



National Performance Reporting Framework Indicator Review

Insights, findings and recommendations

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An overview of the indicator pathways

This report presents the consolidated insights and findings of the Urban Water Utilities National Performance Reporting Framework Indicator Review (the Review).

The Review’s findings for each of the recommended reporting themes are summarised at the end of each section of this report (Sections 4–9). They are also presented in a final consolidated recommendations summary in Section 11.

Rather than reproducing the report’s recommendations, this overview focuses on the four headline issues of interest to the majority of stakeholders, the inclusion of service providers with less than 10,000 connected properties, the number of indicators, the pathway for the existing indicators, and the role of audits in the Framework.

1. The inclusion of service providers with less than 10,000 connected properties

The Review has recommended that all service providers, regardless of their number of connections, report under the Framework. While this position was not supported by all respondents, the Review team remains of the view that transparency and accountability are best served by their inclusion in the Framework and that resourcing and capability arguments, while relevant, should be worked through rather than used as a basis for the blank exclusion of smaller service providers. Section 3 details the Review’s exploration of who should report under the Framework.

2. The number of indicators

The existing Framework has a total of 166 indicators, 110 of which are reported and 56 are derived (calculated) from the reported data. If the revised framework recommendations are adopted there would be a total of 142 indicators, 100 reported and 42 derived. Table 1 summarises the indicator breakdown.

Table 1 – Indicator summary

Theme	Greater than 10,000 connected properties			Less than 10,000 connected properties		
	Reported	Derived	Total	Reported	Derived	Total
Contextual information	11 (2 new)	4	15	11 (2 new)	4	15
Customers and communities	13 (7 new)	9 (4 new) ¹	22	8 (2 new)	5	13
Assets and operations	8	2	10	7	2	10
Finance and pricing	30 (16 new)	12 (2 new)	42	30 (16 new)	12 (2 new)	42
Public health and environment	12 (4 new)	5 (1 new)	17	11 (4 new)	4 (1 new)	16
Water resources	26 (4 new)	10 (3 new)	36	26 (4 new)	7	33
Total	100	42	142	93	34	129

¹ The total includes the 4 proposed customer satisfaction indicators as these are subject to cross jurisdictional agreement and funding—See Section 5.1

3. The pathway for the existing indicators.

Tables 2–6 present summaries of the recommended indicator pathways, mapping the existing Framework categories, sub-categories and indicators to the recommended themes, sub-themes and indicators.

4. The audit framework

A key deliverable of the Review has been recommendations on a National Performance Report data quality framework (HARC 2021b). As part of the Review’s development of this data quality framework, it considered the existing audit framework and its effectiveness in supporting data quality objectives.

The **data quality framework recommendations should be read and understood as a set of recommendations** that collectively address the data quality issues and risks identified by the review team.

However, specifically with respect to the audit framework, the Review has recommended:

1. The current jurisdictional based audits should be replaced with a centrally managed audit program.
2. The objectives of the audit program should be:
 - i. To identify accuracy, collection (reliability) and consistency issues impacting data quality
 - ii. To support continuous improvement of Framework’s indicators and service provider reporting processes and practices
 - iii. Support capacity building for the good practice collection, collation, storage analysis and reporting of performance data.
3. The audit program should be supported by a formal commitment from jurisdictions.
4. The audit program should be funded by jurisdictions on an agreed basis with a minimum 3-year funding commitment.
5. Audits should seek to target 20% (minimum) of reporting entities annually (The final target will be subject to funding commitments and the level of audit adopted—see recommendation 8).
6. The selection of reporting entities should include both a targeted and random sample of service providers.
7. Audits should focus on indicators with known data quality issues and recently introduced indicators.
8. Audits should comply with ASAE 3100 Standard on Assurance Engagements. Note, the election to utilise a limited assurance audit may offer additional cost savings, however, a reasonable assurance engagement will provide greater insight into the process issue that underpin the risks identified.
9. The fundamentals of the existing audit template are still considered to be fit for purpose and should be used as the basis for capturing audit findings



10. To support consistency, audits should be undertaken by either a single auditor or a small panel of auditors.
11. Remote audit technologies should be explored as they have the potential to deliver significant cost savings.
12. Audit findings should be captured in the NPR database and made public and shared across all reporting entities—noting the need to do so in a manner that manages privacy and confidentiality issues.

Table 2 – Indicator transition pathways – Existing customers indicators

Category	Existing		→ Action →	Proposed			Theme
	Sub-category	Indicator		Indicator	Section	Sub-theme	
Customers	Connected properties and population	C1 —Population receiving services: water supply	Move to contextual information theme	C1 —Estimated population receiving water supply services	S. 4.1	Population	Contextual information
		C2 —Number of connected residential properties: water supply	Move to contextual information theme	C2 —Number of connected residential properties: water supply	S. 4.2	Connections	
		C3 —Number of connected non-residential properties: water supply		C3 —Number of connected non-residential properties: water supply			
		C4 —Total number of connected properties: water supply		C4 —Total number of connected properties: water supply			
		C6 —Number of connected residential properties: wastewater		C6 —Number of connected residential properties: wastewater			
		C7 —Number of connected non-residential properties: wastewater		C7 —Number of connected non-residential properties: wastewater			
		C8 —Total number of connected properties: wastewater		C8 —Total number of connected properties: wastewater			
				New			
			CI_N2 —Number of connected non-residential properties: recycled water				

Category	Existing		→ Action →	Proposed			Theme
	Sub-category	Indicator		Indicator	Section	Sub-theme	
Customers	Water quality complaints	IC9—Number of water quality complaints: water supply	Retain with updated definition/supporting notes providing greater clarity on reporting of complaints indicators	IC9—Number of drinking water quality complaints: water supply	S. 5.2	Complaints	Customers and communities
		C9—Number of water quality complaints per 1,000 properties: water supply		C9—Number of drinking water quality complaints per 1,000 properties: water supply			
	Water service complaints	IC10—Number of water service complaints	Retain the existing IC10, C10, IC11, C11, IC12, C12 and IC13 complaints indicators for the 2022-23 reporting year with updated definition/supporting notes providing greater clarity on reporting of complaints indicators	IC10—Number of drinking water service complaints			
	Water service complaints	C10—Number of water service complaints per 1,000 properties		C10—Number of drinking water service complaints per 1,000 properties			
	Wastewater service complaints	IC11—Number of sewerage service complaints		IC11—Number of wastewater service complaints			
		C11—Number of sewerage service complaints per 1,000 properties	C11—Number of wastewater service complaints per 1,000 properties				
	Billing and account complaints	IC12—Number of billing and account complaints: water supply and sewerage	Continue working with the Technical Advisory Panel, Technical Reference Group, policy agencies, regulators and ombudsmen offices to find an agreed basis for reporting on complaints	IC12—Number of drinking water and wastewater billing and account complaints: water supply and sewerage			
		C12—Number of billing and account complaints per 1,000 properties: water supply and sewerage		C12—Number of drinking water and wastewater billing and account complaints per 1,000 properties: water supply and sewerage			
	Total water and wastewater complaints	IC13—Number of water and sewerage complaints	Retire	IC13—Total number of complaints			
		C13—Number of water and sewerage complaints per 1,000 properties					

Category	Existing		→ Action →	Proposed			Theme		
	Sub-category	Indicator		Indicator	Section	Sub-theme			
Customers	Connect time to a telephone operator	C14 —Percentage of calls answered by an operator within 30 seconds	Retire						
	Unplanned water supply interruptions	C15 —Average duration of an unplanned interruption: water supply	Moved to assets and operations and modified	See Table 2	S. 6.1	Reliability	Assets and operations		
	Water interruption frequency	IC17 —Number of unplanned interruptions: water supply							
	Water interruption frequency	C17 —Number of unplanned interruptions per 1,000 properties							
				New customer perceptions indicators subject to agreement on a survey methodology and funding	## —Customer perceptions: value for money	S. 5.1	Satisfaction	Customers and communities	
					## —Customer perceptions: reputation in the community				
					## —Customer perceptions: level of trust				
					## —Customer perceptions: value for money				
				The draft hardship indicators have been revised based on feedback and testing		CC_N3 —Number of residential customers on a hardship program as of 1 July of the reporting year	S5.3		Hardship
						CC_N4 —Number of residential customers entering a hardship program during the reporting year			
CC_N5 —Number of residential customers exiting a hardship program during the reporting year						S5.3	Hardship		Customers and communities

Category	Existing		→ Action →	Proposed			Theme
	Sub-category	Indicator		Indicator	Section	Sub-theme	
Customers				CC_N6 —Percentage of residential customers in hardship program who met their instalment plan			
				CC_N7 —Percentage of residential customers successfully exiting a hardship program during the reporting year			
	Restrictions or legal action for non-payment of water	IC18 —Number of restrictions for non-payment of water bills	The draft hardship indicators have been revised based on feedback and testing	IC18 — Number of restrictions for non-payment of water bills	S5.3	Billing	Customers and communities
	Restrictions or legal action for non-payment	C18 —Number of restrictions for non-payment of water bills per 1,000 properties		C18 —Number of restrictions for non-payment of water bills per 1,000 properties			
	Restrictions or legal action for non-payment	IC19 —Number of legal actions taken for non-payment of water bills		CC_N1 —Percentage of restriction for non-payment of water bills removed within 3 days			
	Restrictions or legal action for non-payment	C19 —Number of legal actions taken for non-payment of water bills per 1000 properties		CC_N2 —Percentage of restriction for non-payment of bills resulting in legal action			
Restrictions or legal action for non-payment	C19 —Number of legal actions taken for non-payment of water bills per 1000 properties	Retire					

Table 3 – Current to proposed indicator mapping – Assets and operations

Category	Existing		--> Proposed action -->	Proposed			Theme
	Sub-category	Indicator		Indicator	Section	Sub-theme	
Assets	Water treatment plants	A1 —Number of water treatment plants providing full treatment	Moved to the contextual information theme	A1 —Number of water treatment plants providing full treatment	S.4.3	Treatment plants	Contextual information
	Other water assets	A2 —Length of water mains		A4 —Number of wastewater treatment plants	S. 4.4	Pipe network	
		A3 —Number of properties served per km of water main		A2 —Length of water supply mains			
	Wastewater assets	A4 —Number of wastewater treatment plants		A3 —Number of properties served per km of water main	S. 4.3	Treatment plants	
		A5 —Length of sewer mains and channels		A5 —Length of sewer mains and channels	S. 4.4	Pipe network	
		A6 —Number of properties served per km of sewer main					
	Water main breaks	IA8 —Number of water main breaks, bursts and leaks	Retained with clarified definitions for the 2022–23 reporting year	IA8 —Number of water main breaks, bursts and leaks	S. 6.1	Reliability	Assets and operations
		A8 —Number of water main breaks, bursts and leaks, per 100 km of water mains		A8 —Number of water main breaks, bursts and leaks, per 100 km of water mains			
	Wastewater breaks and chokes	A14 —Number of sewer mains breaks and chokes per 100 km	Further cross-jurisdictional work on a nationally consistent approach to reporting on reliability indicators is required	A14 —Number of sewerage mains breaks, leaks, and chokes per 100 km of sewerage mains			
		A15 —Number of property connection sewer breaks and chokes per 1,000 properties		A15 —Number of property connection sewer breaks and chokes per 1,000 properties			

Category	Existing		→ Proposed action →	Proposed			Theme
	Sub-category	Indicator		Indicator	Section	Sub-theme	
Assets	See Table 1		Retained with clarified definitions for the 2022–23 reporting year Further cross-jurisdictional work on a nationally consistent approach to reporting on reliability indicators is required	C15 —Average duration of an unplanned interruption: drinking water supply	S. 6.1	Reliability	Assets and operations
				IC17 —Number of unplanned interruptions: drinking water supply			
				C17 — Number of unplanned interruptions per 1,000 properties: drinking water supply			
	Water losses	A9 —Infrastructure leakage index	Retained with updated definition	A9 —Infrastructure leakage index (ILI): drinking water supply system	S. 6.2	Losses	
		A10 —Real losses: service connections		A10 — Real losses, per service connection, from the drinking water supply system			
		A11 —Real losses: water mains		A11 — Real losses, per kilometre of water main, from the drinking water supply system			

Table 4 – Current to proposed indicator mapping – Finance and pricing

Category	Existing		--> Proposed action -->	Proposed			Theme
	Sub-category	Indicator		Indicator	Section	Sub-theme	
Pricing	Residential tariff structure	P1—Tariff structure: water supply	Drinking water, wastewater and recycled water tariff information are encapsulated in more concise, single indicator, representations—As described in Appendix M of the Draft Report (HARC, 2021a).	FP_N1—Residential Drinking water supply tariff data	S. 7.1	Tariffs	Finance and pricing
		P1.2— Fixed charge: water supply					
		P1.3- P1.7—Usage charge: step 1–5					
		P1.3a- P1.7a —Upper bound of usage: step 1-5		FP_N2—Residential wastewater services tariff data			
		P1.12—Special levies: water supply					
		P1.13—Income from special levies retained by the utility: water supply					
		P4—Tariff structure: wastewater		FP_N3—Residential recycled water supply tariff data			
		P4.1—Fixed charge: wastewater					
		P4.2—Usage charge: wastewater					
		P4.3—Special levies: wastewater					
		P4.4—Income from special levies retained by the utility: wastewater					
Pricing	Annual bill	P2—Annual residential bill based on 200 kL per annum: water supply	Transition to derived indicators	P2—Annual residential customer bill based on 200 kL per annum: drinking water supply	S. 7.2	Annual bill	Finance and pricing
		P3—Typical residential bill: water supply		P5—Annual residential customer bill based on 200 kL per annum: wastewater			

Category	Existing		→ Proposed action →	Proposed			Theme
	Sub-category	Indicator		Indicator	Section	Sub-theme	
Pricing	Annual bill	P5—Annual residential bill based on 200 kL per annum: wastewater	Transition to derived indicators	P7—Total annual residential customer bill based on 200 kL per annum	S. 7.2	Annual bill	Finance and pricing
		P6—Typical residential bill: wastewater		P3—Typical residential customer bill: drinking water supply			
		P7—Total annual residential bill based on 200 kL per annum		P6—Typical residential customer bill: wastewater			
		P8—Total typical residential bill		P8—Total typical residential customer bill			
Finance	Revenue	F1—Total revenue: water supply	Retain with updated definition/supporting notes	F1—Revenue: drinking and non-drinking water	S. 7.4	Revenue	
		F2—Total revenue: wastewater		F2—Revenue: wastewater			
			Proposed new	FP_N4— Revenue: developer services charges levied as cash payments			
				FP_N5— Revenue: developer services charges levied as non-cash contributions			
	Revenue	F3—Total income for the utility	Retain with updated definition/supporting notes	F3—Total income for the service provider			
	Community service obligations	F25—Community service obligation		F25—Community service obligation			
		F8—Community service obligations ratio		F8—Community service obligations ratio			
	Capital works grants	F26—Capital works grants: water supply		F26—Capital works grants: water supply			
		F27—Capital works grants: wastewater		F27—Capital works grants: wastewater			

Category	Existing		--> Proposed action -->	Proposed			Theme
	Sub-category	Indicator		Indicator	Section	Sub-theme	
Finance			Bulk charges separated to enable reporting of operating costs less bulk water	FP_N6—Operating cost: purchase bulk potable and raw water	S. 7.4	Costs	Finance and pricing
				FP_N7—Operating cost: purchase bulk recycled water			
	Costs	IF11—Operating cost: water supply		IF11—Operating cost: water supply			
		F11—Operating cost per property: water supply		FP_N8—Operating cost, excluding bulk water purchases, per property: water supply			
		F11.1—Operating cost per ML: water supply—bulk utility	Retire				
			Updated to enable reporting of operating costs less bulk water	FP_N9—Operating cost: bulk wastewater charges	S. 7.5	Costs	
	Cost	IF12—Operating cost: wastewater		IF12—Operating cost: wastewater			
		F12—Operating cost per property: wastewater		FP_N10—Operating cost, excluding bulk wastewater charges, per property: wastewater			
		F12.1—Operating cost per ML: wastewater—bulk utility	Retire				
		F13—Combined operating cost per property: water supply and wastewater					
F13.1—Combined operating cost per ML: water supply and wastewater—bulk utility							

Category	Existing		--> Proposed action -->	Proposed			Theme			
	Sub-category	Indicator		Indicator	Section	Sub-theme				
Finance	Capital expenditure	F14—Capital expenditure: water supply	Retain with updated definition/supporting notes	F14—Capital expenditure: water supply	S. 7.5	Costs	Finance and pricing			
		F15—Capital expenditure: wastewater		F15—Capital expenditure: wastewater						
			New	FP_N11—Capital renewal expenditure: water supply						
				FP_N12—Capital renewal expenditure: wastewater						
		F16—Total capital expenditure: water supply and wastewater	Retained with an updated definition, supporting notes and no longer derived	F16—Total capital expenditure: water supply and wastewater						
		F28—Capital expenditure per property: water supply	Retain with updated definition/supporting notes	F28—Capital expenditure per property: water supply						
		F29—Capital expenditure per property: wastewater		F29—Capital expenditure per property: wastewater						
		F28.1—Capital expenditure per ML: water supply—bulk utility	Retire							
	F29.1—Capital expenditure per ML: wastewater—bulk utility									
	Economic real rate of return	F17—Economic real rate of return: water	Retire							
		F18—Economic real rate of return: wastewater								
F19—Economic real rate of return: water supply and wastewater										

Category	Existing		→ Proposed action →	Proposed			Theme
	Sub-category	Indicator		Indicator	Section	Sub-theme	
	Net profit after tax	F24—Net profit after tax (NPAT)	Retain with updated definition/supporting notes	F24—Net profit after tax (NPAT)	S. 7.6	Performance	
		F30—Net profit after tax ratio		F30—Net profit after tax ratio			
			New	FP_N13—Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA)			
	Dividends	F20—Dividend	Retain with updated definition/supporting notes	F20—Dividend			
	Net debt to equity	F22—Net debt to equity ratio		F22—Net debt to equity ratio			
	Dividends	F21—Dividend payout ratio	Retire				
	Interest cover	F23—Interest cover ratio					
			New	FP_N14—Debt to assets ratio	S. 7.6	Performance	
				FP_N15—Return on assets (ROA)			
				FP_N16—Return on equity (ROE)			
		FP_N17—Funds from operations (FFO) to net debt					
		FP_N18—Funds from operations (FFO) to interest expense					

Table 5 – Current to proposed indicator mapping – Public health and environment

Category	Existing		--> Proposed action -->	Proposed			Theme
	Sub-category	Indicator		Indicator	Section	Sub-theme	
Environment	Comparative wastewater treatment levels	IE1—Volume of wastewater treated to a primary level	Retained with updated definition/supporting notes	IE1—Volume of wastewater treated to a primary level	S. 8.1	Treatment	Public health and environment
		IE2—Volume of wastewater treated to a secondary level		IE2—Volume of wastewater treated to a secondary level			
		IE3—Volume of wastewater treated to a tertiary level		IE3—Volume of wastewater treated to a tertiary level			
		E1—Percentage of wastewater treated to a primary level		E1—Percentage of wastewater treated to a primary level			
		E2—Percentage of wastewater treated to a secondary level		E2—Percentage of wastewater treated to a secondary level			
		E3—Percentage of wastewater treated to a tertiary level		E3—Percentage of wastewater treated to a tertiary level			
	Biosolids	E8—Percentage of biosolids reused	Retained with updated definition/supporting notes	E8—Percentage of biosolids reused	S. 8.2	Efficiency and Reuse	
		Moved from water resources	W27—The percentage of treated effluent supplied as recycled water				

Category	Existing		--> Proposed action -->	Proposed			Theme
	Sub-category	Indicator		Indicator	Section	Sub-theme	
Environment	Net greenhouse gas emissions	IE9—Net greenhouse gas emissions: water supply	<p>The existing GHG emissions indicators be retired</p> <p>The Framework align its reporting with the NGER scheme and only mandate reporting for service providers meeting the NGER scheme reporting thresholds</p> <p>Reporting to be aligned with the NGER scheme and only seek total corporate emissions (Scope 1 and 2)</p>				Public health and environment
		E9—Net greenhouse gas emissions per 1,000 properties: water supply					
		E9.1—Net greenhouse gas emissions per ML: water supply—bulk utility					
		IE10—Net greenhouse gas emissions: wastewater					
		E10—Net greenhouse gas emissions per 1,000 properties: wastewater					
		E10.1—Net greenhouse gas emissions per ML: wastewater—bulk utility					
		IE11—Net greenhouse gas emissions: other					
		E11—Net greenhouse gas emissions per 1,000 properties: other					
		E11.1—Net greenhouse gas emissions per ML: other—bulk utility					
		IE12—Total net greenhouse gas emissions					
		E12—Total net greenhouse gas emissions per 1,000 properties					
		E12.1—Total net greenhouse gas emissions per ML: bulk utility					

Category	Existing		--> Proposed action -->	Proposed			Theme
	Sub-category	Indicator		Indicator	Section	Sub-theme	
Public health			New derived indicator aligned with NGER scheme reporting. Potentially sourced from the Clean Energy Regulator	HE_N1 —Total greenhouse gas emissions reported under the NGER scheme	S. 8.1	Emissions	Public health and environment
			New	HE_N2 —GHG emissions reduction target			
	Water quality compliance	H1 —Water quality guidelines	Retained with the addition of H5.1	H1 —Water quality guidelines	S.8.2	Water quality risk management	
	Water quality guidelines	H5 —Risk-based drinking water management plan externally assessed		H5 —Risk-based drinking water management plan externally assessed			
				HE_N3 —Date of last assessment drinking water quality management plan			
	Water quality compliance	H3 —Percentage of the population where microbiological compliance was achieved	Retained with updated definition/supporting notes	H3 —Percentage of the population where microbiological compliance was achieved	S. 8.3	Water quality compliance	
		H4 —Number of zones where chemical compliance was achieved		H4 —Percentage of the population provided with chemically compliant drinking water			
		H4a —Total number of zones	Retire				
			New	HE_N4 —Number of boil water alerts issued	S. 8.3	Water quality compliance	
				HE_N5 —Number of do not drink notices issued			

Table 6 – Current to proposed indicator mapping – Water resources

Category	Existing		--> Proposed action -->	Proposed			Theme
	Sub-category	Indicator		Indicator	Section	Sub-theme	
Water resources	Sources	W1—Volume of water sourced from surface water	Retained with an updated definition/supporting notes	W1—Volume of water self-sourced from climate dependant surface water sources	S. 9.1	Sources and imports	Water resources
		W2—Volume of water sourced from groundwater		W2—Volume of water self-sourced from groundwater sources			
		W3.1—Volume of water sourced from desalinated marine waters		W3.1—Volume of water self-sourced from marine or estuarine water sources			
			New	WR_N1—Volume of stormwater harvest for supply as recycled water			
	Transfers	W5.3—Volume of water, excluding recycled water, received from other service providers or operational areas within the urban water supply system	Retained with an updated definition/supporting notes	W5.3—Volume of drinking and non-drinking water, excluding recycled water, imported from other service providers	S. 9.2	Supply and exports	
		W14.3—Volume of water, excluding recycled water, exported to other service providers or operational areas within the urban water supply system		W14.3—Volume of drinking and non-drinking water, excluding recycled water, exported to other service providers			
		W6—Volume of recycled water received from other service providers or operational areas within the urban water supply system		W6—Volume of recycled water imported from other service providers	S. 9.1	Sources and imports	
		W15—Volume of recycled water exported to other service providers or operational areas within the urban water supply system		W15—Volume of recycled water exported to other service providers	S. 9.2	Supply and exports	

Category	Existing		--> Proposed action -->	Proposed			Theme
	Sub-category	Indicator		Indicator	Section	Sub-theme	
Water resources	Sources	W7 —Total volume of water sourced	Retained with an updated definition/supporting notes	W7 —Total volume of drinking and non-drinking water, excluding recycled water, self-sourced and imported from other service providers	S.9.1	Sources and imports	Water resources
	Transfers	W5 —Total volume of water received from other service providers or operational areas within the urban water system		W5 —Total volume of drinking and non-drinking water, including recycled water, imported from other service providers			
		W14 —Total volume of water exported to other service providers or operational areas within the urban water supply system	Retire				
	Production	W11.3 —Volume of potable water produced for supply into the urban water supply system	Retained with an updated definition/supporting notes	W11.3 — Volume of drinking water produced for supply into the urban water system	S. 9.3	Production	
	Use	W8.3 —Volume of water supplied to residential customers		W8.3 — Volume of drinking and non-drinking water, excluding recycled water, supplied to residential customers	S. 9.2	Supply and exports	
		W9.3 —Volume of water supplied to non-residential customers		W9.3 — Volume of drinking and non-drinking water, excluding recycled water, supplied to non-residential customers			
			New indicator to support alignment with ABS's WSSS	WR_N2 —Volume of drinking and non-drinking water, excluding recycled water, supplied for own use			

Category	Existing		--> Proposed action -->	Proposed			Theme
	Sub-category	Indicator		Indicator	Section	Sub-theme	
Water resources	Returns	W31 —Volume of water returned to surface water and groundwater from the urban water supply system	Retained with an updated definition/supporting notes	W31 — Volume of drinking and non-drinking water, excluding recycled water, returned to surface water	S. 9.2	Supply and exports	Water resources
		W13 —Volume of water returned as environmental flows from outside of the urban water supply system	Retired				
	Non-revenue water	W10.1 —Volume of non-revenue water	Retained with an updated definition/supporting notes	W10.1 — Volume of non-revenue drinking and non-drinking water, excluding recycled water	S. 9.2	Supply and exports	
	Wastewater collected	W16 —Volume of wastewater, excluding trade waste, collected	Retained with an updated definition/supporting notes	W16 —Volume of wastewater, excluding trade waste, collected	S. 9.4	Wastewater	
		W17 —Volume of trade waste collected		W17 —Volume of trade waste collected			
	Inflow to plant	W18.4 —Volume of wastewater inflow to wastewater treatment plants	Retired				
	Transfers	W18.2 —Volume of wastewater received from other service providers or operational areas within the urban wastewater system	Retained with an updated definition/supporting notes	W18.2 —Volume of wastewater received from other service providers	S. 9.4	Wastewater	
		W18.1 —Volume of wastewater exported to other service providers or operational areas within the urban wastewater system		W18.1 —Volume of wastewater exported to other service providers			
	Extraction for sewer mining	W18.3 —Volume of wastewater taken through sewer mining		W18.3 —Volume of wastewater taken through sewer mining			

Category	Existing		--> Proposed action -->	Proposed			Theme
	Sub-category	Indicator		Indicator	Section	Sub-theme	
Water resources	Outflow from plant	W18.5 —Volume of treated effluent outflow from wastewater treatment plants	Retired				Water resources
	Use	W29 —Volume of treated wastewater disposals	Retained with an updated definition/supporting notes	W29 —Volume of effluent discharged	S. 9.4	Wastewater	
	Outflow from plant	W30 —Volume of wastewater losses and discharges	Retired				
	Use	W20 —Volume of recycled water supplied to residential customers	Retained with an updated definition/supporting notes	W20 —Volume of recycled water supplied to residential customers	S. 9.2	Supply and exports	
		W21 —Volume of recycled water supplied to non-residential customers		W21 —Volume of recycled water supplied to non-residential customers			
		W23 —Volume of recycled water supplied as environmental flows		W23 —Volume of recycled water supplied as environmental flows			
		W25.1 —Volume of recycled water supplied to managed aquifer recharge		W25.1 —Volume of recycled water supplied to managed aquifer recharge			
			New indicator to support alignment with ABS's WSSS	WR_N3 —Volume of recycled water supplied for own use			
			New indicator to address an identified gap in reporting	WR_N4 —Volume of non-revenue recycled water supplied for beneficial reuse			
	Stormwater	W28.4 —Volume of urban stormwater supplied to residential customers	Retired				
W28.5 —Volume of urban stormwater supplied to non-residential customers							

Category	Existing		--> Proposed action -->	Proposed			Theme
	Sub-category	Indicator		Indicator	Section	Sub-theme	
Water resources	Use	W8—Total volume of water supplied to residential customers	Retired				Water resources
		W9—Total volume of water supplied to non-residential customers					
	Production	W11—Total volume of urban water supplied	Retained with an updated definition/supporting notes	W11—Total volume of urban water supplied	S. 9.2	Supply and exports	
	Use	W12—Average volume of residential water supplied per property		W12—Average volume of residential water supplied per property			
	Wastewater collected	W18—Total volume of wastewater collected	Retained with an updated definition/supporting notes	W18—Total volume of wastewater collected	S. 9.4	Wastewater	
		W19—Average volume of wastewater collected per property		W19—Average volume of wastewater collected per property			
	Use	W26—Total volume of recycled water supplied		W26—Total volume of recycled water supplied	S. 9.2	Supply and exports	
		W27— Recycled water as a percentage of total wastewater collected	Moved to the Public health and environment theme				
			New	WR_N5—Number of days spent at level 1 restriction	S. 9.5	Restrictions	
				WR_N6—Number of days spent at level 2 restriction			
		WR_N7—Number of days spent at or greater than level 3 restriction					

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1. Introduction

1.1 Indicator Review scope

Having established the need and value of the National Urban Water Utility Performance Reporting Framework (the Framework) through an independent review ² in 2019, the Commonwealth Department of Agriculture Water and the Environment (DAWE) and the Bureau of Meteorology (the Bureau), with support from the NPR Technical Reference Group (formerly known as the Round Table Group or RTG), commissioned this detailed review (the Review) of the Framework's indicators and the data and information that it collects.

