estimate which is expected to increase by 35% due to current market risk appetite.

The project at its current stage (WFT for D&C appointment), is also potentially increasing its capital cost through a lump sum cost model being implemented. Given the potential projects risks, notwithstanding the wider economic climate risks introduced through the COVID-19 pandemic, progressing with a lump sum commercial model instead of a more risk balanced target cost model will only increase the capital cost of this project further.

A Project Control group has been set up where issues are escalated that need to be discussed by senior management. The Group is made up of Technical advisors that have continued on the course of the project that allows for efficiencies in decision making. The intension of the project is to provide a very robust network capacity once completed which achieves the targets of Central Coast Council's regional water supply strategy.

The original timescale for the project forecast completion was June 2021. This was before the algal bloom event in 2019 which required the process solution to be revised. The current timescale now forecasts completion of the project in March 2024 within a design development & construction phase running for 4 years. This phase of works is currently 7-9 months behind schedule due to budget cuts and further investigation works undertaken during the preliminary design phase, in an effort to reduce project risks (e.g. further geotechnical investigation to reduce contractor ground works risks).

Recommendation

Based upon the in documents assessed and the further project insight gained from the interview undertaken on the 23rd November 2021, it is difficult to endorse the project need as fully efficient based on the following items:

- The information supplied for the peak demand forecast calculation contains some broad assumptions on poorly validated data which in turn could have generated some overestimate

forecast estimates. For example, the demand forecast data is derived from reservoir levels, which are not further authenticated by network flow monitoring. Council should really have more comprehensive validated network models, back up by empirical data, which would in turn provide more credence to the business need for this project.

- Whilst Mardi WTP is not currently able to meet its full name plate capacity of 160MLD, the currently combined output capacity between Mardi (up to 160MLD dependant on raw water quality) and Somersby (up to 140MLD) WTP provides significant resilience of 140MLD against the forecast peak demand of 130MLD +/- 30MLD as part of the regional supply agreement. We expect that greater network storage solutions would provide further resilience, if deemed required, at a much lower capital cost.
- The worst case event of peak demand occurring, whilst Somersby WTP is completely offline and Hunter Water requiring the full 30MLD demand from CCC is very unlikely to occur. More likely is a reduction in output capacity at either one of the plants would occur during a peak demand of 130MLD, during which time significant spare capacity already exists described in the point above.
- We understand from Council that they are required to abstract more water through the Mardi Dam when it is available, notwithstanding raw water quality. However, given the process risks and the available capacity at Somersby WTP, negotiation of this agreement under these operational conditions would be a more prudent first step. We have not been provided evidence of this occurring.

In terms of the project scope, again this could only be classified as partially efficient based on the following:

- The proposed solution is an overhaul of the current treatment process to bring Mardi WTP's output capacity up to 160MLD. For the reasons stated above, the need for this output capacity is not fully substantiated when considering existing spare capacity.
- The catchment-based approach has not been developed to sufficient maturity of understanding by Council before treatment based capital solution has been progressed. Various water companies across Australia (Unity Water & Sunshine Coast Council) and the UK (Seven Trent, Welsh Water, Anglian Water, Northumbrian Water) have all adopted catchment-based solutions to balance nutrients within watercourses to improve water quality. We suggest that these options should have been explored further prior to moving forward with a treatment based solution, particularly when considering a limited immediate need for the project, when the WTP can still output more than 50% (80-90 MLD) of it's nameplate capacity during the worst raw water quality experienced.
- From the material that we have required, pre-treatment solutions for use during poor water quality events have not been considered. We consider that these pre-treatment processes could be sized based on more recent comprehensive water quality data and only utilised when needed. This would avoid having to provide an expensive, albeit robust, continuous treatment process which will mostly likely run at significantly less than 100% capacity for the majority of the year based on the supplied demand data.
- Parallel process solutions which can be sized much smaller to operate during poor raw water quality periods to offset some of the load onto the existing filters have not been investigated.

Regarding the project costs, there are a number of shortfalls within the investigation process through to the proposed procurement approach which again we would recommend as only partly efficient. There are:

- Based on the information provided by council, the costs during investigation stage have not been subject to much challenge through the governance processes and are not well controlled. This on the basis of, at each stage the additional cost of further investigation has not returned proportionate reduction in capital cost. The project budget has doubled at each stage and at no point has a reassessment of need against current estimated cost been undertaken.
- The majority capital efficiencies proposed are derived through net present value. These efficiencies are not realised whilst setting the capital value of the project, rather over the full lifetime of the asset. Therefore, the offset of these efficiencies against the further investigation spend is not a true reflection of efficiency.
- The proposed procurement model, whilst looking to achieve a lowest risk position for council, is having a significant negative effect on the capital cost. The ownership of process risk with challenging handover conditions for the contractor will only significantly increase the contractors risk allowance. Our experience from working with various contractors across the industry is a movement towards an unwillingness to accept high risk contracts. Other risk items such as COVID-19 disruption or material cost volatility, which the contractor cannot reasonably control, will again only increase capital costs further through increased contingencies when passed onto the contractor. A more balanced risk allocation (been Council and the Contractor) with target cost contract conditions would result in significant reductions in tendered capital values and ultimately the project outturn cost.

Our assessment of efficiency

Is the project needed?	
Is the project efficient – best option?	
Is the project efficient – least cost	

Key: Red – Not efficient, Amber - Partially efficient, Green – Efficient

Table 61: Recommended capex – Mardi upgrade

	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Proposed		2.3	1.6	6.80	25.9	7.7
Adjustment				-6.80	-24.9	-6.7
Recommended				0.00	1.00	1.00

Source: Technical Paper 4, Mott MacDonald.

Based on the information provided by council and the further project insight gained during the interview, we believe the following actions should be undertaken by council to further substantiate the project need:

1. Develop a more robust demand forecast through the installation of further network monitoring and validate a network model.

2. Further investigate if the raw water quality issues can be resolved within the catchment or by altering the operational conditions of the dam.
3. Challenge existing abstraction agreements to allow for concessions during poor water quality events.
4. Investigate, network storage, pre-treatment and parallel process solutions suggested earlier.

The funding allowance suggested is indicative to progress further investigations and studies for the actions stated above.

Water Mains Asset Renewal Program

Project overview

CCC has responsibilities to provide its customers with dependable water, sewer and stormwater drainage systems. CCC states its objective for water and sewer is to support ecologically sustainable development and to meet community needs through the provision and maintenance of effective services.

CCC recognises its responsibilities include provision of high-quality water supply (compliance to drinking water guidelines), transport and treatment of sewage for disposal to meet CCC's legislative and regulatory requirements. CCC achieves this through the management of delivering services, problem resolution and minimising system efficiencies in areas like water pressure management, water continuity, sewer overflows and stormwater drainage services.

CCC's water supply network consists of more than 2,300 km of water mains, three water treatment plants, 71 reservoir structures and 50 water pump stations (potable and raw water). CCC is classified as a "Major" utility, for National Performance reporting. The table below provides an overview benchmark of Council's asset metrics against its peer group.

Table 62: CCC's asset metrics against peer group

Urban NPR 2020–21 Major—100,000+ connected properties	Total Number of water connections	Water Main KM	Total Prop per km of water main	Average volume of water supplied - KL/property
Barwon Region Water Corporation	170.759	4187	55.7	158.828
Central Coast Council	**141.200**	**2222**	**50.1**	**158.695**
City West Water Corporation	505.016	5707	107	138.746
City of Gold Coast	271.000	3490	73.8	167.000
Hunter Water Corporation	262.433	5184	46.6	150.861
Icon Water	192.000	3390	55.9	175.901
Logan City Council	128.201	2376	49.5	138.900
South Australian Water Corporation	822.200	27265	70.2	191.580
South East Water Corporation	803.000	9708	78.4	150.342
Sydney Water Corporation	2081.000	23376	76.7	185.937
TasWater	215.419	6501	38.7	178.796
Unitywater	343.532	6348	51	155.400
Urban Utilities	652.482	9655	63.2	157.600
Water Corporation - Perth	890.700	14866	63.9	227.085
Yarra Valley Water Corporation	856.092	10901	79.4	149.450
Relative ranking of CCC (out of 15)	14	15	12	8

Source: BoM – National performance report 2020–21: urban water utilities.

CCC is a relatively small water utility within its industry peer group "Major – 100,000+ connected Properties", however, its total Properties per km, is equivalent to several larger utilities. This is a good indicator for the opportunity for effective revenue raising and the efficient delivery of services.

Key assumptions and status

CCC uses specific indicators and metrics to benchmark their service level for customer service, operational and regulatory purposes. For water infrastructure services these are:

- Water pressure
- Water main breaks and water continuity
- Water quality and compliance

In the 2019 IPART determination, IPART accepted the output measures proposed by Atkins Cardno for water and sewerage services over four years. These stipulated metrics are presented in Table 9 from Technical Paper 2 and what Council is planning to target into the future.

Table 63: IPART's water output measures for CCC

Output or activity measure	Current target	Target for 2020	Target for 2021	Target for 2022	Target for 2023
1. Water quality complaints per 1,000 properties	9.9	9	8	8	7
2. Average frequency of unplanned interruptions per 1,000 properties	151.8	115	115	115	115
3. Water main breaks per 100km of main	23.7	16	16	16	14
4. Compliance with Australian Drinking Water Guidelines – microbial guideline values (%)[a]	100	100	100	100	100
5. Compliance with Australian Drinking Water Guidelines – chemical guideline values (%)[a]	100	100	100	100	100

[a] 100% in measures 4 and 5 means fully compliant with corresponding values in Australian Drinking Water Guidelines.

Note: We have presented the full four years of output measures recommended by Atkins Cardno. However, we will review the Council's output measures as part of our next price review. In the event that our next price review is deferred, these output measures will continue to apply.

Source: Atkins Cardno, *Central Coast Council Expenditure Review*, March 2019, Table 6-1.

CCC's performance against its industry peer group "Major" is shown below.

Table 64: CCC's water asset performance

Urban NPR 2020–21 Major—100,000+ connected properties	Water main KM	No. of main breaks	Breaks per 100km main	Infrast. leakage index (ILI)	Real losses: service connections: l/ CS/ day	Real losses: water mains
Barwon Region Water Corporation	4187	971	23.2	0.3	24	0.89
Central Coast Council	2222	221	9.9	0.9	68	3.80
City West Water Corporation	5707	1332	23.3	0.7	47	3.01
City of Gold Coast	3490	333	9.5	1	65.5	3.30
Hunter Water Corporation	5184	1049	20.2	0.93	64	2.96
Icon Water	3390	408	12	0.7	55	2.00
Logan City Council	2376	143	6	1	66.3	3.20
South Australian Water Corporation	27265	3634	13.3	1	85	2.29
South East Water Corporation	9708	2448	25.2	0.7	47	2.74
Sydney Water Corporation	23376	4872	20.8	1.3	74	5.00
TasWater	6501	3374	51.9	2.5	272	8.90
Unitywater	6348	224	3.5	0.9	52.7	2.30
Urban Utilities	9655	2451	25.4	1	61	N/A
Water Corporation - Perth	14866	1613	10.9	1.5	71.68	3.75
Yarra Valley Water Corporation	10901	3119	28.6	0.5	37	2.29
Relative ranking of CCC (out of 15)	9	14	12	9	5	3

Source: BoM – National performance report 2020–21: urban water utilities.

CCC is performing well within its peer group for mains breaks. However, for Leakage, unplanned interruption, complaints and Water quality complaints, there are opportunities to learn from others. CCC should look at similar size utilities like Logan City Council or similar Rural/ Suburban Utility like Unitywater for areas for further improvements.

Main Breaks

Council is performing well within its peer group for mains breaks (see section 6.2.1). CCC has improved the trend for water main breaks, bursts and leaks per 100km of water mains. The water main breaks per 100km is showing a downward trend from 12.06 in 2018-19 to 11.58 in 2019-20, below the target set by IPART (2019) of 16 per 100km of main breaks. There is an annual peaking at the end of the financial year. This may be due to timing of in climatic weather conditions or lack of maintenance surveillance due to possible constraints on OPEX expenditure.

The good "main breaks" performance needs to be put in context with:

- leakage performance (especially the "Real Losses"), and
- Unplanned interruptions per 1,000 properties/ or Km of main

The relatively poor performance on leakage and unplanned interruptions does not align with the good "main breaks" performance (when compared within the peer group). These network performance measures are linked to how Council is managing the network in conjunction with the operation supply pressure:

> "*Council endeavours to supply water at a minimum of 12 metres of pressure for normal domestic purposes, excluding water for firefighting*."

Network Pressure is a significant driver for the mechanisms causing main breaks/ Unplanned interruptions and leaks (and volume of leaked water) when the right material conditions are met. However, given Council is supplying water that has a minimum head of 12 meters, which is low for urban/suburban population centres, it would be expected that these performance measures would be significantly better.

From the information provided by CCC, it is not clear how CCC has got to this good performance position beyond delivering its renewals program.

> *A review by Council finds that main breaks trend down because of Council's renewals program. If the renewals program cannot be sustained, Council may not be able to meet the output measure. Capital expenditure renewal for water main has been steady over last few years, but as infrastructure ages, Council is proposing to base capital expenditure renewals on risk.*[64]

CCC has not provided any analysis on the drivers influencing these performance measures, this suggests, that it has not considered the depth of efficiencies within the network performance between these key investment drivers and what is planned as part of the investment program.

> *Water Mains (trunk and reticulation) $19.2M*
>
> *Council has a water main replacement prioritisation criteria framework in place for determining annual renewal programs. The framework utilises several inputs such as the main section consequence of failure score (Criticality), three years and seven*

64 *Technical-Paper-2-Service-levels--2022-Central-Coast-Council-water-price-review-10-September-2021*

> *years recorded breaks (Likelihood of failure), as well as taking into consideration the benefit cost ratio. Only mains that meet a minimum score of five are identified for renewal.*[65]

CCCC has provided the workings behind the Risk assessments for Water Supply and Sewer pressure pipelines:

- CCC Pressure Main Criticality Analysis - WSP Final.pdf – 17/07/2020
- Consequence of Failure (CoF) - Tech Memo - WSP Final.pdf – 18/05/2020
- Likelihood of Failure (LoF) - Tech Memo - WSP Final.pdf – 18/05/2020
- WaterMain_Risk review Final_v1.1 - Excel
- Water Mains IPART Projection - Excel

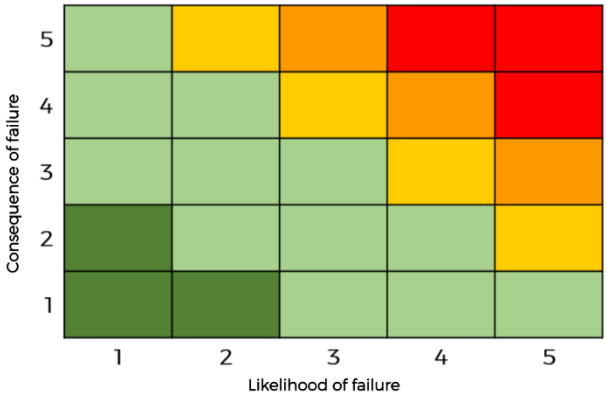
This material provides a comprehensive insight into risk-based prioritisation identification process and the approach taken to estimate the investment needs for water mains renewals.

RISK Assessment process

The risk score is calculated by multiplying the LoF (Likelihood of Failure) score and the CoF (Consequence of Failure) for each asset.

$$Risk\ score = LoF\ score\ x\ CoF\ score$$

The risk assessment approach makes no reference to aligning with CCC Enterprise Risk Framework and there is no positioning description for what these levels of risk mean, i.e. is "Very High" a Catastrophic risk?

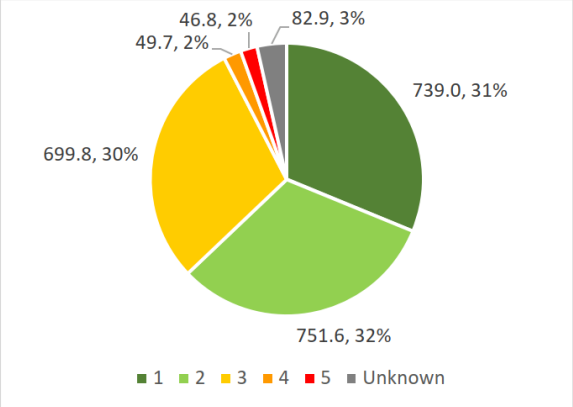


The provided material gives insight on what the LoF score means when an asset score is determined between 1 to 5.

The CoF score is silent on what it means to the Council, when an asset is graded in one of the categories between 1 and 5. The consequence of this is that the assessment shows over a third of the water supply asset base is classified as grade 4 or grade 5 (over 784km), see chart below. Of the 784km of water supply mains in these two grades, the assessment has graded 347km, (44% of this cohort group) for assets that 150dia or smaller. This is a large percentage attributed to relatively low value, small pipes with no understanding what that means to CCC.

65 *Technical-Paper-2-Service-levels--2022-Central-Coast-Council-water-price-review-10-September-2021*

Overall Likelihood of Failure Score Profile

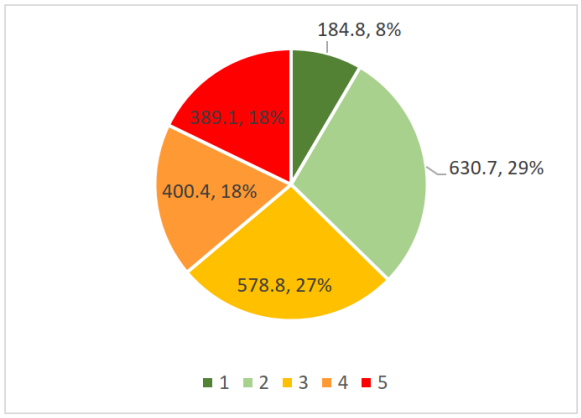


The combined LoF score for water supply pipes is virtually identical to the CA score. This is because the majority of pipes have no failure history to modify the scores. There is a small length of pipes now included in categories 3 and 5 based on their failure records.

This chart is different from the chart published in *Likelihood of Failure (CoF) - Tech Memo - WSP Final.*

CA - Condition Assessment, is age based relative to expected useful life (design life)

Overall Consequence of Failure Score Profile



No Commentry made.

This chart is significiantly different from the chart published in *Consequence of Failure (CoF) - Tech Memo - WSP Final.pdf – 18/05/2020*

Water Supply mains Overall Risk Score Profile

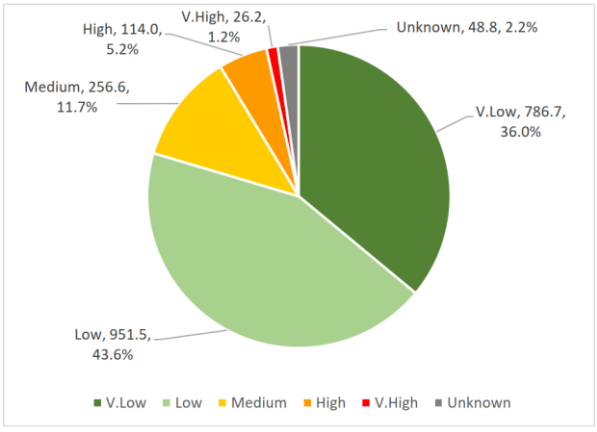


Figure 4-1 Water supply overall risk score

There are 140 km of water supply pipes within the very high- and high-risk categories. These pipes have a high combination of LoF and CoF and could be candidates for further data validation, detailed condition assessment or proactive renewal/rehabilitation.

Source - CCC Pressure Main Criticality Analysis - WSP Final.pdf – 17/07/2020

The outcomes of this analysis (unchanged from the 2020 WPS report) are part of the inputs used in the *Water Mains IPART Projection – Excel* tool, however this information has not informed or influenced the analysis for investment IPART Forecasting.

Water Mains IPART Projection – Excel, the tool used to develop the investment forecast, utilises asset key attribute data (material, dia, status, installed date, length, etc) to drive a replacement cost calculation and an estimated "end of use life year", in addition to the risk analysis.

The replacement cost rates have been informed by NSW Reference Rates Manual 2014.pdf, specifically:

- Reference Rate (2014) PVC
- Reference Rate (2014) DICL
- Construction Difficulty: **HIGH** (ie. suburban site with other services, residential roads and traffic control) Rates
- Contingencies Feasibility stage - 30%

These 2014 rates have been uplifted by 3.6% (inflation rate) to reflect 2017 figures. It needs to be recognised that the information (past contracts and tenders) that would have informed the NSW Reference Rates Manual 2014, would predate 2014.

PVC rates have been used to cost pipes less than 300mm dia and DICL has been used to cost pipes which 300mm dia and greater. The largest DICL rate, is for a 750 dia pipe. This rate has been used unadjusted for all pipes 750 and above.