The Review has sought to:

- (i.) Identify the outcome areas and indicators required to support transparency and public confidence in urban water utilities
- (ii.) Deliver a nationally relevant and valued (by users) set of reporting metrics that provide insight and comparison opportunities, for key aspects of water service provider performance
- (iii.) Develop a data quality framework, including operating procedures relating to data capture, processing, quality control and support. This includes recommendations on auditing procedures and what should be integrated into the data quality framework.

1.2 Purpose of this paper

This paper sets out a way forward for the Frameworks indicators and highlight where there is common ground and where there is a need for further work to reach consensus or acceptance of a way forward. Specifically, it:

- (i.) Draws together and summarises the insights, findings, and draft recommendations of the review
- (ii.) Presents the insights and findings from the testing process and technical advisory panels established in support of the Review
- (iii.) Summarises and responds to the feedback and submissions made in response to the National Performance Reporting Framework Indicator Review: *Draft findings and recommendations report* (HARC, 2021a). ³
- (iv.) Documents the final insights and recommendations of the National Urban Water Utility Performance Reporting Framework (the Framework) 2020–21 Indicator Review (the Review)—this review.

² Aither and HARC 2019. [NPR Framework Review 2019](#). Aither, Melbourne Australia.

³ The draft Review findings and recommendations were released through the [Review website](#) on 29 October 2021.

This paper is written for the Bureau, as the custodian of the Framework and the Commonwealth Agency responsible for the collection of performance data and the production of annual performance reports, the NPR Technical Reference Group (TRG) and the Urban Water Reform Committee (UWRC) as the NPR Steering Committee responsible for decisions on urban water related policy and governance arrangements as they pertain to the NPR Framework.

1.3 Context

This paper should be read in conjunction with the:

- (i.) *National Performance Reporting Framework Indicator Review: Draft findings and recommendations* (the Draft Report) (HARC, 2021a). This paper details:
 - › The background to the Review
 - › The Review objectives
 - › The top-down, bottom-up methodology adopted for the Review
 - › The consultation that was undertaken to support the Review
 - › The draft insights and recommendations developed by the Review team
- (ii.) *National Performance Reporting Framework Indicator Review: NPR data quality framework* (HARC 2021b). This paper details:
 - › The draft data quality assurance framework recommendations for the National Urban Water Utility Performance Reporting Framework (the Framework).

A total of 20 written submissions were received in response to the Draft Report (HARC, 2021a). In addition to written submissions, Technical Advisory Panel input as well as a number of verbal responses and conversations have been a source of insight into sector responses.

1.4 Structure of this paper

This paper is structured around the key recommendations and revised Framework themes presented in the Draft recommendations report (HARC, 2021a)

Section 2—Framework scope and structure recommendations

Section 3—Recommendations on who should report

Section 4—Contextual information recommendations

Section 5—Customer and community indicators recommendations

Section 6—Asset and operations indicators recommendations

Section 7—Pricing and finance indicators recommendations

Section 8—Public health and the environmental indicators recommendations

Section 9—Water resources indicators recommendations

Section 10—Data quality framework recommendations

Section 11—A summary of Review recommendations

2. Framework scope and structure

The following matters were considered by the Review in its exploration of the scope and structure of a revised Framework.

- Support for the collection of performance data
- The scope of reporting
- The scope of data collection
- Aligning data collected with service provider outcomes
- An explicit Framework schema
- Reporting themes
- Reporting sub-themes and gaps
- The spatial scale of reporting

These matters, along with relevant findings and recommendations are presented in the following discussion.

2.1 Support for the collection of performance data

A key finding of the Draft Report (HARC, 2021a) was that the feedback from the Review engagements (submissions, workshops, and discussions) demonstrated **unambiguous support for the Framework and that the performance data it collects is valued and seen as important by a broad range of stakeholders.**⁴

2.2 The scope of reporting

The scope of this Review has been the identification and assessment of performance indicators to support the meaningful, enduring and nationally consistent assessment of service provider performance.

It has not considered:

- the performance assessment methodology that underpins the Framework
- the form and format of the Annual Part A and B National Performance Reports that are produced from the data collected.

However, despite not explicitly considering these matters the following discussion provides valuable context and documents insights and issues raised in the course of the Review for future consideration.

⁴ Neither the scope of the 2019 Framework Review or this Review have included work to quantify the benefit of collecting performance data,

In its current form, the Framework operates under a core indicator methodology.⁵ This approach (also referred to as a partial indicator methodology) seeks to capture core characteristics of performance, which can either directly provide insight into performance or be normalised by service area characteristics such as the number of connections, network length or network density. These indicators can then be compared between groups of service providers with similar characteristics and/or analysed longitudinally to understand changes in a service provider's performance over time.

A 2020 paper exploring the performance measurement of Australian water utilities observes that this methodology is popular due to its relative simplicity in terms of data collection, reporting and comparison.⁶ It is also noted, however, that a major drawback of this methodology is the potential to promote a narrow focus on individual indicators and inhibit a broader service provider view of performance.

In an example cited by the Authors, it is observed that a service provider might be “best in class” in terms of operating cost per connection but have the worst network efficiency and environmental performance due to high system losses.⁶

These observations on the challenge of providing a holistic assessment and appropriately contextualising performance findings when using a core indicator methodology are entirely consistent with the numerous calls for the provision of more context around indicators and the analysis of the reported data that were received by the Review.

Despite these recognised challenges, it is the view of the Review team that the core indicator methodology is entirely appropriate given the Framework's objectives and operation across service providers of vastly differing scales, operating under different jurisdictional legislation, regulation, and policy and each with their own institutional legacy of service delivery.

The question of the form and format of the comparative performance reporting that is undertaken through the Bureau's production of the written annual performance reports (NPR Part A) remains an outstanding issue for the Bureau and the Framework's stakeholders.

Consistent with the findings of the 2019 Framework Review, this Review has found that support for the written NPR Part A remains mixed. However, without some form of written reporting on the performance data, it will be challenging to deliver the improved context and guidance on the comparison and interpretation of data that is called for.

A final insight on the scope of reporting that is undertaken relates to the framing of the analysis and the terminology that is used to describe it. The terms ‘comparative performance reporting’ and ‘benchmarking’ are sometimes used interchangeably in referring to the analysis undertaken. However, as noted by the Productivity Commission, ‘benchmarking’ more synonymously refers to measuring performance against predetermined standards.⁷ As the

⁵ Berg, S.V. 2010, *Water Utility Benchmarking: Measurement, Methodologies, and Performance Incentives*, IWA Publishing, London.

⁶ Akimov, A. and Simshauser, P., 2020. *Performance measurement in Australian water utilities: Current state and future directions*. Griffith Business School, Griffith University

⁷ Productivity Commission, 2020. Report on Government Services 2020 < <https://www.pc.gov.au/research/ongoing/report-on-government-services/2020/approach/performance-measurement> > Accessed 22 February 2022.

Framework does not generally establish best practice benchmarks the term should be avoided in referring to the analysis and reporting that is undertaken.

With respect to the scope of reporting the Review made the following draft recommendation.

Recommendation 1 – It is recommended that both the form and the format of the annual performance reports are reviewed as a key next step of the overarching review process being undertaken by the Bureau of Meteorology. If required, an alternative approach that meets the needs of the stakeholders should be developed.

Submissions and feedback provided in response to the Draft Report supported Recommendation 1.

2.3 The scope of data collection

Through the course of the Review, respondents put forward a diverse set of views on the scope and extent of the information that should be collected by the Framework.

Consequently, the Review explored a broad range of issues, national priorities and policy areas across which the revised Framework could collect data and inform through reporting.

The consideration of these issues and priorities, presented in Appendix C of the Draft Report (HARC, 2021a), led to the following findings.

- Many of the issues and policy areas identified do not solely relate to service provider (utility) performance and are more aptly characterised as urban water sector issues, as an informed understanding cannot be built from service provider data alone
- The Framework's refreshed vision and objectives clearly define its scope as "service provider performance". As such, **its mandate is to collect core data related to urban utility performance**
- The Framework's indicator set should focus on core areas of utility performance and should not be expanded to capture wide-ranging insights into broader water sector performance
- Where possible reporting should be simplified and reduced, not expanded
- Focusing the Framework's indicator set on core areas of utility performance does not mean that the identified desire for data and information on broader sector issues and policy areas is without merit. However, the value of collecting this information should be further tested in terms of cost, benefit, and cross-jurisdictional support for a coordinated national approach to data collection. It is suggested that the identified sector reporting data and information needs be explored through conversations on a refreshed National Water Initiative, in the context of urban water reform priorities.

In response to these findings, the Review made the following draft recommendations (HARC, 2021a).

Recommendation 2 – The sector reporting data and information needs identified by the Review be explicitly considered as part of the conversation on a refreshed National Water Initiative, in the context of urban water reform priorities.

Recommendation 3 – It is recommended that the Framework indicator set focuses on core areas of service provider performance and is not expanded to capture wide-ranging insights into broader water sector performance.

Submissions and feedback provided in response to the Draft Report supported Recommendations 2 and 3.

2.4 Aligning data collected with service provider outcomes

An important criticism of the current Framework is that there is no explicit alignment between the indicators and the outcomes delivered by service providers.

The Review found that:

- A defined set of nationally relevant outcome areas would guide the identification and consideration of the themes, sub-themes and indicators for the revised Framework
- Outcome areas provide a bridge between service provider performance (the focus of the NPR) and the broader urban water sector issues and outcomes that service provider performance can help to inform.

In response, the Review developed, tested and recommended the following outcome areas (HARC, 2021a).⁸

Recommendation 4 – The Framework indicator set should adopt the following set of outcome areas:

- Urban water services are efficient and affordable
- Urban water services are resilient and secure
- Urban water services are transparent and accountable
- Urban water services support healthy and liveable communities

Submissions and feedback provided in response to the Draft Report supported Recommendation 4.

2.5 An explicit Framework schema

The existing Framework utilises a simple two-level classification through categories and sub-categories to thematically group indicators. This classification has evolved somewhat “organically” over the life of the Framework, and while the categories are used to support

⁸ These outcome areas are consistent with the urban water sector objectives set out in the DAWE commissioned report on [Advancing the urban water sector](#) (Aither 2020)

collection and reporting, the sub-categories have no major role in framing or shaping the Framework.

The Review found that:

- An explicit schema (model) would support alignment between the Framework's indicators and the data and information required to inform its outcome areas.

In response, the Review developed, tested and recommended an explicit schema (HARC, 2021a).

The recommended schema, Figure 2-1, defines the relationship and alignment of the outcome areas with the indicator themes, sub-themes, and indicators

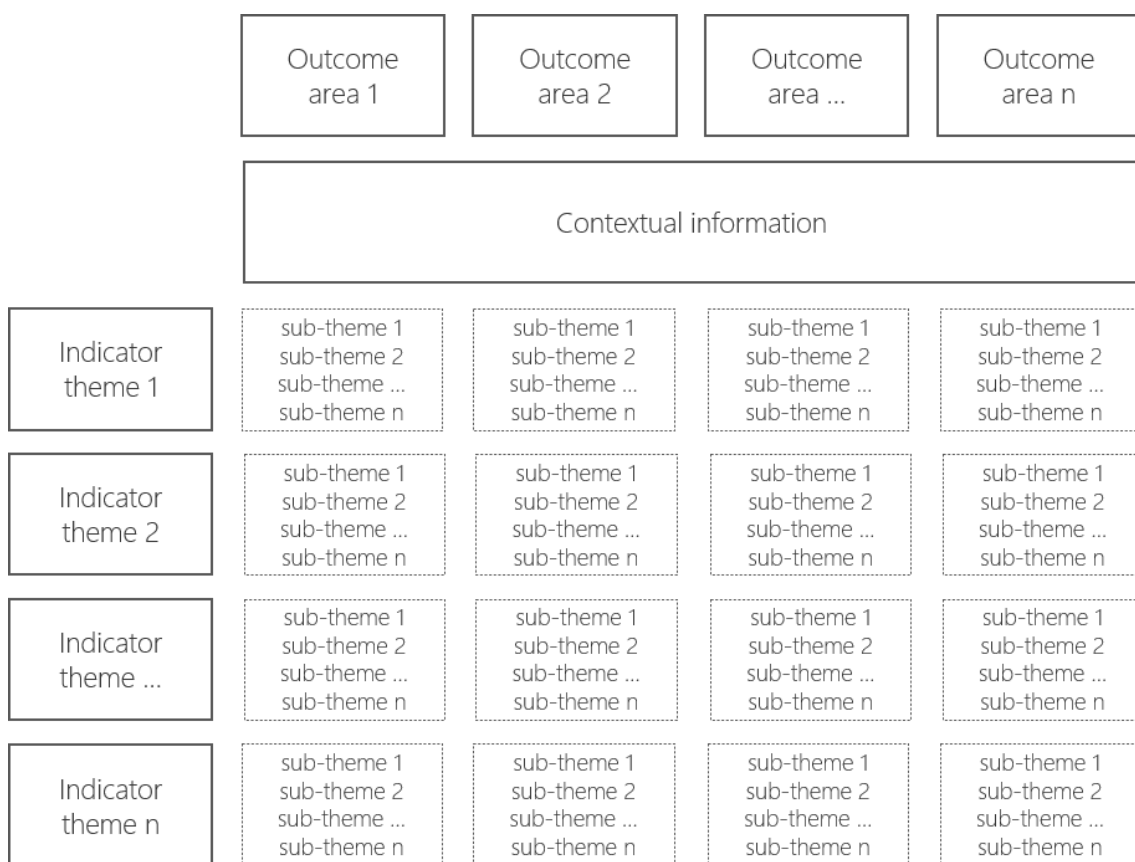


Figure 2-1 – A conceptual representation of the revised schema.

In support of the schema, the Draft Report (HARC, 2021a) proposed the following definitions of outcome areas, indicator themes, sub-themes, indicators and contextual information.

Outcome areas are defined as areas of relevance for performance measurement, as guided by the vision, objectives, and outcomes of the sector. An important aspect of outcome areas is their inherent value-based nature. For example, water security and affordability are outcome areas of interest across the sector. However, defining and evaluating these “outcomes” requires implicit and/or explicit value-based judgements around risks, cost and individual and societal benefits.

Themes are defined as value-neutral topics, that cut across outcome areas. They provide high-level logical groupings that broadly reflect organisational functions within service providers and provide different lenses for understanding performance across service providers. Water resources, finance and pricing are all examples of indicator themes—indeed, all of the current framework indicator categories are indicator themes under this definition.⁹

Sub-themes are defined as groupings of indicators under a specific theme. Sub-themes seek to encapsulate specific topics or issues under a theme. With respect to identifying nationally relevant and enduring indicators, sub-themes offer an ability to call out issues and topics and explicitly map them to the outcome areas that they inform. For example, water supply and restrictions are sub-themes, sitting under the theme of water resources, which encapsulate indicators that inform an understanding of water security.

Indicators are quantifiable metrics for tracking performance towards outcomes over time. Indicators are aligned with outcomes but may not capture all aspects of all outcomes. They provide an indication or signal of the degree to which progress is being made towards an outcome. Both ‘leading’ and ‘lagging’ indicators are important to inform progress towards outcomes. Leading indicators can provide a signal for progress over both the short-term and intermediate timeframes, and can also help to predict the outcome of a change in a process in long-term trends. Lagging indicators are used to measure results at the end of a time period and can be used to gauge historical performance.

The majority of submissions and feedback provided in response to the Draft Report did not explicitly address the proposed schema and definitions—those that did were supportive.

2.6 Reporting themes

The Review explored (both nationally and internationally) how utilities, industry bodies, government agencies, and regulators thematically categorise organisational functions and report on performance.

The Review found that:

- While there is variation in the thematic categorisations used, there are commonly reoccurring themes—water quality, public health, assets, reliability, operations, service quality, customer satisfaction, economic/financial sustainability, efficiency, environmental performance/protection, baseline explanatory data
- There remains strong alignment between the reporting themes identified by the Review and the existing Framework categories.

In response, The Review recommended that the existing reporting categories be kept with minor adaptations (HARC, 2021a).

Recommendation 5 – The Framework indicator set should adopt the following reporting themes:

⁹ While it would be possible to continue using the term “indicator category” (and sub-category) the review team believes that the term “theme” better conveys a link between the indicators and the topics and issues that they inform.

- **Contextual information** – Defined as information and data that helps interpret and understand service provider performance and sector outcomes.
- **Customers and communities** – Defined as information and data informing an understanding and benchmarking of customer service and customer and community outcomes and impacts.
- **Finance and pricing** – Defined as information and data informing an understanding and benchmarking of service pricing, cost and financial performance.
- **Water resources** – Defined as information and data on the availability and use of water and the delivery of urban water services.
- **Assets and operations** – Defined as information and data informing an understanding and benchmarking of infrastructure planning, management and operation and resource planning and risk management.
- **Public health and environment** – Defined as information and data informing an understanding of public health outcomes, environmental impact and public health and environmental risk management.

Submissions and feedback provided in response to the Draft Report supported Recommendation 5.

2.7 Gaps in the Framework's coverage

In the context of the recommended outcome areas, the Review explored drivers and indicators of service provider performance.

The Review found that:

- While the Framework's current reporting categories are broadly suitable (i.e., only in need of minor modification) its sub-categories require amendment and augmentation to better reflect and capture the drivers of service provider performance.

In response, The Review recommended a revised set of indicator sub-themes that inform both a forward-looking (leading) and historical (lagging) understanding of service provider performance (HARC, 2021a).

Recommendation 6 – The Framework should adopt the following sub-themes within each reporting theme:

- **Contextual information:** Population; Connections; Pipe network; Treatment plants
- **Customers and communities:** Complaints; Affordability and hardship; Customer Satisfaction; Engagement
- **Assets and operations:** Reliability; Losses; Staff capacity; Age and condition
- **Finance and pricing:** Tariffs; Bills; Asset-base; Revenue; Costs; Performance
- **Public health and environment:** Water quality compliance; Water quality risk management; Discharges and emissions; Water efficiency and reuse
- **Water resources:** Sources and transfers; Supply; Production; Wastewater; Restrictions

Submissions and feedback provided in response to the Draft Report supported Recommendation 6., It is noted that in some instances this supported was qualified with specific caveats. In these instances, the issues raised are addressed in the detailed discussions of the reporting themes, sub-themes and indicators presented in Sections 4–9 of this report.

2.8 The spatial scale of reporting

The Framework currently operates at a whole of service provider scale, with the majority of indicators reflecting total or average values across all schemes being operated. The Review explored the merits of capturing:

- (i.) All indicators at the individual scheme level
- (ii.) Just contextual information at the individual scheme level.

The Review found that:

- The collection of contextual information, even if only at the scheme level, would provide additional insight for the assessment and comparison of performance
- The cost, in terms of dollars and resources, to transition to scheme-based reporting would be prohibitive
- The capture of indicators at the scheme level is not supported.

In response, The Review recommended that the spatial scale of reporting remain at the aggregated, Framework scale (HARC, 2021a).

The majority of submissions provided in response to the Draft Report did not explicitly address the question of reporting scale. However, feedback through testing activities (Review Deliverable 8) and from Technical Advisory Panels members supported the recommendation to retain the whole of service provider scale of the existing Framework.

3. Entities participating in reporting

Local government and state-owned corporation (SOC) service providers with less than 10,000 connected properties and private service providers do not currently report under the Framework.

The Review considered whether reporting should be extended to include local government and SOC service providers with less than 10,000 connected properties and/or private operators. It has also considered whether bulk water authorities should continue to report under the Framework.

3.1 Local government and state-owned corporation

There are approximately 180¹⁰ local government and SOC service providers with less than 10,000 connected properties delivering urban water services across Queensland, New South Wales, Western Australia and South Australia.

3.1.1 Matters considered and feedback received

With respect to the inclusion of local government and SOC service providers with less than 10,000 connected properties, the Review found that:

- The gap in a national understanding of urban water service delivery, created by the connections threshold, is seen as a limitation of the Framework. The gap not only impacts an understanding of service performance for these smaller providers but also impedes infrastructure planning¹¹ and the tracking of progress on urban water reforms agreed to under the National Water Initiative¹²
- A more complete understanding of urban water service delivery and service provider performance would inform evidence-based policy formulation, regulatory decisions, government program performance reporting (e.g., Closing the Gap) and improve the transparency of customer outcomes for those living outside of Australia's major cities and towns
- All jurisdictions, except South Australia, have compulsory state-level performance reporting for local government and SOC service providers that at least in part align with the information collected through the Framework.¹³

¹⁰ This estimate does not include Water Corporation schemes with less than 10,000 connections or private service providers.

¹¹ Infrastructure Australia, 2019. *Australian Infrastructure Audit 2019*. p.615–618. Infrastructure Australia, Canberra, Australia.

¹² Productivity Commission, 2020. *National Water Reform 2020* – Productivity Commission Inquiry Report No. 96, 28 May 2021. p.170–171 Productivity Commission, Canberra, Australia.

¹³ Performance reporting for small to medium service providers in South Australia was part of the Essential Service Commission of South Australia's (ESOCA's) reporting requirements up until June 2021. However, ESCOSA is moving to a new verified trust and accountability regulatory approach that has reduced reporting requirements for service providers who are designated to be trusted and verified. ESCOSA is yet to release its performance reporting requirements under the new model.

- Clause 75 of the National Water Initiative, which underpins the operation of the Framework, does not specify a threshold for performance reporting, rather it specifies reporting for metropolitan and non-metropolitan water delivery agencies
- Although a cost-benefit analysis has not been undertaken there is broad cross-jurisdictional support for local-government based and SOC service providers with less than 10,000 connected properties to report.¹⁴

In response, the Review recommended that:

- All local government and SOC service providers, regardless of their number of connections, report under the Framework
- The Framework adopts a tiered reporting approach to reporting, such that small providers are only required to report on a subset of the indicators.

In arriving at this recommendation, the Review team considered the appropriateness of alternatives based on a lowered connections threshold.

The challenge with a lowered threshold approach is the arbitrary nature of selecting that threshold. While it is possible to set a threshold based on an outcome such as a specified increase in the population covered by the Framework this approach has two key issues.

- There is no clear case for why understanding the performance of small service providers, serving regional and remote Australians, is of less important than for those living in Australia's major cities and towns
- The number of connections is not the sole measure of the significance of a service provider's operations. Service providers with a small number of connections can still have a locally or regionally significant operation, for example, a large recycled water provider with a small number of major customers.

The recommendation to include local government and SOC service providers regardless of their number of connections was contested by the South Australian Local Government Association (SA LGA) as well as a number of small service providers in South Australia). The issues underpinning these objections were the perceived value of reporting and the burden of doing so.

It is important to recognise that the discussion of the potential inclusion of the South Australian local government service providers has taken place at a time when there has been an expectation that changes to ESCOSA's regulatory model will reduce reporting effort.

The South Australian Office of the Technical Regulator (SA OTR) is, however, establishing a trial of the Queensland Water Directorates State-wide Water Information Management (SWIM)

¹⁴ This support was expressed through the various Review submissions, feedback processes, and workshops as well as publicly expressed views in independent reports. Support was received from commonwealth (DAWE, Productivity Commission and Infrastructure Australia) and state agencies (NSW Department of Primary Industry and Environment, Qld Department of Regional Development, Manufacturing and Water, and the SA Department of Environment), as well as industry bodies (Qld Water and NSW Water Directorate)—noting that this support was typically for the reporting of a subset of the Framework indicators.).

System. The SWIM system simplifies reporting by providing a single database application to manage state and commonwealth reporting requirements.

In response to the issues raised by the SA LGA, it is acknowledged that the issue that those reporting performance data are not typically the primary beneficiary of its collection has been an ongoing challenge for the Framework.

There is also often a reluctance by small service providers to recognise the value of performance data and the role that it can play in understanding and improving operational practices, informing planning and management and supporting funding applications. Indeed, both the Queensland and NSW Water Directorates advocate the value of relevant and well-defined performance metrics to their members.

Where service providers have identified indicators as being of little or no relevance to their operations the Review has sought additional feedback on potentially more relevant indicators. Where this information has been forthcoming it has been incorporated into the indicator recommendations.

The issue of resourcing and capability within small service providers is a real and acknowledged risk for the reporting of quality performance data and is recognised under the data quality framework developed as part of this Review.

3.1.2 Recommendations

While the concerns of SA LGA and its members are acknowledged the arguments presented have not changed the Review team's view on the importance and value of reporting. Therefore, it is recommended that:

- All local government and SOC service providers, regardless of their number of connections, report under the Framework (HARC, 2021a).
- The Framework adopts a tiered reporting approach to reporting, such that small providers are only required to report on a subset of the indicators. The recommended subsets are identified in the reporting theme pathway summaries in Tables 4-9, 5-8, 6-8, 7-12, 8-11 and 9-11.

3.1.3 Unresolved questions and the pathway forward

The Review has not considered the question of implementation. Rather it has put forward an evidence-based set of recommendations that draws together the views of a broad range of stakeholders and where possible identifies where support exists and where matters are contested.

The decision to adopt the proposed recommendations sits with the Bureau as the custodian of the Framework and the UWRC as the NPR Steering Committee.

Where the adoption of a recommendation has resourcing or investment implications for the participating jurisdictions there is also a need to seek formal commitment through an appropriate forum such as the UWRC and capture this commitment in a Memorandum of Understanding (MOU) or letter of agreement.

The following issues have been identified for further consideration as part of the adoption and implementation process.

Resourcing

The recommended addition of over 180 new service providers will significantly increase the administration and support workload of the Bureau's reporting team as well as jurisdictional data coordinators in the states and territories impacted by the increased coverage (South Australia, Queensland, New South Wales and Western Australia).

In particular, additional effort will be required to respond to reporting and indicator queries, and for quality checking of data from new reporting entities.

Additionally, Commonwealth and jurisdictional reporting portals will need to be assessed to determine their ability to accommodate the Review's recommendations. In some instances, these portals may require additional development to support the adoption of the Review's recommendations.

The decision to adopt the recommendation to extend reporting to local government and SOC service providers regardless of their number of connections needs to be considered in the context of the Bureau's and the relevant jurisdictions' ability and willingness to provide the resources, and capacity building required to manage the risks identified in the data quality framework.

The mechanism for reporting within each jurisdiction

The *2019 Framework Review*² (Section 2.6.2) documents the state and territory legislative, regulatory, or other arrangements supporting or requiring the provision of data to the Framework by service providers.

The Review has not considered how the recommended extension would be enacted within each jurisdiction, noting that in most jurisdictions impacted by this change service providers have existing reporting obligations.

Exemptions from reporting

It is recognised that there will be instances where there are grounds for excluding or exempting service providers from reporting.

It is the view of the Review team that Jurisdictions are best placed to understand the nature and relevance of their service providers to the Framework's objectives. Therefore, it is recommended that while the Framework should seek to capture all local government and SOC service providers, regardless of their number of connections, jurisdictions are given the discretion to grant exemptions from reporting where, in the view of the jurisdiction, there is a justified case for doing so.

To support transparency, the reasons for any exemption should be publicly documented and preferably based on a set of principles agreed to by jurisdictions.

Annual written performance reports

This scope of this Review has not included consideration of the form and format of the annual Part A and B National Performance Report. At a minimum, the additional data from the small service providers with less than 10,000 connections will need to be included in the Part B report. The inclusion of the additional service providers in Part A will need to be considered by the Bureau and appropriate analysis and reporting narratives will need to be developed. This integration into the NPR should be a key consideration in any refresh of the NPR's form and format.

Implications for jurisdiction-wide service providers

The review has not explicitly dealt with the question of if and how the large jurisdiction-wide SOCs that exist in Western Australia, the Northern Territory, South Australia and Tasmania should disaggregate their performance data.

The existing arrangements for disaggregation of reporting have evolved from those established under the Frameworks founding agreement, *the National Framework for Reporting on Performance of Urban Water Utilities Deed (the Deed)* ¹⁵.

Under these arrangements:

- The Western Australian Water Corporation provides data on schemes with greater than 10,000 connections.
- Power and Water report on Darwin and Alice Springs
- SA Water report as a single entity but do provide some indicators for the Adelaide metropolitan region.
- Taswater report as a single entity

While it is **not the intention of the Review's recommendation to apply the removal of the reporting threshold to these jurisdiction-wide entities**, a number of respondents did indicate a desire to see additional disaggregation.

With the lapse of the Deed, the pathway for agreeing on any change to the disaggregation of data provided by these entities is unclear. The *2019 Framework Review* ² details historical and current governance arrangements for the Framework and notes that it currently operates through an exchange of letters between the Bureau and jurisdictions.

The challenge of this arrangement is that there is no formal governance framework under which a negotiation on principles for the disaggregation of large jurisdiction-wide entities could be undertaken.

¹⁵ National Water Commission, 2007. National Framework for Reporting on Performance of Urban Water Utilities Deed. NWC, Canberra.

In the absence of such a governance framework, it is suggested that any negotiations on changes to disaggregation practices take place through a cross-jurisdictional body such as the UWRC.

Reporting Cohorts

Size, in terms of connected properties, has traditionally been adopted as the basis for grouping utilities in the NPR. Discussion on the reporting threshold, as well as the applicability of indicators, has demonstrated that this approach is somewhat arbitrary.

An alternative model for the primary grouping of utilities is, therefore, recommended. The proposed grouping model is based on the following delineation

- Economically regulated and price guided service providers.
- Stand-alone service providers operating without formal economic regulation.
- Local government-based service providers.
- Bulk water providers.

Within each of these cohorts, size plays a role in identifying peers for relevant comparison but is not the primary means of doing so.

The Draft recommendations report (HARC, 2021a) proposed this approach as it enables clear narratives around the regulatory and operating environments of reporting entities to be provided as important context to discussions of their performance.

Submission made in response to the Draft recommendations report did not explicitly address this proposal. It is suggested that reporting cohorts be considered as part of any future review of the written Part A annual performance report.

3.2 Private service providers

A review of licencing and regulatory data across Australia has identified over 150 private service providers. The effective number that would be covered by the scope of the NPR may vary as the nature of the services delivered was not readily identifiable for all licenced or registered service providers counted.

3.2.1 Matters considered and feedback received

With respect to private service providers, the Review found that:

- While typically small in terms of connected properties and customers, there is a significant and growing number of private service providers across Australia.
- In some instances the relevance of the operations of these service providers to the objectives of the Framework is unclear, however, in others, their exclusion presents a genuine gap in the insight that the Framework delivers. For example, recycled water services delivered by private service providers are a gap in understanding the scale and role of alternative water supplies in Australia.

The draft Review recommendations report (HARC 2022a) noted that the case for private service providers was unclear due to differences in jurisdictional views. It was noted that

potential barriers to including private providers include commercial sensitivity as well as differences in jurisdictional regulatory frameworks. For example, the current regulatory framework in the Northern Territory does not allow for imposing reporting requirements on private, non-licensed service providers.

In their submissions, on the draft report, both the SA Department of Environment and the SA Office of the Technical Regulator noted their strong support for the inclusion of private service providers. Conversely, the position of New South Wales and Queensland is that they do not support the inclusion of private service providers in the Framework.

3.2.2 Recommendations

While the review team believes that there is merit in a holistic understanding of service providers and their performance it recognises that the issues identified do not provide a strong case for the inclusions of private service providers at this time.

On this basis, we recommend that private service providers are not included in the Framework at this time. However, given the potential importance of private service providers to the objectives of the Framework and the growing number of providers we suggest that their inclusion be discussed by a cross-jurisdictional group, such as the Urban Water Reform Committee and reviewed at an appropriate future juncture.

If the Bureau does wish to adopt private service provider reporting, it is suggested that the approach recommended for the local government and SOC service providers be utilised. That is, require reporting of private service providers under the Framework but allow jurisdictions to grant exemptions. This approach would deliver the flexibility needed to meet the differing views of jurisdictions while at the same time providing transparency around who is reporting.

Bulk water providers

Bulk water service providers remain a challenging anomaly in the context of the NPR. The number of bulk water entities is small and there is significant variation in their roles, responsibilities and operating models, providing only limited opportunity for comparison or benchmarking and leaving a need for caveated performance metrics.

However, there are elements of bulk water entity operations that are important for understanding the performance of the utilities they supply.

Proposed bulk entity reporting requirements are identified as part of the indicator summary tables located at the end of each reporting theme discussion—Tables 4-9, 5-8, 6-8, 7-12, 8-11 and 9-11.

4. Contextual information

Contextual information is fundamental to interpreting and understanding performance but is not itself a measure of performance. For example, the number of connected properties or the length of a service provider’s network are not indicators of performance, rather they are important explanatory data that can be used to understand performance and changes in the scale of water utility service provision over time..

The Review found that:

- Contextual information is important as it underpins comparison by supporting an understanding of the similarities and differences across service providers
- It also plays an important role in the normalisation of performance indicators to support comparison across service providers
- Contextual information is currently collected under the existing Framework, however, it is integrated across reporting categories—this integration clouds perceptions of the number of performance indicators and the nature and focus of the Framework.

In response, the Review recommended bringing 13 of the Framework's existing indicators (9 reported and 4 derived) under a contextual information theme (HARC, 2021a).

The following discussion of the proposed contextual information sub-themes draws the feedback received and submissions made in response to the Draft Report (HARC, 2021a) together with the detailed indicator insights and issues raised across the course of the Review.

4.1 Population

This sub-theme seeks to inform an understanding of the population receiving services and can be used to normalise relevant performance indicators on a per capita basis.

4.1.1 Proposed indicator

The indicator proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme is shown in Table 4-1.

Table 4-1 – Proposed population indicators

Indicator	Definition
C1—Population receiving services: water supply	The population receiving water supply services from the utility during the reporting year (people 000s).

4.1.2 Matters considered and feedback received

Quality of population estimates (C1)

Population data provides contextual information for the assessment, comparison and understanding of performance. Per capita normalisation of indicators is used by those comparing service providers. However, there are questions about the quality of population estimates.

The provision of quality population data requires:

- Access to reliable, scale-appropriate and up to date growth projections
- Spatial data defining service area/s
- GIS capability within a service provider to estimate the population
- Consideration of factors such as the impact of highly variable/transient populations on estimates—e.g., those of holiday towns and remote indigenous communities.

Review feedback and indicator testing (Deliverable 8) have highlighted the challenges faced by service providers, particularly small service providers, across these requirements and the impact this has on the provision of quality data.

In exploring the question of data quality, with respect to population estimates, the Review found:

- There is a strong correlation between connected residential properties (C2) and the population receiving water supply services (C1)—demonstrated by the R^2 value of the fitted linear regression in Figure 4-1
- Despite this correlation, there is also inherent variability, which at the individual service provider scale is significant—as shown in Figure 4-2
- The Framework’s focus on individual service providers means that individual variability is important and can impact comparisons
- Feedback to the Review supports the observation that service providers are not using a consistent methodology for the estimation of the population receiving water supply services—Anecdotally, some service providers are undertaking spatial analysis using Australian Bureau of Statistics (ABS) population data and sophisticated population projections, while others are using less complex estimation methods such as simple average numbers of persons per connection calculations

In response, the Review found that despite the recognised quality issues, population estimates are valued by users and seen as important for normalising indicators on a per capita basis.

Rounding of population estimates

The Review has identified that rounding of population estimates is resulting in data quality issues for the Framework.

In exploring this issue the Review has found that:

- Some service providers are not reporting population estimates to their full precision
- While rounding to the nearest thousand is appropriate for larger service providers, it has the potential to introduce significant rounding errors for those with smaller populations.

To address this issue it is recommended that service providers report population estimates to their full precision and that rounding only be applied in the presentation of data, not to the underlying values stored in the database.

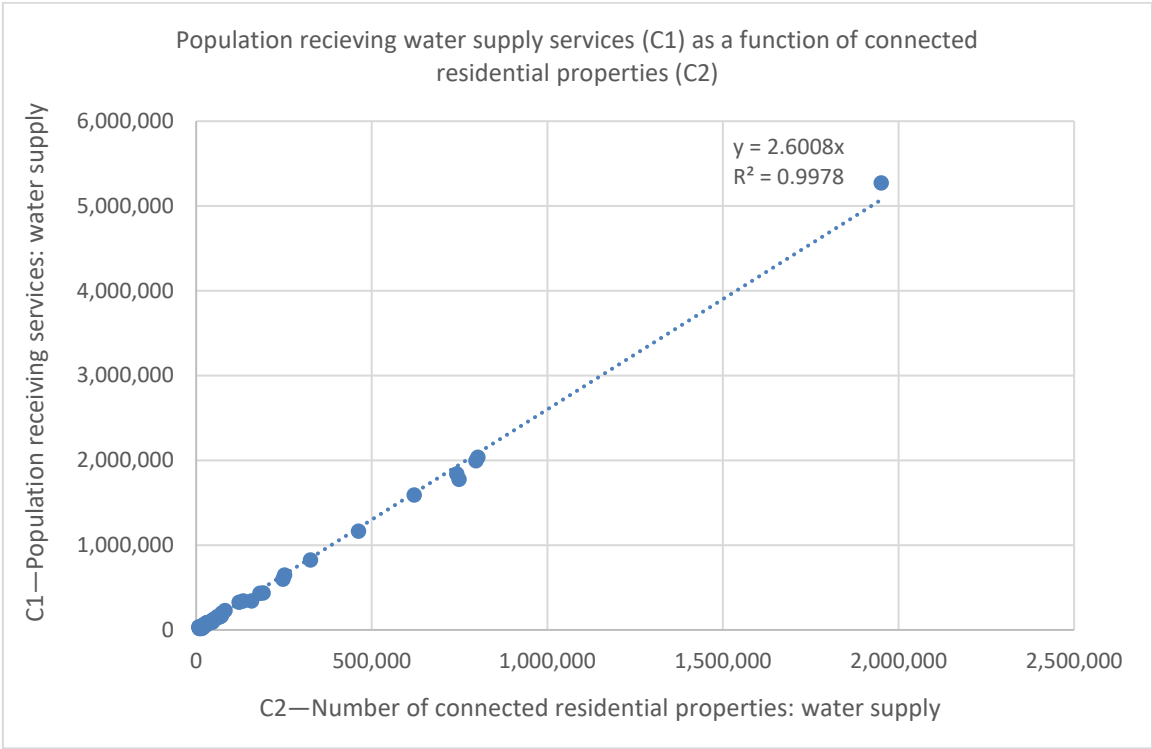


Figure 4-1 – Population receiving water supply services as a function of connected residential properties

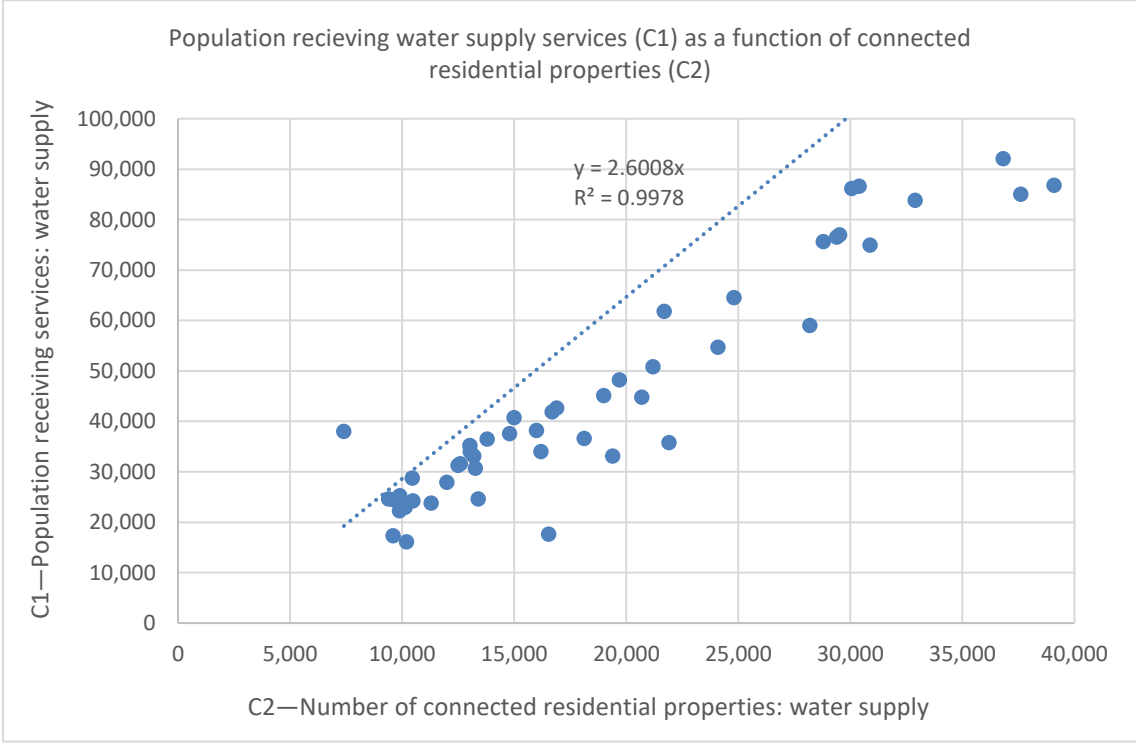


Figure 4-2 – Population receiving water supply services as a function of connected residential properties—zoomed to 0–40,000 connected properties

The inclusion of additional population estimates

In addition to the existing population receiving water supply services indicator (C1), the Review considered the inclusion of:

- (i.) An indicator to capture population estimates for recycled water services
- (ii.) The disaggregation of the population receiving water supply services into drinking and non-drinking water supply.

The Review found that the requirements for the reliable estimation of the population (discussed above) present a material barrier for the inclusion of any additional population indicators.

4.1.3 Recommendations

It is recommended that:

- The population receiving water supply services indicator C1 be retained, with minor definitional amendments, under a population sub-theme as part of the contextual information collected by the Framework—Table 4-2
- The definition of C1 is updated such that population estimates are reported to their full precision and rounding is only applied when appropriate in the presentation of data.

Table 4-2 – Recommended population indicators

Indicator	Definition
C1— Estimated population receiving water supply services	The estimated population receiving water supply services, excluding recycled water , from the service provider during the reporting year (people).

To support data quality improvements, it is suggested that the Bureau of Meteorology consider developing a spatial analysis web service to estimate population based on the intersection of defined service boundaries, ABS population data and population growth projections.

The development of such a service would enable consistent reliable and robust estimates of the population. This service would be of particular value to smaller service providers who have identified resourcing and technical capability as major challenges.

4.2 Connections

Connected properties are seen as a robust estimate of service provider scale due to their derivation from customer billing data. The number of connections is an important driver of performance and can be used to normalise relevant performance indicators on a connected property basis.

4.2.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a) for inclusion in this sub-theme are shown in Table 4-3.

Table 4-3 – Proposed connections indicators ^

Indicator	Definition
C2 —Number of connected residential properties: water supply	The number of connected residential properties receiving water supply services from the utility during the reporting year (properties 000s).
C3 —Number of connected non-residential properties: water supply	The number of connected non-residential properties receiving water supply services from the utility during the reporting year (properties 000s).
C4 —Total number of connected properties: water supply	The total number of connected residential and non-residential properties receiving water supply services from the utility during the reporting year (properties 000s).
C6 —Number of connected residential properties: wastewater	The number of connected residential properties receiving water services from the utility during the reporting year (properties 000s).
C7 —Number of connected non-residential properties: wastewater	The number of connected non-residential properties receiving wastewater services from the utility during the reporting year (properties 000s).
C8 —Total number of connected properties: wastewater	The total number of connected residential and non-residential properties receiving wastewater services from the utility during the reporting year (properties 000s).
^ Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

4.2.2 Matters considered and feedback received

Relevance of the proposed connections indicators

Beyond minor definitional issues raised in the feedback and submission process, the existing connected properties indicators (C2, C3, C4, C6, C7, C8) were recognised as important contextual information. The issues identified have been addressed in the revised definitions and supporting notes developed by the Review team.

The inclusion of residential and non-residential connections for recycled water supplies

The role of the Framework in providing a greater understanding of the availability, use, and cost of alternative supplies (such as recycled water and stormwater) was supported by several State and Territory representatives, including South Australia, New South Wales, and Victoria.

In this context, the inclusion of additional connected residential and non-residential property indicators has been considered by the review team.

The Review found that:

- Understanding residential recycled water connections can provide insight into the growth of residential properties supplied with recycled water and provide a basis for normalising indicator W20, the volume of recycled water supplied to residential customers. Its inclusion would provide insight into the driver of changes to the volume of recycled water supplied to residential properties—i.e., is it due to a change in the number of properties being supplied or a change in usage

- Similarly, understanding non-residential recycled water connections can provide insight into the growth of non-residential customers supplied with recycled water and provide a basis for normalising indicator W21, the volume of recycled water supplied to non-residential customers. The significant variability in the volume of recycled water supplied to non-residential customers is likely to reduce the insight that can be drawn from understanding the number of non-residential customers
- No respondents explicitly commented on the proposed inclusion of connected property indicators for recycled water—the strong support for greater coverage of alternative supplies by several State and Territory representatives is, however, noted
- There is a case for the inclusion of residential and non-residential recycled water connections indicators. The information required to report on these new indicators is likely to be readily available from the customer databases of service providers.

Rounding of connections estimates

The Review has identified that rounding of connections estimates is resulting in data quality issues for the Framework.

In exploring this issue the Review has found that:

- Some service providers are not reporting connections estimates to their full precision
- While rounding to the nearest thousand is appropriate for larger service providers, it has the potential to introduce significant rounding errors for those with smaller populations.

To address this issue it is recommended that service providers report connections estimates to their full precision and that rounding only be applied in the presentation of data, not the underlying values stored in the database.

4.2.3 Recommendations

It is recommended that:

- A connections sub-theme be included in the contextual information theme and that the existing connections indicators C2, C3, C4, C6, C7 and C8, with minor definitional amendments, be adopted as the basis for reporting on connected properties—Table 4-4
- Two new indicators capturing residential and non-residential recycled water connections be included in the connections contextual information sub-theme
- The definition of the connections indicators is updated such that connections data is reported to its full precision and rounding is only applied when appropriate in the presentation of data.

Table 4-4 – Recommended connections indicators ^

Indicator	Definition
C2 —Number of connected residential properties: water supply	The number of connected residential properties receiving water supply services from the service provider during the reporting year (properties).
C3 —Number of connected non-residential properties: water supply	The number of connected non-residential properties receiving water supply services from the service provider during the reporting year (properties).
C4 —Total number of connected properties: water supply	The total number of connected residential and non-residential properties receiving water supply services from the service provider during the reporting year (properties).
C6 —Number of connected residential properties: wastewater	The number of connected residential properties receiving wastewater services from the service provider during the reporting year (properties).
C7 —Number of connected non-residential properties: wastewater	The number of connected non-residential properties receiving wastewater services from the service provider during the reporting year (properties).
C8 —Total number of connected properties: wastewater	The total number of connected residential and non-residential properties receiving wastewater services from the service provider during the reporting year (properties).
CI_N1 —Number of connected residential properties: recycled water	The number of connected residential properties receiving recycled water services from the service provider during the reporting year (properties).
CI_N2 —Number of connected non-residential properties: recycled water	The number of connected non-residential properties receiving recycled water services from the service provider during the reporting year (properties).
^ Orange text denotes proposed changes to the indicator name and definition. Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

4.3 Treatment plants

Treatment plants (water and wastewater) and the type of treatment carried out have a significant impact on utility performance across a range of indicators.

4.3.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 4-5.

Table 4-5 – Proposed treatment plants indicators

Indicator	Definition
A1 —Number of water treatment plants providing full treatment	The total number of water treatment plants providing full treatment during the reporting year (plants).
A4 —Number of wastewater treatment plants	The total number of wastewater treatment plants providing wastewater services to customers during the reporting year (plants).

4.3.2 Matters considered and feedback received

Relevance of the proposed treatment plant indicators

Beyond minor definitional issues raised in the feedback and submission process, the number of water and wastewater treatment plants was recognised as useful contextual information. The issues identified have been addressed in the revised definitions and supporting notes developed by the Review team.

Feedback did, however, also highlight a number of “edge cases” where service providers are seeking clarification on specific plant technologies and their status with respect to reporting under indicators A1 and A4.

These edge cases highlight the issue and data quality risk of understanding indicator definitions. At present there is not a clearly defined process for seeking clarification on edge cases, nor is there a mechanism for sharing insights from any clarification process with reporting parties and, where appropriate incorporating these into indicator definitions (i.e., continuous improvement).

Actions to address these gaps in the Framework’s operation we identified as part of the draft data quality Framework (HARC, 2021b)—Deliverable 10 of this Review.

4.3.3 Recommendations

It is recommended that a treatment plants sub-theme be included in the contextual information theme and that the existing treatment plants indicators (A1 and A4), with minor definitional amendments, be adopted as the basis for reporting—Table 4-6.

Table 4-6 – Recommended treatment plants indicators

Indicator	Definition
A1 —Number of water treatment plants providing full treatment	The number of water treatment plants, owned or operated on behalf of the service provider , providing full treatment during the reporting year (plants).
A4 —Number of wastewater treatment plants	The number of wastewater treatment plants, owned or operated on behalf of the service provider , providing wastewater services to customers during the reporting year (plants).
^ Orange text denotes proposed changes to the indicator name and definition. Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

4.4 Pipe networks

Aligned with the existing network length indicators A2, A3, A5 and A6, the pipe network sub-theme seeks to capture an understanding of the length of pipe assets owned by a service provider and informs an understanding of the scale and density of their operations.

4.4.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 4-7.

Table 4-7 – Proposed pipe network indicators [^]

Indicator	Definition
A2 —Length of water supply mains	The total length of water supply mains as at the end of the reporting year, in kilometres (km).
A3 —Number of properties served per km of water main	The average number of properties connected to the water supply network per kilometre of water main (properties/km).
A5 —Length of sewer mains and channels	The total length of sewer mains and channels at the end of the reporting year, in kilometres (km).
A6 —Number of properties served per km of sewer main	The average number of properties connected to the sewer network per kilometre of sewer main (properties/km).
[^] Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

4.4.2 Matters considered and feedback received

Relevance of the proposed pipe network indicators

Beyond minor definitional issues raised in the feedback and submission process, pipe network data is recognised as important contextual information. The issues identified have been addressed in the revised definitions and supporting notes developed by the Review team.

The inclusion of drainage pipe networks

The South Australian Department of Environment advocated strongly for the inclusion of drainage networks to inform an understating of stormwater management and reuse.

The Review found that:

- Stormwater management does not sit within the responsibilities of all service providers reporting to the Framework. As such, it is limited in its ability to provide a comprehensive national picture of stormwater services and performance
- The inclusion of a draining network length indicator would not meet the principles established by the Review’s indicator selection criteria (HARC, 2021a. p.13).

4.4.3 Recommendations

It is recommended that a pipe network sub-theme be included in the contextual information theme and that the existing treatment plants indicators A2, A3, A5 and A6, be adopted as the basis for reporting—Table 4-8.

Table 4-8 – Recommended pipe networks indicators [^]

Indicator	Definition
A2 —Length of water supply mains	The total length of water supply mains as at the end of the reporting year, in kilometres (km).
A3 —Number of properties served per km of water main	The average number of properties connected to the water supply network per kilometre of water main (properties/km).
A5 —Length of sewer mains and channels	The total length of sewer mains and channels at the end of the reporting year, in kilometres (km).
A6 —Number of properties served per km of sewer main	The average number of properties connected to the sewer network per kilometre of sewer main (properties/km).
[^] Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

4.5 A summary of the contextual information theme pathway

The following summary presents the changes recommended under the contextual information theme. It is recommended that:

- The population receiving water supply services indicator C1 be retained, with minor definitional amendments, under a population sub-theme as part of the contextual information collected by the Framework
- The definition of C1 is updated such that population estimates are reported to their full precision and rounding is only applied when appropriate in the presentation of data.
- To support data quality improvements, it is suggested that the Bureau of Meteorology consider developing a spatial analysis web service to estimated population based on the intersection of defined service boundaries, ABS population data and population growth projections.
- A connections sub-theme be included in the contextual information theme and the existing connections indicators C2, C3, C4, C6, C7 and C8, with minor definitional amendments, be adopted as the basis for reporting on connected properties
- Two new indicators capturing residential and non-residential recycled water connections be included in the connections contextual information sub-theme
- The definition of C1, C2, C3, C4, C6, C7 and C8 is updated such that data is reported to its full precision and rounding is only applied when appropriate in the presentation of data
- A treatment plants sub-theme be included in the contextual information theme and the existing treatment plants indicators (A1 and A4), with minor definitional amendments, be adopted as the basis for reporting
- A pipe network sub-theme be included in the contextual information theme and the existing treatment plants indicators A2, A3, A5 and A6, be adopted as the basis for reporting.