As shown above, the rates used are course (basic for asset valuation purposes only) and are significantly out of date. The CCC delivery approach outlined below; shows they have a single supplier supporting the water mains replacement program:

- *Delivered in accordance with Councils single supplier arrangement, four-year contract with extension options, Schedule of rates contract.*
- *The water main renewal program is adjusted/ reprioritised accordingly by AP then issued to W&S Asset Delivery (AD) team for construction within annual budget requirements.*
- *AD is responsible for undertaking the appropriate levels of planning, performing due diligence investigations prior to construction. Consideration of risks: Including Safety, community impact, environmental, heritage.*
- *All projects are prioritised and packaged for construction based on:*
    - *Stockpile locations to allow delivery of multiple separate water main renewal projects using the one approved stockpiling site.*
    - *Projects that require further planning investigations for reasons such as identified acid sulphate requiring geotechnical investigations, Aboriginal Heritage Impact Permit (AHIP) applications to Heritage NSW.*[66]

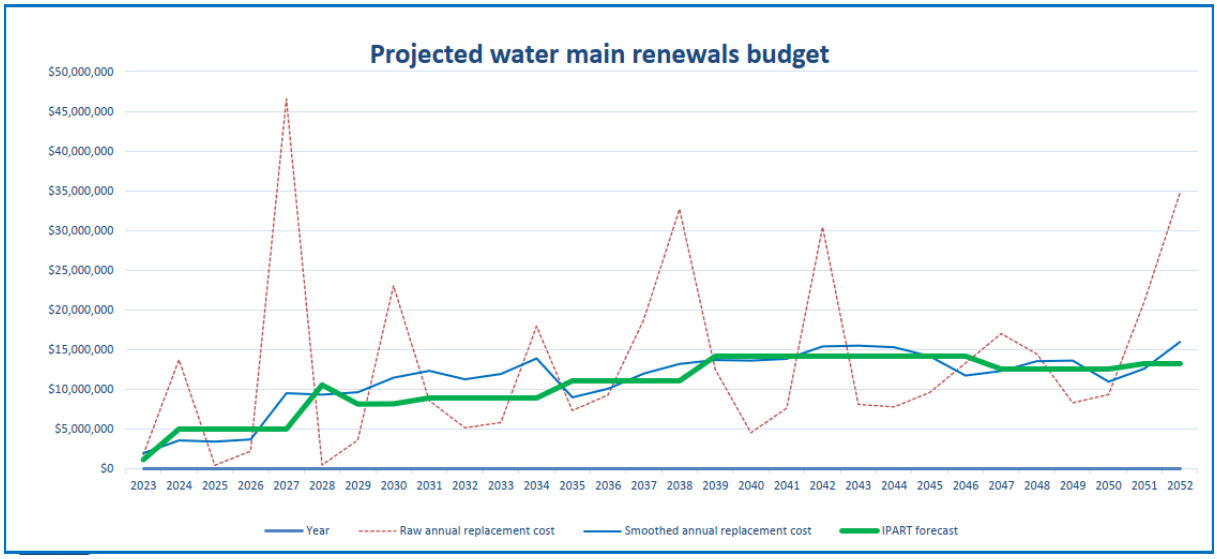
CCC has not compared these rates and performances against their own contract rates and experiences from the last five years, or against their current supply agreement. There is no uplift regarding Acid Sulphate soils/ dewatering/ rock, which CCC is aware off, and their impacts on costs of delivery.

CCC have developed Summary costing analysis, based on the developed replacement costs to show:

66 Linear mains renewal program – IPART.pdf

- Raw water main renewals replacement costings summary (100 years)
- Smoothed water main renewal replacement costing summary (30 years) (8 year rolling average based on raw water mains replacement costs)
- IPART efficient water main renewal forecast summary (30 years) – no assumptions made.

Figure 49: Projected water main renewals budget



Source: Linear Mains Renewal Program - IPART.pdf

The cost estimates in the assessment are likely to significantly underestimate the true cost of the forward program, in conjunction with this there is no analysis regarding the outcomes of this investment, that is:

- planned length of infrastructure replaced/ augmented.
- Impact on main break performance (number/ length of assets removed who are repeat main break cohorts)
- Frequency of unplanned interruptions
- Water losses due to mains breaks
- Water Infrastructure Risk profile improvement

The proposed expenditure profile is an unallocated funding pot. There was only one project identify for the Water Mains Renewal, below. However, there is no information on timing, priority, project readiness, breakdown of the cost estimate and the planned expenditure, within the Asset Management Plan or flagged on the Watermain risk review (excel).

> *Council also proposes to invest approximately $2.2M to undertake the renewal of a critical section of trunk water main that feeds through Avoca Lagoon. Sections of the main have experienced multiple breaks in the past. The trunk water main is a critical supply feed to the suburbs of North Avoca, Avoca beach, Copacabana and MacMasters Beach.*[67]

This proposed investment could significantly impact the replacement in the year it occurs (currently unknown), as it would represent close half of the proposed budgeted amount.

CCC acknowledged during the workshop Interviews that it only starts evaluating replacements scopes at the beginning of the financial year, starting at the top of the priority list. This planning activity incorporates "appropriate levels of planning, performing due diligence investigations prior to construction. Consideration of risks: Including Safety, community impact, environmental, heritage."

There were no examples of how council looks to drive efficiencies from undertaking long term programming approach to grouping cohorts (geography, sizes, materials, etc), timing and aligning projects (with other water or Council projects), except anecdotally (via the workshop).

It would be challenging for CCC to evaluate their projects and program to understand efficiencies (budgets vs delivered), due to low maturity of scope definitions for budget estimate at the time of budgeting, and the real time redeveloped/ redefined and refinement of scopes, which occurs as a consequence on not having fully formed projects, at the time of committing funds.

Water Supply Interruptions

Council's approach to mitigate water supply interruptions

Delivery of projects to reduce main breaks (Section 3.3) will significantly decrease the number of unplanned water supply interruptions. With secured funding for cathodic protection, valve replacements, pump replacements, civil and mechanical work, network asset renewals, pump station replacement and rehabilitation and upgrade of SCADA packs etc., Council will be able mitigate unplanned water supply interruptions.

Source: Technical-Paper-4-Capital Expenditure--2022-Central-Coast-Council-water-price-review-10-September-2021

CCC clearly recognises the link between water supply interruptions and mains breaks. It is not clear from the information provided and the investment profiles if the expenditure flagged is addition to mains breaks or will be incorporated as an additional beneficial outcome.

[67] *Technical-Paper-4-Capital Expenditure--2022-Central-Coast-Council-water-price-review-10-September-2021.PDF*

Table 65: Water Network Infrastructure Program ($2021-22)

	2022-23	2023-24	2024-25	2025-26	Total
Water main breaks					
Water Main	2.0	6.0	5.0	5.0	18.0
Water Network Assets	0.0	0.2	0.1	0.2	0.5
Water Pump Station	0.0	0.2	0.1	0.2	0.5
Average frequency of water unplanned interruptions					
Water Main	0.3	0.8	1.4	1.8	4.3
Water Network Assets	3.9	1.7	0.3	0.2	6.0
Water Pump Station	0.0	0.7	0.5	1.0	2.1
Water Reservoir	0.6	1.4	0.5	1.0	3.5
Total	**4.8**	**4.5**	**2.6**	**4.0**	**15.9**

Source: Technical-Paper-2-Service-levels--2022-Central-Coast-Council-water-price-review-10-September-2021.PDF Note – numbers may not add due to rounding

CCC is undertaking several initiatives to better place the operational team to manage the impact of asset failure and minimise customer interruptions. The outcomes of these should provide the foundation of both productivity and efficiency improvement for council's future programs.

In addition to the capital works project and programs proposed, Council has commenced trialling the implementation of a water reticulation shut-off blocks model. The model divides the water reticulation network into the smallest size polygons or areas, to identify the critical valves necessary during an unplanned or planned water activity to minimise the number of customers affected.

Source: Technical-Paper-2-Service-levels--2022-Central-Coast-Council-water-price-review-10-September-2021.PDF

We recommend IPART track delivery of these initiatives and account for the benefits in future efficiencies in

- operational productivity
- capex programs (targeting well evidenced asset drivers against customers' needs

CCC - Proposed Expenditure

The following summarises the capital works program by water asset classes and drivers:

Water mains:

- ***Asset and service reliability**: These projects and programs are proposed in order to reduce unplanned water interruptions and water main breaks and reduce and address water quality complaints.*

- ***Asset renewals**: Several projects and programs are proposed, including the ongoing annual water main renewal and critical valves replacements in order to address asset and service reliability. Water main renewals are prioritised based on the water mains renewal prioritisation framework and risk and criticality framework. The risk and criticality framework define criticality or consequence of failure using a multicriteria analysis, as well as a likelihood of failure assessment based on age and asset condition. Water mains condition assessments are carried out as required following the risk and criticality intervention strategy. Critical valves renewals are based on the risk prioritisation (shut off blocks model) and condition with valve exercising carried out periodically. Other projects include the ongoing water service connections program in order to meet service reliability requirements.*
- ***Asset upgrades**: The program includes the construction of a critical water trunk main upgrade addressing asset and service reliability to three suburbs, as well as the construction of civil infrastructure to facilitate water trunk main mechanical cleaning.*

Source – Technical-Paper-4-Capital-expenditure-2022-Central-Coast-Council-water-price-review-14-September-2021.PDF

CCC's Water Network Infrastructure Capital Program is centred around their key outcome measure, but the inconsistent proposed financial projections (below) and mixing of program driver areas above, it is not clear what is planned to be delivered in the "Water Mains Asset Renewal Program - Region Wide". Is the water mains renewals from the figures below only figures from Table A1 or both Table A1 and Table A2.

Table 66: Water Network Infrastructure Program projections ($2021-22)

	2022-23	2023-24	2024-25	2025-26	Total
Proposed [1]	2.0	6.4	5.2	5.5	19.10
Adjusted Proposed [2]	0.75	6.4	5.2	5.5	18.35
Proposed forecast program [3]	0.75	5.0	5.0	5.0	15.75
Table A1 – Capital works program by asset category to meet compliance with water main breaks per 100km of main [4/5]					
Water Mains	2.0	6.0	5.0	5.0	18.0
Water Network Assets	0.0	0.2	0.1	0.2	0.5
Water Pump Station	0.0	0.2	0.1	0.2	0.5
Forecast Totals	**2.0**	**6.3**	**5.2**	**5.4**	**18.9**
Table A2 – Capital works program by asset category to meet compliance with average frequency of unplanned interruptions per 1,000 properties [4/5]					
Water Mains	0.3	0.8	1.4	1.8	4.3
Water Network Assets	3.9	1.7	0.3	0.2	6.0
Water Pump Station	0.0	0.7	0.5	1.0	2.1
Water Reservoir	0.6	1.4	0.5	1.0	3.5
Forecast Totals	**4.8**	**4.5**	**2.6**	**4.0**	**15.9**

Note:
1. Technical-Paper-4-Capital-expenditure-2022-Central-Coast-Council-water-price-review-14-September-2021.PDF – page 64
2. a reduction to $750k in the 2022-23 year - page 64
3. Water Mains IPART Projection – Excel - Water Mains Asset Renewal Program - Region Wide – Output measure: Water Main breaks
4. Technical-Paper-2-Service-levels--2022-Central-Coast-Council-water-price-review-10-September-2021.PDF – page 101
5. numbers may not add due to rounding

Program need

Leading utilities recognise the needs and benefits from having well-defined, long-term sustainment investment programs for this asset class. The CCC asset base performance as experienced by the customers and the community has suffered from historic under investment, however Council, through IPART determinations, has been put on a path of improvement. This needs to be sustained, but Council needs to now enhance its approach to demonstrating and targeting its investment for this asset class.

It is recognised that programs would be adjusted each year as conditions deteriorate, risks are realised, and investment efficiencies can be developed. However, effective planning to reduce delivery risks, productivity gains and links to outcomes, will help shape an informed and defined program that represents and communicates value for money to customers and community.

Assessment of efficiency

- The proposed expenditure profile is an unallocated funding pot, based on no foundation output performance measures or targets.
- No planning has been made on, beyond a course risk ranking register.
- There were no examples of how council looks to drive efficiencies from undertaking long term programming
- It would be challenging for Council to evaluate efficiencies in their projects and
- Current replacement cost estimates are course, based on 2014-unit rates uplifted to 2017

The cost estimates in the assessment are likely to significantly underestimate the true cost of the forward program. This underestimate is balanced by the opportunities for efficiencies and improvements in targeting investment resulting from the maturing asset management systems.

Therefore, our recommendation is that the budget is not adjusted but that accountability measures are strengthened to ensure that the investment made is efficient given the likelihood for cost overruns.

Recommendation

Is the project needed?	
Is the project efficient – best option?	
Is the project efficient – least cost	

Key: Red – Not efficient, Amber - Partially efficient, Green – efficient

No variation to expenditure. **($M),** as the underestimation should be balanced by the opportunities for efficiencies and improvements in targeting investment resulting from the maturing asset management systems

Table 67: Target budget profile – Water Mains Asset Renewal Program ($2021-22)

	2022-23	2023-24	2024-25	2025-26	Total
TARGET BUDGET PROFILE	0.75	5.0	5.0	5.0	15.75

Reasons for variations between actual and forecast expenditures

Adjustment to the output measure is to promote targeted planned investment systems and decision making, culture of value for money investment and continuous improvement.

Sewer Main Asset Renewal Program – Regional Wide

Project overview

Sewage is collected through 2,660 km of sewage mains and 324 pumping stations. Treatment is undertaken at one of eight sewage treatment plants. The table below provides an overview benchmark of the CCC against its peer group.

Table 68: CCC's wastewater metrics against peer group

Urban NPR 2020–21 Major—100,000+ connected properties	Total Number of wastewater connections	Sewerage KM	Total Prop per km of water main
Barwon Region Water Corporation	155.238	2787	40.8
Central Coast Council	**129.800**	**2593**	**63.5**
City West Water Corporation	501.548	4688	88.5
City of Gold Coast	257.000	3481	77.7
Hunter Water Corporation	250.182	5374	50.6
Icon Water	191.000	3416	56.6
Logan City Council	115.586	2335	54
South Australian Water Corporation	642.200	9144	30.2
South East Water Corporation	777.000	9916	82.7
Sydney Water Corporation	2031.000	26493	89
TasWater	187.610	4847	33.1
Unitywater	307.869	6040	54.1
Urban Utilities	625.278	9889	67.6
Water Corporation - Perth	816.400	12782	59.9
Yarra Valley Water Corporation	798.701	10054	78.5
Relative ranking of CCC (out of 15)	**14**	**14**	**7**

Source: BoM – National performance report 2020–21: urban water utilities.

CCC is a relatively small water utility within its industry peer group "Major – 100,000+ connected Properties", however, its total Properties per km, is in the middle of the pack and better than several larger utilities. This is a good indicator for the opportunity for effective revenue raising and the efficient delivery of services.

Key assumptions and status

Council uses specific indicators and metrics to benchmark their service level for customer service, operational and regulatory purposes. For sewerage infrastructure services these are:

- Sewer overflows (storm events & other)
- Sewer odour complaints
- Sewer main breaks and chokes
- Compliance with EPL loads and concentrations of certain constituents

In the 2019 IPART determination, IPART accepted the output measures proposed by Atkins Cardno for water and sewerage services over four years. These stipulated metrics are presented in the table below for sewerage infrastructure.

Table 69: IPART's 2019 output measures for sewerage

Output or activity measure	Current target	Target for 2020	Target for 2021	Target for 2022	Target for 2023
1. Wastewater overflows per 100 km of main	32.6	32	30	28	26
2. Wastewater overflows reported to the environmental regulator, per 100km of main	1.6	1.6	1.5	1.4	1.3
3. Wastewater odour complaints per 1,000 properties	1.9	1.7	1.7	1.5	1.3
4. Wastewater main breaks and chokes per 100km of main	35.6	35.6	34	32	30
5. Compliance with EPL concentration, load limits.	N/A	Yes	Yes	Yes	Yes

Note: We have presented the full four years of output measures recommended by Atkins Cardno. However, we will review the Council's output measures as part of our next price review. In the event that our next price review is deferred, these output measures will continue to apply.

Source: Atkins Cardno, *Central Coast Council Expenditure Review*, March 2019, Table 6-2.

CCC's performance across these categories is shown below in following figures.

CCC's performance is mid-pack relative the national water industry peer group except for sewerage service complaints per 1,000 properties. There are opportunities to learn from others. Council should look at similar size utilities like Logan City Council or similar Rural/ Suburban Utility like Unitywater for areas for further improvements.

Figure 50: Asset performance and customer service - NPR

Urban NPR 2020–21 Major—100,000+ connected properties	Sewerage KM	Sewer mains breaks and chokes per 100 km	Breaks and chokes per 1,000 properties	Number of wastewater service complaints.	Number of water and sewerage complaints	Number of sewerage service complaints per
Barwon Region Water Corporation	2787	55.8	10	156	1146	1
Central Coast Council	2593	30	3	266	1537	2
City West Water Corporation	4688	20.4	2.9	73	2217	0.1
City of Gold Coast	3481	3.8	1.7	144	1067	0.6
Hunter Water Corporation	5374	33.6	8.2	231	547	0.9
Icon Water	3416	52.3	10.5	146	419	0.8
Logan City Council	2335	8.1	0.9	364	2965	3.1
South Australian Water Corporation	9144	49.3		57	1548	0.1
South East Water Corporation	9916	16.2	3.9	61	4678	0.1
Sydney Water Corporation	26493	49	0.2	1301	4082	0.6
TasWater	4847	56.6	6.9	378	No data	2
Unitywater	6040	9.8	1.3	195	742	0.6
Urban Utilities	9889	24	3.1	148	3244	0.2
Water Corporation - Perth	12782	17.5	N/A	91	525	0.1
Yarra Valley Water Corporation	10054	32.3	5.6	645	9823	0.8
Relative Ranking of CCC (out of 15)	14	8	8	5	8	2

Source: BoM - National performance report 2020–21: urban water utilities

Figure 51: Asset performance and customer service - NPR

Urban NPR 2020–21 Major—100,000+ connected properties	Sewerage KM	Sewer mains breaks and chokes per 100 km	Breaks and chokes per 1,000 properties	Number of wastewater service complaints.	Number of water and sewerage complaints	Number of sewerage service complaints per
Barwon Region Water Corporation	2787	55.8	10	156	1146	1
Central Coast Council	2593	30	3	266	1537	2
City West Water Corporation	4688	20.4	2.9	73	2217	0.1
City of Gold Coast	3481	3.8	1.7	144	1067	0.6
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Urban Utilities	9889	24	3.1	148	3244	0.2
Water Corporation - Perth	12782	17.5	N/A	91	525	0.1
Yarra Valley Water Corporation	10054	32.3	5.6	645	9823	0.8
Relative Ranking of CCC (out of 15)	14	8	8	5	8	2

Source: BoM - National performance report 2020–21: urban water utilities

Figure 52: Asset performance and customer service - NSW Gov - LWU performance

Major—10,000+ connected properties	Resid' Sewer conn's 2019-20	Sewer mains km	Breaks and Chokes per 100 Km - Sge 2020-19	2019-18	2018-17	Chokes and Breaks (Retic + Rising Main) - Sge 2020-19	2019-18	2018-17
Albury City Council	24063	580	52.05	43.96	9.24	302	251	52
Armidale Regional Council	9114	284	58.41	51.02	48.91	166	156	148
Ballina Shire Council	14947	358						
Bathurst Regional Council	14681	449	35.87	48.53	55.35	161	214	243
Bega Valley Shire Council	11676	418	18.42	17.72	27.4	77	73	114
Byron Shire Council	10067	294	12.91	8.3	6.92	38	24	20
Central Coast Council	125907	2587	32.89	38.21	36.6	851	986	952
Clarence Valley Council	14822	401	66.31	63.78	35.71	266	260	143
Coffs Harbour City Council	25039	661	87.59	82.43	83.88	579	535	536
Dubbo Regional Council	16902	533	62.68	40.41	38.43	334	213	200
Essential Energy	9041	246	143.5	115.45	121.54	353	284	299
Eurobodalla Shire Council	19250	562	28.65	37.41	33		209	180
Goulburn Mulwaree Council	10234	302	44.37	44.11	68.71	134	131	202
Kempsey Shire Council	8448	277	12.27	4.91	22.46	34	13	62
Lismore City Council	11123	377	23.87	16.84	26.29	90	63	97
MidCoast Council	35907	1144	27.45	24.14	22.38	314	273	252
Orange City Council	16133	481	40.3	90.13	82.66	194	429	391
Port Macquarie-Hastings Council	30153	976	5.74	9.3	13.99	56	90	111
Queanbeyan-Palerang Regional Council	19572	440	54.56	101.17	58.68	240	445	249
Shoalhaven City Council	47134	1245	3.13	2.73	10.64	39	34	132
Snowy Monaro Regional Council	7043	249	20.86	14.46	8.29	52	35	
Tamworth Regional Council	19462	588	12.42	7.19	0.28	73	42	48
Tweed Shire Council	33114	716	0.42	0	73.32	3	0	2
Wagga Wagga City Council	25447					432	621	503
Wingecarribee Shire Council	17106	610	8.36	45.05	26.08	51		156
CCC Ranked (out of 24)			11	12	10	1	1	1

Source: NSW Gov - LWU performance monitoring data and reports: Major utilities >10,000 prop

CCC's performance is mid pack or worse relative to their State based water industry peer group especially Sewer Overflows / 100 km - Reported to Regulator, which is trending in the wrong direction. Council is significantly larger than many of its state base water industry peers and should be an example of good stewardship.

Current approach to Network Performance

Breaking And Choking

Council seldom met the target output measure for sewer main breaks and chokes from 2017 until September 2020. However, there has been a favourable trend towards meeting the performance output measure since August 2019.

Source: Technical-Paper-2-Service-levels--2022-Central-Coast-Council-water-price-review-10-September-2021.PDF

Sewage Overflow

A consolidated analysis indicates that the main cause for Council's failure to meet the output measure was the wet weather and the impact is particularly noticed in certain hotspots (e.g. March 2019 flash flooding). The occurrence of major flooding events (e.g. February 2020 and March 2021) can also impact multiple catchments and result in unavoidable overflows due to widespread inundation of customers' private overflow relief gullies. While Council has a significant program of work underway to improve system performance in response to planned growth and asset deterioration, there are no current programs planned to address impacts of catchment wide flooding caused by major storms.

Source: Technical-Paper-2-Service-levels--2022-Central-Coast-Council-water-price-review-10-September-2021.PDF

Council has indicated they are targeting investments to improve performance and have evaluated what may be driving the poor outcomes. Council's approach has evolved to be proactive, instead of a previous focus on contingency plans to prevent and avoid.

CCC - mitigate sewer breaking and choking concerns

Council's investment in the main and asset renewals program appears to play a favourable role. With a consistent commitment, Council will be able to sustain this improvement. A suite of capital works projects and programs is proposed by Council for the period of 2022-23 to 2026-27, to meet the sewer main breaks and chokes per 100 km of main IPART output measure targets.

Source: Technical-Paper-2-Service-levels--2022-Central-Coast-Council-water-price-review-10-September-2021.PDF

CCC - mitigate sewage overflow concerns

Sewer network overflow monitoring, SCADA upgrades, sewer pump station emergency overflow prevention, rising main rehabilitation, vacuum system renewals, rising main asset management, manhole rebuilds, pump station renewals and refurbishments, sewer main coating, sewer rising main renewals, cathodic protection, leaking manhole detection and management and other similar measures will enable Council to reduce sewer overflows and meet the aspirational output measures.

Source: Technical-Paper-2-Service-levels--2022-Central-Coast-Council-water-price-review-10-September-2021.PDF

CCC – investment approach for sewer mains

The proposed level of investment aims to maintain current network performance in line with the IPART output measures for sewage overflows, chokes and breaks and addresses the requirements of the NSW EPA PRPs and enforceable undertakings, while managing ageing assets.

Source: Technical-Paper-2-Service-levels--2022-Central-Coast-Council-water-price-review-10-September-2021.PDF

Council's mitigation and investment for sewer mains management is primarily driven by asset age, to drive Condition Assessments (CA), which is undertaken by the single supplier for sewer mains rehabilitation contractor.

- *Results of CA data is reviewed by Councils AP and AD team against specific criteria consisting of structural and service grade scores per surveyed line.*
- *Councils Principal Contractor will provide rehabilitation options assessment including cost estimates in accordance with the schedule of rates contract. A number of operational and regulatory drivers influence the rehabilitation strategy including DPIE and EPA Pollution Reduction Programs (PRP)*
- *Following Councils review of CA data, AP will develop an efficient sewer asset rehabilitation program in consultation with critical stakeholders in line with the above mentioned operational and regulatory drivers.*
- *Each annual sewer rehabilitation program consists of predominantly trenchless sewer main relining including sewer manhole rehabilitation works all delivered in accordance with contract schedule of rate items.*

Source: Linear Mains Renewal Program - IPART.pdf

Council has provided high level working for the development of the program forecast (below). There was no documentation on the background or logic for assumption for critical sewer main, especially pipe located within 150m of waterways, plus what pipes make up the cohorts for 2 or more chokes and overflows.

***Sewer mains renewal** - High risk mains & Environmental compliance:*
Critical sewer mains - methodology:

- *Pipe diameter =<300 mm diameter*
- *Pipe material subjected to corrosion, I/I, etc: AC / RC / VC / UNK (VC assumed)*
- *Pipe located within 150 m to waterways*

Total renewals	*Total Cost estimate:*	*$58,284,904*
	Length of mains (m):	*458,568m*
	Av unit rate	*$127/m*
	renewal scenario adopted	*20yr*
	Cost estimate ($/year):	*$2,914,245*
	Length of mains (m/year):	*22,928m*
Sewer gravity mains with 2 or more chokes and overflows in 3 years. Renewals		
Rehabilitation identified	*Total Cost estimate:*	*$3,178,549*
	Length of mains (m):	*18,416*
	Av unit rate	*$172*
	Rehabilitation scenario adopted	*3yr*
	Cost estimate ($/year):	*$1,059,516*
	Length of mains (m/year):	*6,139*
***Total sewer gravity main rehabilitation**:*		
	Cost estimate ($/year):	*$3,973,762*
	Length of mains (m/year):	*29,067*

Source: Sewer gravity main rehabilitation program_IPART forecast. Excel

Council has developed total reline cost rates, based on the Council's Principal Contractor contact, which have been uplifted by 1.67%, 15% on cost for "Sunday" and 2% internal PM. The unit rate development needs reviewing as the uplifts have not been assigned correctly, plus the addition of Cut and seal junction cost have been accounted for very coarsely.

Council approach	*Corrected function**
LINE + ((CUT JUNCTION+ SEAL JUNCTION)/25) CPI* Sundry*Int PM = Total rate*	*[LINE + ((CUT JUNCTION+ SEAL JUNCTION)/25)]* CPI* Sundry*Int PM = Total rate*

Source: Sewer gravity main rehabilitation program_IPART forecast. Excel

*Note *: assuming both line, cut junction and seal junction require CPI uplift*

This error means the total rates for small diameter mains (300mm or less) could be 12% underestimating the value of lining repairs. For larger diameter mains (above 300mm) this increases to 13% and escalates to 19%.

CCC - Proposed Expenditure

The following summarises the capital works program by Sewer main asset classes and drivers:

Sewer mains:

- ***Asset and service reliability****: These projects and programs are proposed in order to mainly meet sewage overflows and sewer main breaks output targets, as well as addressing odour complaints output targets.*
- ***Asset renewals****: Several projects and programs are proposed, including the ongoing annual sewer rising mains, sewer gravity mains, maintenance holes and odour vents renewal programs. Other programs include aerial sewer mains coating renewals, cathodic protection renewals, critical valve replacements, trunk mains and tunnels renewals and odour vent renewals. Sewer rising main renewals are prioritised based on the risk prioritisation framework This framework defines criticality or consequence of failure using a multicriteria analysis, as well as a likelihood of failure assessment based on age and asset condition. Rising mains condition assessment is carried out as required following the risk framework intervention strategy. Sewer gravity main and maintenance hole renewals are based on a combination or a risk prioritisation framework and asset performance (breaks, chokes and overflows). Gravity mains and maintenance hole condition assessment is carried out on an ongoing basis based on the risk and asset performance. Odour vent renewals are based on odour complaints and condition assessment carried out periodically. Sewer tunnel renewals are based on performance and condition assessment which is carried out on a four-year basis.*
- ***Asset upgrades****: A program for the installation of permanent flow monitoring and sewer gauges is proposed in order to increase the accuracy and reliability of the sewer hydraulic models.*

Source – Technical-Paper-4-Capital-expenditure-2022-Central-Coast-Council-water-price-review-14-September-2021.PDF

Table 70: Sewerage Network Infrastructure Program ($2021-22)

	2022-23	2023-24	2024-25	2025-26	Total
Proposed [1]					
Low Pressure and Vacuum System	0.0	1.1	1.9	1.9	4.9
Sewer Main	4.5	8.7	9.2	9.6	32
Sewer Networks	0.3	0.3	0.5	0.6	1.7
Sewage Pump Station	2.7	3.7	7.7	7.4	21.5
Total	**7.5**	**13.8**	**19.3**	**19.5**	**60.1**
Proposed forecast program [2]					
Sewer Gravity Main Relining Program – Env. Compliance	0.0	0.95	0.95	0.95	2.85
Sewer Main Asset Renewal Program - Region Wide	2.75	3.0	3.0	3.0	11.75
Total	**2.75**	**3.95**	**3.95**	**3.95**	**14.6**
Table A7 – Capital works program by asset category to meet compliance with sewer main breaks and chokes per 100 km of main [3/4]					
Sewer Main	2.8	4.9	4.6	4.7	17
Total	**2.8**	**4.9**	**4.6**	**4.7**	**17**
Table A5 – Capital works program by asset category to meet compliance with sewage overflows per 100 km of main [3/4]					
Low Pressure and Vacuum System	0.5	1.1	1.9	1.9	5.4
Sewer Main	2.1	5.8	10.4	8.7	26.9
Sewer Networks	0.0	0.7	0.9	0.3	1.8
Sewage Pump Station	4.4	6.9	16.7	13.1	41.1
Sewage Pump Station and mains	7.5	4.3	0.0	0.0	11.8

	2022-23	2023-24	2024-25	2025-26	Total
Total	**14.6**	**18.8**	**29.8**	**23.9**	**87.1**

1. Technical-Paper-4-Capital-expenditure-2022-Central-Coast-Council-water-price-review-14-September-2021.PDF – page 74
2. Sewer gravity main rehabilitation program_IPART forecast – Excel - Sewer Main Asset Renewal Program - Region Wide - Output measure: Wastewater main breaks and chokes
3. Technical-Paper-2-Service-levels--2022-Central-Coast-Council-water-price-review-10-September-2021.PDF – page 101
4. numbers may not add due to rounding

The nominated proposed investment areas defined by Council accumulates to $29.39M, leaving a shortfall of $2.61M for the Sewer mains programs unallocated.

Sewer Mains $32M

The annual proposed investment for priority and programmed sewer gravity main and maintenance holes renewals is $3.65M per year. (Circa $14.6M)

Council is proposing $10.26M in rising main ongoing renewals over the determination period. (This figure for sewer rising mains program has been adjust down, see section below, to $10M)

Council is proposing a $1.25M investment in the renewal of critical sewer rising main valves.

Council is proposing a $1.24M investment in the renewal of sewer maintenance holes.

Council is proposing a $2.3M investment in the renewal of poor performing sewer trunk mains and tunnels in order to meet the sewer gravity mains output measure targets.

Source: Technical-Paper-4-Capital-expenditure-2022-Central-Coast-Council-water-price-review-14-September-2021.PDF - page 74

These figures also do not align to the investment profile outlined in Technical Paper 2.

Program need

Leading utilities recognise the needs and benefits from having well-defined, long-term sustainment investment programs for this asset class. This asset base performance as experienced by the customers and the community has suffered from historic under investment, resulting in poor performance. Council, through IPART determinations, has been put on a path of improvement, and has seen an uplift in performance. This improvement pathway needs to be sustained, but Council needs to now enhance its approach to demonstrating and targeting its investment for this asset class.

It is recognised that programs, like these, would be adjusted each year as conditions deteriorate, risks are realised, and investment efficiencies can be developed. However, effective planning to reduce delivery risks, productivity gains and links to outcomes, will help shape an informed and defined program that represents and communicates value for money to customers and community.

Assessment of efficiency

This recommendation based upon the following considerations and assessment:

- Continuity investment in sustaining the asset base is needed
- No planning on priority targeted assets or reflection on reasons for historic improvements
- No relationship evident to the EPA improvement requirements or Historic overflows
- Flawed and course estimations based on single contractor rate (2019, and uplifted)

- Unallocated project forecast expenditure with no foundational reasoning
- No relationship between the expenditure top down budgets and target output performance
- There are potential under-estimates of 12%-19% for lining repairs.

The cost estimates in the assessment are likely to significantly underestimate the true cost of the forward program. This underestimate is balanced by the opportunities for efficiencies and improvements in targeting investment resulting from the maturing asset management systems.

Therefore, our recommendation is that the budget is not adjusted but that accountability measures are strengthened to ensure that the investment made is efficient given the likelihood for cost overruns.

Recommendation

	Sewerage
Is the project needed?	
Is the project efficient – best option?	
Is the project efficient – least cost	

Key: Red – Not efficient, Amber - Partially efficient, Green – efficient

No proposed adjustment to expenditure as expenditure levels need to be maintained, but CCC have poorly demonstrated effectiveness of pass expenditure. Estimates developed by CCC are course and are potential more than 10% under-valued.

Table 71: Target budget profile – Sewer Main Asset Renewal Program ($2021-22)

	2022-23	**2023-24**	**2024-25**	**2025-26**	**Total**
TARGET BUDGET PROFILE	2.750	3.0	3.0	3.0	11.75

CCC needs to ensure their expenditure has an impact on their output performance.

Reasons for variations between actual and forecast expenditures

Adjustment to the output is to promote targeted planned investment systems and decision making, culture of value for money investment and continuous improvement.

Sewer rising Main rehabilitation Program

Project overview

CCC has 324 pumping stations and over 470kms of rising mains. The table below, provides a high-level overview of the asset base characteristics.

Table 72: Asset base characteristics

Materials	Lengths	Dia Range	Length (m)
AC	75,424	150mm or less	166,245
CI	147	>150mm to 300mm or less	120,992
CICL	721	>300mm to 600mm or less	118,642
CONC	152	675	6,247
DI	33	750	12,892
DICL	69,955	900	13,855
FRP	1,860	1000	1,017
GRP	6,588	1800	2,361
HDPE	13,991	Unknown dia	57,829
HOBAS	7,234	**Total**	**470,184**
MPVC	5,503		
MS	9,447		
MSCL	32,320		
OPVC	2,813		
PE	35,595		
PP	878		
PVC	7,891		
RC	2,361		

Materials	Lengths	Dia Range	Length (m)
Steel	81		
UNK	41,639		
UPVC	111,117		
Unknown	197,191		
Total	**470,184**		

Source: Sewer rising main renewals CAPEX forecast - IPART 2023-27_Final

Council has 42% of the rising mains with unknown materials and over 12% of the rising mains with unknown diameters. These are key elements for risk assessments and replacement cost estimating.

Council's pumping stations, on average are connected to over 1450m of rising main. This length is relatively high. Council also has a significant length of rising mains, classed as large dia meters pipes.

Council is proposing $10.26M in rising main ongoing renewals over the determination period. The program is comprised of prioritised partial sewer rising main renewals/replacements with high and very high risk of failure, according to the sewer pressure mains criticality framework. This framework defines criticality or consequence of failure using a multicriteria analysis, as well as a likelihood of failure assessment based on age and asset condition. Rising mains condition assessments, condition monitoring or proactive and reactive renewals are carried out as required according to the risk framework intervention strategy. The program addresses also the Enforceable Undertaking requirements and expectations from the NSW EPA.

Source: Technical-Paper-4-Capital-expenditure-2022-Central-Coast-Council-water-price-review-14-September-2021.PDF

Key assumptions and status

The asset performance has been covered in Sewer Main Asset Renewal Program section. Sewer rising mains is seen as a contributor to the poor performance of:

- Sewer Overflows / 100 km
- Sewer main breaks and chokes

CCC has identified the following projects for rising mains over the coming IPART period.

Figure 53: Projects for rising mains

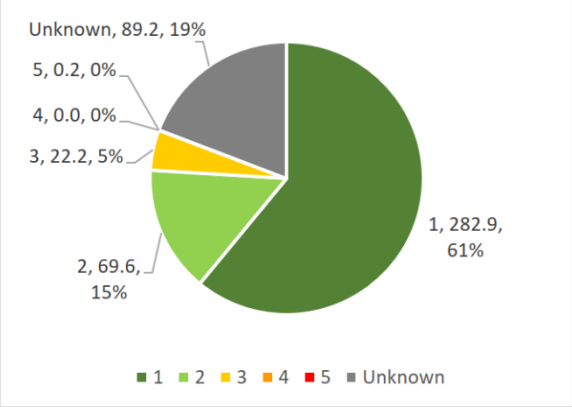
GIS Common RM name	Dia mm	Len' m	Cost estimate	SRM Renewal	Cost estimate	Renewal length	Est'd Renewal year	Risk Class Score
SPS MP06 RM - Complete main	300	172	$304,669	100%	$304,669	172	2024	V.High
SPS T022 RM - Complete main	525	4722	$10,673,405	25%	$2,668,351	1180	2024	High
Killcare carrier - North St to Wandi Close -Bensville	450	757	$4,061,638	100%	$4,061,638	757	2025	High
SPS BB01 RM - Complete main	375	1464	$3,494,019	50%	$1,747,010	732	2026	High
SPS WS29 RM - Complete main	225	3967	$5,321,448	50%	$2,660,724	1983	2026	High
SPS WS16 RM - Complete main	200	65	$805,856	100%	$805,856	65	2027	High
SPS BB07 RM - Complete main	150	336	$1,020,544	100%	$1,020,544	336	2027	High
SPS WS20 RM - Complete main	100	197	$334,972	100%	$334,972	197	2027	High
Total		11680	$26,016,551		$13,603,763	5422		

Source: Sewer rising main renewals CAPEX forecast - IPART 2023-27_Final

RISK Assessment process

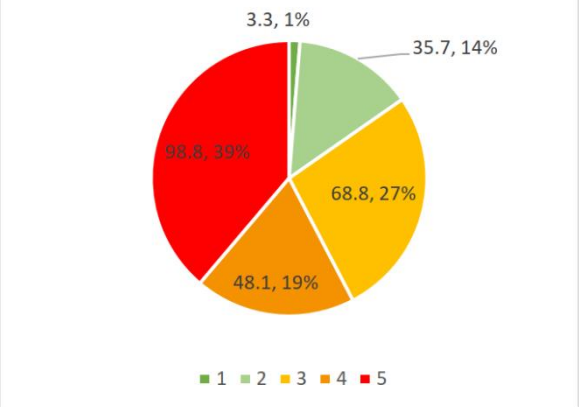
The sewer rising mains risks, have been assessed in line with approach outlined in water mains. The outcome of this analysis is presented below:

Overall Likelihood of Failure Score Profile



The combined LoF score for sewer pipes is similar to the CA score due to the majority of pipes having no failure history. There is a small length of pipes now included in categories 3 and 5 based on their failure records.

Overall Consequence of Failure Score Profile



The sewer pipes are more skewed towards high CoF scores. Some of the reasons for this are; the higher average diameter of sewer mains, their low-lying location with respect to coastal areas, and the typically longer length of single assets leading to a higher proportion of pipes with GIS layer interactions.

This chart is significiantly different from the chart published in *Consequence of Failure (CoF) - Tech Memo - WSP Final.pdf – 18/05/2020*

Sewer Pressure mains Overall Risk Score Profile

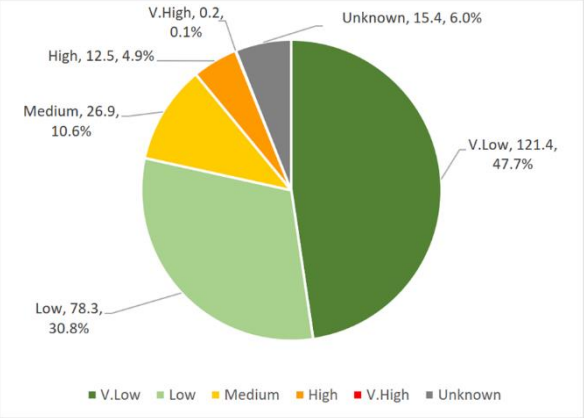


Figure 4-2 Sewer overall risk score

There is a small length (13 km) of sewer pressure pipes within the very high- and high-risk categories. The low LoF scores for sewer pipes mean that the overall failure risk for this portfolio is low, despite relatively high CoF scores. The driver of the low LoF scores is the comparatively young age of the of sewer pipes and the low number of recorded failures attributable to pipes in the database.

Source - CCC Pressure Main Criticality Analysis - WSP Final.pdf – 17/07/2020

The risk assessment for sewer rising mains have the same issues as those identified in the Water Mains Asset Renewal Program assessment.

Sewer rising main renewals CAPEX forecast - IPART 2023-27_Final – Excel, the tool used to develop the investment forecast, for identified mains based around asset key attribute data (dia, length) to drive a replacement cost calculation.

The replacement cost rates have been informed by *NSW Reference Rates Manual 2014.pdf*, specifically:

- Reference Rate (2014) DICL; uplifted by CPI to 2021, which included Survey, Investigation, Design and Project Management (SID)
- No reference rate provided for Micro tunnelling (225mm and 600mm), and if it includes set-up, launch and retrieval pits, push, enveloper pipes, host pipe, etc
- All projects have included construction difficulty and dewatering for the full length of the renewed asset.
- Contingencies Risk - 35% (above *NSW Reference Rates Manual 2014.pdf,* suggested percentage)
- No refence sources for Connections, EO Road Restoration trench and Acid Sulphate soils contingency
- No reference source for CCC Client Cost

Below is an example of one of the project cost-estimating sheets developed by CCC, which highlights the formulaic approach taken.