Table 4-9 summarises the final indicator recommendations for the contextual information theme along with updated recommendations on the service providers who should report them. The updated reporting requirements are based on feedback from the Technical Advisory Panels as well as feedback from the indicator testing activity (Deliverable 8).

Table 4-9 – Recommended contextual information indicators [^]

	Indicator	<10,000	>10,000	Bulk
Population	C1 —Estimated population receiving water supply services	✓	✓	
Connections	C2 —Number of connected residential properties: water supply	✓	✓	
	C3 —Number of connected non-residential properties: water supply	✓	✓	
	C4 —Total number of connected properties: water supply			
	C6 —Number of connected residential properties: wastewater	✓	✓	
	C7 —Number of connected non-residential properties: wastewater	✓	✓	
	C8 —Total number of connected properties: wastewater			
	CI_N1 —Number of connected residential properties: recycled water	✓	✓	
	CI_N2 —Number of connected non-residential properties: recycled water	✓	✓	
Treatment plants	A1 —Number of water treatment plants providing full treatment	✓	✓	✓
	A4 —Number of wastewater treatment plants	✓	✓	✓
Piped networks	A2 —Length of water supply mains	✓	✓	✓
	A3 —Number of properties served per km of water main			
	A5 —Length of sewer mains and channels	✓	✓	✓
	A6 —Number of properties served per km of sewer main			
[^] Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.				

5. Customers and community indicators

The existing Framework has 25 customer indicators (15 reported and 10 derived). These indicators provide insight into the population and connected properties serviced, complaints received, reliability of services, and service restrictions and legal actions for non-payment.

The Review found that:

- The existing customer indicators do not, in the view of many, adequately inform an understanding of performance on customer and community outcomes
- Customer satisfaction is broadly seen as one of the most important outcomes that should be captured by the Framework
- The use of complaints as a measure of service and performance is contested
- Changes to how customers contact and engage with their service provider mean that the percentage of calls answered by an operator within 30 seconds is no longer relevant as an indicator of customer service
- Many respondents believe that changes to how service providers approach hardship means that service restrictions and legal actions for non-payment provide little insight into service provider performance
- In addition to customer satisfaction, performance on service affordability, hardship support and customer and community engagement were seen as important inclusions for the Framework.

In response, the Review's draft recommendations (HARC, 2021a) proposed:

- The existing customer theme be renamed "Customers and communities" to reflect the role service providers play in delivering outcomes for communities as well as customers
- The population receiving water supply services indicator (C1) be moved under the contextual information theme—discussed in Section 4.1
- The 6 existing customer connections indicators C2, C3, C4, C6, C7 and C8 be moved under the contextual information theme —discussed in Section 4.2
- Engaging with the Victorian Essential Services Commission (ESC) to explore leveraging their [customer perception survey](#) as a means of incorporating customer satisfaction into the Framework
- The existing complaints indicators IC10, C10, IC11, C11, IC12, C12, IC13 and C13 be retained with updated definitions and supporting notes that address the issues raised
- Complaints to the ombudsman are considered as an augmentation/alternative to the existing complaints metrics
- The existing indicator C14, percentage of calls answered by an operator within 30 seconds, be retired
- The addition of affordability, hardship and engagement indicators

- Moving and modifying the service interruptions indicators C15, IC17 and C17 to the assets and operations theme.

The following discussion of the proposed sub-themes draws the detailed indicator insights and issues raised across the course of the Review together with the feedback received and submissions made in response to the Draft Report (HARC, 2021a). It provides a summary of what was proposed in the draft recommendations, what has been considered in the course of the Review, recommendations on the way forward, and unresolved matters.

5.1 Customer satisfaction

Customer satisfaction is broadly accepted as a good indicator of customer service performance. Measuring and publicly reporting on customer satisfaction over time can help drive performance improvements through transparency and competition by comparison. It can also inform an understanding of the extent to which service providers are delivering on community expectations.

5.1.1 Proposed indicators

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 5-1.

Table 5-1 – Propose customer satisfaction indicators [^]

Indicator	Definition
##—Customer perceptions: value for money	The average customer rating for value for money.
##—Customer perceptions: reputation in the community	The average customer rating for reputation in the community.
##—Customer perceptions: level of trust	The average customer rating for the level of trust.
##—Customer perceptions: value for money	The average customer rating for overall satisfaction.

[^] Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.

5.1.2 Matters considered and feedback received

Review participants indicated that customer satisfaction is one of the most important performance areas that should be captured by the Framework.

While the importance of understanding customer satisfaction is acknowledged, there are several significant challenges in undertaking a national assessment of service providers.

The most significant of these is the need for any such measure to be able to be quantified in a consistent and nationally-comparable manner. Differences in jurisdictional operating models and roles and responsibilities of service providers is acknowledged as a barrier to comparability.

Furthermore, assessing customer satisfaction of council (local government) based water service providers is problematic due to the diversity of services and interactions that customers have with councils and the need to separate these views from views on water and wastewater service provision.

The Draft Report (HARC, 2021a) recommended that the way forward for the inclusion of customer satisfaction metrics within the Framework is to engage with the Victorian Essential Service Commission (ESC) and seek to collaborate on the collection of their [customer perception survey](#).

Run quarterly by an external service provider, the survey uses robocalling to collect customer responses to 4 questions covering value for money, reputation in the community, level of trust and overall satisfaction.

Leveraging this survey is seen as the most practical and feasible pathway for the inclusion of customer satisfaction in the Framework.

Importantly, the New South Wales Independent Pricing and Regulatory Tribunal (IPART) utilises the same methodology and service provider to survey customers of its own economically regulated water utilities.

The Draft Report (HARC, 2021a) proposed that the ESC survey approach should only be used for State-Owned corporations (SOCs) above an agreed threshold—for example, greater than 50,000 connected properties. It is noted that the NSW DPIE did express interest in the customer satisfaction survey for its local water utility (council-owned) operations.

Feedback and submissions to the Review on the Draft Report (HARC, 2021a) demonstrated broad but not universal support for the inclusion of customer satisfaction, with some caveating their support with a need for a deeper understanding of the ESC's methodology.

5.1.3 Unresolved questions and the pathway forward

Noting the value placed on customer satisfaction by Review participants and the support it has received in submissions and stakeholder engagements it is recommended that the Framework, its custodian and stakeholders work towards an agreed and implementable methodology to measure and report on satisfaction, value for money and trust.

The ESC survey provides a solid foundation for achieving this and the next step is to engage directly with the ESC. It is noted that ESC staff have indicated their willingness to share their experience and insights from their implementation of the survey.

Adoption will require cross-jurisdictional agreement on the method and a commitment to funding to support the survey process underpinning it. It is recommended that a jurisdictional agreement be sought on the survey and that this agreement includes a commitment to ongoing funding. It is suggested that this be raised for consideration through a suitable national forum, such as the Urban Water Reform Committee (UWRC).

Importantly it should be noted that in their submission on the Draft Report the Water Services Association of Australia (WSAA) noted its willingness and the willingness of its members to support the development/implementation of a customer satisfaction survey.

5.2 Complaints

Complaint indicators have been used to inform an understanding of customer service, service levels and customer satisfaction. Measuring and reporting on complaints over time can help drive performance improvements through public reporting and in the view of some promote ‘competition by comparison’.

5.2.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 5-2.

Table 5-2 – Propose complaints indicator/s ^

Indicator	Definition
IC9 —Number of water quality complaints: water supply	The total number of complaints received by the utility that relate to the quality of the water supplied, including water quality complaints resulting from operational practices during the reporting year (complaints).
C9 —Number of water quality complaints per 1,000 properties: water supply	The average number of complaints received by the utility, per 1,000 connected properties, that relate to water quality, including water quality complaints resulting from operational practices during the reporting year (complaints/1,000 properties).
IC10 —Number of water service complaints	The total number of water service complaints received by the utility during the reporting year (complaints).
C10 —Number of water service complaints per 1,000 properties	The average number of water service complaints, per 1,000 connected properties, received by the utility during the reporting year (complaints/1,000 properties).
IC11 —Number of sewerage service complaints	The total number of complaints received by the utility that relate to wastewater service quality and reliability during the reporting year (complaints).
C11 —Number of sewerage service complaints per 1,000 properties	The average number of complaints received by the utility, per 1,000 connected properties, that relate to wastewater service quality and reliability during the reporting year (complaints/1,000 properties).
IC12 —Number of billing and account complaints: water supply and sewerage	The total number of complaints received by the utility that relate to billing and accounts during the reporting year (complaints).
C12 —Number of billing and account complaints per 1,000 properties: water supply and sewerage	The average number of complaints received by the utility, per 1,000 connected properties, that relate to billing and accounts during the reporting year (complaints/1,000 properties).
IC13 —Number of water and sewerage complaints	The total number of complaints received by the utility during the reporting year (complaints).
C13 —Number of water and sewerage complaints per 1,000 properties	The average number of complaints received by the utility, per 1,000 connected properties, during the reporting year (complaints/1,000 properties).
^ Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

5.2.2 Matters considered and feedback received

Reporting of customer complaints indicators received general, but qualified, support from review respondents. **While there is support for reporting customer complaints indicators the basis of those indicators is strongly contested.**

The suitability of the existing complaints indicators

Jurisdictional agencies and regulators have expressed their support for the existing complaints indicators while acknowledging there is a need for tighter definitions to aid reporting and improve comparability.

Conversely, a number of water utilities engaging with the Review have expressed concern over the proposed indicators. In the view of these service providers the current complaints indicators, with the exception of the water quality complaints indicator (C9), are no longer reflective of best practice and their continued inclusion in the Framework is hindering *“improved customer outcomes”*.¹⁶

The issues raised by these utilities are well summarised in WSAA’s submission on the Draft Report (HARC, 2021a). In their submission, WSAA contends that:

- A higher number of complaints does not necessarily reflect an increase in dissatisfied customers or a decrease in customer service
- The culture around complaints is shifting to consider complaints as a valuable source of customer data as opposed to a ‘black mark’ against an individual or organisation
- If the existing complaints indicators are retained under the Framework there is a risk that utilities move away from best practice to avoid adverse reporting.

In support of their position, WSAA note that Ofwat (the Water Services Regulation Authority for England and Wales) no longer includes complaints in their customer measure of experience (C-MEX) index, which is used to benchmark water businesses.

Complaints to the ombudsman

Complaints to the ombudsman were identified as a potential alternative indicator of customer service outcomes, as they quantify issues that have not been able to be resolved with the service provider.

WSAA and several service providers responding to the review expressed their support for the adoption of complaints to the ombudsman over the existing indicators.

The Review found that:

- Complaints to the ombudsman only feature in one jurisdiction's performance reporting requirements. TasWater report on complaints to the Tasmanian Ombudsman as part of the State’s performance reporting framework operated by the Office of the Tasmanian Economic Regulator (OTTER)

¹⁶ Water Service Association of Australia, 2021. *WSAA submission to Urban National Performance Reporting Framework Indicator Review - draft Report November 2021*. WSAA, Sydney, Australia.

- While conceptually appealing, differences in the rules around ombudsmen reporting across and within jurisdictions need further consideration and possible alignment if it is to be adopted as the basis for understanding customer complaints
- Key considerations in the comparability of ombudsman reporting are:
 - › The operation of separate ombudsmen offices for SOC and council-based service providers in some jurisdictions
 - › The scope of the services covered by different offices and the visibility of the complaints process—e.g., while some ombudsmen cover multiple services and government departments, others are focused solely on energy and water service providers
 - › Differences in complaint categorisation across jurisdictions and within jurisdictions where there are different ombudsmen
 - › Differences in the granularity of reporting—not all offices report complaints at the service provider scale.
- While it is likely that a workable solution for complaints based on ombudsman reporting could be found for the large SOC service providers it is unclear how practical this approach would be for local government-based operations. Comments by the New South Wales Department of Primary Industry and Environment suggest that Ombudsman reporting would not provide meaningful insight into customer complaints data or trends for local water utilities in the State.

5.2.3 Unresolved questions and the pathway forward

The identification of a broadly supported basis for reporting customer complaints remains an unresolved issue at the end of this Review.

Members of the Customer and Community Technical Advisory Panel (TAP) have provided feedback on draft revisions of the customer complaints indicator definitions and supporting notes. While these revisions go some way to addressing a number of the issues raised by respondents, they do not deliver the fundamental shift in the basis of reporting that is being advocated for by some respondents.

Given the strength of the views that exist, it is the opinion of the Review team that a recommendation for or against a particular methodology at this junction would not support the necessary process of seeking consensus on the way forward.

In this regard, further revision of the complaints indicators IC10, C10, IC11, C11, IC12, C12, IC13 and C13 is seen as a secondary issue to the more pressing question of what, if any, reform there should be around how service provider complaints are captured, tracked and reported on by the industry.

It is the opinion of the Review team that the next step in the resolution of this issue needs to be the bringing together of service providers, industry bodies, policy agencies and regulators to discuss the reforms sort by utilities. This process will require leadership and cross-jurisdictional support—as such, it should be raised in an appropriate national forum such as the UWRC.

If the current basis of complaints reporting is to be retained into the long term this needs to be supported by a consensus view and clear position from state and territory agencies and where appropriate regulators.

Given the open question on the way forward for capturing customer complaints data and the recognised effort in implementing changes to indicator definitions and supporting notes, it is recommended that the next steps be:

- (i.) Retain the supported water quality complaints indicators (IC9, C9) and update their definition in line with feedback received from submissions and the customer and community TAP
- (ii.) Retain the existing IC10, C10, IC11, C11, IC12, C12 and IC13 complaints indicators for the 2022-23 reporting year and update their definition in line with feedback received from submissions and the customer and community TAP
- (iii.) Continue working with the TAP, policy agencies, regulators and ombudsmen offices to find an agreed basis for reporting on complaints.

Table 5-3 – Recommended complaints indicators ^

Indicator	Definition
IC9 —Number of drinking water quality complaints: water supply	The total number of complaints received by the service provider that relate to the quality of the drinking water supplied, including water quality complaints resulting from operational practices, during the reporting year (complaints).
C9 —Number of drinking water quality complaints per 1,000 properties: water supply	The average number of complaints received by the service provider , per 1,000 connected properties, that relate to drinking water quality, including water quality complaints resulting from operational practices, during the reporting year (complaints/1,000 properties).
IC10 —Number of drinking water service complaints	The total number of drinking water service complaints received by the service provider during the reporting year (complaints).
C10 —Number of drinking water service complaints per 1,000 properties	The average number of drinking water service complaints, per 1,000 connected properties, received by the service provider during the reporting year (complaints/1,000 properties).
IC11 —Number of wastewater service complaints	The total number of complaints received by the service provider that relate to wastewater service quality and reliability during the reporting year (complaints).
C11 —Number of wastewater service complaints per 1,000 properties	The average number of complaints received by the service provider , per 1,000 connected properties, that relate to wastewater service quality and reliability during the reporting year (complaints/1,000 properties).
IC12 —Number of drinking water and wastewater billing and account complaints	The total number of complaints received by the service provider that relate to drinking water and wastewater billing and accounts during the reporting year (complaints).
C12 —Number of drinking water and wastewater billing and account complaints per 1,000 properties	The average number of complaints received by the service provider , per 1,000 connected properties, that relate to drinking water and wastewater billing and accounts during the reporting year (complaints/1,000 properties).

Indicator	Definition
IC13—Total number of complaints	The total number of complaints received by the service provider during the reporting year (complaints).
^ Orange text denotes proposed changes to the indicator name and definition. Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

5.3 Affordability and hardship

Understanding affordability and how service providers respond to customers who face hardship (not only financial) informs an understanding of how they are connecting with and supporting their customers and community. Reporting on hardship practices promotes and drives good practices and supports transparency.

5.3.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 5-1

Table 5-4 – Propose affordability and hardship indicator/s

Indicator	Definition
##—Number of restrictions for non-payment of water bills in place for greater than 2 days (threshold to be tested)	The number of restrictions for non-payment of water bills in place for greater than 2 days (threshold to be tested)
##—Number of restrictions for non-payment of water bills in place for greater than 2 days (threshold to be tested) per 1,000 properties	The number of restrictions for non-payment of water bills in place for greater than 2 days (threshold to be tested) per 1,000 properties
##—Percentage of restriction resulting in legal action	The percentage of restrictions for non-payment of water bills in place for greater than 2 days that result in legal action
##—Number of customers enrolled in, or entering hardship programs	Number of customers enrolled in or entering hardship programs within the financial year
##—% in hardship program meeting instalment plans and/or successfully exited	The percentage of customers enrolled in a hardship program meeting instalment plans and/or successfully exiting the program within the financial year
##—Average water and wastewater bill as a percentage of average annual gross household income	Average water and wastewater bill as a percentage of average annual gross household income
^ Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

5.3.2 Matters considered and feedback received

Restrictions and legal actions for non-payment

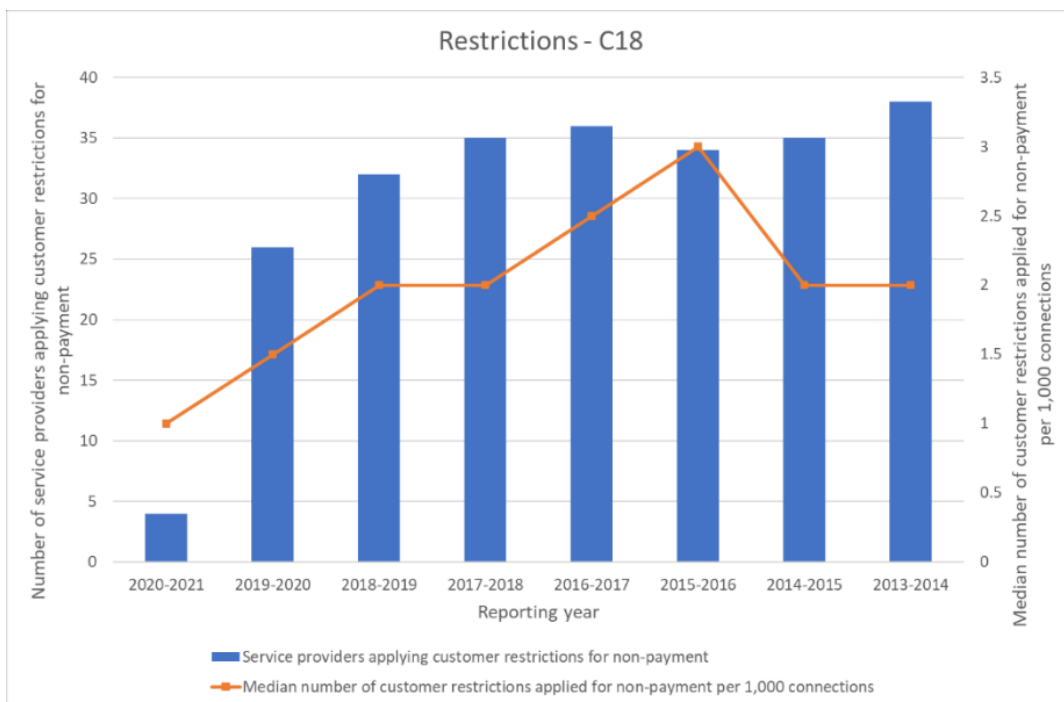
Restrictions and legal actions for non-payment are contested areas of reporting. Multiple Review respondents noted that customer restrictions for non-payment are no longer used in some jurisdictions. Others expressed the view that they are not an indicator of service provider

performance as they are typically an option of last resort for those who will not engage on payment issues.

Conversely, an analysis by the South Australian Council of Social Services (SACOSS, 2020)¹⁷ found, in South Australia, that higher usage of customer restrictions by minor and intermediate service providers, in comparison to that reported by SA Water for metro Adelaide, demonstrated water affordability issues in regional locations. SACOSS note that “*equity, compliance, and consumer protections, ... are a crucial part of the water affordability story*”.

In its exploration of restrictions and legal actions for non-payment the Review found that:

- An analysis of historical data, Figure 5-1 and Figure 5-2, show that while restrictions and legal actions for non-payment are still utilised by service providers, the last two years has seen a reduction in the number of service providers using them
- It is unclear if this trend is due to a systemic change in the use of these measures or a short-term shift in policies in response to the COVID-19 pandemic. In the case of restrictions for non-payment (C18), 19 service providers footnoted their 2020–21 data, stating a relaxation of the use of customer restrictions due to the pandemic. This is reflected in the observed decrease in both the number of service providers applying restrictions and the median number of restrictions applied
- In contrast, while the number of service providers taking legal action (C19) has reduced, the median number of legal actions taken increased in 2020–21.



¹⁷ South Australian Council of Social Service, 2020. Towards Equitable Access to Clean Water and Sanitation for All. SACOSS Discussion Paper August 2020

Figure 5-1 – Number of service providers reporting the use of customer restrictions for non-payment and the median ¹⁸ number of restrictions applied



Figure 5-2 – Number of service providers taking legal action for non-payment and the median ¹⁸ number of restrictions applied

The relevance and value of the proposed restrictions and legal actions indicators has been considered by the Review team along with the feedback received through the submissions, workshops, advisory panel and testing processes. The Review has found that:

- While it has been argued that restrictions and legal action are a measure of last resort, to drive customer engagement on payment matters where all other means have failed, their ongoing use suggests that service provider practices may not be consistent.
- The use of these measures by small and intermediate service providers in South Australian (SACOSS, 202) suggests that they are relevant to the less than 10,000 connected properties group being recommended for inclusion in the Framework
- Reporting on restrictions and legal actions is important for transparency and informs an understanding of customer and community outcomes—even if only to demonstrate a shift in industry practice
- The Victorian ESC collect and report on the total number of restrictions for non-payment and the percentage of restrictions removed within 3 days and those in place after 14 days. Similarly, OTTER collect data on the total number of customer restrictions for non-payment and the number removed within seven days.

¹⁸ The median shown is the median of the subset of service providers applying 1 or more restrictions for non-payment.

The Review's draft recommendations (HARC, 2021a) proposed:

- Retaining the customer restriction and legal action indicators with updated definitions
- The introduction of a two-day threshold for counting restrictions—The threshold seeks to exclude instances in which restrictions are used as a last resort to drive customers to engage on billing issues, focusing reporting on chronic non-payment matters.

Feedback and submissions on the draft recommendations were mixed. While WSAA noted that the introduction of a threshold addressed some of their concerns over the ongoing reporting of restriction and legal action data, other respondents were not supportive of their inclusion even with a threshold.

Conversely, the Western Australian Economic Regulation Authority (ERA) and DPIE stated that they do not support the introduction of a threshold for reporting. The positions of other jurisdictional entities were not expressed through the submissions, feedback and testing processes.

An additional issue raised by service providers was the inclusion of the proposed indicators under a hardship sub-theme. In the view of those raising this issue, restrictions and legal actions should be separated under a billing sub-theme and not conflated with a service provider's support for customer hardship.

Based on the feedback received a revised set of billing sub-theme indicators has been defined. These are:

- IC18— Number of restrictions for non-payment of bills
- C18—Number of restrictions for non-payment of bills per 1,000 properties
- CC_N1—Percentage of restriction for non-payment of bills removed within 3 days
- CC_N2—Percentage of restriction resulting in legal action.

These revised indicators adopt the approach used by the ESC and OTTER and separate reporting of a raw number of restrictions from a percentage removed within a given threshold. While a threshold of 3 days has been proposed to align with ESC reporting, there is an opportunity, through further national conversations, to adopt an agreed threshold that is consistent across jurisdiction and commonwealth reporting.

It is recommended that these revised indicators be put to the TGR and TAP for further comment and if supported adopted for reporting in the 2022–23 financial year.

Hardship programs

Hardship provisions seek to assist customers that are facing difficulties paying their water utility bills due to financial stress or other hardships. While the energy sector has been reporting data on retailer hardship programs for close to a decade it is not commonplace for Australian water utilities. Victoria and Tasmania have led the way on reporting hardship provisions, with the inclusion of Hardship indicators in their state performance reporting framework.

In considering the case for the inclusion of Hardship indicators the Review found:

- A common theme in the definition of hardship programs is that they seek to support customers who are willing but unable to pay their utility bill due to financial difficulties or other forms of hardship
- Hardship programs typically include payment plan programs to enable customers to pay down their debt over an extended period of time
- Reporting on hardship programs typically focuses on these payment programs and the number of customers enrolled in them
- In addition to providing transparency on the number of customers enrolled in hardship programs performance reporting often includes a quantification of the average debt of customers entering, and in some cases exiting, a hardship program.

The Review's draft recommendations (HARC, 2021a) proposed focusing Framework reporting on the number of customers entering and successfully exiting hardship programs.

Feedback and submissions to the Review demonstrated broad but not universal support for the inclusion of hardship indicators. The challenge of defining agreed indicators that will support nationally consistent reporting across jurisdictions was identified as a key issue.

Based on the feedback received from the TAP a revised set of indicators has been defined to

- ##—Number of customers on hardship program as of 1 July of the reporting year
- ##—Number of customers entering a hardship program during the reporting year
- ##—Number of customers exiting a hardship program during the reporting year
- ##—Percentage of customers in hardship program meeting instalment plans
- ##—Percentage of customers exiting a hardship program during the reporting year who did so successfully

It is recommended that the revised indicators be put to the TGR and TAP for further comment and if supported adopted for reporting in the 2022–23 financial year.

It is noted that the revised set of hardship metrics focuses on quantifying participation, successful or otherwise, in a service provider's hardship program. It does not, however, include any insight into the number of customers denied entry to a hardship program. In testing the revised set of indicators with the TAP and TRG the Bureau may wish to include a measure such as the number of customers denied entry to a hardship program during the reporting year.

Finally, participation is not the only measure of a hardship program's success. Customer debt is commonly used to gain insight into the success of hardship programs.

In testing the revised set of indicators with the TAP and TRG the Bureau may wish to include the following measure:

- The average debt upon entry into the hardship program
- The average debt upon exiting the hardship program.

Affordability

Feedback and submissions to the Review demonstrated broad support for the inclusion of affordability as a sub-theme. Understanding affordability can help service providers to identify and support customers experiencing financial stress and also be a driver for innovation.¹⁹

The assessment of water supply affordability features as a measure of Australia’s performance against Sustainable Development Goal (SDG) Number 6—Ensure availability and sustainable management of water and sanitation for all. Under this goal, SDG target 6.1 is: ‘By 2030, achieve universal and equitable access to safe and affordable drinking water for all.’