Figure 54: Project cost-estimating sheets

SRM	SPS MP06 RM - Complete main
Basis	NSW REFERENCE RATES MANUAL, 2014
Cost estimate	$304,669

Item	Description	Parameter	Unit	Quantity	Rate ($)	CPI	Total ($)
	DIRECT COSTS						
Open trench							
1	Rising mains UPVC	300 dia	m	172	295	1.10	55,603
2	Moderate construction difficulty	300 dia	m	172	122	1.10	22,995
4	Dewatering	300 dia	m	172	115	1.10	21,676
5	Rock excavation - Trench excavation at minimum depth	300 dia	m	172	12	1.10	2,262
	Connections		each	2	5,000		10,000
	EO Road Restoration Trench Std Depth		m	65	362		23,530
11	Acid sulphate soils contingency		each	1	25,000		25,000
12	Sub Total Direct Costs (1 to 11)						161,066
	INDIRECT COSTS						
13	Contractor Design Costs (% of Direct Costs)	Included in Reference rates		10%			5,853
14	Contractor Indirect Costs (% of Direct Costs)	Included in Reference rates		20%			11,706
15	Contractor Margin (% of DC+Indirect Costs)	Included in Reference rates		15%			11,413
16	Risk Contingency (% of (Direct Costs+Indirect Costs+Margin))			35%			66,514
17	Total Indirect costs (13 to 16)						95,486
	CONSTRUCTION COSTS						
18	Total Construction Cost (12+17)						256,552
	CCC CLIENT COSTS						
19	Design Costs (% of Construction Costs)			1.00%			2,566
20	Tender Costs (% of Construction Costs)			0.50%			1,283
21	Planning Costs (% of Construction Costs)			5.00%			12,828
22	Project Management Costs (% of Construction Costs)			10.00%	0		25,655
23	Insurances & Financing Costs (% of Construction Costs)			0.55%	0		1,411
24	Land Acquisition/Easement Costs			N/A	0		0
25	Risk Contingency (% of the CCC Client Costs only)			10.00%			4,374
26	Total CCC Client Costs (19 to 25)						48,116
27	**TOTAL PROJECT BUDGET REQUIREMENT (18+26)**						304,669

Source - Sewer rising main renewals CAPEX forecast - IPART 2023-27_Final

All rising mains identified for replacement appear to have "Rising mains UPVC", but the replacement unit rate is for a DICL material pipe. It is unclear what is preferred material and how these will perform in local conditions.

CCC has developed high level budget estimates for five projects to be delivered in this IPART period for a combined value of $11.442 M plus a further $2.161M (three projects) in 2027.

This expenditure has been distributed to be a combined value of $10M. There are no assumptions provided regarding Council's plan for efficiencies to deliver the five projects for $10M.

Table 73: Sewer Rising Main Rehabilitation Program ($2021-22)

	2022-23	2023-24	2024-25	2025-26
SEWER RISING MAIN REHABILITATION PROGRAM	$0.0	$2.96	3.52	$3.52

Source: Sewer rising main renewals CAPEX forecast - IPART 2023-27_Final

Expectations should be made clear that these five projects are delivered within this IPART period for the budget proposed. Each project should have a comprehensive planning investigation and business case, that tracks the variance in scheme scope and budget estimates. This should be used as a template present project readiness for the next IPART evaluation submission.

Program need

The sewer rising main rehabilitation program is a key element in supporting CCC asset performance. Council has selected rising main assets based on CCC's Risk classification score.

Assessment of efficiency

The program efficiencies are not defined well and needs improving in line with Council Asset Management Improvement Plan. This recommendation based upon the following considerations and assessment:

- Investments to sustain the asset base is needed, targeting the high-risk raising mains
- No planning on priority targeted assets, or case for the urgency or justification for complete rising main replacement
- Reasonable to high project cost estimation, but these are founded on 2014-unit rates uplifted to 2021 figures, and possibly against different planned installed materials.
- No relationship between the budget and output target performance

Recommendation

	Sewer Rising Mains
Is the project needed?	
Is the project efficient – best option?	
Is the project efficient – least cost	

Key: Red – Not efficient, Amber - Partially efficient, Green – efficient

No Variation to expenditure**. ($M).** The program covers five nominated High Risk rising mains, which each have their own coarse Cost estimate sheet based on 2014 unit rates. This is likely to underestimate delivery costs.

Table 74: Target Budget profile **-** Sewer Rising Main Rehabilitation Program ($2021-22)

	2022-23	2023-24	2024-25	2025-26
TARGET BUDGET PROFILE	$0.0	$2.96	3.52	$3.52

CCC needs to ensure their expenditure has an impact on their output performance.

Reasons for variations between actual and forecast expenditures

Council has developed high level budget estimates for five projects to be delivered in this IPART period for a combined value of $11.442 M plus a further $2.161M (three projects) in 2027.

Adjustment to the output is to promote targeted planned investment systems and decision making, culture of value for money investment and continuous improvement. Accountability measures are recommended that these five projects are delivered within this IPART period for the budget proposed.

SPS electrical and control switchboard replacement program

Project overview

The sewer pump station (SPS) electrical and control switchboard replacement program has been developed by CCC to provide proactive replacement of ageing or obsolete assets which are beyond practical repair due to component age, pose a workplace health and safety (WHS) risk to operations staff or, their failure contributes to breaches in maintaining environmental standards.

The program has been developed through a systematic approach of undertaking survey of an initial sample of CCCs >300 SPS sites. This surveyed sample was used to identify key asset risk areas of which ageing switchboards were identified as key. This prompted a second more comprehensive survey of SPS sites which had an asset age of greater than 25 years. The sites were again surveyed, by an external subcontractor, against a comprehensive criterion and scored. The cumulative scores were used by Council to define an overall asset condition score between 1 – 5 . A score of 1, Very Good, denoting an asset requires no intervention at this stage whereas a score of 5, Very Poor, would denote an asset which require immediate replacement due to imminent failure. The scores were then used by CCC to batch the sites by similar complexity and geographic region, with sites that scored 4 or 5 being prioritised in the program.

During the interview held on 23rd November 2021, CCC highlighted that the rate of program delivery is paced by available funding. The program by its nature is very scalable, as the number of sites which require replacement exceeds available annual expenditure, so the scoring and batching for priority ensures that the sites which have the greatest impact upon failure are delivered first.

Key assumptions and status

Documents reviewed:

- 24580 – Sewer Pump Station Electrical and Control Switchboard Replacement Program (excel document)
- Sewer Pump Business Case Supporting Document (PDF document)
- EPA Letter to CCC Administration Regarding required improvements to wastewater system (PDF document)
- EPA Enforceable Undertaking (Published Copy)

Investment Drivers

CCC has identified the following investment drivers for this project.

- Serviceability and reliability of existing equipment due to the asset age and condition.
- WHS risks introduced due to the age and condition of the equipment.
- Non-compliance with the asset management class management plan.
- Obsolete equipment
- Inadequate monitoring capability of existing control equipment for compliance with Environmental Protection Agency (EPA) enforceable undertaking requirements.
- Historic failure of previous assets leading to the EPA enforceable undertaking notice.

Table 75: Preliminary expenditure – Sewer Pump Station Electrical and Control Switchboard Replacement Program ($m)

	2018-19	2019-20	2020-21	2021-22
SPS Switchboard Replacement Program	$1,375,000	$1,000,000	$823,216	$1,500,000

Source: 24580 – Sewer Pump Station Electrical and Control Switchboard Replacement Program.

The intended outcomes of the project are as follows:

- Reduce risk of failure of the asset and in turn reduce return to service time through standardised equipment and documentation.
- Enable more resilient assets through capacity to connect backup generators during power outage or natural disasters.
- Enhanced monitoring and control enabling remote diagnostics and pumping station performance monitoring.
- Enhanced network control and monitoring enabling early detection of network issues e.g. leakage

The project delivery program is in year 4 of a 4 year program. The program is managed by an internal council team with panel electrical and systems integration subcontractors undertaking the manufacture, supply, installation and testing of the new equipment.

From discussion during the interview held on the 23rd November 2021, the program team stated that the project was being delivered to program and on budget.

Procurement and project delivery process

Most of the work scope under this project is undertaken by panel subcontractors which have been appointed by assessment on quality and commercial criteria. Quotations have been sought by Council from these preferred suppliers for a package of works which contains multiple sites that have been grouped by similar scope and complexity. The supplier selection at this stage is heavily weighted on cost due to the quality assessments being previous undertaken at panel appointment phase. Electrical service suppliers are selected by Council by the same process.

A single systems integration supplier is engaged through the same process however a schedule of rates basis is typically employed for the assessment of cost. Programs are used during the delivery phase to assess value returned against the schedule of rates pricing.

Overarching project management is undertaken by council project managers. The programme and quality of delivery is managed through staged milestones within the procurement contracts which serve several purposes. First, they allow Council to control the pace of delivery to ensure that any pre-works risk assessments, customer engagement activities etc can be completed ahead of works proceeding to site. The hold points also allow quality inspections to be undertaken ahead of equipment being installed on site Through a process of standardising much of the switchboard design, this has in turn eliminated much of the quality risk. This is further reduced through extensive factory acceptance testing prior to equipment being delivered to site. The approach adopted enables a streamlined site installation and testing phase further reducing project risk.

The combined effect of these integrated efficiencies allows for minimal contingencies to be included within the program budgets. Council endeavours to further increase efficiency of this programme through more turnkey delivery with a single supplier.

Project need

Council has advised that the project need is due to the existing asset condition which in turn increases service reliability risk. The consequence of failure risks breaching the EPA's enforceable undertaking introduced in December 2019. It is not evident that CCC has fully assessed the risk of asset condition driving failure. The second part of the project need relates to the asset age being beyond economical repair and assets which increase WHS risk of the operations & maintenance staff. Customer willingness to pay is not considered within the business case.

Assessment of efficiency

Due to the discrete nature of the Sewer Pump Station Electrical and Control Switchboard Replacement Program, we consider that limited options beyond straight forward assets replacement were possible therefore an options assessment would not have been an efficient proposal for this program. Additionally, running the asset to failure would not be possible due to the EPA enforceable undertaking.

A critical dataset not fully assessed by the selection and prioritisation process employed was the operational condition of the assets. During the interview held on the 23rd November 2021, the project team explained that operational performance data was sought through the associated teams. However, we have not witnessed this feedback being included within the condition assessment scoring matrix.

The costs for this investment are based on Councils historic cost data. For each batch of projects, a quote is provided to Council through a competitive panel set up by CCC. For example, the cost of each switchboard is $35 plus $15k for installation and ancillary works.

Minimum contingency is included as the scope of the project is well defined and understood and delivery risk is minimised as assessments are done in advance of commencement.

The impact of COVID on costs is considered by CCC project team to be minimal for this program of works due to the locally procured equipment. We believe this to be unusual given global increases in raw material values for steel and copper.

A project control group has been set up by Council where issues are escalated that need to be discussed by senior management. The Group is made up of Technical advisors that have maintained continuity during the course of the project that allows for efficiencies in decision making.

Recommendation

Through assessment of the provided documentation listed above and the supporting understanding gained from the interview held with CCC project team on the 23rd November 2021, our recommendation for this project is that it is needed and is efficient.

We have arrived at this recommendation based upon the following considerations and assessment:

- The need for the asset replacement is established through a systematic and efficient approach with an initial small sample of the wider asset based used to define a greater detail the specification for the wider survey.

- The survey and subsequent condition assessments were comprehensive and enabled consistent scoring of asset condition to be applied and in turn prioritised against. Albeit these assessments don't consider operational risk assessment.
- The standardisation of replacement assets has introduced significant efficiencies to the design, procurement, installation and long-term operation and maintenance of the assets (albeit if these efficiencies are not well quantified by CCC's project team). This is based upon our experience of undertaking similar asset standardisation approaches with other clients which have returned capital and operational efficiencies when benchmarked against historic costs
- The replacement asset provides enhanced features to improve future operability of the sites and provide EPA data on operational performance should it be required to satisfy the enforceable undertaking. Whilst we do not consider these additional enhancements directly related to the business need, the negligible cost increase is offset by the standardisation of the replacement asset.
- The procurement approach adopted by Council is widely considered by the water industry to be industry good practice by establishing preferred suppliers which can bring consistent quality to the program of works when continuity of work is offered.
- The costs provided within the business case are efficient and consistent with anticipated market rates for the scope of works based upon benchmarking the included rates against similar projects.

We set out below our recommendations for improvements on future programs of works as follows:

- We suggest that, sole sourcing of systems integration works limits opportunity for market testing to ensure efficient costs.
- Baselining of internal costs should be against historic cost which are adjusted to present day value, allowing the project team to better determine project efficiencies in turn justifying project budgets.
- Further assessment of operational condition, with scoring attributed to associated criteria, would further validate the prioritisation of each site.

Our assessment of efficiency

Is the project needed?	
Is the project efficient – best option?	
Is the project efficient – least cost	

Key: Red – Not efficient, Amber - Partially efficient, Green – Efficient

Table 76: Recommended capex – Sewer Pump Station Electrical and Control Switchboard Replacement Program

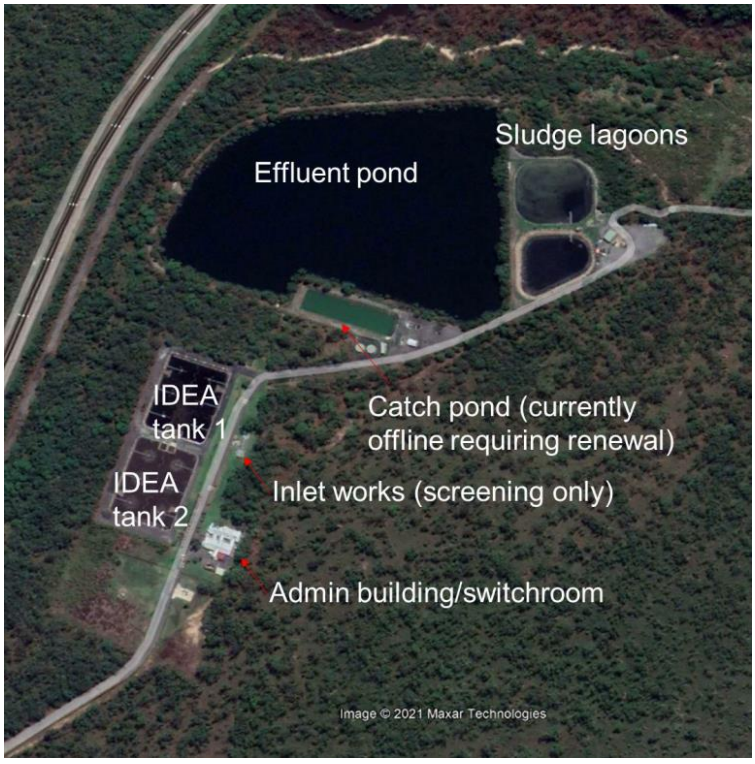
	2018-19	2019-20	2020-21	2021-22
Preliminary proposed budget by CCC	$1,375,000	$1,000,000	$823,216	$1,500,000
Adjustment	-	-	-	-
Recommended	$1,375,000	$1,000,000	$823,216	$1,500,000

Source: Mott MacDonald.

STP major Augmentation Works - Charmhaven

The Charmhaven STP (CHSTP) is located West of Budgewoi Lake, within the Northern region of Central Coast, NSW, servicing local areas encompassing Summerland Point and Charmhaven catchments. CHSTP is one of five STPs discharging to the ocean via the Norah Head Outfall under EPL247 (Toukley Sewage Treatment System Environmental Protection license). CHSTP was commissioned in 1988, with an original design capacity of 40,000 Equivalent People (EP) and daily flow of 9.6 ML/day. The connected population exceeds 47,000 EP with a projected serviced population of 80,000-90,000 EP by 2036.

Figure 55: Site overview of Charmhaven STP



Source: Capacity Assessment Review Memorandum - Charmhaven STP

Council has advised that there are constraints on both the combined outfall and on the performance of the Charmhaven STP. There is also ammonia carry over which was reported within the GHD Capacity Assessment 2018. We consider this a clear sign of a system moving towards a key capacity constraint. We noted during the interview with CCC that there is not the capacity / potential to improve other plant discharges to meet license compliance. As such focus needs to be at Charmhaven.

Project overview

To address non-compliance with the Environmental Protection Licence, pollutant concentration and load breaches in treated effluent quality, EPA has strongly recommended urgent upgrade works at CHSTP. A capacity study conducted by GHD in 2018[68] reviewed data showing that CHSTP's effluent does not meet the treatment design targets for ammonia and biochemical oxygen demand (BOD), it is also approaching the design TSS effluent quality. This is reiterated in in the figure below from the updated 2021 GHD capacity study[69] with mean decant concentrations across 2020-21 largely exceeding the design target values.

Figure 56: CHSTP Effluent Quality Results

Tank	Pollutant	Design target values (mg/L)	2008-2017 mean decant concentrations (mg/L)	Jan 2020-Aug 2021 mean decant concentrations (mg/L)
IDEA tank 1	Ammonia	5	9	37.9
	BOD_5	20	N/A	56.6
	TSS	30	N/A	24.4
IDEA tank 2	Ammonia	5	6.5	36.4
	BOD_5	20	N/A	37.5
	TSS	30	N/A	22.1

Source: GHD Capacity Assessment Review Memorandum - Charmhaven STP 2021.

Due to the worsening effluent quality, first assessed in 2018, an interim aeration upgrade was recommended by GHD to be completed in 2018. This aeration upgrade was not implemented, resulting in deteriorating effluent quality since then.

The 2018 study relied on a 2014 population forecast based on a 2011 census. The population of the Charmhaven catchment has increased in recent years and CCC's revised future population projections are much greater than the projections adopted in the 2018 GHD study. A recent 2021 capacity assessment[70] was completed by GHD, with projections based on 2016 census data. The adopted planning horizon is to the year 2036 with a forecast of 80,000 to 90,000 EP. Given the drive out of the cities through Covid, we expect that this number may grow and that growth rates may also have been higher than expected within this study.

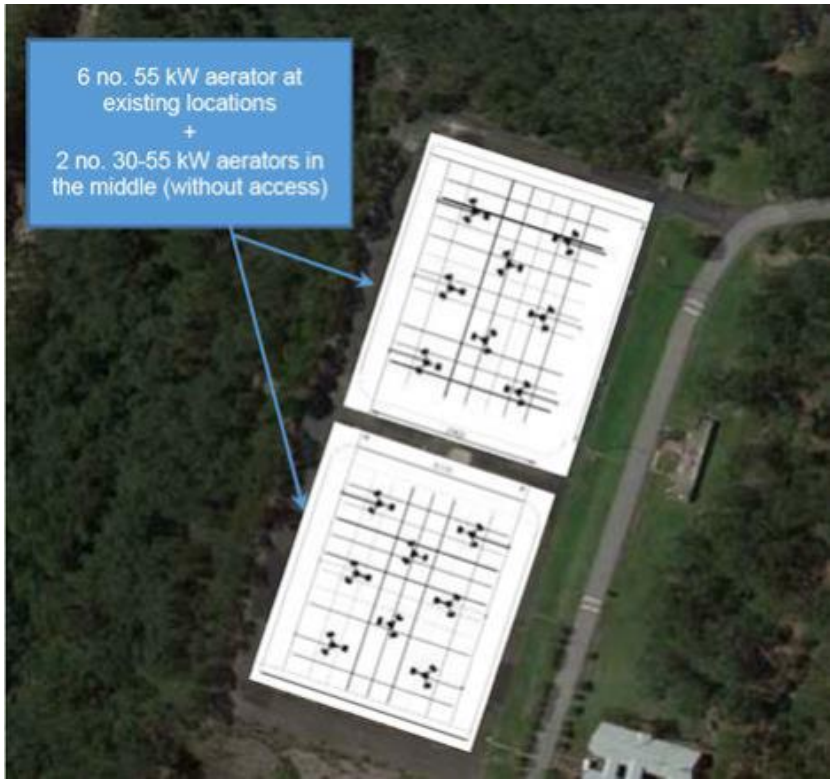
From GHD's 2021 Capacity Assessment, CCC has been experiencing year on year EPL 2647 breaches on effluent quality including 2018 to 2021 TN limit breaches, which we expect will escalate without urgent upgrades to CHSTP.

[68] Charmhaven STP Capacity Study, GHD 2018

[69] Charmhaven STP Capacity Assessment Review Memorandum, GHD, 2021

[70] Charmhaven STP Capacity Assessment Review Memorandum, GHD, 2021

Figure 57: 2018 interim aeration proposal



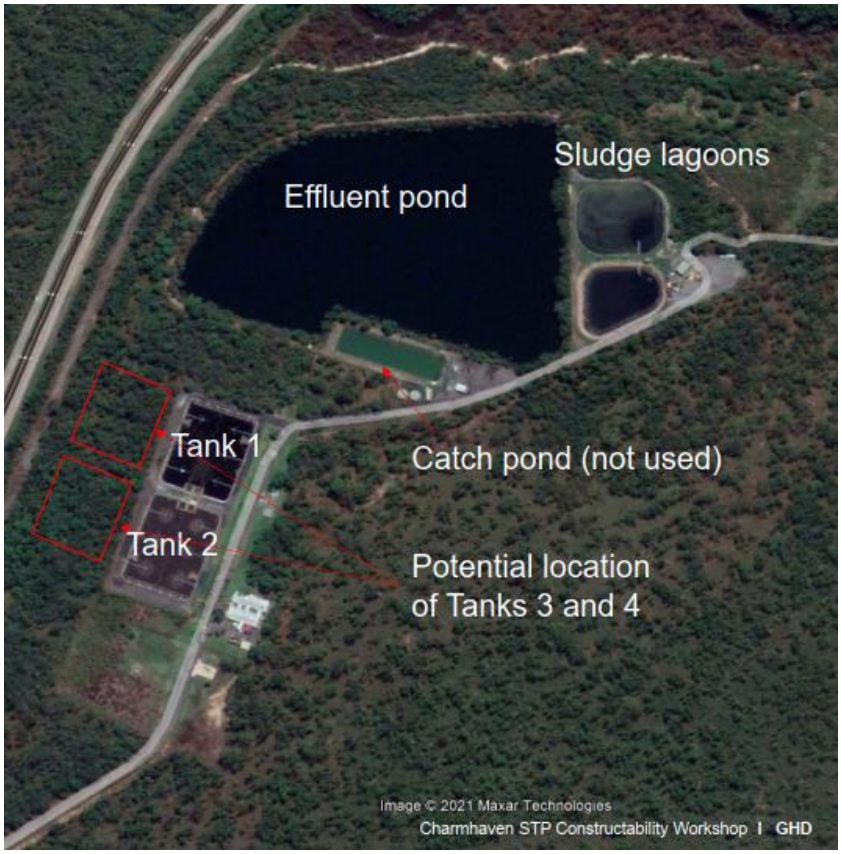
Source: [Insert reference source text here]

In March 2021 CCC experienced the overtopping of the Charmhaven wet weather pond due to excessive wet weather inflow, combined with an undersized effluent pump station.