The draft recommendations (HARC 2021a) proposed the adoption of the average water and wastewater bill as a percentage of average annual gross household income as an indicator of affordability.

Feedback and submissions centred on two primary issues, differences in views on the best measure of affordability and the availability of data to support the reliable estimation of an affordability indicator.

- **Measures of affordability** – Affordability is typically expressed as the ratio of costs to an income metric. The draft recommendations (HARC, 2021a) proposed average water and wastewater bills as a percentage of average annual gross household income as an indicator of affordability.

Submissions and feedback made in response to the Draft Report highlighted differing views on the income measure that should be adopted. Disposable income, measuring the actual purchasing power of a customer, was put forward as a preferable basis for calculating affordability. It is noted that disposable income is used by the Monash Sustainable Development Institute (MSDI) for reporting on progress on SDG 6.²⁰ Disposable income was also used by Yarra Valley Water in an analysis of their bill affordability.¹⁹

In addition to disposable income, feedback suggested that reliable estimation of affordability requires a more nuanced analysis that looks at those below the average income. In early work on an indicator of affordability for measuring SDG target 6.1 the National Sustainable Development Council looked at affordability across each disposable income quintiles (The National Sustainable Development Council, 2018).

- **Data availability** – While definitional arguments are important, data availability is a more fundamental issue for the inclusion of an affordability indicator in the Framework.

Responses to the Draft Report (HARC, 2021a) echo the views expressed by Pamminer et al.¹⁹ who note that while conceptually simple, calculating affordability is complicated by the availability of the required data. Service providers have access to household bill information but income data must be sourced externally and is not

¹⁹ F Pamminer, P Greenwood, L Morandini, R Sinnott. *Water e-Journal* Vol 4 No 4 2019. *Driving innovation by measuring affordability*. water-e-journal, Australian Water Association, 10 Jan 2020, Vol 4. No. 4 2019.

²⁰ Monash Sustainable Development Institute. 2020. *Transforming Australia: SDG progress report 2020 update*. Melbourne: Monash University.

readily available at a spatial or temporal scale that supports an annual estimation of affordability.

The Australian Bureau of Statistics (ABS) publishes total and disposable income data as part of its biennial Survey of Income and Housing (SIH). However, the lowest geographic level at which this data is available is as a split between “Greater Capital Cities” and the “Rest of State”. This resolution, the data’s biennial collection and a 12 month lag between collection and publication render the SIH data unsuitable for the estimation of an annually estimated affordability indicator.

Median and average income data are available for the smaller SA2 ABS statistical unit (typically between 2,000 to 25,000 people). However, this data is derived from the National Census and as such is only collected every five years, again rendering it unsuitable for the estimation of annual an affordability indicator.

Pamminger et al. ¹⁹ present a methodology for modelling disposable income based on ABS and other third party data. However, while this methodology was successfully applied by Yarra Valley Water it is the opinion of the Review team that its broader application would be challenging for many of the service providers reporting to the Framework.

Given the absence of accessible and timely data on household income measures, there is no straightforward pathway for the inclusion of an explicit affordability metric in the revised Framework. Therefore, it is recommended that the proposed affordability metric not be included in the revised Framework at this time.

However, given the importance of, and interest in, affordability as an issue, it is suggested that consideration be given to how an affordability analysis using census data might be incorporated into the written performance reports, currently produced by the Bureau. The timing of census data collection and release will mean that such an analysis would not take place annually, however, feedback through the Review has demonstrated that this type of analysis would be highly valued by users. There is an opportunity for the Bureau to partner with subject matter experts, such as the ABS, to produce this type of analysis.

The Review recommends the exploration of this pathway as part of a future review of the written Part A – National performance report.

5.3.3 Recommendations

It is recommended that separate billing and hardship sub-themes be included in the customer and communities theme and that the proposed indicators detailed in Tables 4-5 and 4-6 be adopted as the basis for reporting, subject to further feedback from the TAP and TRG.

Table 5-5 – Recommended billing indicators ^

Indicator	Definition
IC18— Number of restrictions for non-payment of water accounts	The number of restrictions applied to residential and non-residential customer’s water supply services for non-payment of water accounts during the reporting year (restrictions)

C18 —Number of restrictions for non-payment of water accounts per 1,000 properties	The number of restrictions applied to residential and non-residential customer's water supply services , per 1,000 connected properties, for non-payment of water accounts during the reporting year (restrictions per 1,000 properties)
CC_N1 —Percentage of restriction for non-payment of water accounts removed within 3 days	The number of restrictions applied to residential and non-residential customer's water supply services, for non-payment of water accounts during the reporting year, that were removed within 3 business days (%)
CC_N2 —Percentage of restriction for non-payment of water accounts resulting in legal action	The percentage of restrictions applied to residential and non-residential customer's water supply services during the reporting year that resulted in legal action (%)
^ Orange text denotes proposed changes to the indicator name and definition. Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

Table 5-6 – Recommended hardship indicators ^

Indicator	Definition
CC_N3 —Number of residential customers on a hardship program as of 1 July of the reporting year	The number of residential customers on a hardship program, offered by the service provider, as of 1 July of the reporting year (customers)
CC_N4 —Number of residential customers entering a hardship program during the reporting year	The total number of residential customers entering a hardship program offered by the service provider, during the reporting year (customers)
CC_N5 —Number of residential customers exiting a hardship program during the reporting year	The total number of residential customers exiting a hardship program, offered by the service provider, during the reporting year (customers)
CC_N6 —Percentage of residential customers in hardship program who met their instalment plan	The percentage of residential customers in a hardship program, offered by the service provider, who meet their instalment plan during the reporting year (%)
CC_N7 —Percentage of residential customers successfully exiting a hardship program during the reporting year	The percentage of residential customers in a hardship program, offered by the service provider, who successfully exited the program during the reporting year (%)
^ Orange text denotes proposed changes to the indicator name and definition	

5.3.4 Unresolved questions and the pathway forward

Hardship

In a discussion of proposed hardship indicators ²¹, the Australian Energy Regulator (AER) notes that assessing the impact of a service provider hardship policy is complex because many external factors influence customer hardship, in particular, general economic and employment conditions as well as the personal circumstances of the customer.

²¹ Australian Energy Regulator, 2010. *Developing National Hardship Indicators Issues Paper*, AER, Canberra

If the recommendation to include the hardship indicators is adopted, the Bureau will need to consider if and how they will be presented in the Part A report and appropriately contextualised given the difference in hardship policies that exist across jurisdictions.

5.4 Engagement

Engagement underpins a service provider's understanding of customer and community expectations and preferences. Measuring and reporting on engagement can identify good practices for service providers and inform regulatory processes and policy development.

5.4.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 5-7.

Table 5-7 – Propose engagement indicators

Indicator	Definition
##—Engagement with customers to understand preferences and priorities for service delivery	The service provider is undertaking engagement activities to identify customer preferences and priorities that are being used to inform decisions on service delivery and pricing
##—First nations engagement	The service provider operates dedicated first nations engagement activities or programmes

5.4.2 Matters considered and feedback received

In considering the inclusion of an engagement sub-theme the review found that:

- Identifying meaningful, nationally consistent indicators of engagement is challenging because of the individual nature of engagement programs
- Despite this challenge, engagement received support from early Review submissions with feedback demonstrating interest in understanding the adoption of best practice engagement in establishing customer preferences
- Understanding service providers' engagement with First Nations peoples was seen as a gap in existing knowledge and a potential indicator of awareness of First Nations issues and inclusive decision making—which in turn, could provide a lead indicator of improved outcomes for First Nations people.²²

Responses to the draft recommendations (HARC, 2021a) were mixed, with the balance of feedback received not in favour of the proposed engagement indicators or the sub-theme itself.

For example, in its submission, the WSAA notes that:

- Engagement does not lend itself to reporting against indicators. While many utilities have measures of success for individual engagement programs they are difficult to measure consistently across service providers

²² This view was informed by discussions with the Committee on Indigenous Water Issues (CAWI).

- Consequently measuring engagement is better suited to a maturity assessment framework or similar that provides principle-based guidance on its assessment
- Concerning First Nations engagement, while the development of a Reconciliation Action Plan (RAP) could be adopted as a partial indicator of performance it does not measure the development of enduring relationships and improved outcomes for First Nations people.

In response to the issues considered and the submissions and feedback received the Review team have taken the view that engagement, as a sub-theme, should not be included in the revised Framework. This view is based on the identified challenges of defining meaningful, nationally relevant engagement indicators and the absence of a clear use case or value for their collection.

5.5 A summary of the customers and communities theme pathway

The following summary presents the changes recommended under the customer and communities theme. It is recommended that:

- A cross-jurisdictional agreement be sought on a national customer satisfaction survey and that this agreement includes a commitment to ongoing funding—It is suggested that this be raised for consideration through a suitable national forum, such as the UWRC
- The supported water quality complaints indicators IC9, C9 be retained with updated definitions and supporting notes
- The existing IC10, C10, IC11, C11, IC12, C12 and IC13 complaints indicators be retained with updated definitions and supporting notes for the 2022–23 reporting year
- In parallel continue work with the TAP, policy agencies, regulators and ombudsmen offices to explore the unresolved basis of complaint reporting
- The existing indicator C14, percentage of calls answered by an operator within 30 seconds, be retired
- The existing customer restrictions indicators IC18 and C18 be retained, with updated definitions and supporting notes that address, as part of a billing sub-theme
- Two new indicators capturing the percentage of customer restrictions removed within 3 days and the percentage of customer restrictions resulting in legal actions be included in the Billing sub-theme—as defined in Table 5-5
- Four new indicators capturing participation in service provider hardship programs be included in a Hardship sub-theme—as defined in Table 5-6

Table 5-8 summarises the final indicator recommendations for the customer and communities theme along with updated recommendations on the service providers who should report them. The updated reporting requirements are based on feedback from the Technical Advisory Panels as well as feedback from the indicator testing activity (Deliverable 8).

Table 5-8 – Recommended customer and community indicators ^

	Indicator	<10,000	>10,000	Bulk
Customer perceptions	##—Customer perceptions: value for money		†	
	##—Customer perceptions: reputation in the community		†	
	##—Customer perceptions: level of trust		†	
	##—Customer perceptions: value for money		†	
Complaints	IC9—Number of drinking water quality complaints: water supply	✓	✓	
	C9—Number of drinking water quality complaints per 1,000 properties: water supply			
	IC10—Number of drinking water service complaints	✓	✓	
	C10—Number of drinking water service complaints per 1,000 properties			
	IC11—Number of wastewater service complaints	✓	✓	
	C11—Number of wastewater service complaints per 1,000 properties			
	IC12—Number of drinking water and wastewater billing and account complaints	✓	✓	
	C12—Number of drinking water and wastewater billing and account complaints per 1,000 properties			
	IC13—Total number of complaints	✓	✓	
Billing	IC18—Number of restrictions for non-payment of water bills	✓	✓	
	C18—Number of restrictions for non-payment of water bills per 1,000 properties			
	CC_N1—Percentage of restriction for non-payment of water bills removed within 3 days	✓	✓	
	CC_N2—Percentage of restriction for non-payment of bills resulting in legal action	✓	✓	
Hardship	CC_N3—Number of residential customers on a hardship program as of 1 July of the reporting year		✓	
	CC_N4—Number of residential customers entering a hardship program during the reporting year		✓	
	CC_N5—Number of residential customers exiting a hardship program during the reporting year		✓	
	CC_N6—Percentage of residential customers in hardship program who met their instalment plan		✓	
	CC_N7—Percentage of residential customers successfully exiting a hardship program during the reporting year		✓	
<p>^ Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.</p> <p>† Final threshold for inclusion will be subject to a jurisdictional agreement on the funding of the customer perceptions survey</p>				

6. Asset and operations indicators

The existing Framework has [13 customer indicators](#) (10 reported and 3 derived). These indicators provide insight into:

- The water supply and wastewater assets owned or operated on behalf of service providers
- Breaks, bursts, leaks and chokes in the mains and property connections
- Losses from the potable supply system.

In considering the asset indicators the Review found that:

- There is strong support for the assets theme and related indicators which are valued by users of the Framework
- While there are definitional issues with the existing indicators, these are seen as resolvable
- There is support for moving information about the assets owned or operated on behalf of service providers to a contextual information theme
- There is support for the collection of data on asset ages and conditions, which is seen as a gap in the Framework
- Understanding performance on asset management could provide leading insight into the outcome areas recommended for the Framework
- Operational staff capacity, especially for smaller regional service providers, is seen as a key risk for the delivery of safe and secure water and wastewater services—consequently, there is support for the inclusion of operational staff capacity indicators.

In response, the Review's draft recommendations (HARC, 2021a) proposed:

- The existing Assets theme be renamed "Assets and operations" to accommodate a broader scope of sub-themes and performance indicators
- The Assets and operations theme be defined as information and data informing an understanding of infrastructure planning, management and operation and resource planning and risk management
- Moving the asset inventory indicators A1, A2, A3, A4, A5 and A6 to the contextual information theme
- Retaining the water losses sub-theme and indicators A9, A10, A11
- Retaining the water and wastewater breaks and chokes indicators (IA8, A8, A14 and A15) under a reliability sub-theme
- Moving and modifying the service interruptions indicators C15, IC17 and C17 from the Customer theme to the reliability sub-theme
- The addition of asset-age and condition and staff capacity sub-themes and indicators.

The following discussion of the proposed sub-themes draws the detailed indicator insights and issues raised across the course of the Review together with the feedback received and submissions made in response to the Draft Report (HARC, 2021a). It provides a summary of what was proposed in the draft recommendations, what has been considered in the course of the Review, recommendations on the way forward, and unresolved matters.

6.1 Reliability

Collecting and reporting on asset reliability provides a lead understanding of water efficiency and affordability outcomes and, in turn, customer, community and liveability outcomes.

6.1.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 6-1

Table 6-1 – Propose reliability indicator/s ^

Indicator	Definition
IA8 —Number of water main breaks, bursts and leaks	The number of water main breaks, bursts, and leaks in the water distribution and reticulation mains during the reporting year (mains breaks).
A8 —Number of water main breaks, bursts and leaks, per 100 km of water mains	The total number of water main breaks, bursts, and leaks per 100km of water distribution and reticulation mains during the reporting year (mains breaks/100 km).
A14 —Number of sewer mains breaks and chokes per 100 km	Sewerage mains breaks and chokes (no per 100km sewer main)
A15 —Number of property connection sewer breaks and chokes per 1,000 properties	Property connection sewer breaks and chokes (no per 1000 properties)
## —Percentage of properties that experience more than 1 unplanned interruption in the last 12 months	The percentage of the service providers connected properties that experience more than 1 unplanned interruption in the last 12 months (%)
## —80th percentile duration of an unplanned interruption	The 80th percentile duration of an unplanned interruption
^ Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

6.1.2 Matters considered and feedback received

The reliability sub-theme was recognised as relevant and important for the Framework. The proposed indicators were broadly supported by Review respondents, including those responding to the Draft Report (HARC, 2021a).

The following summaries present the matters considered, feedback received and the proposed way forward.

Level of services

Customer standards level of service (LOS) reflect standards about the reliability of service delivered to customers. Importantly they are distinct from water security levels of service which reflect the accepted frequency and severity of supply restrictions.²³

Early feedback to the Review identified interest in, and support for, the inclusion of reporting on agreed service levels and targets. A number of respondents noted the link between such reporting and the Framework's scope under its founding National Water Initiative clause, Clause 75.²⁴

"75. The States and Territories will be required to report independently, publicly, and on an annual basis, benchmarking of pricing and service quality for metropolitan, nonmetropolitan and rural water delivery agencies."

In considering the inclusions of agreed service levels and targets the Review found:

- Despite being one of eight National Urban Water Planning Principles adopted by the Council of Australian Governments (COAG) in 2008, the delivery of urban water supplies in accordance with agreed levels of service is yet to be established as a uniform national practice.²⁵

For example, in South East Queensland service standards are set in accordance with the South East Queensland Customer Water and Wastewater Code.²⁶ Under the Code, South East Queensland service providers are required to specify Key Performance Indicators (KPIs) for line breaks, unplanned interruptions, pressure and flow rates, and response times. In contrast, the WA Water Corporation's Customer and Service Commitments²⁷ establishes standards for water pressure and flow but only commits to "making every effort" to minimise planned and unplanned interruptions without establishing KPIs or standards

- The difference in jurisdictional approaches to setting service levels means that comparison of performance across jurisdictions on levels of service and KPIs is not possible.

In response, the draft recommendations (HARC, 2021a) proposed that the Framework retain its focus on the aspects of service levels that are meaningfully comparable, such as specific aspects of reliability.

²³ Killen, A, 2019. Water security levels of service, Water e-Journal Vol 4 No 1 2019, Australian Water Association

²⁴ Council of Australian Governments (COAG), 2004. Intergovernmental Agreement on a National Water Initiative. <http://www.agriculture.gov.au/SiteCollectionDocuments/water/Intergovernmental-Agreement-on-a-national-waterinitiative.pdf> – accessed 02/02/2022.

²⁵ Department of the Environment, 2015. Review of the National Urban Water Planning Principles – Final Report, Department of the Environment, Canberra.

²⁶ DEWS. 2017. South East Queensland Customer Water and Wastewater Code. Department of Energy and Water Supply (DEWS), QLD Government, Brisbane, QLD, Australia.

²⁷ Water Corporation, 2022, Customer & service commitments. <https://www.watercorporation.com.au/About-us/Our-commitments/Customer-and-service-commitments> Accessed 20/02/2022.

Submissions and feedback received in response to the Draft Report (HARC, 2021a) supported the inclusion of reliability indicators and reinforced their value to stakeholders

Defining indicators of reliability

In considering the definition of reliability indicators the Review explored the extent and basis of reliability indicators reported across jurisdictions. Table 6-2 presents a summary of the generalised format of reliability indicators used across jurisdictions (Appendix B tabulates the actual reliability indicator used across all state and territory performance reporting frameworks).

The Review found:

- While there are core themes, i.e., breaks, breaks and chokes, planned and unplanned interruptions, blockages and spills, not all jurisdictions report on all themes. Furthermore, where jurisdictions report on a theme there is little consistency in the indicators/measures used to measure performance (beyond those included in the NPR)
- The expression (e.g., number, percentage), scope (e.g., all or only residential customers), and thresholds (e.g., of or greater than a given number or time period) used in the definition of indicators varies significantly across jurisdictions
- The exception to these observations is for the following indicators, which are, by and large, common across jurisdictions as well as the Framework.
 - › The number of water main breaks—No. and No. per 1,000 properties
 - › The number of unplanned interruptions—No.
 - › The average duration of unplanned interruptions—minutes
 - › The number of sewer main breaks and chokes—No. per 1,000 properties
 - › Property connection sewer breaks and chokes—No. per 1,000 properties
- There is support for the inclusion of new indicators to address the gaps in reliability reporting, i.e., planned interruption, blockages and spills, however, there are differences of opinion on the expression, scope and thresholds that should be adopted.

In response, the draft recommendations (HARC, 2021a) proposed that the Framework:

- Retain its water and sewer breaks and chokes indicators—Table 6-1
- Retain but modify the definition of its unplanned interruptions indicators to introduce a threshold—Table 6-1.

Feedback received on the draft recommendations indicates that there remains a diverse set of views on the appropriate expression, scope and thresholds of reliability indicators and that there is further work needed to arrive at a consensus supported set of reliability indicators.

Table 6-2 – Generalised reliability indicators by jurisdiction

System	Reliability indicator	Generalised indicator	Used in
Water Supply	Mains breaks	Number of breaks	All except ACT
		Response time	Vic, SA
		Rectification time	Vic
	Planned interruptions	Number unplanned interruptions	Vic, Tas, SA, ACT
		Average duration	Tas, ACT
		Number of interruptions exceeding Y hours	Vic
		Number of customers experiencing X interruptions that last more than Y hours	Vic
		Number and percentage of interruption restored within Y hours	Vic, Tas
		Number of planned residential interruptions during peak hours	Vic
		Number of premises not given at least 2 business days' notice of a planned interruption to water supply	ACT
	Unplanned interruptions	Number unplanned interruptions	All
		Average duration	All
		Number of customers/properties experiencing X interruptions or greater than X interruptions	NSW (IPART), Vic, Tas, ACT, SA
		Number of interruptions exceeding Y hours	Vic
		Number of customers experiencing X interruptions that last more than Y hours	Vic, NSW (IPART), ACT
		Number and percentage of interruption restored within Y hours	Vic
	Combined planned and unplanned interruptions	Planned water interruptions or unplanned water interruptions which taken together have a cumulative duration exceeding X hours	NSW (IPART)
	Service standards	Number of properties that experience a water pressure failure (as defined a license or standard)	NSW (IPART)
		Percentage of water service incident responses that met customer service standards or targets	Qld

System	Reliability indicator	Generalised indicator	Used in
Sewerage	Breaks, chokes etc.	Number of breaks chokes – Total / Gravity (reticulation) / Rising (pressure) main	All
		Number property connection sewer breaks and chokes	NSW (LWU)
	Blockages, spills and overflows	Number of customers experiencing X or greater than X sewer blockages	Vic
		Total minutes to respond to reported sewer blockage/spill	Vic, Tas
		Number of sewage spills from reticulation and branch sewers fully contained within Y hours	Vic
		Number and percentage of sewage spills from reticulation and branch sewers contained within Y hours	Vic, Tas
		Number of properties subject to X or greater than X uncontrolled wastewater overflows	NSW (IPART)
		Number of sewer spills within a house	Vic, SA
	Interruptions	Number of unplanned interruptions to sewerage service	SA, ACT
		Number of properties / residential properties sewer customer interruptions restored within X hours	Vic, SA, ACT
	Service standards	Percentage of sewerage incident responses that met customer service standards or targets	Qld

6.1.3 Recommendations

It is recommended that the Bureau retain the existing reliability indicators IA8, A8, A14, A15, C15, IC17 and C17 (Table 5-3) with clarified definitions as the basis for the 2022–23 reporting year and continue to work with the TAP, TRG as well as jurisdictional policy agencies, regulators and service providers to develop an agreed set of nationally consistent reliability metrics.

Table 6-3 – Recommended reliability indicator/s

Indicator	Definition
IA8 —Number of water main breaks	The number of water main breaks (i.e., bursts and leaks) in the service providers drinking and non-drinking water, excluding recycled water, distribution and reticulation mains during the reporting year (mains breaks)
A8 —Number of water main breaks per 100 km of water mains	The number of water main breaks (i.e., bursts and leaks) per 100km of the service providers drinking and non-drinking water, excluding recycled water, distribution and reticulation mains during the reporting year (breaks/100 km of water main)
A14 —Number of sewerage mains breaks, leaks and chokes per 100 km of sewerage mains	The number of sewerage main breaks, leaks and chokes in the service provider's sewerage network during the reporting year (breaks, leaks and chokes/100 km main).
A15 —Number of property connection sewer breaks, leaks and chokes per 1,000 properties	The number of residential and non-residential property connection breaks, leaks and chokes in the service provider's sewerage network during the reporting year (breaks, leaks and chokes/1,000 properties) .
C15 —Average duration of an unplanned interruption: drinking water supply	The average duration that customers, residential and non-residential, are without drinking water due to an unplanned supply interruption during the reporting year (minutes).
IC17 —Number of unplanned interruptions: drinking water supply	The number of residential and non-residential customers affected by unplanned drinking water supply interruptions, during the reporting year (interruptions).
C17 — Number of unplanned interruptions per 1,000 properties: drinking water supply	The number of residential and non-residential customers affected by unplanned drinking water supply interruptions per 1000 properties, during the reporting year (interruptions/1,000 properties).
Orange text denotes proposed changes to the indicator name and definition. Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

6.1.4 Unresolved questions

An agreed basis for reporting on network and service reliability remains unresolved at the end of this Review.

Variability in the expression, scope and thresholds of jurisdictional reliability metrics is a barrier to the national consistency sought by the Framework. It is also a clear example of the increased reporting effort that is created when reporting is not aligned and service providers are required to report on different indicators of the same performance dimension.

It is the view of the Review team that the development of nationally consistent reliability metrics needs to be undertaken in partnership with the jurisdictions and their regulatory agencies and that an agreed basis for reporting should be adopted across all jurisdictions.

It is not the expectation that all jurisdictions would adopt a single set of indicators, rather it is proposed that a single set of consistently defined core reliability metrics be developed that can be augmented as required by jurisdictions based on their individual needs.

In part, this core set exists with respect to water main breaks, sewer main breaks and chokes and unplanned interruptions. However, discrepancies in definitions across jurisdictions and/or the absence of a clear statement of equivalence cause interpretation issues for service providers and data users and result in data quality issues that impact the value of comparative performance assessments.

Table 6-4 present a proposed starting point for this further engagement based on a combination of areas of existing commonality and industry best practice.

Table 6-4 – Proposed basis for a core set of nationally consistent reliability metrics

System	Reliability indicator	Generalised indicator
Water Supply	Mains breaks	Number of mains breaks
	Planned interruptions	Number of customers experiencing X interruptions that last more than Y hours
	Unplanned interruptions	Number unplanned interruptions
Number of customers experiencing X interruptions that last more than Y hours		
Sewerage	Breaks, chokes etc.	Number of sewer mains breaks chokes
		Number property connection sewer breaks and chokes
	Blockages, spills and overflows	Number of customers experiencing X or greater than X sewer blockages
	Unplanned interruptions	Number of unplanned interruptions to sewerage service
Number of customers experiencing X interruptions that last more than Y hours		

6.2 Losses

Measuring and reporting on water supply system losses provides insight into a service provider’s network condition and informs an understanding of efficiency and affordability outcomes.

6.2.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 5-1

Table 6-5 – Proposed water loss indicators

Indicator	Definition
A9 —Infrastructure leakage index (ILI)	The ratio of the utility’s current annual real losses (CARL) to the unavoidable annual real losses (UARL) within the potable water supply system during the reporting year.

A10 —Real losses: service connections	The average volume of leakage and overflow from the utility's potable water supply mains and service reservoirs per service connection during the reporting year (L/service connection/ day).
A11 —Real losses: water mains	The average volume of leakage and overflow from the utility's potable water supply mains and service reservoirs per kilometre of water mains during the reporting year (kL/km water supply main/day).

6.2.2 Matters considered and feedback received

The loss sub-theme and potable supply system loss indicators were supported by Review respondents, including those responding to the *Draft recommendations report* (HARC, 2021a).

The following summaries present the matters considered, feedback received and the proposed way forward.

Relevance of the proposed loss indicators

While the proposed indicators were recognised as relevant by Review respondents, the most appropriate measure of losses was contested. While a number of large SOCs were supportive of the Infrastructure leakage index (ILI), due to its broad international acceptance and role as one of the Frameworks few genuine benchmarking indicators, the ILI is not always an effective measure for smaller service providers.

The ILI is the ratio of current annual real losses (CARL) to Unavoidable Annual Real Losses (UARL). The calculation of UARL relies on a fitted multivariate regression model to estimate the lowest technically achievable annual real losses based on a system's mains length, number of service connections, customer meter location and average operating pressure. Importantly the ILI relies on the assumption that the assets are in good condition. ²⁸

Ongoing research into the reliability of UARL estimates has resulted in a series of revisions to the recommended thresholds for its application with current advice suggesting caution and potential use of a correction factor for systems with less than 5,000 service connections and or average pressures less than 45m and greater than 60m. ²⁸

Consequently, the Review finds that the ILI indicator should only be reported in instances where the system for which the ILI is being calculated meets the applicability thresholds.