Adopting per capita flow of 220 L/EP/day from the GHD 2018 Charmhaven STP Capacity Study, the target daily flow for this upgrade is 19.8 ML/day. The NSW EPA advised CCC in June 2021 that it will be implementing several Pollution Reduction Programs (PRPs) to address concerns it has with the operation of Council's sewerage system and the public health and environmental implications with CHSTP's current performance. To accommodate for service planned growth within EPL provisions and compliance to mandatory standards, major augmentation works at Charmhaven will involve:

- Construction of major new and upgraded works
  - Construction of new IDEA tanks 3 and 4.
  - Construction of WAS dewatering facilities.
  - Upgrading of inlet work for capacity and consider construction of grit removal facilities.
  - Upgrading of effluent pumping station for capacity.
- Rehabilitation and upgrading of IDEA tanks 1 and 2 - with new decanters, surface aerators (55 kW) with bridges, baffle replacement, new pumps, and inlet modifications to prevent short-circuiting. The deposited grit will be removed and concrete joints re-instated in damaged areas.
- Capacity upgrades through the construction of two new IDEA basins identical to the existing

Figure 58: Capacity assessment – Charmhaven STP



Source: Capacity Assessment Review Memorandum - Charmhaven STP

Key assumptions and status

The key assumptions adopted in the development of this review:

- We have reviewed and accepted the assumptions in GHD capacity assessment and Jacob's IPART submission review.
- We have assumed that the information provided is accurate and representative
- There is no ability to reduce the discharge requirements within the EPA license
- License limits will not, foreseeably, get more strict requiring further process units
- Costings have not been included for environmental and licensing assessments for the outfall as part of this submission.
- To meet future demand the aeration system upgrade in the existing tanks will be required (we note it may be more cost effective to uprate the new IDEA tanks)

Documents reviewed

The following outlines the key documents we have reviewed for this work. It is noted that there are a number of smaller spreadsheets etc that are not listed.

- **IPART and CCC -** IPART Presentation - Charmhaven and Bateau Bay Sewage Treatment Plants (7 December 2021)

- **Jacobs -** IPART Business Case Submission - STP Major Augmentation Works Program - Charmhaven and Gwandalan FINAL (12 November 2021)
- **GHD -** Asset Management Plan - Sewage Treatment Plants (10 November 2021)
- **GHD -** Capacity Assessment Review Memorandum - Charmhaven STP (28 October 2021)
- **Central Coast Council -** Capital Expenditure Technical Report (2019-2022) (14 September 2021)
- **NSW EPA –** EPA letter to CCC addressing Central Coast Wastewater Management Issues (30 June 2021)

Investment Driver

The following outlines the investment drivers for the project where the main drivers are growth and compliance relevant:

- Growth and compliance with mandatory requirements
  - Service planned growth within EPL provisions.
  - Address various PRP from EPA
- Asset and service reliability (replacement)
- Address aging assets impacting performance/safety

Investments into new assets and upgrades are necessary to accommodate CHSTP's growing population whilst ensuring ongoing compliance with regulatory requirements within the EPL.

Proposed capex profile over the period

The table below summarises the forecast CAPEX profile as shown in the September 2021 IPART submission profile.

Table 77: CHSTP's capex profile September 2021

	2022-23	2023-24	2024-25	2025-26	Total
Capacity upgrade	$4.5M	$7.7M	$4.1M	$ -	$16.3M

Source: CCC Technical Paper 4 Capital Expenditure (September 2021)

Since the September 2021 Capital Expenditure report, CHSTP's scope has significantly escalated, also resulting in cost escalations. The following table outlines the CAPEX profile over the proposed periods by Jacobs, based on the GHD capacity assessment.

Table 78: CHSTP's capex profile November 2021

	2021-22	2022-23	2023-24	2024-25	2025-26	Total
Capacity upgrade	$0.62M	$3.3M	$18.9M	$28.3M	$7.93M	$59.05M

Source: Jacobs IPART Submission - Charmhaven STP (November 2021)

Given the timeframe of 3 weeks between the Jacobs IPART submission and GHD's capacity assessment memorandum, we consider it likely Jacobs based and reprofiled the cost profile off GHD's capacity assessment, as, at least, Jacobs will have had access to GHD's draft report. GHD's Class V accuracy (-50%/+100%)[71] cost profile is provided below. We assume that Jacobs also recognised that the interim solution could not be implemented within 2022-23 and reprofiled the cost accordingly across the 5-year period, we agree with this reprofiling assuming that the surface aerators cannot be implemented in 2022-23.

Table 79: STP Major Augmentation Works– Charmhaven, Real $2021-22 (GHD)

	2022-23	2023-24	2024-25	2025-26	Total
Capacity upgrade	$4,925,000	$25,932,000	$25,932,000	$ -	$56,789,000
Interim solution	$2,611,000	$ -	$ -	$ -	$2,611,000

Source: Capacity Assessment Review Memorandum - Charmhaven STP (October 2021)

GHD's investment profile is broken down into studies, an interim solution (aeration system upgrade) and the upgrade for growth (the two new reactors). The capacity upgrade cost profile, however, involves 35% risk contingency for direct and indirect costs and 30% for CCC costs. The interim solution cost profile is completed with 35% risk contingency for direct and indirect costs but 10% for CCC costs. This is inconsistent with the Class V accuracy, and these numbers have been used in Jacobs' IPART submission[72].

Intended Outcome

The regulatory drivers for the project are

- Legislation: EPL 2647 compliance
- Growth: Provision of two new IDEA tanks of equal size to existing (re-rated to 22,000 EP) to meet growth demand

Project Status

The project is past Gateway 1 and approaching Gateway 2, within pre-concept stages following significant scope escalation since 2018. In our interview with IPART and CCC, the main observations were made:

The 2018 scope saw delayed construction of IDEA tank 3 to a later date by installing an interim aeration upgrade. This was not implemented due to operational issues, thus leading to deteriorating effluent quality. Since then, with increased population forecast, the 2021 scope has increased with proposed installation of two new IDEA tanks and a dewatering facility, and upgrades in inlet works and the pumping station. An interim aeration upgrade will also occur prior to the major construction stages.

[71] American Association of Cost Engineering, AACE International Recommended Practice No. 18R-97 Class 5 estimate is L: -20% to -50% H: +30% to +100%

[72] IPART Submission, STP Major Augmentation Works Program - Charmhaven and Gwandalan, Jacobs, 2021

The updated capacity assessment and constructability review for CHSTP was completed by GHD in October/November 2021. This review saw a significant increase in scope required to address the 2036 planning horizon. The key changes observed by IPART from the previous study undertaken included:

- Inadequate optimisation approach (based on 2011 census) on IPART's submission cashflow.
- Significant deterioration of effluent quality between 2018 and 2021 without interim aeration upgrade.
- Inability to take existing tanks offline for aeration system (interim) upgrade due to growth.

From our review of the documentation, we agree with IPART's observations above. The project's next step is to complete concept designs, regulator engagements with EPA and procurement/supplier engagement workshops. During the interview the process selection was discussed. CCC informed that the concept design would be when the process was to be defined. CCC has also hired a project manager, commencing in January 2022, with aims to progress the project after several project investigation delays.

Procurement and project delivery process

The studies to date have been defined by Mott MacDonald as high level only. The asset management plans have been utilised to assess asset condition and the overall plant risk profile. As CHSTP's scope has materially increased, concept designs have yet to be completed and project delivery routes will be defined during concept design. The cost estimate appears to have been based on a design and construct (D&C) delivery route.

CCC still needs to complete concept designs, reference designs, tendering and awarding. With the cost profile above, the contract must be awarded by mid to late 2023. This is a tight timeline to uphold, considering CHSTP is still at pre-concept stages.

Project need

CHSTP is experiencing frequent annual breaches of EPL 2467 for effluent quality which will escalate without urgent augmentation and upgrades to its assets. NSW EPA has advised CCC that several PRPs will be implemented to address compliance, environmental and public health implications.

The GHD and Jacobs' reports outline the interim upgrade cannot be undertaken as the plant cannot be taken off-line to replace the surface aerators. We consider this to be unusual as we are unaware of any evidence that this decision, to not take the surface aerators offline, was verified by a construction contractor. Given the current compliance risk, we recommend further investigation into this decision.

The community requires safe recreational facilities. Given the regulatory framework driven by EPA it is necessary to comply with discharge license limits. In terms of levels of customer service and willingness to pay, the drivers from EPA must be met.

Assessment of efficiency

The following outlines our assessment of the efficiency of the project. The assessment is based on the options assessed, the cost estimates, alignment to broader goals and the risk profile.

From our review of the material, we consider that the project is required in the FY2022-27 regulatory period to meet compliance requirements for the outfall and accommodated projected demand growth. There is no ability to off-set the environmental / public health risk with improvements in the other plants.

Options analysis

The following table from Jacobs summarises the options considered by CCC. Option 2 is the most cost-efficient for this period of upgrades. The comments as to feasibility are Jacobs'.

Table 80: Options assessment – STP Major Augmentation Works– Charmhaven

Options	Comments
Do Nothing	Under this option CCC would have to undertake reactive maintenance when required which would see ongoing increase in operation costs. These costs are expected to increase as CHSTP's capacity weakens. CCC would face environmental and public health risks, and non-compliance with mandatory standards. This option is not feasible.
Meeting mandatory standards and addressing key constraints.	This option is recommended.
Meeting mandatory standards and addressing all current and future constraints.	CCC would be required to provide capital to maintain or upgrade assets with useful life remaining. This option incurs greater costs and deferment of future works until necessary. This option is not recommended.

Source: Jacobs.

The business case by Jacobs has developed three simplistic options as shown above, as GHD has not completed an options assessment. We consider the 'options' shown in the table above as delivery outcomes, not options. Jacobs' options table does not summarise capital work options to address mandatory standards. There are no options considered by GHD in their capacity assessment, the proposed upgrade works are to derive a cost estimate for CHSTP's cost profiling. We questioned CCC regarding this, and their comment was that the options assessment will be completed as part of the next concept design stage.

Scope of the preferred option

A constructability workshop was conducted between GHD and CCC on the 23rd September 2021, regarding the aeration upgrades at CHSTP. The following options were recommended:

- Proceed with upgrade to provide additional IDEA tankage **before** upgrading 3 aerators in IDEA 1 and IDEA 2 to 45 kW aerators to up-rate to 22,000 EP.

It is considered by CCC and GHD (and we agree) high risk to undertake any works that would require the IDEA tanks to be out of service for anything other than short outages (i.e., hours). If one IDEA tank was taken offline for an extended duration, then this could heavily overload the other IDEA tank. This option avoids the risk of capacity exceedance on the IDEA tanks if one were to go offline for upgrades.

The proposed locations of these tanks are a parallel arrangement, enabling them to operation in pairs if required and simplify flow division. The proposed location's cost estimate is assumed with allowance for a contingency for future site relocation. The costs estimates are a Class V estimate (-50%/+100%) and primarily based on the preliminary 2021 capacity assessment and escalations of other projects. Direct costs will amount to $34M and indirect costs of $15.8M (including 35% contingency), the internal CCC costs are approximately $9M (including 30% contingency). The total project budget requirement is $59M.

It is surprising to us that the surface aerators cannot be removed via a crane while the plant continues to operate. This should be reviewed with a contracting partner. It is also noted the construction review suggests the new IDEA tank(s) need to be in operation prior to replacing the surface aerators, however the spend profile indicates the interim solution (surface aerators) are installed while the new system design is taking place.

- Nominal allowance for temporary aeration solutions works.

The report suggested that further nitrification could be achieved through addition of aeration in the effluent lagoons. The Class V estimate has a 35% contingency on indirect costs and 10% contingency on CCC client costs for a total project budget requirement of $2.9M.

This is not correct and should not be relied on as without media for growth of nitrifiers lagoon systems cannot nitrify. Generally, the ammonia profile in lagoons is associated with the respiration profile of algae.

The long-term solution has simply taken the original plant upgrade plan and duplicated the existing two IDEA basins. It is noted that this solution only provides capacity up to 2035.

Cost efficiency of the preferred option (reflect efficient project costs, taking into account comparable or benchmark industry rates)

The cost estimates are reasonable; some comments were noted in the capacity upgrade cost estimate breakdown:

- Contractor preliminaries typically range 10% of total direct costs (TDC), the current estimate of $200,000 is abnormally much lower than 10% of the TDC (circa $34M).
- The dewatering facility construction cost of $2.33Mis low compared to a $2.8M cost estimate completed for a smaller 7 ML/d plant we are involved in. CHSTP's target flow is 19.8 ML/d, almost double the smaller plant, though the dewatering facility cost is not expected to also double, its current estimate is lower in capacity comparison. An estimate in the order of $4 – 6M may be more appropriate (depending on the need for a new building).
- Contingency percentages are reasonable, there are some inconsistencies with risk contingencies, for e.g. 35% for direct and indirect costs and 30% for CCC costs.
- There are several items where contingencies have been included on each individual line item. It is recommended to avoid contingencies upon contingencies to prevent price escalations.
- CCC's design costs of $2.5M are quite high relative to the contractor design costs of $1.98M, part of this cost can be allocated into CCC's planning costs which are relatively low. It is not clear where the costs of the license application and outfall studies are allocated.
- Preliminary, IDEA Tank refurbishment, inlet works and IEC works were based off a reasonable Construction Cost Index (CCI) of 1.095 (109.5% @ 1.3% pa) and escalation of multitude 1.344 from Wyong South STP's 55,000 EP to CHSTP's 90,000 EP. Considering the similar nature of upgrades to Wyong South, this is an appropriate cost escalation.

- An escalation of 1.3% pa is below that of the Wage Price Index (WPI), this is an abnormally low escalation for construction and labour works especially from 2014 to 2021 when there was a hot market.
- IEC works amount to $3M, this is very low, against its usual 10-12% of capital works costs (circa. $59M), considering the IEC upgrades occurring within the project as well.

In summary, there are items that appear to have cost allocation less than current market rates and others where contingencies have been added as individual line items. Overall, the cost appears in the right order of magnitude, however as noted above the expenditure profile does not match the constructability review. The key point from the review is that it would seem unlikely that an old inefficient process would be utilised for further upgrades. This then puts into question the validity of the cost estimate.

Consistency with CCC's longer-term expenditure and strategic plans

This upgrade is clearly required; however, the plant only provides capacity to 2035. It is questioned whether this is the most efficient means of expenditure.

Trade-offs between operating and capital expenditure, where relevant

It is expected that the current process will not be utilised for long term operation. It is unlikely to be the lowest CAPEX and certainly will not be the lowest OPEX solution. This high OPEX solution does not align to operational cost reduction targets or modern best practice. Further whole life costs and OPEX assessments will be completed in the next phase of this project.

Is deliverable by CCC within the proposed timeframe, taking into CCC's performance and approach to capital delivery

It was shown in the interview that CCC has a proven track record of similar upgrade works in inlet works and IDEA tank upgrades from the Wyong South STP Upgrade. CCC successfully delivered 48,000 EP upgraded to 60,000 EP capacity at a capital cost of $15.8M.

Additional early works delivery resources are expected to arrive in 2022/23, with an experienced Project Manager commencing in January 2022 for Bateau Bay, Charmhaven and Gwandalan STP Design and Preconstruction.

Recommendation

The current cost estimates provided by GHD and CCC are within a valid ballpark. However, CCC should consider alternative options to address plant capacity upgrades. It is understood from our interview that this will be part of the next stage of procurement.

While we agree with the need for the project there is a significant discrepancy between the project value submitted in July 2021 compared to the IPART supporting submissions received in November 2021. The scope of the project between the two estimates is changed substantially, we consider that the project estimate requires further development before we can assess the efficiency of the project. The current scope of the project is in an immature state. Further, the substantial difference between the costs also brings into question the governance process at CCC that lead to this change.

The key risks identified through the upgrade are associated with the potential for change in license conditions and the likelihood that the process selection (due to this being old inefficient technology and not aligned to OPEX reduction / efficiency drivers) will change through concept design phases changing the CAPEX solution and potentially delaying the project.

There are several inconsistencies in the cost estimate, particularly around the dewatering system, preliminary and general costs, electrical items and also the contingencies used against the final business case. The cost estimate does not look out of the ballpark for a plant upgrade such as this, however the costing is based on a process solution that is unlikely to be taken through to delivery. Further to this the delivery timeframes for the investment profile appear ambitious in the early stages of project development.

This process upgrade is also likely to provide capacity to 2035 only. Through the concept design development, a longer-term solution may be preferred. Again, this would alter the CAPEX/OPEX balance.

This project needs to be re-visited or reviewed at the end of the concept design phase with an acceptable and robust options evaluation, risk and opportunity assessment and risk adjusted cost evaluation. The investment is urgently required which leads to risks through time pressures on procurement.

Given CCC have employed a dedicated project manager to deliver these projects, the risk should be reduced.

Our assessment of efficiency

Is the project needed?	
Is the project efficient – best option?	
Is the project efficient – least cost	

Key: Red – Not efficient, Amber - Partially efficient, Green – Efficient

A more accurate cost and efficiency analysis can be completed once CHSTP's upgrade reaches its concept design phase, by which cost efficiencies can be checked against spend profiles.

Table 81: Recommendation STP Major Augmentation Works – Charmhaven

	2021-22	2022-23	2023-24	2024-25	2025-26	Total
Proposed	$1.2M	$4.5M	$7.7M	$4.1M	$ -	$16.3
Adjustment	-$0.58M	-$1.2M	+$11.2M	+$24.2M	+$7.93M	+$42.13
Recommendation	$0.62M	$3.3M	$18.9M	$28.3M	$7.93M	$58.43

Source: Mott MacDonald

As the proposed cost profile completed by Jacobs based on GHD's capacity assessment is a reasonable estimate, we concur with the cost escalation from CCC's Expenditure Plan to the new Jacob's cost profile. Thus the adjustments we recommend are the same as Jacobs'.

STP process improvements Bateau Bay

Bateau Bay STP (BBSTP) is the single and main treatment facility in the North of CCC's operating area, discharging to EPL 1942. It currently serves 40,000 EP and receives an average daily flow of 9 ML/d. BBSTP was originally designed and constructed in the early 1970s as a trickling filter facility with the addition of an activated sludge process (MLE) in the 1980's. The inlet works was upgraded in 2013 to include fine screens.

Figure 59: BBSTP site overview

Source: Bateau Bay STP Capacity and Condition Assessment Summary Report

Project overview

The plant consistently breached its annual nitrogen limit from 2010 to 2015 and its annual suspended solids load limit in 2011, 2014 and 2015. CCC was able to obtain increased load limits in 2017 which has seen compliance improve.

A capacity assessment report[73] was completed by GHD in September 2018, which indicated several areas of the plant that require process modifications, upgrades or refurbishment in order to provide sufficient capacity to operate the plant up to the design horizon of 2031, where BBSTP is expected to undergo major renewal or upgrade works. The report was undertaken in response to several mechanical and electrical assets reaching the end of their useful life and EPL breaches in TSS and TN limits. The target Average Dry Weather Flow (ADWF) is 10.1 ML/day for a 43,041 EP population. Immediate works in this upgrade involves:

- Refurbishment works for PST 1 and 2, including consideration of alternative odour cover arrangements to reduce ventilation capacity and improve odour capture and treatment
- Refurbishment works for Clarifier 3 and 4

[73] Bateau Bay STP Capacity and Condition Assessment Summary Report, GHD, 2018

- Upgrade works for Flow Splitter 1 and 2
- Renew Reactor Tank 1 diffusers, upgrade aeration capacity and RAS capacity
- Rectification of critical condition/compliance issues identified

Key assumptions and status

The key assumptions adopted in the development of this review:

- Refer to assumptions in GHD capacity assessment and Jacob's IPART submission review.
- Again, it is assumed that there will be no changes to the discharge license (both in terms of quality and the on – going use of Chlorine for disinfection)
- It is understood that a major upgrade is planned for 2030 and no planning studies have yet been undertaken for this work and there is no site master plan
- All key condition-based upgrades will be completed as per the GHD condition assessment
- The process modelling works do not suggest that aeration will be suppressed creating odour risks
- It is assumed that all options have been modelled (BioWin) and modelling also includes variable flow and load profiles. Particularly given the low aerobic mass fractions used.