Definitional issues

Review respondents identified several definitional issues, particularly with respect to the supporting notes provided to aid interpretation and understanding: These were:

- Clarification on the losses to be included in A10 and A11
- Guidance on the use of non-standard parameters in the estimation of CARL
- Clarification on the scope of the indicators in the indicator name
- Guidance of the applicability of indicators for service providers with multiple schemes

²⁸ The LEAKsuite Library, 2022. Unavoidable Annual Real Losses & Infrastructure Leakage Index, How Low Could You Go? <<https://www.leakssuitelibrary.com/uarl-and-ili/>> Accessed 22 February 2022

These issues have been addressed in the revised definitions and supporting notes developed by the Review team.

Simplifying the derivation of A10 and A11

Feedback to the Review suggested separating the number of service connections into its own contextual information indicator to allow service providers to report real losses as a total volume and enable A10 and A11 to be calculated as derived indicators using the service connections and network length indicators.

Revisions to the definitions of indicators A10 and A11 have included advice to service providers with multiple schemes to limit the scope of their reporting to major towns. This advice was part of the original handbook definitions but omitted in the 2017 revision.

Given that contextual information is required for all schemes there are instances where the exclusion of smaller towns from the estimation of A10 and A11 would mean that derivation using contextual indicators would not be possible.

Consequently, the Review finds that this proposed change would not deliver the desired simplification and should therefore not be adopted. It is however recommended that going forward the systems, as well as the network length and the number of service connections, be included in the footnotes provided by service providers when reporting A10 and A11.

6.2.3 Recommendations

It is recommended that:

- A water losses sub-themes be included in the assets and operations theme and existing indicators A9, A10 and A11 be retained with updated definitions and supporting notes that address the issues raised in the course of the Review—Table 6-6.

Table 6-6 – Recommended water loss indicators

Indicator	Definition
A9 —Infrastructure leakage index (ILI): drinking water supply system	The ratio of the current annual real losses (CARL) to the unavoidable annual real losses (UARL) for the service provider's drinking water supply system .
A10 —Real losses, per service connection , from the drinking water supply system	The volume of real losses from the service provider's drinking water supply system during the reporting year, in litres per service connection per day (L/service connection/d) .
A11 —Real losses, per kilometre of water main, from the drinking water supply system	The volume of real losses from the service provider's drinking water supply system during the reporting year, in kilolitres per kilometre of water main per day (kL/km water main/d) .

[^] Orange text denotes proposed changes to the indicator name and definition.

6.3 Staff capacity

Staff capacity indicators provide insight into the resourcing and levels of training and qualifications of operators and other key technical staff within utilities, and will also identify skill and training gaps and operational risks. Measuring and publicly reporting on staff capacity can

help identify benchmarks and support the assessment of policy, while also informing regulatory decisions and policy development.

6.3.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 5-1.

Table 6-7 – Propose staff capacity indicators

Indicator	Definition
##— Staffing levels (total FTEs, FTEs by certified operator levels)	The average number of fully qualified full-time equivalent water treatment plant operators employed by the service provider during the reporting year (FTE)
##—Average number of training hours per key plant operator at a certified level	The average number of training hours per fully qualified full-time equivalent water treatment plant operator employed by the service provider during the reporting year (hrs/FTE)

6.3.2 Matters considered and feedback received

The acknowledged skills shortage in the Australian water industry^{29, 30} was identified by Review respondents as an important issue impacting service provider risks and performance, particularly for small and regional service providers.

In considering the inclusion of staffing indicators the Review found:

- Queensland, New South Wales³¹ and Victoria collect workforce data through their state-based performance reporting schemes—It is noted, however, that general workforce data is often also published as part of annual reports and/or collected through other state and territory reporting processes
- Of these three jurisdictions, only New South Wales collects data beyond general workforce numbers (full-time equivalents). Data collected by New South Wales includes the number of “qualified” water treatment and sewage treatment plant “operators”, the number of staff undertaking operator training, and the number of operators receiving 2 or more training days
- While not the view of all respondents, total workforce numbers were seen by many to provide little insight into service provider performance or risk.

In response, the Draft recommendations report (HARC, 2021a) proposed two new staff capacity metrics focusing specifically on operator numbers and operator training.

²⁹ Water Industry Operator Certification Taskforce, 2019. *Water Industry Operator Certification Framework 2018: Drinking Water Wastewater Recycled Water*, WIOA.

³⁰ Queensland Water Directorate, 2020. *Snapshot of the Queensland urban water industry 2020*, Queensland Water Directorate, Brisbane.

³¹ Not including IPART regulated entities.

The proposed indicators received mixed support from review respondents. Treatment plant “operator” numbers and training were seen as more insightful indicators of performance and risk, however, questions were raised with respect to the value of these indicators for larger state-owned water corporations.

More fundamentally, feedback and discussion with key industry stakeholders highlighted the significant challenges that exist with respect to the definition of meaningful, nationally comparable indicators. In particular:

- The absence of a nationally consistent definition of an “operator”
- The absence of a nationally consistent framework for operator accreditation and training
- The need to contextualise staff capacity and training data with an understanding of the differences in the operator competencies and resources required for different treatment plants.

6.3.3 Unresolved questions and the pathway forward

Given the issues raised and the feedback received the way forward on staff capacity indicators remains unclear and the inclusion of staff capacity indicators is not recommended at this time.

Despite this, understanding performance issues and risks arising from staff capacity issues is seen as an important gap in current understanding. However, before nationally relevant indicators can be defined there is a need for greater consistency across jurisdictions or the adoption of a national framework for training and accreditation. Such reform needs to be pursued through an appropriate national body such as the UWRC.

The Water Industry Operator Certification Framework (Operator Certification Framework), developed by the Water Industry Operator Certification Taskforce²⁹ provides one possible pathway forward. While the Operator Certification Framework is currently voluntary, it has broad membership and a comprehensive database of registered plant operators and their qualifications, contextualised with information on service provider schemes.

Initial discussions with the Taskforce’s Secretariate have highlighted a willingness to engage on a pathway forward for meaningful national reporting on staff capacity issues.

Separate to the Operator Certification Framework, the New South Wales Town Water Risk Reduction Program has engaged an external consultant to explore the definition of operator resourcing requirements and competencies for categories of schemes across regional NSW. If successful this work may be able to be leveraged by other jurisdictions to support nationally consistent reporting of staff capacity issues. It is suggested that the Bureau of Meteorology seek an update on this work upon its completion in 2022.

6.4 Age and condition

Information on the age and condition of a service provider’s assets can provide a lead indication of reliability and service level risks as well as provide contextual information to aid in the understanding of maintenance costs and/or capital expenditure.

6.4.1 Proposed indicator/s

Recognising the need to develop asset age and condition reporting requirements in partnership with the sector the Review has not sort to recommend specific indicators at this stage, rather it has begun an exploration that can be built on overtime to define relevant, values and enduring indicators.

6.4.2 Matters considered and feedback received

Feedback from policy agencies and technical regulators identified the need and value of better understanding:

- the asset bases of urban water service providers
- how effectively those assets are being managed
- the risk of governments needing to intervene/fund new assets, as well as the maintenance, renewal and upgrade of existing assets

In considering the inclusion of an asset age and condition sub-theme and indicators the Review found:

- Asset age and condition reporting was supported by review respondents and broadly recognised as a gap in the data collected by the Framework
- Asset age and condition indicators should be part of broader reporting changes that seek to inform an understanding of the following outcomes:
 - › Service providers are operating under sound asset management framework/s
 - › Maintenance and renewal investment is keeping pace with asset deterioration (i.e. an agreed level of service is likely to be maintained)
 - › Upgrade and new infrastructure investment is keeping pace with growth
 - › Service reliability and efficiency can be understood in the context of asset condition
- Structural, legislative and policy differences within and between jurisdictions are key considerations in the development of nationally relevant and valued indicators. For example, differences in the financial management and regulation of SOC utilities and local government based service providers result in different operating environments which in turn influence asset management decisions and outcomes. These differences will need to inform both the development of indicators and how performance data is presented and interpreted

In considering how asset age and condition reporting might be included in the Framework and what the scope of the indicators should be the Review found that:

- The key considerations for the development of asset age and condition reporting are:
 - › **The methodology/s to be adopted for classifying asset condition**—There is no national standard for classifying asset condition and, therefore, the national comparability of any data collected could be an issue. There are, however, methodologies that are accepted as good practice, for example, the methodology

set out in the International Infrastructure Management Manual (IIMM)³²—New Zealand’s water utility performance and benchmarking framework addresses this issue by collecting data on the assessment methodology used by utilities.

- › **The age metric to be adopted**—While the actual age of assets is typically well documented, the effective age, where assessed, is seen as more valuable as it provides insight into the assets remaining useful life. However, feedback from service providers suggests that effective age assessments are not undertaken by all service providers and where such assessments are completed they are not done on an annual basis, in part due to their cost.
- › **The scope of the assets to be assessed**—Service providers own and operate a broad range of assets. Age and condition indicators will need to explicitly define the class or classes of assets for which reporting should occur. For example, New Zealand’s water utility performance and benchmarking framework reports on asset condition, separating assets based on those above and below ground.
- › **Data quality**—Feedback from the asset TAP members indicates that the quality of condition assessment data varies widely. The National State of the Assets survey (discussed below) addresses this issue by asking respondents to not only provide a condition assessment but to also provide additional metadata on the confidence in the assessment.
- › **The cost of data collection for service providers**—Feedback from asset TAP members indicate that the cost of asset age and condition data collection would likely be material even for large SOCs. If age and condition reporting is to be incorporated into the Framework it will require cross-jurisdictional support from policy agencies
- › **Overlap with existing reporting**—The extent and maturity of reporting on asset age and condition across the sector varies greatly between local government based service providers and SOCs. While the SOCs do not currently report publicly on asset age or condition there are two publicly accessible sources of information for local government based service providers—one national and one operating only within NSW.
 - i.) Run on behalf of the Australian Local Government Association (ALGA), the Institute of Public Works Engineers Australia (IPWEA) conducts and reports on an annual National State of the Assets (NSoA) survey of local governments.³³ While the survey captures data on asset conditions across all local government operations, water and wastewater services is a distinct class of assets within the report. Despite being voluntary, the NSoA survey has over a 90% participation rate from local governments across Australia.
 - ii.) The NSW local water utility performance scheme is the only jurisdictional performance reporting scheme to include age or condition indicators. Using an

³² Institute of Public Works Engineers Australia, 2015. *International Infrastructure Management Manual 5th (2015) Edition*. Institute of Public Works Engineers Australia

³³ Australian Local Government Association, 2021 National State of the Assets Report. <<https://alga.com.au/2021-national-state-of-the-assets-report/>>. Accessed 18 December 2021

asset condition scale of 1–5, local water utilities report on the water supply, sewerage and stormwater assets in each condition group as a percentage of gross replacement cost.

6.4.3 Unresolved questions and the pathway forward

The Review team has begun the process of exploring asset age and condition reporting indicators. Despite interest and support from the sector, feedback and insights provided to the Review demonstrate that there are significant challenges to overcome. Importantly though, stakeholders have also demonstrated a willingness to explore these issues and work collaboratively towards their resolution.

Given this, the finalisation of an indicator set that provides insight into asset age and condition is beyond the scope and timeframe of this Review.

However, the inclusion of such indicators in the Framework is seen as central to its objectives and worthy of further investigation and investment by the Bureau and its jurisdictional partners. Should the Bureau continue to pursue these indicators it is essential that it do so in close collaboration with service providers, jurisdictional agencies, regulators and industry bodies.

6.5 A summary of the assets and operations pathway

The following summary presents the changes recommended under the assets and operations theme. It is recommended that:

- The existing reliability indicators A14, A15, C15, IC17 and C17 with clarified definitions for the 2022–23 reporting year and the Bureau continue to work with the TAP, TRG as well as jurisdictional policy agencies, regulators and service providers to develop an agreed set of nationally consistent reliability metrics based on those proposed in Table 5-3
- A water losses sub-theme be included in the assets and operations theme and existing indicators A9, A10 and A11 be retained with updated definitions and supporting notes that address the issues raised in the course of the Review—Table 6-6
- An agreed basis for reporting national relevant indicators of asset age and condition and staff capacity continue to be explored, noting that they are recognised gaps and supported sub-themes.

Table 6-8 summarises the final indicator recommendations along with updated recommendations on the service providers who should report them. The updated reporting requirements are based on feedback from the Technical Advisory Panels as well as feedback from the indicator testing activity (Deliverable 8).

Table 6-8 – Recommended asset and operations indicators ^

	Indicator	<10,000	>10,000	Bulk
Reliability	IA8—Number of water main breaks	✓	✓	✓
	A8—Number of water main breaks per 100 km of water mains			
	A14—Number of sewerage mains breaks, leaks and chokes per 100 km of sewerage mains	✓	✓	✓
	A15—Number of property connection sewer breaks, leaks and chokes per 1,000 properties	✓	✓	
	C15—Average duration of an unplanned interruption: drinking water supply	✓	✓	
	IC17—Number of unplanned interruptions: drinking water supply	✓	✓	
	C17— Number of unplanned interruptions per 1,000 properties: drinking water supply			
Losses	A9—Infrastructure leakage index (ILI): drinking water supply system		✓ †	✓
	A10— Real losses, per service connection, from the drinking water supply system	✓	✓	
	A11— Real losses, per kilometre of water main, from the drinking water supply system	✓	✓	
Age and condition	Age and condition is a recognised gap and supported sub-theme however further work is required to define a supported nationally relevant basis for reporting	✓	✓	✓
Staff capacity	Staff capacity is a recognised gap and supported sub-theme however further work is required to define a supported nationally relevant basis for reporting	✓	✓ ‡	
<p>^ Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.</p> <p>† The threshold may vary as the revised indicator supporting notes suggests caution when estimating ILI for systems with less than 5,000 service connections</p> <p>‡ Final threshold for reporting will be subject to an agreed basis to be determined in the development of capacity indicators.</p>				

7. Finance and pricing indicators

The existing Framework has 25 pricing indicators (23 reported and 2 derived) and 40 financial indicators (22 reported and 18 derived).

These indicators provide important insights into:

- The nexus between the costs of providing water supply and sewerage services and the charges levied on customers
- The levels of investment in the management of assets
- The sources of water utility revenue
- The pricing incentives for customers to use water in an efficient manner
- The financial status of the water supply and sewerage business

In considering the Finance and Pricing indicators the Review found that

- Finance indicators are seen as valuable but are currently poorly defined and outdated.
- Improved definitions and guidance are an important part of the solution.
- There is interest in understanding utility efficiency as well as increased granularity of operational expenditure.
- There is strong support for the pricing indicators with consensus on their relevance and alignment with the NPR's objectives.
- There are questions around the ability of the indicator set to support the collection of data on dynamic pricing structures such as drought pricing.

In response, the Review's draft recommendations (HARC, 2021a) proposed:

- Streamlining the indicators to improve focus on performance
- Removing indicators whose only significance is in their use for calculation of other indicators
- Providing improved definitions for certain indicators.

7.1 Pricing indicators

Pricing information provides insight into customer and community outcomes, the affordability of services, promotes transparency and accountability of service providers and contributes to an understanding of water use, water security and livability outcomes.

7.1.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 7-3.

Table 7-1 – Proposed pricing indicators

Indicator	Definition
P1.2 — Fixed charge: water supply	The fixed charge levied on a residential property by the utility for water supply services during the reporting year (\$).
P1.3- P1.7 —Usage charge: step 1 to 5	The usage charge associated with each step of the utility's residential tariff structure, during the reporting year (\$/kL).
P1.3a- P1.7a Upper bound of usage: step 1 to 5	The volume of water above which the next pricing step of the utility's residential tariff structure applies (kL).
P4.1 —Fixed charge: wastewater	The fixed charge levied on a residential property by the utility for wastewater services during the reporting year (\$).
P4.2 —Usage charge: wastewater	The volumetric usage charge levied on residential customers by the utility for wastewater collection, during the reporting year (\$/kL).
## —Fixed charge: recycled water	The fixed charge levied on a residential property by the utility for recycled water services during the reporting year (\$).
## —Usage charge: recycled water	The volumetric usage charge levied on residential customers by the utility for recycled water, during the reporting year (\$/kL).

7.1.2 Matters considered and feedback received

The pricing sub-theme was supported by Review respondents, including those responding to the Draft Report (HARC, 2021a).

The following summaries present the matters considered, feedback received and the proposed way forward.

The relevance of pricing indicators

In considering the Framework's pricing indicators the Review found:

- Pricing information is seen as integral to a robust performance Framework
- The inclusion of pricing data supports the assessment of compliance with the NWI pricing principles,^{34, 35} the estimation of typical and average bills and the estimation of affordability metrics (Section 5.3)
- Pricing of non-drinking water products (raw, partially treated and recycled water) is seen as a gap in the pricing indicators.

In response, the Review's draft recommendations (HARC, 2021a) proposed keeping the existing tariff indicators, along with the addition of indicators to facilitate the reporting of residential recycled water tariffs.

³⁴ Ministerial Council, 2010. *National Water Initiative Pricing Principles (NWI) pricing principles*. <https://www.awe.gov.au/water/policy/policy/nwi/pricing-principles> Accessed 20 September 2021.

³⁵ The NWI pricing principles apply only to charges levied to provide drinking water services and do not include wastewater.

The review also considered the inclusion of indicators for raw and or partially treated water supply as well as non-residential pricing. While there was some interest in these indicators from a small number of users the Review did not establish a clear mandate for their inclusion.

Responses and feedback on the Draft Report (HARC, 2021a) did not explicitly address these findings and recommendations.

Tariff structure indicators (P1 and P4)

In considering the tariff structure indicators (P1 and P4) the Review found:

- Understanding tariff structures is important for interpreting usage charges and informing an understanding of the adoption of NWI pricing principles—i.e., the adoption of a tariff structure comprised of a fixed and a consumption-based charge
- The use of a “free text” field for data entry has resulted in a lack of standardisation in how tariff structures are reported. For example, “Two Part”, “Two part tariff”, and “2-Part Tariff” are all used to describe the same tariff structure. This lack of standardisation impacts the usability of the data
- Tariff data quality would be significantly improved by encapsulating tariff structure information into a more concise, single indicator, representation of tariffs

In response, the Draft Report (HARC, 2021a) recommended that:

- The existing tariff structure indicators P1 and P4 are retired
- Tariff structure information is encapsulated into a more concise, single indicator, representation of tariffs—As described in Appendix M of the Draft Report (HARC, 2021a)
- Where possible, standardised definitions of tariff structures be adopted—e.g., Two part tariff be adopted as the standard naming convention.

Responses and feedback to the Draft Report (HARC, 2021a) did not explicitly address this proposal.

Usage charges (P1.3–P1.7, P1.3a–1.7a, P4.1, and P4.2)

In considering the usage charges indicators P1.3–P1.7 and P1.3a–1.7a the Review found:

- Despite being valued ³⁶ by stakeholders, the quality of usage charge data is poor because of inconsistencies in reporting
- Tariff data quality would be significantly improved by encapsulating usage charges into a more concise, single indicator, representation of tariffs

In response, the Draft Report (HARC, 2021a) recommended:

- Retiring the existing usage charges indicators P1.3–P1.7, P1.3a–1.7a, P4.1, and P4.2
- Encapsulated usage charges in a more concise, single indicator, representation of tariffs—As described in Appendix M of the Draft Report (HARC, 2021a).

³⁶ A small number of Review respondents did question the value of capturing tariff structures beyond the usage steps required to calculate the typical and 200 kL bills. However, it was found that a threshold was not required as only a small number of service providers, predominantly in WA, have 3 or more usage steps in their pricing structures.

Responses and feedback to the Draft Report (HARC, 2021a) did not explicitly address this proposal.

Special levies (P1.12, P1.13, P4.3, and P4.4)

Reporting special levies are important for pricing and revenue transparency. However, their continued use and therefore inclusion in the Framework was questioned

In considering the ongoing inclusion of special levies indicators the Review found that:

- Reported data shows that the use of special levies is limited
- In the last 5 years, only 3 service providers have reported charging water supply levies, none of which were retained by the service provider. Similarly, only 5 utilities have reported wastewater levies, however, these have typically been retained.
- Tariff data quality would be significantly improved by encapsulating information on special levies into a more concise, single indicator, representation of tariffs

In response, the Draft report (HARC, 2021a) recommended:

- Retiring the existing special levies indicators P1.12, 1.13, P4.3 and P4.4
- Special levies information is encapsulated into a more concise, single indicator, representation of tariffs—As described in Appendix M of the Draft Report (HARC, 2021a).

Responses and feedback to the Draft Report (HARC, 2021a) did not explicitly address this proposal.

7.1.3 Recommendations

It is recommended that:

- A tariff sub-theme be included in the pricing and finance theme
- The existing tariff indicators P1, P1.2, P1.3- P1.7, P1.3a- P1.7a, P1.12, P1.13, P4.1–P4.4 be retired
- Drinking water, wastewater and recycled water tariff information are encapsulated in more concise, single indicator, representations—As described in Appendix M of the Draft Report (HARC, 2021a).

Table 7-2 – Recommended tariff indicators ^

Indicator	Definition
FP_N1—Residential Drinking water supply tariff data	Pricing and contextual data defining the service provider’s residential drinking water supply tariffs,
FP_N3—Residential wastewater services tariff data	Pricing and contextual data defining the service provider’s residential wastewater supply tariffs.
FP_N3—Residential recycled water supply tariff data	Pricing and contextual data defining the service provider’s residential recycled water supply tariffs.
^ Orange text denotes proposed changes to the indicator name and definition.	

7.1.4 Unresolved questions and the pathway forward

Pricing of raw or partially treated water

The testing process (Deliverable 8) highlighted the significance of raw and partially treated supplies for small service providers. While the Review did not establish a mandate for the inclusion of residential raw/partially treated water supply pricing indicators the Review believes that there is merit in explicitly testing this question with jurisdictional representatives from policy agencies and technical regulators.

7.2 Annual bill indicators

Publicly reporting on pricing and bills can help drive performance improvements through transparency and ‘competition by comparison’. It can also support the assessment of policy and investment decisions and inform regulatory decisions and policy development.

7.2.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 7-3.

Table 7-3 – Proposed annual bill indicators [^]

Indicator	Definition
P2 —Annual residential bill based on 200 kL per annum: water supply	The annual residential water supply bill, based on the consumption of 200 kL of water during the reporting year (\$).
P5 —Annual residential bill based on 200 kL per annum: wastewater	The annual residential sewerage bill, based on the consumption of 200 kL of water during the reporting year (\$).
P7 —Total annual residential bill based on 200 kL per annum	The total annual residential water supply and wastewater bill, based on the consumption of 200 kL of water during the reporting year (\$).
P3 —Typical residential bill: water supply	The annual residential water supply bill, based on the utility's customers' average annual residential usage during the reporting year (\$).
P6 —Typical residential bill: wastewater	The annual residential wastewater bill, based on the utility's customers' average annual residential usage during the reporting year (\$).
P8 —Total typical residential bill	The annual residential water supply and wastewater bill, based on a utility's customers' average annual residential usage during the reporting year (\$).
[^] Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

7.2.2 Matters considered and feedback received

The bill sub-theme was supported by Review respondents, including those responding to the Draft Report (HARC, 2021a).

The following summaries present the matters considered, feedback received and the proposed way forward.

The volumetric basis used for the residential bill indicators P2, P5 and P7

Several Review respondents questioned the ongoing use of 200kL as the basis for calculating volumetric bill indicators P2, P5 and P7. In response, the review found that:

- The distribution of average annual household water use (W12) is positively skewed with a mean usage of 202kL per annum and a median value of 175kL—Figure 7-1
- The current 200kL value equates to approximately 210 L/person/day for a typical household size of 2.6 people
- While the 200kL figure is high than the target usage of some jurisdictions it remains representative of the mean consumption
- The collection of tariff data makes the calculation of bills based on alternative volumes straightforward
- A change to the basis of the volumetric bill would require careful explanation to users to ensure transparency around the change

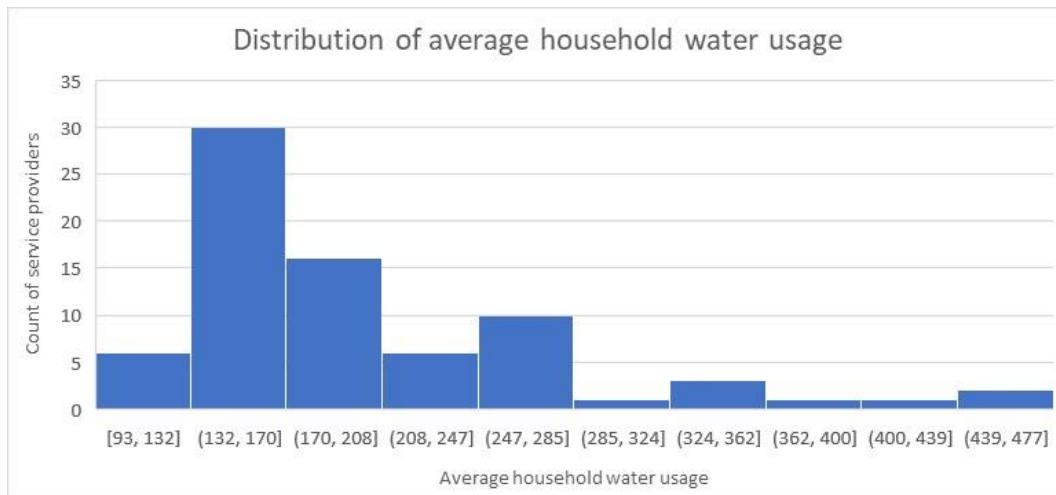


Figure 7-1 – Distribution of average household water usage (W12) for all service providers reporting in 2020—21

Based on these findings the Review does not recommend a change to the basis of the volumetric bill indicators P2, P5 and P7.

Transitioning bills indicators to be derived

Service providers report tariff information through the Framework, the typical and annual bill indicators P2, P3, P5, P6, P7 and P8 can be automatically calculated (derived) once a service provider reports their average volume of residential water supplied per property (indicator W12).

Deriving all billing indicators would not only reduce the overall number of reported indicators but also serve to reduce opportunities for calculation errors.

The Draft report recommended transitioning all billing indicators be calculated in the data entry process.

Responses and feedback to the draft submissions did not explicitly address this proposal.

7.2.3 Recommendations

It is recommended that:

- An annual bill sub-theme be included in the pricing and finance theme and that the existing bill indicators P2, P3, P5, P6, P7 and P8, be adopted as the basis for reporting—Table 7-4
- The Bureau update the Framework reporting portal to derive the billing indicators from reported data.