Documents reviewed

The following outlines the key documents we have reviewed for this review of BBSTP. It is noted that there are a number of smaller spreadsheets etc that are not listed.

- **IPART and CCC -** IPART Presentation - Charmhaven and Bateau Bay Sewage Treatment Plants (7 December 2021)
- **GHD -** Asset Management Plan - Sewage Treatment Plants (10 November 2021)
- **Central Coast Council -** Capital Expenditure Technical Report (2019-2022) (14 September 2021)
- **Hunter H2O -** Optimisation Investigations and Design: Bateau Bay Sewage Treatment Plant (May 2021)
- **Central Coast Council -** Operations Plan Report (2021-2022)
- **GHD -** Bateau Bay STP Capacity and Condition Assessment - Summary Report (September 2018)

Investment Driver

The following outlines the investment drivers for the project where the main drivers are growth and compliance relevant:

- Growth and compliance with mandatory regulations
  - Service planned growth within EPL 1942 provisions.
  - Address various PRP from EPA
- Asset and service reliability
  - Address aging assets impacting performance/safety

Investments into new assets and upgrades are necessary to accommodate BBSTP's growing population and regulatory compliance up to the 2031 design horizon.

In short, there are several process units that require refurbishment from the condition assessment, there are peak flow issues and also general compliance risks.

Proposed capex profile over the period

The following table outlines the capex profile of BBSTP's upgrades over the proposed periods.

Table 82: BBSTP's capex profile ($2021-22)

	2022-23	2023-24	2024-25	2025-26
Capacity upgrade	$3.3M	$2.5M	$2.0M	$ -

Source: July 2021 Technical paper 4 Capital Expenditure

Intended Outcome

BBSTP's upgrades will take capacity to 2031 planned horizon by maximising performance of existing process units onsite to meet compliance (particularly for annual TN and TSS limits) while renewing the aging assets. The project will defer the next major plant augmentation while required environmental studies and negotiations with the EPA are completed and infill population trends can be monitored to confirm timing of future work. These works intend to fulfil compliance until the next major upgrade or construction of a new plant. In summary, intended outcomes include:

- Additional operation flexibility from PSTs and Clarifiers
- Ability to meet peak flow treatment
- Plant improvement designs to accommodate population growth
- Improved odour management

Project Status

An options assessment is being completed for BBSTP through 2021 and 2022, making BBSTP's upgrade roughly 6 months ahead of CHSTP. A contract was awarded to commence concept optioneering, concept design, regulator engagement with EPA and procurement workshops for the upgrade. Different aspects of this upgrade are within Gateway 3 (main delivery items) or approaching Gateway 4 (refurbishment items) such as early works on the PST odours and M&E refurbishments that are commencing. CCC has also hired a project manager, commencing in January 2022, with aims to progress the project after several project investigation delays.

Again, the key risk item appears to be associated with discharge license negotiations.

Procurement and project delivery process

Through our interview with IPART in December 2021, CCC explained that the project procurement and delivery process will be developed through the next design phases; however, the project has been broken up into refurbishment which is taking place now and then the larger delivery. It appears that the allowance is for a detailed design of portions of the upgrade although there is only 8% design allowance, whereas the same consultant has allowed a total

design cost of 22% for Kincumber for a detailed design delivery mechanism. Given both projects are at a similar stage of delivery this should include a similar allowance. We would recommend revisiting the allowance for Bateau Bay as it is challenging to assess the level of design required without intimate knowledge of the upgrade.

Project need

Ultimately the project is required due to growth and the current inability to meet license limits, particularly during wet weather events. This will get worse with growth in the near term.

The condition of aging assets introduced EPL 1942 non-compliance risks particularly in the primary sedimentation area which has seen one of the tanks taken offline. The lack of redundancy led to hydraulic capacity issues during wet weather events, leading to poor effluent quality, posing risk to the public health and environment.

The key customer requirements are the provision of safe recreational waters. The major risk for the plant upgrade is the outcome of environmental / public health assessments and the associated EPA requirements. The plant is also surrounded by neighbouring properties and odour will be a core risk moving forward. It is noted that the key unit processes are covered, however there will be more load pushed to the activated sludge plant.

CCC sought community customer feedback in a Representative Resident Survey by Woolcott Research and Engagement, where 10% of respondents identified that improvement to Odour control is important to them and the community rated the concern over frequency of sewerage overflows as **High Importance.** The last 6 years saw a reduction in operational service delivery where there is increase in sewer overflows, odour complaints, water quality complaints that are above service level targets. The table below summarises CHSTP's quality and function performances currently and in 10 years time, with main changes in odour complaints and compliance with EPA licenses.

Given the proximity to the community and also the issues with wet weather treatment it is clear there is a mandate from the community.

Figure 60: BBSTP performance measures

	Expectation	Performance measure used	Current performance	Expected position in 10 years based on the current budget.
Service Objective: Provide water services to all urban release areas.				
Quality	**Odour**			
	Odour complaints per 1000 Properties	Complaints / 1000 customers	1.6 per 1000 Properties	1.5 per 1000 Properties
	Confidence levels		High	High
Function	**Availability of supply**			
	System coverage	% of serviced urban areas	96%	96%
	Compliance with EPL 1802, 1942, & 2647 concentration and load limits	% compliance	No	Yes
	Confidence levels	-	High	High

Source: Asset Management Plan (GHD) 2021

Assessment of efficiency

The options analysis completed by CCC

- Did CCC undertake appropriate options and cost benefit analysis (is it clear why the preferred investment is preferred)

The following table summarises the 6 options considered for BBSTP's liquid stream capacity upgrade. A contingency of 30% of Total Construction and Client Costs (TCCC) was applied to each option.

Table 83: Options assessment – BBSTP process improvements

Options	Comments
Option 1 – TF and MLE Fixed Flow Split	This option provides a combined effluent TN in the order of 15.5mgTN/L. It is understood the target value is 17.8mgTN/L. This does not provide significant margin for error.
Option 2 – Option 1 with Clarifier 3 and 4 Offline	This is the preferred option. Option 2 is considered CCC preferred option; this appears odd since recent refurbishment of clarifier 3. There is noted risk for clarifier solids carry over for option 1 and the clarifier capacity is further reduced for option 2.
Option 3 – Option 1 with Maximised Dry Weather Treatment	This option involves pushing even more flow through the MLE process. This was discounted due to perceived risk with the TF plant. It is noted that the risk for the clarifiers will be even higher for this option.
Option 4 – Existing MLE Reactor and New Secondary Process	This option includes a new reactor and would result in sunk costs prior to the major 2031 upgrade.
Option 5 – New Secondary Process	This option has been discounted as it may limit the 2031 upgrade options.
Option 6 – Existing MLE Reactor Only	This option should be heavily considered due to some significant benefits. Option 6 is very similar to Option 2 however with the existing trickling filters decommissioned, the increase in operational space will allow for other upgrades. This option appears to be discounted without much further assessment. This provides much reduced risk for clarifier capacity and TN removal (if the model shows the system can nitrify and there is sufficient carbo to denitrify).

The only concern with the options above is that there is no master plan, and as such much of the works will end up being redundant in 2031. Further to this, there are options for treating and bypassing wet weather flows which have not been investigated. Given the costs of the upgrade, it is unlikely that a new side stream wet weather treatment system will be cost effective, however it is felt it should be included in the options assessment. CCC also noted that this would be non-compliant with license conditions and require discussion with EPA.

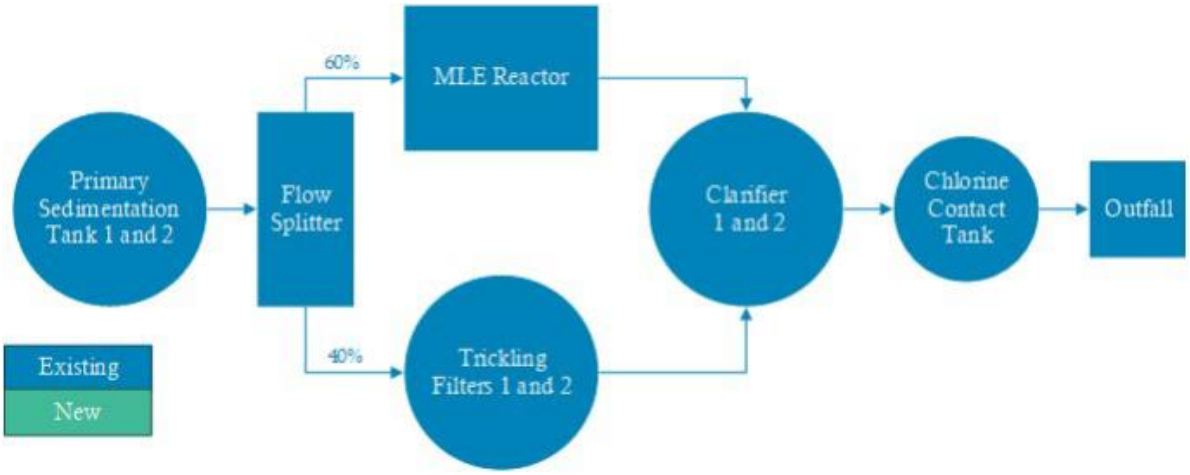
Scope of the preferred option

The scope of option 2 (**Figure 61**) is similar to that of option 1 and 6, with works as follows:

- Provision of a fixed flow split between the MLE and TF processes. A split of 60% to the MLE and 40% to the TF system
- Reinstatement of the MLE process to utilise clarifiers 1 and 2 for solid-liquid separation
- Redirection of Trickling Filter Effluent to clarifier 1 and 2 to perform solid-liquid separation.
- Decommissioning of clarifier 3 and reactor 2.
- Upgrade of the internal MLR recycle pumps to a higher flowrate to achieve the optimum for nitrogen removal
- Upgrade of the aeration system (diffusers/blowers) to achieve the required airflow rates for effective treatment

Clarifier 3 has already been refurbished and adopting this option will result in sunken capital. Option 6 should be considered due to greater advantages to disadvantages with compliance and reduction in risk. We have assumed that models have been successfully run for all options, particularly with the high anoxic mass fraction.

Figure 61: Option 2 - Process flow diagram



Source: Hunter H_2O Options Assessment

- **Cost efficiency of the preferred option (reflect efficient project costs, taking into account comparable or benchmark industry rates)**

Cost estimates appear low to us. An example of this is the aeration system with the blowers and the new diffusers. This is recommended to be completed given the inefficiency in aeration transfer identified. We have recently completed a project for a 1.6ML/d system and the diffuser cost estimates were similar. The other key risk is the installation of the diffusers which does not

appear to be considered. Following are some further comments on the Option 2 upgrade cost estimate breakdown:

- Preliminary costs of $296,000 is an appropriate estimate, being roughly 10% of the overall TDC (circa. $3.3M).
- The aeration blower costs appear low as we have had similar estimates ranging $90-100,000 for a 1.6ML/d project.
- The majority of direct costs are based on a GHD budget estimate[74], these 2018 estimates were previously made for BBSTP's interim upgrade. These costs were not adjusted by the CCI from 2018 to 2021, thus the costs may be slightly lower than they realistically should be.
- The engineering design costs (indirect) is quite low at 8% in comparison to 22% overall used for Kincumber by the same consultant.
- Electrical upgrades will cost $411,750, 15% of the main refurbishment direct costs, this is a reasonable estimate where similar upgrade projects typically lie within 10-15% for electrical and control costs.

Given this upgrade is to 2031 it is surprising to us that a broader site master plan has not been completed. Option 6 appears to be preferred by the consultant in the options assessment. This option combined with a master plan may well be the best option.

Another consideration that became clearer during out interview with CCC is that the PST refurbishments are due to wet weather flow treatment. We concluded from the interview that most of the risk may also have been associated with this. There is no option review of a dedicated Wet Weather bypass facility around the major unit processes.

- **consistency with CCC's longer-term expenditure and strategic plans**

Again, we concur with CCC and Hunter H2O that some form of upgrade is necessary. Without a master plan given the proposed 2031 upgrade and understanding of the longer-term options, it is hard to gauge whether this option is the most efficient means of spend.

The preferred option would need to be refined and further review of risks given the risks around solids settlement and TN compliance. This would also be the case for option 6 in the options assessment report as well.

Replacing the old inefficient aeration system is strongly recommended and will provide payback, and aligns to requirements around OPEX spend reduction.

- **trade-offs between operating and capital expenditure, where relevant**

The lowest OPEX solution will be to retain a portion of the load passing through the Trickling Filters (the preferred option). This assumes the maintenance associated with the Trickling Filters is less than the aeration in the MLE process.

Further to this the aeration system upgrade is being completed which aligns very well to OPEX reduction.

- **is deliverable by CCC within the proposed timeframe, taking into CCC's performance and approach to capital delivery**

Delivery of this upgrade is likely to be the least time-consuming option, although a side stream wet weather bypass system may reduce delivery time.

[74] Bateau Bay STP Capacity and Condition Assessment Summary Report, GHD, 2018

Recommendation

We identified several risks, from the discharge license and potential changes due to environmental assessments, through to the selected process upgrade and on-going compliance with TN limits.

Mott MacDonald concluded it is clear an upgrade is required. We recommend a site master plan which would enable better decisions to be undertaken on what processes could be retained in the existing plant (if any). It is not clear that the current Option 2 is the best option or the most efficient expenditure, particularly when this was not the preferred option by the consultant through the options development

There is no master plan for the site to review appropriate options post 2031. Given the preferred option from the consultant appears to be Option 6 which involved the construction of a new process alongside the existing MLE process, this option should be evaluated through the concept development or as part of a dedicated master plan. This plan should also (aligned to discussions with EPA) investigate the potential for Wet Weather treatment rather than refurbishing older PSTs and clarifiers. This may off set the need for several of the proposed alterations.

We have concerns over the cost estimates. We have recently completed an evaluation for a 1.5 MLD plant where aeration systems are to be replaced at a similar cost to that estimated for the proposed 6 MLD passing through the MLE process. This should be reviewed by a contractor as this would also evaluate the physical works required for the replacement.

It is not clear to us that the option taken forward will meet compliance given the low level of tolerance presented for TN limits. However, it is clear the aeration system requires upgrading and it is likely that this will have payback regardless of the upgrade required in 2031.

We recommend to complete robust review through process simulation modelling of the process to confirm the risk profile associated with the TN limits on the preferred option prior to approving the final spend. The works on the PST and the odour system are necessary along with the M&E refurbishment, so the current works should continue.

Our assessment of efficiency

Is the project needed?	
Is the project efficient – best option?	
Is the project efficient – least cost	

Key: Red – Not efficient, Amber - Partially efficient, Green – efficient

Our adjustments of the proposed expenditure were based on our analysis of BBSTP's cost breakdown. BBSTP's design contract has been awarded but with only 8% design allowance. In comparison to Kincumber's 22% design allowance by the same consultant, with refurbishment construction set to occur in the 2022-23 period, we recommend an additional $0.7M to account for detailed design costs for the main delivery components. Adjustments of $0.5M and $0.2M are recommended for 2023-24 and 2024-25 respectively to account for inflated direct costs that were based on a 2018 budget estimate by GHD. The adjustment also includes adjustments to components such as the aeration blowers which seem low in the current cost breakdown.

Table 84: Recommendation STP Major Augmentation Works – Bateau Bay

	2022-23	2023-24	2024-25	2025-26
Proposed	$3.3M	$2.5M	$2M	-
Adjustment	+$0.7M	+$0.5M	+$0.2M	-
Recommendation	$4M	$3M	$2.2	-

Source: Mott MacDonald

STP sludge mechanical Dewatering Renewal Kincumber

Project overview

Kincumber STP (KSTP) is the largest and main treatment facility in CCC's Southern operational area currently operating under EPL 1802. It is currently treating an average daily flow of approximately 30ML/d for a 150,000 EP population.

Figure 62: Kincumber STP site overview

Source: Kincumber STP Dewatering Facility Upgrade Concept Design

Figure 63: Kincumber STP dewatering facility overview

Source: Kincumber STP Dewatering Facility Upgrade Concept Design

The facility consists of 2 independent Belt Filter Press (BFP) dewatering trains, housed in separate buildings and discharging via inclined conveyors into a common biosolids hopper. One dewatering train was constructed in the mid-1990's and the other in 2011.

The 1990's train is primary 'out of service' as all components are reaching or have reached end of life (EOL), hence is an operational liability and affects the plant's dewatering capacity. The 2011 dewatering unit is operating at full capacity at 22 hours per day. EPA expressed concerns that this service redundancy can affect effluent quality. The dewatering upgrade aims to achieve the future loads summarised in the table below.

Table 85: Upgrade objectives

Parameter	Value	Unit	Comment
Current Solids Loading	6.5	Dry tonnes/day	5 day per week operation
Future Solids Loading	8.1	Dry tonnes/day	25% increase from current, 5-day operational basis
Current Digested Sludge Production	325	m^3/day (5 day/week basis)	
Future Digested Sludge Production	405	m^3/day (5 day/week basis)	

The dewatering system upgrade will involve:

- Replacement of original (1990) dewatering train and conveyor system
- Extension of the existing 2011 building for a second BFP train in series.
- Replacement of polymer dosing system to deliver polymer to the new dewatering system

Figure 64: Kincumber STP dewatering facility proposed upgrade overview

Source: Kincumber STP Dewatering Facility Upgrade Concept Design

Key assumptions and status

The key assumptions adopted in the development of this review:

- Refer to assumptions in Hunter H2O's Kincumber upgrade options assessment and concept design reports
- Final biosolids disposal / reuse routes negotiated as part of an overall biosolids strategy will not result in significantly more trucking
- At this stage CCC have not looked at common procurement for this type of equipment (although all three projects we investigated have involved dewatering equipment and most likely of a similar size)

Documents reviewed

The following outlines the key documents we have reviewed for this work. It is noted that there are a number of smaller spreadsheets etc that are not listed.

- **GHD -** Asset Management Plan - Sewage Treatment Plants (10 November 2021)
- **NSW EPA -** EPA letter to CCC addressing Central Coast Wastewater Management Issues (30 June 2021)
- **Central Coast Council -** Capital Expenditure Technical Report (2019-2022) (14 September 2021)
- **Hunter H2O -** Kincumber STP Dewatering Facility Upgrade - Concept Design (September 2020)
- **Hunter H2O -** Kincumber STP Dewatering Facility Upgrade - Options Report (April 2020)
- **Central Coast Council -** Operational Plan (2021-2022)

Investment Driver

The key drivers of this dewatering facility upgrade mainly revolves around regulatory compliance and necessary upgrades to deteriorating assets, these drivers include:

- Asset and service reliability
  - Service redundancy
  - 1990 infrastructure nearing EOUL
  - Inability to waste sludge during maintenance and breakdowns
- Work Health and Safety
  - Operation and maintenance simplification
- Environmental
  - NSW EPA EPL 1802
  - NSW EPA biosolids guidelines (transportation) compliance

NSW EPA Biosolids Guidelines, "Environmental Guidelines: Use and Disposal of Biosolids Products", NSW EPA, 2000, states that "It is generally considered unsafe to transport biosolids with a solids content less than 15% in open trailers". The existing BFPs can produce biosolids of around 14% and at times do not meet these criteria and there is a risk that replacement BFPs will also at times produce biosolids below 15% solids. This poses non-compliance risk in the future.

Intended Outcome

To meet the 25-year design horizon, the project aims to develop a robust, efficient, operator friendly and best for business conceptual design to meet CCC and KSTP's dewatering needs. The project intends to complete the following:

- Provide sufficient capacity to cater for current and future loads
- Provide redundancy to guarantee supply of service
- Simplify operation and maintenance activities
- Maximise retention of fit for purpose existing infrastructure
- Minimise operation disruptions during construction
- Integrate effectively with biosolids transport contractor needs
- Minimise WHS and environmental compliance risks

Project Status

KSTP's upgrade is highly developed and currently progressing into Gateway 4 in 2022-23. A technology review workshop was completed in 2020, a high-level options MCA analysis followed in April 2020 for 4 shortlisted options, it was determined that Option 1 was the preferred solution. A sensitive analysis was completed to verify the MCA outcome. A concept design report for Option 1 was completed by Hunter H2O in September 2020. The next step involves a number of high-level design drawings, likely to progress into delivery in 2022:

- Process unit sizing, Piping and instrumentation diagram (P&IDs)
- Design drawings (civil, mechanical and electrical)
- Operation risk review

Proposed capex profile over the period

The following table outlines the CAPEX profile over the proposed period. KSTP's upgrade is highly developed. With detailed drawings starting in 2021-22 and construction to occur from 2022-23, the cost profile spans predominantly in the 2022-23 period.

Table 86: Proposed expenditure - Kincumber STP Dewatering Facility Upgrade ($2021-22)

	2022-23	2023-24	2024-25	2025-26
Kincumber STP Dewatering Facility Upgrade	0.95	2.24	1.50	6.80

Source: July 2021 Technical paper 4 Capital Expenditure

Procurement and project delivery process

The cost estimate for this delivery is $3.77M with a current 30% contingency with $325k funding set aside for detailed design across 2021-22. This project will follow a D&C approach, with a forecasted $3.4M allocation towards the completion of the detail design and construction across 2022 and 2023.

Project need

This upgrade is required, the existing equipment is nearing end of life and is not able to meet regulatory requirements. It should be noted that the technology still retains risk of non – compliance.

Due to service redundancy caused by the non-operational 1990 dewatering train, KSTP requires a new sludge dewatering facility to be constructed to cater for current and future loads.

CCC found that the service level decisions will need to be based on asset criticality, risk and consequence of failure. This upgrade is certainly required to meet required levels of service and redundancy.

Summary of the options analysis completed by CCC

5 options were shortlisted by CCC's options analysis. An MCA workshop was completed on 7 April 2020 to determine the preferred option for concept design, these criteria were:

- Required key infrastructure
- Process description and operational philosophy
- Indicative PFD and site layout
- Interface requirements
- Residual risks
- Capital, Operational & Maintenance and Net Present Value (NPV) costs.

It was determined that Option 1 is the preferred approach. A sensitivity analysis was completed and provided high confidence level that Option 1 is the best for business solution at a capital cost of $3M.

Assessment of efficiency

The options analysis completed by CCC

- **Did CCC undertake appropriate options and cost benefit analysis (is it clear why the preferred investment is preferred)**

The options analysis completed by CCC and Hunter H2O in the Options Report is very high level, the MCA workshop was conducted by comparing cost and non-cost criteria ratings of each option. It identified Option 1 (two dedicated dewatering buildings with belt filter press technology) as the preferred option. Its key advantages included:

- Construction of a second building allowed the existing 2011 BFP to be completely delineated from construction activities reducing both construction and operational risks.
- Maintenance risks are reduced as large-scale maintenance activities on the dewatering machines can be undertaken in isolation from the other operating machine.
- CCC have a long operational knowledge with these machines.
- Machines they can be serviced locally without specialist equipment.
- Ready access to spare parts.

Detailed NPV analysis including direct and indirect costs were completed for all 5 options, with 25% cost contingency. These options and associated costs are summarised in the following table.

Table 87: Options assessment – Kincumber STP Dewatering Facility Upgrade

Options	Capex	Comments
Option 1 – 2x dedicated dewatering buildings - BFP (dedicated conveyors)	3,019,328	This is the preferred option.
Option 2 - Extension of 2011 building – BFP (dedicated conveyors)	2,946,808	
Option 3a) – New dewatering building – Centrifuge (dedicated conveyors)	4,799,657	
Option 3b) – 2 dedicated dewatering buildings – RSP & BFP (dedicated conveyor)	4,425,685	
Option 4 - 2011 building (dedicated conveyors) – Centrifuge - Option developed in workshop	3,791,983	

The key highlight of the options assessment is the overall biosolids strategy and the risks of greater truck movements moving forward. A BFP is relatively old technology, and it would be likely a screw press or centrifuge option would be preferred if trucking costs increased.

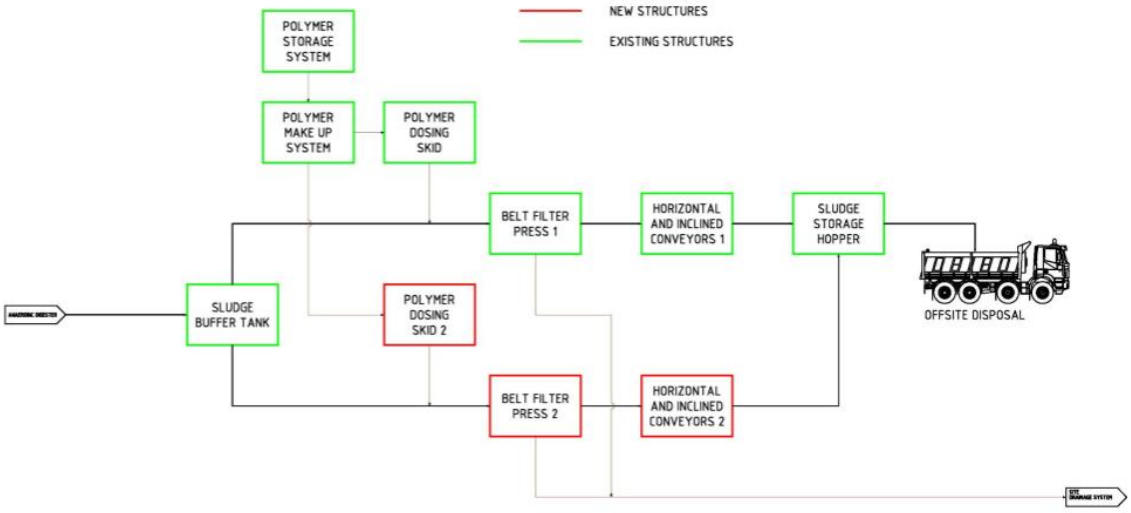
- **Scope of the preferred option**

The scope of works for the upgrade specified in Option 1 includes the following main items:

- Decommissioning and removal of all the original 1990's mechanical plant and equipment and electrical components / switchboards housed in the original dewatering building
- Demolition and removal of the original 1990's building
- Construction of a new dewatering building
- Installation of a feed macerator and bypass pipework
- Installation of two new (duty / standby) feed pumps and associated pipework / valving
- Installation of a single belt filter press (Giotto BPF 3000 Optima press or equivalent) and associated compressed air system and machine access / guarding (900 kg.DS/hr)
- Installation of two conveyors (horizontal and inclined) to discharge into biosolids hopper.
- Installation of two new (duty/standby) polymer dosing pumps and associated pipework/ valving.

- New electrical and control infrastructure servicing new equipment and instrumentation

Figure 65: Dewater facility concept design process flow diagram



Source: Kincumber STP Dewatering Facility Upgrade – Concept Design Report

Cost efficiency of the preferred option (reflect efficient project costs, taking into account comparable or benchmark industry rates) ***How to fit industry/relevant rates?***

The proposed cost estimates of the project are predominantly based on GHD and Hunter H2O's experience. With the project at its concept design phase, 30% contingency is allocated and is considered sufficient alongside the $3.4M cost estimate for this period. $325k was set aside for detailed design, this allows for 3D modelling that can completed to see how the machinery will fit into the building.

These costs appear closely aligned to costs we have recently developed at tender design phase (whilst for a slightly larger installation, the requirements are similar).

Below are some comments regarding the CAPEX cost estimate for the preferred Option 1:

- As this is a dewatering facility upgrade, the overall CAPEX of $3,377,073 is reasonable in comparison to a similar dewatering component cost of a project we completed, considering KSTP is operating at a much greater capacity.
- With respect to CHSTP's dewatering upgrade component costs of $3.2M, this project's costs seem within appropriate but low estimates.
- The preliminaries cost of $37,000 is very low with respect to the overall $1.6M TDC. It is usually recommended roughly 10% allocation to this component. Since almost one quarter of capital costs is attributed to new dewatering infrastructure alone, these preliminaries may be within acceptable bounds.
- Electrical and control costs of $295,000 is reasonable for this upgrade, lying roughly 10% of the project cost.

In general, given the project is highly developed and approaching construction phases in 2022, the overall cost breakdown of Option 1 by CCC and Hunter H2O is appropriate.

- **consistency with CCC's longer-term expenditure and strategic plans**

There is resource and economic potential in the biosolids produced by KSTP, however CCC does not have a holistic biosolid strategy and therefore consideration of biosolids is not included in business strategy case. Currently, there is no intention to set up a regional biosolids processing facility though there is emerging work in the EPA regarding biosolids.

CCC is also discussing potential for a COGEN project at KSTP entailing Solar Photovoltaic (PV) installations at the STP. The program will fit the business efficiency requirements proposed by IPART in the 2019 determination, given the proposed reduction in energy operation costs at the STP and the relatively short payback periods of 3-5 years. As the dewatering upgrade is just a D&C project and there are several smaller projects existing on the treatment plant, CCC and IPART have determined that sunk assets are not likely.

- **trade-offs between operating and capital expenditure, where relevant**

At this stage the key risk item is associated with the overall biosolids end use. This may swing the option selected as the cost for trucking biosolids may increase.

- **is deliverable by CCC within the proposed timeframe, taking into CCC's performance and approach to capital delivery**

This project will be delivered via a design and construct contract. This appears reasonable and consideration has been made for plant interface risks. Timeframes for delivery seem well thought out.

Recommendation

The project need is required, however, whether this is the best option or not depends on the trucking risk and the perceived risk of continued non-compliance with a Belt Filter Press. This is the least cost option, however we are concerned whether the budget is on the low end.

This upgrade is necessary to provide levels of service and redundancy to the system dewatering capacity. The key residual risk item is the overall biosolids strategy and in particular the end use of the Biosolids. If this resulted in additional trucking it is expected that a belt filter press option would quickly become less economic. Given the on – going issues with biosolids reuse it is expected that trucking distances are more likely to increase in the future.

CCC have stated that the cost assumptions align well to recent tender box costs from similar projects they have worked on. Our recent experience would present some risk that the costs are lower that the probably out-turn cost.

The key element of cost efficiency would be to investigate the potential for procurement of dewatering systems for all 3 STP upgrades and see if there is efficiency with purchase of multiple items of equipment or development of a standard product novated to contractors.

The project should continue to be developed, however a hold point on the biosolids strategy risk should be included to ensure that this is the best option. We recommend an adjustment of around $1.6M for the project given our recent experience.

Is the project needed?	
Is the project efficient – best option?	
Is the project efficient – least cost	

Key: Red – Not efficient, Amber - Partially efficient, Green – efficient

Our recommendation

Table 88: Kincumber STP Dewatering Facility Upgrade

	2022-23	2023-24	2024-25	2025-26
Proposed	$3.4M	$-	$-	-
Adjustment	+$1.6M	$0	$0	-
Recommendation	$5M	$-	$-	-

Source: Mott MacDonald

Riou Street, Albany street to Brisbane water Drainage

Project overview

The Riou Street, Albany street to Brisbane water Drainage project is part of a package of four Gosford CBD projects totalling $8.35m. Each of the projects is a discrete piece of work so no interactions. The four projects have been sequenced to reduce disruption over next 4 years.

The existing drainage systems throughout Gosford are under capacity with respect to current standards and during heavy rainfall surcharging of drainage lines and thus flooding occurs to properties and also important access routes. It is proposed to upgrade the drainage lines to address the 100 year storm flows using both Section 94 contributions and Council raised revenue. The upgrade of these assets will improve the stormwater system to meet current capacity requirements and reduce safety risk through improved vehicular access routes.

The Riou Street project has been deemed essential to supporting the increased growth and densification of Gosford CBD – which is prioritised in the NSW Government Central Coast Regional Plan as the number one regional priority. Water quality improvements are a secondary driver with pollution control measures planned. A proposed new water park in the catchment is an additional sensitive receptor for poor quality surface water and increases the water quality drivers.

A 2005 Strategic Trunk Drainage Study was used to define the briefs and multicriteria analysis, with outputs from the modelling used to prioritise projects. The Concept design was costed using construction unit rates and a risk allowance.

The Section Manager - Program and Planning - Roads Transport and Drainage endorsed the Riou Street project on 10 March 2021 with a total estimate of $3,808,000 over 3 Financial Years. The project has been included in Council's 4 Year Developer Contribution Program submitted at Ministerial request in March 2021. To enable construction, project design will occur in 2021-22 under the Drainage Design Program Budget and is estimated at 10% of the construction budget (the Project Initiation document allowed for 7.5% design in later years). Asset condition data is deemed to be 'fairly modest'. A full CCTV inspection will be undertaken in Gosford during detailed design.

The governance process includes challenge stages at Concept design (30/40% design), detailed design with early contractor consultation on the constructability- alignment and methodology.

It is planned to open tender the Project and award as a lump sum. The tender process will include review of any alternative tenderer designs.

These design and procurement stages of challenge and review are deemed to be best practice in driving efficiencies and certainty of outcomes.

The Operating Plan has a budget of $2,308,000 over 2 years which matches the Project Initiation Gateway 1 document for the equivalent years.

Developer contribution is relatively small. New development accounts for 15% of the scheme driver. Based on current day construction costs, the available Contribution often equates to much less than 15% of the total actual cost of the works – for this project it equates to $435,656 or 11.44% of the project.

Key assumptions and status

Documents reviewed

- CCC Water Operational Plan 2021-2022
- CCC July 2021 Technical paper 4 Capital Expenditure
- Parsons Brinkerhoff (2005) Gosford City Council Trunk Drainage Study - Gosford S94A Drainage Works,
- CCC Infrastructure Services (Sept 2021) Asset Management Plan – Stormwater Drainage – Version 1.0
- CCC CAPEX IPART Business Case – Stormwater Drainage – FINAL
- CCC PROJECT INITIATION – Riou Street from Donnison Street West to Brisbane Water, Gosford – Drainage Upgrade
- CCC PROJECT INITIATION DOCUMENT- Riou Street from Donnison Street West to Brisbane Water, Gosford – Drainage Upgrade

From the interview it was understood that Gosford is tracking in front of the growth that has been forecast supporting the project need. However, the flood modelling is 'old' and has not been updated with current growth forecasts.

At this point, there are no planned changes to the project scope or estimate because the concept scope is generally consistent with the strategic trunk drainage study. There is potential for changes during the concept and detail design development phases, but these would only occur to realise construction or operational savings, or because of unforeseen site constraints that cannot be mitigated or worked around. The growth targets do not seem to be impacted by COVID or any recent events. CCC will need to consider the impact of COVID and changing working behaviour once more data has been gathered and trends understood.

Investment Driver – *Growth (primary) and Water Quality (secondary)*

The quantification and allocation of the project benefits between the different drivers has not been considered by CCC.

Proposed capex profile over the period

Table 89: Riou Street Drainage Upgrade ($2021-22)

	2022-23	2023-24	2024-25	2025-26
Riou Street Drainage Upgrade	$0	$904,000	$1,404,000	1,500,000

Source: CCC July 2021 Technical paper 4 Capital Expenditure

Project Status

Gateway 1 (Project Initiation) has not moved to stage 2 as yet.

Procurement and project delivery process

It is planned to open tender the Project and award as a lump sum.

Project need

This project is identified and part funded by the Gosford Section 7.12 (then 94A) Civic Improvement Plan and the Drainage Works Study (hydrologic, hydraulic and water quality modelling) that preceded it. The project has been deemed essential to supporting the increased growth and densification of Gosford CBD – which is prioritised in the NSW Government Central Coast Regional Plan as the number one regional priority. The project has been prioritised based on the needs of new development to manage stormwater runoff, stormwater velocities, localised flooding and pollutants. It is part of an overarching stormwater drainage strategy designed to manage the impacts of growth and safeguard life, property and the natural environment in Gosford.

Assessment of efficiency

The options analysis presented in the Project Initiative document is very high level. Quantification on the benefits has not been undertaken and costs associated with the Option 1. Do Nothing and Option 3: Alternative Approach are not presented. A quantified cost benefit analysis was not undertaken by Council due there being 'clear drivers and business justifications' for the projects. The qualitative cost / benefit analyses was completed based on initial engineering investigations. Further investigations were undertaken to support project prioritisation, development of the Project Initiation and Business Case documentation and the overall IPART Submission.

Table 90: Options assessment – Riou Street Drainage Upgrade

Options	Comments
Option 1 -Do Nothing The stormwater drainage system is left in its current state. Development constraints, flooding and safety impacts remain Possible. Potential for Moderate consequences.	▪ No works undertaken. ▪ Drainage system capacity would be exceeded resulting in property, road and railway corridor flooding. ▪ Access into the CBD would be restricted leading to congestion. ▪ Regional development would be slowed / impacted. Receiving waters would become more polluted.
Option 2 -Recommended the stormwater drainage system is upgraded to current standards. Development constraints, flooding and pedestrian safety impacts will be reduced to Unlikely. Potential for Minor consequences. Risk to be assessed in line with the adopted corporate risk framework	▪ Staged implementation of drainage upgrade works. ▪ Drainage system capacity increased to meet current standards and accommodate future development. ▪ Mitigate road, property and railway flooding. ▪ Support regional development and access into the CBD. Compliment other utility works.
Option 3 –Alternate Approach Upgrade the stormwater drainage system beyond current standards to safeguard against changes in future growth. Whilst this would reduce the likelihood to Rare it would come at significant extra cost and result in the system being at over capacity for much of its useful life.	▪ Accelerated implementation of drainage upgrade works. ▪ Drainage system capacity increased to exceed current standards and accommodate increased future development. ▪ Mitigate road, property and railway flooding. ▪ Support regional development and access into the CBD. ▪ Impact sequencing of other utility works e.g. water / sewer upgrades. ▪ Would require additional revenue and deferral of other projects. Potential to lock down CBD and impact the economy.

Scope of the preferred option

The Riou Street Drainage Upgrade Design has not commenced but is due in 2021/22 based on the interview. The standard of design will be in accordance with Council's Civil Works Specification which is comprised of; Design Guideline Volume 1, Construction Guideline Volume 2 and Standard drawings Volume 3. The work will include increase of drainage system capacity, mitigation of flood risk, pollution control and integration with other utilities.

It is not certain whether catchment measures such as water sensitive urban design or flow attenuation measures have been considered as part of the overall strategy for mitigating the Riou Street issues. It is recommended that these form part of the options assessment.

Cost efficiency of the preferred option (reflect efficient project costs, taking into account comparable or benchmark industry rates)

The costs are outlined in the Initiation Cost Estimate from January 2021. This includes allowances for utilities reallocation and property acquisition, design costs for 7.5%, project management at 10%, night works at 10% and an overall contingency of 10%.

We have reviewed the pricing using cost data from civil contractors and the metre rates and unit rates are reasonable. The project management, design and contingency at the high level are reasonable as a percentage of the project costs.

CCC has confirmed that in general, a contingency of 10% is adopted for major contract projects and with review / approval by Council's Procurement team via the Tender Evaluation process. A higher contingency is often applied when the project is in the early planning / initiation phase – however this may be moderated if specific allowances are made (as in this project) for high risks items e.g. utility relocations, environmental constraints, nightworks etc. A lower contingency may be adopted for more routine works e.g. tender contract pipe relining.

CCC has noted that the range is also generally consistent with the proposed Contribution Planning Reforms as documented in IPARTs Information Paper relating to essential works, benchmarks and approach to risk and contingency.

At this stage of the project the contingencies are appropriate to address the potential for optimism bias.

Consistency with CCC's longer-term expenditure and strategic plans

The work is consistent with the long term plan for Gosford.

Trade-offs between operating and capital expenditure, where relevant

The maintenance costs associated with the drainage system are not referenced in the Strategic Trunk Mains Study from 2005 or the Initiation Estimate from 2021. The capital costs are identified but no whole life costing with respect to changes in maintenance are provided.

This will need to be covered as part of the optioneering in the design stage.

Is deliverable by CCC within the proposed timeframe, taking into CCC's performance and approach to capital delivery

The project is proposed for delivery between 2023-2026. This allows time for design, land acquisition and environmental permitting and studies in advance. The most significant risk to meeting the timescales is securing land agreements. There will need to be capital spend on these planning works in advance of the main spend in 2023. During interview it was stated that there would be an increase risk from a flood event if the project is delayed. The Strategic Trunk Drainage Study describes the option for temporary onsite detention systems where there is an increase in impervious areas on in Gosford following development.

Reflect efficient project costs, taking into account comparable or benchmark industry rates.

The Project costs are derived from CCC's CAPEX Unit Rate Database which is reviewed on an annual basis to assess any changes in major project components i.e. an increase in tip fee rates, changes resulting from material or service tender contracts etc. The remainder of the database is indexed on an annual basis in line with Australian Bureau of Statistics NSW Construction Indices. This is a reasonable approach to pricing at the Feasibility Stage.

Recommendation

The Riou Street project is of strategic importance to Gosford and a solution to the issues with drainage system capacity and water quality is needed. The project was initiated though a study in 2005 and updated with a Project Brief in 2021. Design is in the very early stages and there are considerable uncertainties around the preferred solution and risk such as land acquisition, ground conditions, catchment based solutions to attenuate flows and construction methodologies.

It is recommended that some spend is brought forward from the start date in FY2022-2023 to undertake more investigation into these project complexity factors in order to give more certainty on the cost estimate. CCC has confirmed that the design will be undertaken using the Drainage Design Program Budget at 10% of the budget. This is duplicated in the capex budgets below ($202,553 -pre contingency added) and so has been removed.

There are allowances for risk items as well as a contingency of 10% overall. The overall budget may be +/- 30% at this stage. An amber rating has hence been assigned to whether the project is the efficient below.

Our assessment of efficiency

Is the project needed?	
Is the project efficient – best option?	
Is the project efficient – least cost	

Key: Red – Not efficient, Amber - Partially efficient, Green – efficient

Our recommendation

Table 91: Riou Street Drainage Upgrade ($2021-22)

	2021-22	2022-23	2023-24	2024-25
Proposed		$904,000	$1,404,000	$1,500,000
Adjustment		-$220,000 (design spend in 2021-22)		
Recommended		$684,000	$1,404,000	$1,500,000

Source: Mott MacDonald

Lakedge Ave – drainage upgrades

Project overview

The properties and road on Lakedge Drive are subject to flooding in minor storm events due to limited drainage system capacity which causes backflows into the roadway and uncontrolled surface runoff into the properties.