Table 7-4 – Recommended annual bill indicators ^

Indicator	Definition
P2—Annual residential customer bill based on 200 kL per annum: drinking water supply	The annual residential customer drinking water supply bill, based on the consumption of 200 kL of drinking water during the reporting year (\$).
P5—Annual residential customer bill based on 200 kL per annum: wastewater	The annual residential customer wastewater bill, based on the consumption of 200 kL of drinking water during the reporting year (\$).
P7—Total annual residential customer bill based on 200 kL per annum	The total annual residential customer water supply and wastewater bill, based on the consumption of 200 kL of drinking water during the reporting year (\$).
P3—Typical residential customer bill: drinking water supply	The annual residential customer water supply bill, based on the service provider's customers' average annual residential drinking water usage during the reporting year (\$).
P6—Typical residential customer bill: wastewater	The annual residential customer wastewater bill, based on the service provider's customers' average annual residential drinking water usage during the reporting year (\$).
P8—Total typical residential customer bill	The annual residential customer water supply and sewerage bill, based on a service provider's customers' average annual residential drinking water usage during the reporting year (\$).

^ Orange text denotes proposed changes to the indicator name and definition. Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.

7.3 Asset base indicators

Infrastructure and its management is fundamental to the operation, service delivery and performance of utilities and local government service providers. Asset-base indicators can inform an understanding of service levels, risk and inform asset management and financial performance metrics.

7.3.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 7-5.

Table 7-5 – Proposed asset base indicators ^

Indicator	Definition
F9 —Written-down value of fixed water supply assets	The written down value of the utility's fixed assets which are required for delivery of water services and derivation of income for the reporting year (\$ 000s).
F10 —Written-down value of fixed wastewater assets	The written down value of the utility's fixed assets which are required for delivery of wastewater services and derivation of income for the reporting year (\$ 000s).
###—Replacement costs of fixed water supply assets.	Is the cost of replacing the fixed water supply assets an existing asset with a substantially identical new asset or a modern equivalent (\$ 000s).
###—Replacement costs of fixed wastewater assets.	Is the cost of replacing the fixed wastewater assets an existing asset with a substantially identical new asset or a modern equivalent (\$ 000s).
###—Asset consumption ratio	The percentage of current replacement cost over the replacement cost.
###—Annual statutory depreciation: Water	Is the value of the annual depreciation as reflected in statutory accounts for the water assets
###—Annual statutory depreciation: Wastewater	Is the value of the annual depreciation as reflected in statutory accounts for the wastewater assets
###—Regulatory depreciation: Water	The value of the total regulatory depreciation for the water assets
###—Regulatory depreciation: Wastewater	The value of the total regulatory depreciation for the wastewater assets
###—Regulated Asset Base (RAB) Value: Water	The current regulated asset base value for water assets
###—Regulated Asset Base (RAB) Value: Wastewater	The current regulated asset base value for wastewater assets
Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

7.3.2 Matters considered and feedback received

As noted in Section 6.4.2, the draft recommendation for the inclusion of the asset base sub-theme was in response to feedback from policy agencies and regulators (financial and technical) who identified the need and value of better understanding

- The asset bases of urban water service providers
- How effectively those assets are being managed
- The risk of governments needing to intervene/fund new assets, as well as the maintenance, renewal and upgrade of existing assets.

In considering the inclusion of financial asset base indicators the Review found:

- Infrastructure and its management is fundamental to the operation and performance of utilities and local government service providers
- Asset base metrics could provide lead insight into asset performance, reliability and risk

- While fundamentally underpinned by Australian Accounting Standards, the Framework's financial indicators are complicated by differences within and between jurisdictions with respect to policy and legislation governing financial reporting.
- These differences create significant challenges for the development of nationally consistent and comparable financial indicators that provide meaningful insight into the performance of service providers.

The draft recommendations (HARC, 2021a) proposed the inclusion of a new asset base sub-theme as part of the pricing and finance theme. In addition to the existing written-down value of fixed water supply and wastewater asset indicators (F9 and F10), the proposed sub-theme included indicators to support reporting of:

- The replacement cost of water supply and wastewater asset
- The statutory and regulatory depreciation of assets
- The value of the regulated asset base for economically regulated service providers.

Based on feedback and submissions on the Draft report as well as input from the pricing and finance TAP the Review has found that:

- With respect to reporting on the current and written down value of the asset base the proposed indicators (F9, F10 and the new RAB indicators):
 - › Do not on their own directly inform an understanding of utility performance in relation to the indicator outcome areas adopted. They are more aptly characterised as contextual information, however, differences in the valuation methods used by service providers limit the insight that they provide as contextual information
 - › Are implicitly captured as inputs in the calculation of the proposed financial performance Return on Assets and Return on Equity indicators.
- With respect to reporting on asset replacement cost, the proposed indicators:
 - › Are not readily reportable by many SOCs as they do not typically report or have estimates of current asset replacement costs. In line with accounting standards, SOCs typically use a 'market value' of their asset for accounting purposes ³⁷
 - › The cost of undertaking a current asset replacement cost assessment for a large SOC is seen as a material barrier to the inclusion of these proposed indicators for this reporting group ³⁷
 - › Unlike SOCs, local government-based service providers do typically keep up to date asset replacement costs as part of these financial reporting obligations
 - › Replacement cost data is reported by NSW local government service providers as part of the State's LWU performance reporting framework

³⁷ Price Waterhouse Coopers, 2000. *Urban Water Pricing – Asset Optimisation*. < <https://www.qca.org.au/wp-content/uploads/2020/11/urban-water-pricing-asset-optimisation.pdf>>

- › Replacement cost data is also reported by local government service providers as part of their participation in the voluntary NSoA reporting run by the IPWEA on behalf of ALGA³⁸
- With respect to reporting on depreciation:
 - › It is noted that depreciation on its own does not directly inform an understanding of utility performance.

7.3.3 Recommendations

Given the updated findings the Review no longer recommends the inclusion of the proposed asset base sub-theme.

As such, it is recommended that the F9—Written-down value of fixed water supply assets and the F10—Written-down value of fixed wastewater assets be retired from the Framework.

7.3.4 Unresolved questions and the pathway forward

It is acknowledged that the Review’s recommendation on the asset base indicators leaves the Framework without any explicit measure of asset value.

As acknowledged, asset value is not an indicator of performance but does on its own provide contextual information on the scale of a service provider and its ability to generate income.

Noting that conversations on improving consistency in asset valuations have been underway for over a decade ago, it is clear that there is no straightforward resolution.

Given the challenges of defining a nationally consistent measure of asset value, a decision on the path forward needs to be informed by an understanding of the jurisdiction’s position on this question and their willingness to invest in the further exploration of a resolution.

If the retention of a measure of asset value is supported it is recommended that it is included as part of the contextual information theme

7.4 Revenue indicators

Publicly reporting on revenue supports transparency and accountability and provides insight into the financial health of service providers, customer and community outcomes and insight into affordability. Furthermore, revenue indicators can support the assessment of policy and investment decisions and inform regulatory decisions and policy development.

7.4.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 7-6.

³⁸ NSoA reporting does not disaggregate survey data beyond the state and territory scale.

Table 7-6 – Proposed revenue indicators [^]

Indicator	Definition
F1 —Total revenue: water supply	The total revenue generated from the utility's water businesses and related activities during the reporting year (\$ 000s) (excluding developer service charges)
F2 —Total revenue: wastewater	The total revenue generated from the utility's wastewater businesses and related activities during the reporting year (\$ 000s) (excluding developer service charges)
### —Revenue from developer service charges	The total revenue derived from the developer services charges during the reporting year (\$ 000s).
F3 —Total income for the utility	The total income from water and wastewater businesses and related activities received the utility during the reporting year (\$ 000s).
F5 —Revenue per property: water supply	Revenue from water supply services per property connected to the water supply system during the reporting year (\$/property).
F6 —Revenue per property: wastewater	Revenue from wastewater services per property connected to the wastewater system during the reporting year (\$/property).
F26 —Capital works grants: water supply	The dollar amount of funds received within the reported financial year from the government for capital works related to water supply services (\$ 000s).
F27 —Capital works grants: wastewater	The dollar amount of funds received within the reported financial year from governments for capital works related to wastewater services (\$ 000s).
F25 —Community service obligation	The dollar amount of any community service obligation subsidies provided by the government, to the utility, to allow for the provision of goods or services at less than total cost during the reporting year (\$ 000s).
F8 —Community service obligations ratio	The ratio of the dollar amount of any community service obligation subsidies provided by the government, to the utility's total income, to allow for the provision of goods or services at less than total cost to its total income for the reporting year.
[^] Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

7.4.2 Matters considered and feedback received

The Revenue sub-theme was recognised as relevant and important for the Framework. The proposed indicators were broadly supported by Review respondents, including those responding to the Draft Report (HARC, 2021a) and through participation in the price TAP.

The following summaries present the matters considered, feedback received and the proposed way forward.

The relevance of F4

The national relevance and value of reporting on the percentage of residential urban water supply revenue from usage charges (F4) was questioned by review respondents. While the NSW Best-Practice Management of Water Supply and Sewerage Guidelines ³⁹ set targets for

³⁹ New South Wales Government, 2007, Best-Practice Management of Water Supply and Sewerage Guidelines.

revenue from usage charges this metric is not used in other jurisdictions and is inconsistent with the principle of marginal cost pricing, which is seen as best practice.⁴⁰

The Review proposed the retirement of F4 in the draft indicator pathways paper (HARC, 2021c). This proposal was carried through to the draft recommendations, released for comment in October 2021 (HARC, 2021a).

Submissions and feedback on the Draft Report have not explicitly addressed the retirement of F4 and no specific objections have been raised through the pricing and finance TAP.

Revenue and income per property and megalitre (F5, F5.1, F6, F6.1, F7, F7.1)

Early feedback to the Review raised questions on the alignment and value of the derived revenue and income per property indicators F5, F5.1, F6, F6.1, F7, F7.1.⁴¹

In considering this issue the Review found that:

- While the indicators were of interest to some stakeholders there was no specific use case underpinning their inclusion in the Framework
- The indicators are not aligned with jurisdictional performance measures or reflective of modern financial return metrics
- As derived (calculated) indicators, there would be no material loss of information if these indicators were retired from the indicator set—i.e., individuals can still readily calculate the information if required
- The absence of contextualisation of the indicators coupled with the need for caution when selecting comparison groups and normalisers presents a risk for the interpretation of indicators.

Supported by these findings the Review proposed the retirement of F5, F5.1, F6, F6.1, F7, F7.1 in the draft indicator pathways paper (HARC, 2021c). This proposal was carried through to the draft recommendations, released for comment in October 2021 (HARC, 2021a).

The proposed retirement was challenged by a small number of policy agencies and industry users who contended that their retirement would reduce the transparency and the usability of the Framework (i.e., requiring users to calculate normalised values). Importantly, however, responses did not identify a specific use for the indicators themselves.

Based on the initial findings and consideration of the feedback received, the Review team still support the retirement of F5, F5.1, F6, F6.1, F7, F7.1.

If, however, the indicators are retained the Review recommends the provision of appropriate contextual information around their use and comparison across service providers.

⁴⁰ Aither, 2017, National urban water pricing standards and implementation pathway. Aither, Melbourne.

⁴¹ F5.1, F6.1, and F7.1 are only calculated for bulk water service providers.

Revenue from developer charges

Developer charges (also known as gifted assets, developer contributions or headworks contributions) are charges (cash or assets) that service providers levy to:

- recover a component of the infrastructure costs associated with servicing new developments or extending or changing the network within existing developments
- provide signals regarding the cost of development and thus encourage efficient development practices.⁴²

The existing Framework does not explicitly capture or report on revenue from developer charges. This has been identified as a gap in the Framework's financial indicators by Review respondents.

In considering this issue the Review found that:

- The existing Framework explicitly captures revenue from capital works grants through indicators F26 and F27 and community service obligations through F25
- Developer charges are reported as part of the total revenue indicators F1 and F2, whose definition includes developer contributions
- Submissions and feedback provided to the Review highlighted the importance of providing transparency on the receipt and accounting of developer charges and the importance of their treatment in the Framework's financial metrics
- Transparent reporting and explicit consideration of developer service charges is fundamental to understanding progress on the implementation of the COAG agreed NWI Pricing Principles.^{34, 43}

The draft recommendations (HARC, 2021a) proposed the inclusion of a new revenue from developer services charges indicator.

Submissions and feedback in response to the Draft Report did not explicitly address the inclusion of the new indicator. Feedback from the pricing and finance TAP was supportive of the indicator but did suggest separately reporting cash and non-cash charges (assets).

In response, the Review recommends the **addition of two new indicators for revenue from developer charges** (cash and non-cash).

Definitional issues

A number of definitional issues were raised in the feedback, submission and testing processes

In response, these issues have been addressed in the revised definitions and supporting notes developed by the Review team. Key changes include:

⁴² Frontier Economics, 2008. *Developer Contributions to the Water Corporation*: Report Prepared for Economic Regulation Authority April 2008.

⁴³ [NWI Pricing Principle 6 requires](#) "New contributed assets (i.e. grants/gifts from governments and contributions from customers (e.g. developer charges)) ... be excluded or deducted from the RAB or offset using other mechanisms so that a return on and of the contributed capital is not recovered from customers."

- The removal of contributed cash and assets, water revaluations, foreign exchange adjustments and defined benefit adjustments from the calculation of total revenue (F1)
- Revision of the community service obligations definition to clarify that it pertains to the previous accounting year, to address accounting issues.

7.4.3 Recommendations

It is recommended that:

- A “Revenue” sub-theme be included under the Finance and pricing theme
- Existing indicators F4, F5, F5.1, F6, F6.1, F7, F7.1 be retired from the Framework
- Existing indicators F1, F2, F3, F8, F25, F26, and F27 be retained as part of the revenue sub-theme, with updated definitions and supporting notes that address the issues raised in the course of the Review—Table 7-7
- Two new indicators to capture revenue from developer charges (cash and non-cash) are included in the revenue sub-theme—Table 7-7.

Table 7-7 – Recommended revenue indicators

Indicator	Definition
F1 —Revenue: drinking and non-drinking water	The revenue from the service provider’s drinking and non-drinking water , including recycled water, services and related activities during the reporting year (\$ 000s)
F2 —Revenue: wastewater	The revenue from the service provider’s wastewater services and related activities during the reporting year (\$ 000s)
FP_N4 —Revenue: developer services charges levied as cash payments	The revenue from the developer services charges, levied as cash payments, by the service provider on developers during the reporting year (\$ 000s).
FP_N5 —Revenue: developer services charges levied as non-cash contributions	The revenue from the developer services charges, as non-cash contributions, by the service provider on developers during the reporting year (\$ 000s).
F3 —Total income for the service provider	The total revenue from drinking and non-drinking water, including recycled water and wastewater services and related activities received by the service provider during the reporting year (\$ 000s).
F26 —Capital works grants: water supply	The dollar amount of funds received within the reported financial year from the government for capital works related to water supply services (\$ 000s).
F27 —Capital works grants: wastewater	The dollar amount of funds received within the reported financial year from governments for capital works related to wastewater services (\$ 000s).
F25 —Community service obligation	The dollar amount of any community service obligation subsidies provided by the government, to the utility, to allow for the provision of goods or services at less than total cost during the reporting year (\$ 000s).
F8 —Community service obligations ratio	The ratio of the dollar amount of any community service obligation subsidies provided by the government, to the utility’s total income, to allow for the provision of goods or services at less than total cost to its total income for the reporting year.
^ Orange text denotes proposed changes to the indicator name and definition. Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

7.5 Cost indicators

Publicly reporting on costs provides transparency and accountability. Cost indicators provide an understanding of the operating efficiency of a service provider and can inform industry benchmarks and support ‘competition by comparison’.

Like revenue indicators, cost indicators inform an understanding of the financial health of service providers, customer and community outcomes and insight into affordability. Furthermore, they can support the assessment of policy and investment decisions and inform regulatory decisions and policy development.

7.5.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 7-8.

Table 7-8 – Proposed costs indicators ^

Indicator	Definition
###—Operating cost: purchase bulk potable and raw water	The costs of bulk potable and raw water purchase by the service provider during the reporting year (\$ 000s).
###—Operating cost: purchase bulk recycled water	The costs of bulk recycled water purchase by the utility during the reporting year (\$ 000s).
IF11—Operating cost: water supply	The operation, maintenance and administration (OAM) cost of the utility for the provision of water supply services during the reporting year (\$ 000s).
###—Operating cost, excluding bulk water purchases, per property: water supply	The operation, maintenance and administration (OAM) costs of the utility for the provision of water supply services, less bulk water purchases, per property connected to the water supply system during the reporting year (\$/property).
###—Operating cost: bulk wastewater charges	The costs of bulk wastewater services purchased by utility during the reporting year (\$ 000s).
IF12—Operating cost: wastewater	The operation, maintenance and administration (OAM) costs of the utility for the provision of wastewater services during the reporting year (\$ 000s).
###—Operating cost, excluding bulk wastewater charges, per property: wastewater	The operation, maintenance and administration (OAM) costs of the utility for the provision of wastewater services, less bulk wastewater charges, per property connected to the wastewater system during the reporting year (\$/property).
F14—Capital expenditure: water supply	The capital expenditure of the utility on the provision of water supply services (including recycled water) during the reporting year (\$ 000s). An allocation of corporate capex is not required.
###—Capital renewal expenditure: water supply	It is expenditure on an existing water supply asset or on replacing an existing asset, which returns the service capability of the asset up to that which it had originally (\$ 000s).
F15—Capital expenditure: wastewater	The capital expenditure of the utility on the provision of wastewater services during the reporting year (\$ 000s). An allocation of corporate capex is not required.

Indicator	Definition
###—Capital renewal expenditure: wastewater	It is expenditure on an existing wastewater asset or on replacing an existing asset, which returns the service capability of the asset up to that which it had originally (\$ 000s).
F16—Total capital expenditure: water supply and wastewater	The total capital expenditure of the utility on the provision of water supply and wastewater services during the reporting year (\$ 000s).
F28—Capital expenditure per property: water supply	The capital expenditure of the utility on the provision of water supply services per property connected to the water supply system during the reporting year (\$/property).
F29—Capital expenditure per property: wastewater	The capital expenditure of the utility on the provision of wastewater services per property connected to the wastewater system during the reporting year (\$/property).
^ Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

7.5.2 Matters considered and feedback received

The cost sub-theme was recognised as relevant and important for the Framework. The proposed indicators were broadly supported by Review respondents, including those responding to the Draft Report (HARC, 2021a) and through participation in the pricing and finance TAP.

The following summaries present the matters considered, feedback received and the proposed way forward.

Increased granularity of operational expenses

A desire for increased granularity of operational expenses was expressed by a number of Review participants through submissions and workshop feedback.

In considering this issue the Review found:

- The current disaggregation of operating costs does not separate them in a manner that supports comparative assessment or benchmarking
- Differences in jurisdictional operating models (i.e., vertically integrated vs separation of bulk and retail services) impact on the transparent accounting of operating and capital expenditure—i.e., bulk water costs implicitly include capital costs of bulk providers, skewing comparisons
- There is a need to clarify the use case for the Framework’s operational expenditure indicators. While the indicators provide a comparative understanding of costs the spatial scale and scope of its indicators and the reporting provided through the Framework’s Part A Annual National Performance Reports do not provide a benchmarking analysis—i.e., measuring performance against predetermined standards.

In response, the draft recommendations (HARC, 20-21a) proposed:

- The addition/amendment of indicators to support the reporting of costs associated with the:
 - › purchase bulk potable and raw water
 - › purchase bulk recycled water
 - › water supply operations
 - › bulk wastewater transfers
 - › wastewater operations.
- The amendment of the definition of the operating costs per property (water supply and wastewater) to exclude bulk charges.

Submissions and feedback in response to the Draft Report did not explicitly address the inclusion of the new indicator. Feedback from the pricing and finance TAP were supportive of the proposed changes.

Operating costs per megalitre (F11.1 and F12.1) and combined operating costs (F13 and F13.1)

Feedback to the Review raised questions on the alignment and value of the derived operating costs per megalitre F11.1, F12.1, F13 and F13.1.

In considering this issue the Review found:

- While the indicators were of interest to some stakeholders there was no specific use case underpinning their inclusion in the Framework
- As derived (calculated) indicators, there would be no material loss of information if these indicators were retired from the indicator set—i.e., individuals can still readily calculate the information if required
- The absence of contextualisation of the indicators coupled with the need for caution when selecting comparison groups and normalisers presents a risk for the interpretation of indicators.

Supported by these findings the Review proposed the retirement of F11.1, F12.1, F13 and F13.1 in the draft indicator pathways paper (HARC, 2021c). This proposal was carried through to the draft recommendations, released for comment in October 2021 (HARC, 2021a).

The proposed retirement was challenged by a small number of policy agencies and industry users who contended that their retirement would reduce the transparency and the usability of the Framework (i.e., requiring users to calculate normalised values). Importantly, however, responses did not identify a specific use for the indicators themselves.

Based on the initial findings and consideration of the feedback received, the Review team still support the retirement of F11.1, F12.1, F13 and F13.1.

If, however, the indicators are retained the Review recommends the provision of appropriate contextual information around their use and comparison across service providers.

Reporting of capital expenditure (F15, F16 and F17)

Submissions and feedback to the Review identified support for reporting capital expenditure (capex), however current definitions and supporting notes are seen as inadequate.

The specific issue identified were:

- The absence of guidance on apportioning corporate capital expenses between services and/or its inclusion in the total capital expenditure indicator F16
- Clarity on the treatment of recycled water capital expenditure
- The need for further disaggregation of capital expenditure—e.g., reporting a breakdown based on operations (storage, treatment and transmission) or expenditure type (new, renewal and upgrade).

In response, the draft recommendations (HARC, 20-21a) proposed:

- Transition F16—Total capital expenditure for water supply and wastewater from a derived (calculated) indicator to a reported value that includes non-network (corporate) capex, such that F16 would reflect the total capex as reported in service provider’s annual report—Implicit in this is the clarification that F14 and F15 exclude corporate capex
- The inclusion of two new capital renewal expenditure indicators (for water supply and wastewater)— capital renewal expenditure is seen as a leading indicator of utility resilience and does not face the same reporting challenges that inhibit reporting for other possible indicators on utility resilience, such as the asset renewal funding ratio.

7.5.3 Recommendations

It is recommended that:

- A “costs” sub-theme be included under the Finance and pricing theme
- Three new indicators capturing bulk water costs be included as part of the costs sub-theme—Table 7-9
- The existing operating costs per property indicators F11 and F12 are redefined to exclude bulk water charges (as defined in Table 7-9) and the existing operating costs per mega litre indicator F11.1, F12.1 and combined operating cost indicators F13 and F13.1 are retired
- F16—Total capital expenditure for water supply and wastewater should be transitioned from a derived (calculated) indicator to a reported value that includes non-network (corporate) capex, such that F16 would reflect the total capex as reported in service provider’s annual report
- The definition of F14 and F15 be updated to exclude corporate capex.
- The proposed capital renewal expenditure indicators, for water supply and wastewater, should be included in the Framework as part of the costs sub-theme—Table 7-9
- The capital expenditure per megalitre indicators F28.1, F29.1 are retired from the Framework.

Table 7-9 – Recommended costs indicators

Indicator	Definition
FP_N6—Operating cost: purchase bulk potable and raw water	The costs of bulk drinking and raw water purchased by the service provider during the reporting year (\$ 000s).
FP_N7—Operating cost: purchase bulk recycled water	The costs of bulk recycled water purchased by the service provider during the reporting year (\$ 000s).
IF11—Operating cost: water supply	The operation, maintenance and administration (OAM) costs for the service provider's drinking and non-drinking water, including recycled water, services during the reporting year (\$ 000s).
FP_N8—Operating cost, excluding bulk water purchases, per property: water supply	The operation, maintenance and administration (OAM) costs of the service provider for the provision of drinking, non-drinking water and recycled water services, less bulk water purchases, per property connected to the water supply system during the reporting year (\$/property).
FP_N9—Operating cost: bulk wastewater charges	The costs of bulk wastewater services purchased by the service provider during the reporting year (\$ 000s).
IF12—Operating cost: wastewater	The operation, maintenance and administration (OAM) costs of the service provider for the provision of wastewater services during the reporting year (\$ 000s).
FP_N10—Operating cost, excluding bulk wastewater charges, per property: wastewater	The operation, maintenance and administration (OAM) costs of the service provider for the provision of wastewater services, less bulk wastewater charges, per property connected to the wastewater system during the reporting year (\$/property).
F14—Capital expenditure: water supply	The capital expenditure of the service provider on the provision of drinking and non-drinking water, including recycled water, during the reporting year (\$ 000s).
FP_N11—Capital renewal expenditure: water supply	The capital expenditure of the service provider on existing drinking, non-drinking and recycled water assets, where the expenditure returns the service capability of the assets to their original capacity (\$ 000s).
F15—Capital expenditure: wastewater	The capital expenditure of the service provider on the provision of wastewater services during the reporting year (\$ 000s).
FP_N12—Capital renewal expenditure: wastewater	The capital expenditure of the service provider on wastewater assets, where the expenditure returns the service capability of the assets to their original capacity (\$ 000s).
F16—Total capital expenditure: water supply and wastewater	The total capital expenditure of the service provider on the provision drinking, non-drinking and recycled water supply and wastewater services during the reporting year (\$ 000s).
F28—Capital expenditure per property: water supply	The capital expenditure, per property connected property, of the service provider on the provision of drinking and non-drinking water, including recycled water, services during the reporting year (\$/property)
F29—Capital expenditure per property: wastewater	The capital expenditure, per property connected property, of the service provider on the provision of wastewater services during the reporting year (\$/property).
^ Orange text denotes proposed changes to the indicator name and definition. Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

7.5.4 Unresolved questions

The treatment of recycled water expenditure in the context of the Frameworks capital expenditure indicators has not been fully resolved and further feedback is required from the TAP and/or TRG.

7.6 Financial performance indicators

Reporting on financial performance is broadly recognised as one of the highest priorities for the Framework. Publicly reporting on service provider financial performance supports transparency and accountability and provides an understanding of the financial health of service providers.

7.6.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 7-10.

Table 7-10 – Proposed performance indicators [^]

Indicator	Definition
F24 —Net profit after tax (NPAT)	The net profit after tax, disclosed in the utility's annual financial statements for the reporting year (\$ 000s).
F30 —Net profit after tax ratio	The ratio of the net profit after tax, disclosed in the utility's annual financial statements, to its total income for the reporting year.
## —EBIT–DA	Earnings Before Interest, Taxes, Depreciation, and Amortization
F20 —Dividend	The dividends paid, payable or proposed to be paid by the utility in relation to profits from its water supply and wastewater business for the whole water utility for the reporting year (\$ 000s).
F22 —Net debt to equity	The net debt for the water supply and wastewater businesses of the whole utility to its equity for the reporting year.
## —Debt to assets	Calculated by regulated utilities as debt divided by the regulatory value of fixed assets (RAB). For unregulated providers (with no RAB), this would be calculated as debt divided by total assets, rather than RAB.
## —Return on assets	Calculated as EBITDA (minus depreciation) divided by RAB (for regulated providers) or total assets (for unregulated providers).
## —Return on equity	Calculated as EBIT divided by total equity.
## —FFO to net debt	Calculated as funds from operations divided by net debt (interest-bearing liabilities less cash).
## —FFO to interest expense	Calculated as the sum of funds from operations and net interest expense divided by net interest expense. (For regulated utilities, metrics based on the RAB; for small utilities without a RAB, metrics based on assets).
[^] Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

7.6.2 Matters considered and feedback received

The Financial performance sub-theme was recognised as relevant and important for the Framework, including by those responding to the *Draft recommendations report* (HARC, 2021a). The proposed indicators have been supported by Review respondents and are seen as an important modernisation of the Frameworks financial metrics.