Stage 1 of the Lakedge Project in construction. It is forecast by CCC that Stage 1 will be completed within the 2020/21 financial year. Based on prior financial year expenditure and the current financial year budget our understanding of the total cost of the project is $2.42M. This includes $1.42M funded via the Stormwater Drainage Charge and the remainder via General Fund and Grants.

The construction timeframe for Stage 1 is forecast by CCC to be 13 months in total; spread across two construction phases from May 2020 to October 2020 and August 2021 to February 2022. It is noted by CCC that the delivery of Stage 1 was very irregular with stops and starts and thereby inefficiencies due to CCC's lack of funding causing approval changes. Under Administration, a direction was given to cease the project in late 2021 and phase the remaining budget requirement into the 2021/22 financial year. As such the duration and delivery model should not be considered as typical or indicative of future project delivery.

Council's submission to IPART for project for the 2022 determination includes $6,050,000 for Lakedge over 3 years from 2021/2-2024/5 for two more sections identified from engineering investigation.

- Jean Drive to Shannon Parade, Berkeley Vale Drainage Upgrade (Stage 2). Install 670m of new trunk drainage - reconstruct and reshape the road for 750m
- Aloha Drive to Platypus Drive, Berkley Vale Drainage Upgrade (Stage 3) Install 510m of new trunk drainage and 460 m of reconstruct and reshape the road formation.

The projects involve upgrading the existing drainage network to increase the capacity of the drainage system and manage stormwater surface runoff such that it enters the drainage system in a controlled manner. The drainage standard for Lakedge Avenue is the 20% AEP design storm event. This is consistent with CCC's Civil Works Specification (Design Guideline Volume 2) and industry standards.

Key assumptions and status

Documents reviewed

- CCC Water Operational Plan 2021-2022
- CCC July 2021 Technical paper 4 Capital Expenditure
- CCC Infrastructure Services: Asset Management Plan – Stormwater Drainage – Version 1.0 Sept 2021
- CAPEX IPART Business Case – Stormwater Drainage – FINAL
- CCC COST ESTIMATE – Lakedge Avenue from Jean Drive to Shannon Parade, Berkeley Vale – Drainage Upgrade
- CCC Issued for Construction Plans – Lakedge Avenue Drainage Upgrade – Stage 2 – Jean Avenue to Shannon Parade

- CCC Issued for Construction Plans - Lakedge Avenue Drainage Upgrade – Stage 3 – Platypus Road to Aloha Drive
- CCC PROJECT ESTIMATE – Lakedge Avenue from Aloha Drive to Platypus Avenue Chittaway – Drainage Upgrade
- CCC PROJECT ESTIMATE - Riou Street from Donnison Street West to Brisbane Water, Godsford – Drainage Upgrade
- CCC PROJECT INITIATION – Riou Street from Donnison Street West to Brisbane Water, Godsford – Drainage Upgrade
- CCC PROJECT INITIATION DOCUMENT- Lakedge Avenue from Aloha Drive to Platypus Avenue Chittaway – Drainage Upgrade
- CCC PROJECT INITIATION DOCUMENT – Lakedge Avenue from Jean Drive to Shannon Parade, Berkeley Vale – Drainage Upgrade

Investment Driver - Asset and Service Reliability

The driver for the project is legislation consistent with Asset and Service Reliability. Section 59a of the Local Government Act which states that Council is responsible to ensure that it carries out all necessary works to ensure that the stormwater drainage works can be used in an efficient manner for the purposes for which the works were installed. CCC proposes that the number of customer complaints demonstrates that existing drainage infrastructure at this site does not function effectively.

Proposed capex profile over the period

Table 92: Proposed expenditure - Lakedge Drive Drainage Projects ($2021-22)

	2022-23	2023-24	2024-25	2025-26	Total
Jean Drive to Shannon Parade, Berkeley Vale Drainage Upgrade (Stage 2).	2.3	1.5	1	0	4.8
Aloha Drive to Platypus Drive, Berkley Vale Drainage Upgrade (Stage 3)	0	0	1.3	2	3.2

Source: July 2021 Technical paper 4 Capital Expenditure

Intended Outcome

The intended outcome is a reduction in community complaints associated with flooding of road and properties and compliance with the Local Government Act.

Project Status

The IPART submission scope was initiated by Council in 2019 with a Project Initiation Document. Detailed design drawings were issued by Council in January 2020. The Project has passed Gate 1 of CCC's capital works expenditure evaluation and approvals process and is going through the

Planning Stage of Gate 2 within the next 12months. This gate process is set out below in the figure below.

Figure 66: Gate process - Lakedge Drive Drainage Projects

Gate		Description	Key Documents
1	A - Recognition	Investigate, validate and register new stormwater drainage projects into the CAPEX database and confirm consultation requirements	Investigation Report
Refer to Section 6.3.3			CAPEX Database
			Initiation Form Part A
	B - Budget	Prepare and submit the one-year, four-year and ten-year stormwater drainage capital works program budget, phasing and funding source	Budget Template(s)
			Initiation Form Part B
	C - Initiation	Confirm stormwater drainage project scope, budget and scheduling and initiate project development / design	Approved Initiation Form
			Concept estimate and financial year phasing
2	Planning	Develop stormwater drainage projects, consult and prepare concept / detail designs and provide design advice during construction	Approved Design Brief
			Construction Handover Form
			Design Completion Report
			Detail Design Estimate
3	Delivery	Govern stormwater drainage capital works delivery, control scope and budget variation and prepare monthly reports	Construction Handover Form
			Variation Request Form
			Decision Register

Source: CCC Sept 2021 Infrastructure Services Asset Management Plan – Stormwater Drainage

The 2019 budget was reassessed by CCC as part of the IPART submission and is based on a capex database which uses historical project costs. It is assumed by CCC that majority of works are done as night works. CCC stated during interviews with us that this capex database is a 'continual rolling construction rate' which incorporates the actual project outturn costs and is then used to forecast costs for future projects.

It was stated by CCC that the cost database has not included cost intelligence from the Lakedge Drive 'Stage 1 Gregory Street to Emerald Place' drainage upgrade because there were inefficiencies in the construction delivery due to multiple construction stop starts due to CCC's financial situation. We understand from our review of documentation that the key risk realised on the Stage 1 project was a greater volume of Acid Sulphate Soils management than budgeted. Stage 2 and Stage 3 are broadly similar in complexity to Stage 1 with key differences on the stage 2 and 3 works being traffic and community management of an adjacent shopping precinct is and a nearby a playground.

Procurement and project delivery process

CCC stated that the design was at 80% developed during the last determination with remained tasks to include more detailed service risk assessments, compliance with any flood strategy planning and sampling for Acid Sulphate Soils to quantify the disposal costs (using the lesson learnt from Stage 1) in accordance with CCC's Environmental management guidelines.

Factors of safety including a 50% blockage factor have been allocated by Council for works in this low-lying area. A pipe slope of 0.5% to 1% has been used by CCC to maintain self-

cleansing/flushing velocities. No climate change level has been adopted for Tuggerah Lakes and incorporated into the designs; to improve the longevity of any investments on stormwater infrastructure, climate change scenarios could be considered to understand the impacts of increased rainfall intensity or tailwater conditions.

CCC's operating plan combines the two projects into R105 with the budget matching the two combined in the IPART 2022 submission. During our interview with CCC, it was explained that there will be separate tenders for Stage 2 and Stage 3 with two awards to allow CCC the ability to monitor and track the contract and due to the resourcing constraints faced by CCC.

CCC's intention is to award the work through an open tender with a lump sum price and with some day rates. Typically, from the interview CCC stated that they will apply 5-10% of the value awarded as contingency to manage changes.

Project need

The project is driven by community flood resilience needs in accordance with Section 59a of the Local Government Act. The benefits from the reduction in flood risk to the community is qualified rather than quantified and the reduction in maintenance cost is unknown. Council records and trends on customer requests compared to other areas have supported determining the customer requirements. Analysis provided by Council demonstrates a clear need, community benefit and priority of the project evidenced by:

- Lakedge Avenue receives an above average number of complaints to Council regarding road / property flooding. Between 2019 and 2021, 113 customer requests were received.
- CCC has stated that maintenance allocations show Lakedge Avenue is in the top 5% if the network for the number of reactive and planned maintenance actions. 346 maintenance actions were recorded by Council between 2019 and 2021. Actions included with 301 reactive responses, driven by customer request, storm event or crew patrols.
- It is anticipated by Council that completion of the Lakedge Avenue projects would significantly reduce both the number of customer requests, complaints and the frequency of maintenance action. Due to the condition of the road and drainage system, and the excessive number of complaints / maintenance actions, we consider the level of benefit will compare favourably with other priority Council stormwater drainage projects.
- Once the Lakedge Avenue projects are completed, it is estimated by Council that the number of complaints will drop by over 50%. It is anticipated by Council that complaints / requests will continue because Lakedge Avenue is such a high profile, highly trafficked road. It is estimated by Council that the number of reactive maintenance actions would reduce by the same – placing Lakedge Avenue the bottom 50% of the network for maintenance action.
- It is noted by Council that any ongoing operational saving generated by the reduction in complaints and reactive maintenance actions in Lakedge Avenue – would be reinvested to support maintenance of other sections of the drainage asset network as they progress towards similar age and condition profiles.

Assessment of efficiency

- The options analysis completed by CCC

The options analysis presented in the Project Initiative document is very high level and not to the level of rigour we would normally see in a regulatory submission. Quantification on the benefits has not been undertaken by Council and costs associated with the Option 1. 'Do Nothing' and Option 3: 'Alternative Approach' are not presented by Council. Council advised us that it did not

undertake a quantified cost benefit analysis due there being 'clear drivers and business justifications' for the projects. The need statements above and the fact that this is a common solution to these issues mean that we agree with CCC that the only way to address the problem is to install upsized drainage and fix the road levels. Option 1 and 3 were not considered viable by CCC because of 'clear cost impacts' including reactive maintenance and resident claims.

The qualitative cost / benefit analyses were completed by CCC based on initial engineering investigations. Further investigations were undertaken by CCC to support project prioritisation, development of the Project Initiation and Business Case documentation and the overall IPART Submission. We set out below the options considered by CCC and its reasons for rejecting or adopting an option.

Table 93: Options assessment – Lakedge Ave Drainage Upgrades

Options	Comments
Do nothing	Property flooding and safety risks remain. Complaints continue. ▪ *No works undertaken – drainage / road formation in current state.* ▪ *Drainage system capacity would be exceeded resulting in regular property and road flooding.* ▪ *Potential insurance claims.* ▪ *Frequent road closures.* ▪ *Frequent reactive maintenance.* ▪ *High level of customer requests.* *Local businesses impacted.*
Drainage upgrade and road formation to current standards	Reduces risk of flooding to property and roads to 'low'. Complaints reduced. ▪ *Staged implementation of drainage upgrade including road formation.* ▪ *Drainage system capacity increased to meet current standards.* ▪ *No insurance claims.* ▪ *Reduction in road closures.* ▪ *Reduction in reactive maintenance.* ▪ *Reduction in customer requests.* *Local businesses supported.*
Alternate approach	Address the trunk drainage but lead the road formation in current state. Leads to continues medium risk of flooding. ▪ *Localised drainage improvements only – no road formation works.* ▪ *Flooding would continue due to flat topography and road profiles.* ▪ *Minor reduction in property and road flooding.* ▪ *Potential insurance claims.* ▪ *Minor reduction in road closures.* ▪ *No significant reduction in reactive maintenance – table drains remain.* *Local businesses impacted.*

- Scope of the preferred option

The preferred options for both Stage 2 and Stage 3 are a combination of new trunk drainage and road reshaping.

The pricing is based on CCC's CAPEX Unit Rate Database which is reviewed by CCC on an annual basis to assess any changes in major project components i.e., an increase in tip fee rates, changes resulting from material or service tender contracts etc. The remainder of the database is indexed on an annual basis in line with Australian Bureau of Statistics NSW Construction Indices. CCC provided a copy of the CAPEX Unit Rate Database showing the change for the last two years.

The previous IPART determination asked CCC to demonstrate high level benchmarking against other Water Supply Authorities and Councils. This has not been demonstrated by the pricing of this project.

We have reviewed the pricing using cost data from civil contractors and the metre rates and unit rates are reasonable. The project management, design and contingency at the high level are reasonable as a percentage of the project costs.

CCC has assumed that the majority of works are done as night works to avoid disruption to traffic. Undertaking works at night is more expensive and less efficient than undertaking works during the day due, in part to night time shift rates being applied and because of restricted hours and limitations on some activities such as saw cutting to certain times. The interview process referred to lessons learnt several times with an example of plans for Acid Sulphate Soil sampling in advance of Stage 2 based on learning from Stage 1 to gain confidence on disposal costs. This culture of continuous improvement is a credit to CCC Stormwater Management team.

A contingency of 10% has been added by Council to the budget from the historical costs for risks such as interface with other services and infrastructure, property acquisitions and acquiring easements.

Council stated that a 10% level of contingency is typically applied for major contract projects. The approach to contingency is generally based on Transport for NSW project guidelines – albeit CCC applies a smaller contingency level than is set out in the guidelines due to the difference in the nature / scale of local government projects over major projects for which the guidelines have been developed. CCC has noted that the range is also generally consistent with the proposed Contribution Planning Reforms as documented in IPARTs Information Paper relating to essential works, benchmarks and approach to risk and contingency.

CCC will report on the length of asset renewed, refurbished and upgraded each year (see section 6.3.3).

The Stage 2 and Stage 3 Lakedge projects form 3.9% of the total planned 30.3 km of asset upgrades with 1.18 km of new trunk drainage. At a capex cost of $6.1m these two projects form 18% of the capital budget of $34,12m for Stormwater drainage from 22/23 to 25/26. The two Lakedge projects have a higher cost per metre than the average cost per metre drainage project needed for Council to meet their target of 30.3km stormwater drainage lengths proposed. The fact that these projects require a combination of new trunk drainage and road reconstruct and reshape means that less output per dollar invested is achieved than other stormwater drainage investment as such works will increase the per metre cost for drainage over other projects. The priority of the work and the benefits to community targeted may justify the cost/benefit (18% of Council budget to return 4% of their output) but CCC will need to be mindful that other projects in their program will need to be delivered at a lower rate per metre to meet their target. We recommend that Council develops an accountability measure based on reduction in property flooding or customer complaints due to flooding rather than length of main to reflect a customer centric approach.

- consistency with CCC's longer-term expenditure and strategic plans

The Project is consistent with Council's obligations under Section 59a of the Local Government Act which states that Council is responsible to ensure that it carries out all necessary works to ensure that the stormwater drainage works can be used in an efficient manner for the purposes for which the works were installed.

- trade-offs between operating and capital expenditure, where relevant

Prioritising the top 5% maintenance cost schemes such as Lakedge is a logical strategy to optimise capex and opex costs. There will be a benefit to the road maintenance activities from the reprofiling works under the drainage budget. CCC will need to recognise this reduction in maintenance costs in their road budget. The Lakedge project will also have a benefit to Growth budgets in catchment with the upsizing taking into account changes to permeability and changing climates. This growth benefit is not currently recognised in CCC's capital program delivery approach.

Recommendation

We recommended that, in line with Council's Stormwater Asset Management Plan, the detailed design is updated based on the 1% AEP + 30% Increase in rainfall intensity for local catchment / overland flow inundation and 1% lake level +0.5 m freeboard for lake (mainstream) inundation – trimmed to the Probable Maximum Flood.

We also recommend that CCC would gain efficiencies from tendering both Stage 2 and Stage 3 together. A contractor will be able to manage their risks and leverage the market to provide a lower price for a package of two projects rather than single awards. The savings will more than cover the allocation of more Council internal or external professionals to the project to manage it. CCC would also have savings by halving the number of tender events and in being able to manage their contingency across the package rather than two separate projects.

Our assessment of efficiency

Is the project needed?	
Is the project efficient – best option?	
Is the project efficient – least cost	

Key: Red – Not efficient, Amber - Partially efficient, Green – efficient

Our recommendation

Table 94: Lakedge Ave Drainage Upgrades

	2022-23	2023-24	2024-25	2025-26
Proposed	$2.3m	$1.5m	$2.3m	$2m
Adjustment	-5%	-5%	-5%	-5%
Recommendation	$2.185m	$1.425m	$2.185m	$1.9m

Source: Mott MacDonald

E Asset management improvement plans

Task No	Task	Priority	Responsibility	Timeline
1	Clearly define Asset Management responsibilities for the organisation and communicate across the organisation	Very High	Water Planning and Development	2022
2	Review current and required skills base and implement workforce training and development to meet required operations and maintenance needs	Very High	Water Planning and Development	2022
3	Review management of operations and maintenance activities to ensure Council is obtaining best value for resources used	Very High	Water Planning and Development	2022
4	Review current and required skills base and implement training and development to meet required construction, renewal and project management needs	Very High	Water Planning and Development	2022
5	Review management of capital renewal, replacement and capital project management activities to ensure Council is obtaining best value for resources used.	Very High	Water Planning and Development	2022
6	Develop a comprehensive asset management plan for each asset class	Very High	Water Planning and Development	2022
7	Development and implement IPS asset management system including Maintenance Management System (MMS), Condition Inspection and Work Order modules	Very High	Water Planning and Development	2022
8	Develop consolidated register of maintenance records including alarms / work orders (integrate ASAM database (mainly civil assets for reservoirs), SCADA database, electrical including CP, defects register into IPS database)	Very High	Water Planning and Development	2022
9	Develop and implement preventative and breakdown maintenance	Very High	Water Planning and Development	2022
10	Develop an Approved Products and Manufacturers Register for Civil, Mechanical, Electrical, Instrumentation and Telemetry assets	Very High	Water Planning and Development, System Operations	2022
11	Maintain a current infrastructure risk register for assets and service risks associated with providing services from infrastructure assets and reporting Very High and High risks and residual risks after treatment to management and Council	High	Water Planning and Development	2023
12	Maintain a current hierarchy of critical assets and capital renewal treatments and timings required	High	Water Planning and Development	2023
13	Develop an Information Management Strategy (IMS) to ensure data is aligned with the organisations planning and operational processes and resourcing is available to manage the information	High	Water Planning and Development	2023
14	Review resources allocated within the Water Planning and Development section for physical data collection (field work) against data management (office work)	High	Water Planning and Development	2023
15	Prepare Water and Wastewater Total Asset Management Plans linked into Levels of Service, critical assets and condition assessments	High	Water Planning and Development	2023
16	Prepare procedures for managing planned and unplanned maintenance in accordance with the maintenance strategy. Prepare and implement maintenance specifications	High	Water Planning and Development	2023

Task No	Task	Priority	Responsibility	Timeline
17	Develop asset hierarchies in IPR in accordance with procedures	High	Water Planning and Development	2023
18	Record identified critical assets in risk management plan, vulnerability assessments and emergency response plans	High	Water Planning and Development	2023
19	Review current condition assessment processes and consolidate into condition assessment procedures that cover all asset classes	High	Water Planning and Development	2023
20	Review and update Asset Data Management Guidelines	High	Water Planning and Development	2023
21	Undertake an Asset Management Gap Analysis to inform the Asset Management Strategy	High	Water Planning and Development	2023
22	Develop a 5 year prioritised Data Collection program based on the information required to enable effective asset management, statutory requirements and risk	High	Water Planning and Development	2023
23	Develop written procedures for collection of asset data	High	Water Planning and Development	2023
24	Establish and implement training programs across the organisation	High	Water Planning and Development	2023
25	Prepare procedures for asset management audit and review	High	Water Planning and Development	2023
26	Prepare written asset GIS mapping procedure	High	Water Planning and Development	2023
27	Update valuation, depreciation and effective life data to take condition data into account	High	Water Planning and Development	2023
28	Prepare written asset handover procedure. Needs to include for handover of developer as well as CCC generated assets	High	Water Planning and Development	2023
29	Development and refinement of a risk/criticality assessment program for each asset class	High	Water Planning and Development	2023
30	Comprehensive interrogation and confirmation of criticality and fundamental intervention levels in AMS for implementation in inspection and maintenance schedules	High	Water Planning and Development	2023
31	Improve and implement mobile solutions for all relevant W&S operational and networks field teams	High	Water Planning and Development	2023
32	Continued integration of Asset Management Information Systems (AMIS)	High	Water Planning and Development	2023
33	Improve data quality of the asset register for decision making by keeping up to date asset dimensions / quantities, maintenance records, physical condition assessment scores, asset residual lives, network renewals, defect repairs	High	Water Planning and Development	2023

Task No	Task	Priority	Responsibility	Timeline
34	Enhance the use of SCADA as an asset management tool (in addition to its principal function) and provide staff training for those uses	High	Technical and System Control	2023
35	Incorporate fault reporting and response into the asset management systems	High	Water Planning and Development	2023
36	Develop and implement guidelines/processes for lifecycle planning and funding projections, including operating, maintaining, renewals, development and disposal of assets	Medium	Water Planning and Development	2024
37	Rationalise disparate data management systems into the corporate system	Medium	Water Planning and Development	2024
38	Improve future planning tools including the revision of existing hydraulic models	Medium	Water Planning and Development	2024

Source - Central Coast Council (NSW) Water and Sewer Network Asset Management Plans and Strategy – Nov 2021.

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