However, submissions, feedback, workshops and input from the pricing and finance TAP clearly demonstrated the often-contested views on not only the best financial measure to assess performance but also on their specific definition and their formulation

A suitable measure of profitability

The suitability of the Framework's profitability metric for comparison across service providers was raised as an important issue by Review respondents.

In considering this issue the Review found:

- Views on the relevance and alignment of the Framework's existing measure of profitability, F24—Net profit after tax (NPAT), are mixed.
- There are numerous profitability metrics used in the assessment of financial performance and individual views on the best metric vary across individuals and organisations
- While NPAT has its supporters, others contend that earnings before interest, taxes, depreciation and amortization (EBITDA) provides a stronger comparison of profitability (earnings) because it excludes the influence of accounting and financial deductions.

In response, the draft recommendations proposed the addition of an indicator for the reporting of EBITDA.

Submissions and feedback in response to the Draft Report did not explicitly address the inclusion of this new indicator, however, feedback from the pricing and finance TAP was supportive of the proposed changes.

Financial Return

The suitability of the Framework's financial return indicators F17, F18 and F19 were the subject of significant feedback and comment by review respondents.

In considering indicators of financial return the Review found:

- The economic real rate of return (ERRR) is not used by regulators or service providers for the assessment of financial return
- The national comparability of ERRR is questioned due to differences in jurisdictional accounting methods
- The ERRR is inconsistent with the National Water Initiative Pricing Principles ⁴⁴

⁴⁴ Productivity Commission, 2020. National Water Reform 2020 – Productivity Commission Inquiry Report No. 96, 28 May 2021. Productivity Commission, Canberra, Australia.

- Counter to the Productivity Commission’s recommendation of reporting a financial return metric consistent with the National Water Initiative Pricing Principles, alongside the existing ERRR metric ⁴⁴ there is strong support for retiring the ERRR indicators.

In response the draft recommendations proposed

- Retiring the ERRR indicators (F15, F16 and F17)
- The addition of two new indicators:
 - › Return on assets (ROA)—ROA is an indicator of how efficient or profitable a company is relative to its assets or the resources it owns or controls—measures how much money a service provider earns by putting its assets to use
 - › Return on equity (ROE)—ROE is a measure of a utility’s profitability in the context of its equity (assets less debt). It provides a measure of efficiency by providing insight into how well a utility is able to use its assets to generate profits.

Submissions and feedback in response to the Draft Report did not explicitly address the inclusion of these new indicators, however, feedback from the pricing and finance TAP was generally supportive of the proposed changes. It is noted that NSW DPIE supported the productivity commissions call to retain the ERRR indicators.

Financial performance ratios

Submissions and feedback to the Review demonstrated consensus on support for the inclusion of modern financial metrics consistent with industry practice.

In considering the inclusion of financial performance ratios the Review found:

- There are numerous financial performance ratios used in the assessment of financial performance and individual views on the best metric vary across individuals and organisations
- Consensus on individual metrics will be difficult to achieve because of the diversity and strength of individual views.

In response, the draft recommendations proposed:

- Retaining the existing net debt to equity indicator F22
- The inclusion of:
 - › ROA and ROE ratios—as discussed above
 - › A debt to assets (leverage) ratio indicator to measure a service provider’s ability to repay its debt—this is a key private sector indicator and is included in and aligned with ESC and IPART reporting
 - › A funds from operations (FFO) to net debt ratio to measure of a service provider’s ability to generate cash flows— i.e., it is a measure service provider’s ability to pay off its debt using net operating income alone and, therefore, provides insight into financial risk
- Retiring the interest cover ratio indicator F23 and replacing it with a FFO to interest ratio to measure the extent of the financial buffer that a service provider has to meet its

debt obligations. The FFO to interest ratio is seen as preferable and is a key credit rating metric used by credit agencies.

Submissions and feedback in response to the Draft Report did not explicitly address the inclusion of this new indicator, however, feedback from the pricing and finance TAP was supportive of the proposed changes.

Definitional issues

The definitional issues raised in the feedback, submission and testing processes. In response, these issues have been addressed, where possible, in the revised definitions and supporting notes developed by the Review team or flagged for further industry consultation through the TAP and TRG.

7.6.3 Recommendations

It is recommended that:

- A “performance” sub-theme be included under the finance and pricing theme
- Indicators F17, F18, F19, F21, F23 are retired from the Framework
- The proposed EBITDA, debt to assets, return on assets, return on equity, FFO to net debt, and FFO to interest expense indicators are included under the performance sub-theme—Table 7-11

Table 7-11 – Recommended performance indicators ^

Indicator	Definition
F24 —Net profit after tax (NPAT)	The net profit after tax, disclosed in the service provider’s annual financial statements for the reporting year (\$ 000s).
F30 —Net profit after tax ratio	The ratio of the net profit after tax, disclosed in the service provider’s annual financial statements, to its total income for the reporting year.
FP_N13 —Earnings before interest, taxes, depreciation, and amortization (EBITDA)	The earnings before interest, taxes, depreciation, and amortization (EBITDA) disclosed in, or calculated from, the service provider’s annual financial statements, for the reporting year (\$ 000s).
F20 —Dividend	The dividends paid, payable or proposed to be paid by the service provider in relation to profits from its water supply and wastewater business for the whole water utility for the reporting year (\$ 000s).
F22 —Net debt to equity	The net debt for the water supply and wastewater businesses of the whole service provider to its equity for the reporting year.
FP_N14 —Debt to assets	The ratio of the service provider’s total debt for its drinking and non-drinking water, recycled water and wastewater businesses to its regulated asset base value (RAB), or total assets, for the reporting year.
FP_N15 —Return on assets (ROA)	The ratio of the service provider’s earnings before interest, taxes, depreciation, and amortization (EBITDA) for its drinking and non-drinking water, recycled water and wastewater businesses to its regulated asset base value (RAB), or total assets, for the reporting year.

Indicator	Definition
FP_N16—Return on equity (ROE)	The ratio of the service provider's earnings before interest, taxes, depreciation, and amortization (EBITDA) for the water supply and wastewater businesses of the whole utility to its total equity for the reporting year.
FP_N17—Funds from operations (FFO) to net debt	The ratio of the service provider's funds from operating (FFO) for its drinking and non-drinking water, recycled water and wastewater businesses to its net debt, for the reporting year.
FP_N18— Funds from operations (FFO) to net interest expenses	The ratio of the service provider's funds from operating (FFO) for its drinking and non-drinking water, recycled water and wastewater businesses to its net interest expenses, for the reporting year.
^ Orange text denotes proposed changes to the indicator name and definition. Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

7.6.4 Unresolved questions

The following unresolved matters require further consideration, indicator development and testing with the TAPs, TRG and other jurisdictional representatives:

- **Reporting of NPAT and EBITDA** – If adopted the Review’s recommendations will see service providers report both NPAT and EBITDA. However, the case for the inclusion of these metrics as standalone indicators has been contested. It has been proposed that neither NPAT or EBITDA are, on their own, insightful measures of performance, rather that they are contextual information that is used in the calculation of financial performance metrics. It is suggested that the value of these metrics as standalone indicators be further explored with the TAP, TRG and other stakeholders before a final decision is made on their inclusion or retirement.
- **Collection of financial report data** – In the course of the Review it was proposed that major, and potentially large, service providers could report a summary of their annual Profit and Loss, Balance Sheet and Cashflow statements in addition to the Frameworks performance metrics.

The proposal, put forward by WSAA, was in response to the observation that the basis of financial comparisons remains contested and individual users have firm views on their preferred financial metrics and their calculation.

Leveraging financial reporting in this manner would facilitate the detailed collection of revenue, cost and equity data to underpin the calculation of financial performance metrics in a manner that meets the individual needs of users.

While the data that this proposal would collect is already available, it is not typically published in a readily usable format—i.e., it is often embedded in annual reports and accounting statements.

The Review has focused on the definition of a base set of financial metrics that would be reported by all service providers. However, it is noted that WSAA’s proposal has been supported by several service providers and as such the Review team believes that its adoption warrants further consideration.

7.7 A summary of the pricing and finance pathway

The following summary presents the changes recommended under the pricing and finance theme. It is recommended that:

- The existing tariff indicators P1, P1.2, P1.3- P1.7, P1.3a- P1.7a, P1.12, P1.13, P4.1–P4.4 be retired and drinking water, wastewater and recycled water tariff information are encapsulated in more concise, single indicator, representations—As described in Appendix M of the Draft Report (HARC, 2021a)
- The Bureau's Framework reporting portal be updated to enable the billing indicators to be derived from reported data
- F9—Written-down value of fixed water supply assets and the F10—Written-down value of fixed wastewater assets be retired from the Framework.
- A “Revenue” sub-theme be included under the Finance and pricing theme
- Existing indicators F4, F5, F5.1, F6, F6.1, F7, F7.1 be retired from the Framework
- Two new indicators to capture revenue from developer charges (cash and non-cash)—as defined in Table 7-7

Existing indicators F1, F2, F3, F8, F25, F26, and F27 be retained with updated definitions and supporting notes that address the issues raised in the course of the Review— Table 7-7

- A “costs” sub-theme be included under the Finance and pricing theme
- Three new indicators capturing bulk water costs be included as part of the costs sub-theme—Table 7-9
- The existing operating costs per property indicators F11 and F12 are redefined to exclude bulk water charges
- The existing operating costs per property indicators F11 and F12 are redefined to exclude bulk water charges (as defined in Table 7-9) and the existing operating costs per mega litre indicator F11.1, F12.1 and combined operating cost indicators F13 and F13.1 are retired
- F16—Total capital expenditure for water supply and wastewater should be transitioned from a derived (calculated) indicator to a reported value that includes non-network (corporate) capex, such that F16 would reflect the total capex as reported in the service provider’s annual report
- The definition of water supply and wastewater capex, F14 and F15, be updated to exclude corporate capex
- The proposed capital renewal expenditure indicators, for water supply and wastewater, should be included in the Framework as part of the costs sub-theme
- The capital expenditure per megalitre indicators F28.1, F29.1 are retired from the Framework
- A “performance” sub-theme be included under the finance and pricing theme
- Indicators F17, F18, F19, F21, F23 are retired from the Framework
- The proposed EBITDA, Debt to assets, Return on assets, Return on equity, FFO to net debt, and FFO to interest expense indicators are included under the performance sub-theme.

Table 5-8 summarises the final indicator recommendations along with updated recommendations on the service providers who should report them. The updated reporting requirements are based on feedback from the Technical Advisory Panels as well as feedback from the indicator testing activity (Deliverable 8).

Table 7-12 – Recommended pricing and finance indicators ^

	Indicator	<10,000	>10,000	Bulk
Pricing	FP_N1—Residential Drinking water supply tariff data	✓	✓	
	FP_N2—Residential wastewater services tariff data	✓	✓	
	FP_N3—Residential recycled water supply tariff data	✓	✓	
Annual bill	P2—Annual residential customer bill based on 200 kL per annum: drinking water supply			
	P5—Annual residential customer bill based on 200 kL per annum: wastewater			
	P7—Total annual residential customer bill based on 200 kL per annum			
	P3—Typical residential customer bill: drinking water supply			
	P6—Typical residential customer bill: wastewater			
	P8—Total typical residential customer bill			
Revenue	F1—Revenue: drinking and non-drinking water	✓	✓	✓
	F2—Revenue: wastewater	✓	✓	✓
	FP_N4—Revenue: developer services charges levied as cash payments	✓	✓	✓
	FP_N5—Revenue: developer services charges levied as non-cash contributions	✓	✓	✓
	F3—Total income for the service provider	✓	✓	✓
	F26—Capital works grants: water supply	✓	✓	✓
	F27—Capital works grants: wastewater	✓	✓	✓
	F25—Community service obligation	✓	✓	✓
	F8—Community service obligations ratio			
Costs	FP_N6—Operating cost: purchase bulk potable and raw water	✓	✓	
	FP_N7—Operating cost: purchase bulk recycled water	✓	✓	
	IF_11—Operating cost: water supply	✓	✓	
	FP_N8—Operating cost, excluding bulk water purchases, per property: water supply			
	FP_N9—Operating cost: bulk wastewater charges	✓	✓	
	IF12—Operating cost: wastewater	✓	✓	
	FP_N10—Operating cost, excluding bulk wastewater charges, per property: wastewater			
	F14—Capital expenditure: water supply	✓	✓	✓
	FP_N11—Capital renewal expenditure: water supply	✓	✓	✓
	F15—Capital expenditure: wastewater	✓	✓	✓
	FN_N12—Capital renewal expenditure: wastewater	✓	✓	✓

	Indicator	<10,000	>10,000	Bulk
Costs	F16—Total capital expenditure: water supply and wastewater	✓	✓	✓
	F28—Capital expenditure per property: water supply			
	F29—Capital expenditure per property: wastewater			
Performance	F24—Net profit after tax (NPAT)	✓	✓	✓
	F30—Net profit after tax ratio			
	FP_N13—Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA)	✓	✓	✓
	F20—Dividend	✓	✓	✓
	F22—Net debt to equity	✓	✓	✓
	FP_N14—Debt to assets ratio	✓	✓	✓
	FP_N15—Return on assets (ROA)	✓	✓	✓
	FP_N16—Return on equity (ROE)	✓	✓	✓
	FP_N17—Funds from operations (FFO) to net debt	✓	✓	✓
FP_N18—Funds from operating (FFO) to net interest expenses	✓	✓	✓	
^ Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.				

8. Public health and environment indicators

The existing Framework has 19 environmental indicators (7 reported and 12 derived) covering effluent discharge greenhouse gas emissions and biosolids reuse. In addition, it has 5 public health indicators, all of which are reported, that provide insight into water quality management planning and compliance.

The Review found that:

- There is strong but qualified support for both the health and environmental indicator themes
- Definitional issues and overlap with other state and territory and commonwealth reporting frameworks were raised as key issues that the Review should address.

In response, the Review's draft recommendations (HARC, 2021a) proposed:

- Bringing the public health and environmental indicator together under a single theme, primarily to simplify the Framework's structure but also in recognition of the shared importance of these areas to customers and community outcomes
- Aligning the definitions of treated wastewater with those used by SDG Indicator 6.3.1
- Aligning greenhouse gas emissions reporting, including the reporting threshold with the National Greenhouse and Energy Reporting (NGER) Scheme
- The inclusion of an indicator to capture greenhouse emissions reduction targets
- Introducing a water efficiency sub-theme along with measures of investment in efficiency measures and the volumetric water savings achieved
- The collection of additional information on drinking water quality management plans, identifying the frequency and nature of its assessment by an external party
- The addition of indicators to report on the number of boil water alerts and do not drink notices issued by a service provider.

The following discussion of the proposed sub-themes draws the feedback received and submissions made in response to the Draft (HARC, 2021a) together with the detailed indicator insights and issues raised across the course of the Review. It provides a summary of what was proposed in the draft recommendations, what has been considered, recommendations on the way forward and unresolved matters.

8.1 Discharges and emissions

Discharges and emissions indicators support the transparency and accountability of service providers and can provide insight into the impacts they have on the environment and the effectiveness of their management practices. These insights can inform an understanding of the alignment between customer and community expectations and service provider practices as well as informing livability outcomes.

8.1.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 8-1.

Table 8-1 – Proposed discharges and emissions indicators

Indicator	Definition
IE1—Volume of wastewater treated to a primary level	The volume of wastewater only treated to a primary level, during the reporting year in megalitres (ML).
IE2—Volume of wastewater treated to a secondary level	The volume of wastewater only treated to a secondary level, during the reporting year in megalitres (ML).
IE3—Volume of wastewater treated to a tertiary level	The volume of wastewater only treated to a tertiary level, during the reporting year in megalitres (ML).
E1—Percentage of wastewater treated to a primary level	The percentage of total wastewater collected by the utility that receives only treated to a primary level, during the reporting year (%).
E2—Percentage of wastewater treated to a secondary level	The percentage of the total wastewater collected that is only treated to a secondary level, during the reporting year (%).
E3—Percentage of wastewater treated to a tertiary level	The percentage of the total wastewater collected that is only treated to a tertiary level, during the reporting year (%).
IE12—Total net greenhouse gas emissions	The total net greenhouse gas emissions generated by the utility, through all its operations during the reporting year (t CO ₂ equivalents).
##—GHG emissions reduction target	The adopted GHG emissions target for the service provider
##—NPI emissions placeholder	TBD
^ Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

8.1.2 Matters considered and feedback received

The proposed discharges and emissions sub-theme was supported by Review respondents, including those responding to the Draft Report (HARC, 2021a).

Feedback on individual indicators was mixed, in part reflecting observed differences in the value placed on “environmental” indicators—which in the view of some sit outside the scope of a national performance report focused on pricing and service quality, as agreed to under the NWI.²⁴

Wastewater treated (IE1, E1, IE2, E2, IE3, E3)

In considering the treated wastewater (effluent) indicators, IE1, E1, IE2, E2, IE3, E3 the Review found:

- The existing indicators provide some contextual information to support an understanding of operational performance and aid in the interpretation of operating and capital costs
- As effluent discharges are licenced by the relevant environmental regulator in each jurisdiction the indicators do not provide any direct measures of performance on outcomes for which service providers are responsible, for example, licence compliance,

nutrient emissions and reuse (the potential for reporting on these are considered below).

- Definitional issues limit the insights that can be drawn from the data collected. The existing definitions are based on treatment infrastructure, consequently, where infrastructure does not achieve the expected treatment outcomes (ie, it performs poorly), there is uncertainty about how to report discharges ⁴⁵
- Introducing target bands to separate effluent quality based on key parameters would support clearer differentiation of treatment categories ⁴⁵
- There is merit in the continued inclusion of the wastewater treated indicators, subject to the adoption of revised definitions addressing the issues raised
- A small number of review respondents expressed interest in disaggregating effluent discharges based on the type of receiving environment, citing the importance this plays in understanding performance. For example, a service provider discharging to a protected coastal estuary is likely to be required to meet more stringent water quality targets than one discharging to an ocean outfall
- IE1, IE2 and IE3 capture the total volume of water treated and, therefore, includes both effluent that is recycled and disposed of. As such, a disaggregation of disposals based on the receiving environments would need to be based on W29—Volume of treated wastewater disposals, not IE1, IE2 and IE3. The question of disaggregation is discussed in Section 8.4.

The draft recommendations (HARC, 2021a) proposed that the Framework adopts or adapt the effluent quality based definitions of primary, secondary and tertiary treatment established for Sustainable Development Goal 6.3.1. ⁴⁶ Not only does this approach provide a nationally consistent basis for reporting treated wastewater it supports efforts to report on SDG targets by the Commonwealth.

These definitions are:

- **Primary wastewater treatment** – Treatment of wastewater by a physical and/or chemical process involving settlement of suspended solids, or other process in which the Biochemical Oxygen Demand (BOD5) of the incoming wastewater is reduced by at least 20% before discharge and the total suspended solids of the incoming wastewater are reduced by at least 50%.
- **Secondary wastewater treatment** – Post-primary treatment of wastewater by a process generally involving biological treatment with a secondary settlement or other process, resulting in a Biochemical Oxygen Demand (BOD) removal of at least 70% and a Chemical Oxygen Demand (COD) removal of at least 75%. Natural biological treatment processes are also considered under secondary treatment if the

⁴⁵ Tasmanian EPA 2021, Urban NPR Indicator Review Survey – Tasmanian EPA response.

⁴⁶ United Nations Statistic Division, 2020, SDG 6.3.1 Indicator Metadata. United Nations Statistic Division. Accessed 29 October 2021 [<https://unstats.un.org/sdgs/metadata/files/Metadata-06-03-01.pdf>]

constituents of the effluents from this type of treatment are similar to the conventional secondary treatment.

- **Tertiary wastewater treatment** – Treatment (additional to secondary treatment) of nitrogen and/or phosphorous and/or any other pollutant affecting the quality or specific use of water: microbiological pollution, colour etc. The different possible treatment efficiencies ('organic pollution removal' of at least 95% for BOD5, 85% for COD, 'nitrogen removal' of at least 70%, 'phosphorous removal' of at least 80% and 'microbiological removal') cannot be added and are exclusive.

Submissions and feedback provided in response to the Draft recommendations and through the testing process did not specifically address the revised definitions put forward in the draft recommendation. It is anticipated that service providers will make further comments as they work through the changes to indicator definitions as part of their implementation processes.

Compliance

Licensed by the environmental authority in each jurisdiction, sewage treatment plant compliance primarily relates to water quality consideration (nutrients as well as other contaminants), with licence conditions typically set to avoid/reduce risks to human health and minimise adverse impacts on the receiving environment—e.g., maintaining agreed water quality objectives for receiving waters.

In considering the question of compliance the Review found that:

- Sewage treatment plant compliance was part of Framework reporting up until 2014, with service providers reporting on ⁴⁷:
 - › **E4**—Per cent of sewage volume treated that was compliant (%)
 - › **E5**—Number of sewage treatment plants compliant at all times (e.g. 5 of 6)
 - › **E6**—Public disclosure of your sewage treatment plant's performance (yes/no)
 - › **E7**—Compliance with the environmental regulator – Sewerage (yes/no)
- These indicators were removed from the Framework because of issues with national comparability stemming from differences in regulation across jurisdictions
- The Tasmanian EPA, NSW DPIE and a number of participants in the environmental indicator pop-up workshop were supportive, in principle, of the reintroduction of compliance indicators.

While compliance indicators were supported by several stakeholders the Draft recommendations (HARC, 2021a) did not include their reintroduction. This decision was based on the absence of a broad use case and the noted comparability issues.

Feedback on the Draft recommendations raised the question of why sewerage treatment plant compliance had been excluded when water quality compliance was part of the indicator set. In

⁴⁷ National Water Commission, 2012, 2012 – 13 *National Performance Framework: Urban performance reporting indicators and definitions handbook*. National Water Commission, Canberra

responding to this observation it is noted that, unlike sewerage treatment plant compliance, water quality compliance is based on an agreed national standard and therefore meets the national comparability indicator test set for the Review.

Nutrient emissions

Responding to submissions expressing an interest in reporting on nutrient and chemical emissions the Review found that:

- As service providers are not directly responsible for setting effluent quality, the definition of service provider performance metrics is challenging
- Under licence models (e.g. load-based and bubble licences), environmental incentive schemes and other mechanisms, service providers can and do elect to reduce emissions
- Comparison of service providers' performance on nutrient emissions reductions would require complex indicators with limited cross-jurisdictional comparability—two key indicator selection criteria
- There is potential to leverage existing reporting by service providers to the National Pollution Inventory (NPI).⁴⁸ The NPI tracks and reports on substance emissions in Australia
- Inclusion in NPI reporting is based on emission thresholds. As such it only applies to a subset of service providers. An analysis of historical reporting has shown that the NPI currently includes data from over 300 water treatment and wastewater plants operated by, or for, service providers reporting to the Framework
- The Review has not identified a use case that would justify the Framework setting emission reporting thresholds below those established by the NPI
- As such the Review team does not recommend the explicit inclusion of nutrient emissions indicators. However, there is an opportunity to provide a direct linkage between the NPR and NPI to enable ready access to emissions data for TN, TP and other reported substances.

Greenhouse gas emissions

Under the existing Framework, service providers report on their Scope 1 (direct) and Scope 2 (indirect) Greenhouse Gas Emissions (GHG) from their water supply, wastewater and overall operations.

The mixed support for GHG emissions reporting expressed through submissions and feedback to the Review was consistent with historical viewpoints expressed previously by stakeholders.

Issues raised by respondents broadly fell under the following themes:

- (i.) Relevance as a measure of performance
- (ii.) The use case for the data

⁴⁸ The National pollution Inventory <http://www.npi.gov.au/>

(iii.) Alignment/overlap with other reporting frameworks

(iv.) Data quality and comparability

(v.) The scale of service provider emissions

In weighing up the pathway forward for the GHG indicators, the Review has considered each of these issues.

- **Relevance as a measure of performance** –GHG emissions are not a direct indicator of performance. Operational constraints such as the water sources available to a service provider, the scale and topography of their service region and the nature of the receiving environment/s that they discharge effluent to all play a major role in driving emissions

While emissions are not a direct indicator of performance, it is argued that where service providers explicitly invest in emissions reductions, by choice or policy direction, there is a financial cost and therefore an impact on performance

As such understanding which service providers have established emissions reduction targets and what these targets are is seen as valuable information that supports an understanding of performance. Once emissions targets are understood it will also then be possible to transition to reporting on progress towards meeting them

- **The use case for the data** – While some respondents expressed an interest in, and support for, GHG emissions reporting the review did not establish a specific user for this information. This finding aligns with the perceived lack of benefit that exists around the collection of the GHG emissions indicators.
- However, noting that transparent and accountable urban water services is one of the four outcomes areas for the refreshed Framework it is argued that public disclosure of GHG emissions is a valid use case for the data.

Overlap with other reporting frameworks – The National Greenhouse and Energy Reporting (NGER) scheme, established by the *National Greenhouse and Energy Reporting Act 2007* seeks to provide a single national framework for reporting and publicly disclosing information about greenhouse gas emissions, energy production, and energy consumption. Importantly, the NGER scheme notes the avoidance of duplication amongst its objectives.

Under the NGER scheme, entities are required to report when:

- An individual facility that they operate emits more than 25 kt greenhouse gases (CO₂-e) scope 1 and scope 2 emissions
- Corporate group emissions are greater than 50 kt greenhouse gases (CO₂-e) scope 1 and scope 2 emissions.⁴⁹

⁴⁹ Clean Energy Regulator. Reporting thresholds, Accessed 16/08/2020, <<http://www.cleanenergyregulator.gov.au/NGER/Reporting-cycle/Assess-your-obligations/Reporting-thresholds>>

Importantly, with respect to overlap, the NGER scheme only publishes emission data for corporations with combined net emissions (scope 1 and scope 2) equal to or greater than 50 kilotonnes CO₂-e.

Table 7-2 summarises the corporations reporting to the Framework that, based on their reported emissions, met the NGER scheme publishing threshold in 2019-20.

Table 8-2 – Utilities meeting the NGER scheme publishing threshold in 2019–20

NPR reporting water utility	2019–20 NPR net tonnes CO ₂ -e
Water Corporation - Perth	680,084
Melbourne Water Corporation	513,651
Sydney Water Corporation	358,538
South Australian Water Corporation	277,729
Queensland Bulk Water Supply Authority	165,680
Urban Utilities	113,996
Hunter Water Corporation	89,151
Goulburn Valley Region Water Corporation	77,754
Unitywater	76,703
City of Gold Coast	67,246
Central Coast Council	65,887
Icon Water	61,484
WaterNSW	60,550
NGER publishing threshold (50,000) tonnes CO₂-e.	
TasWater	46,248
Barwon Region Water Corporation	44,260
Toowoomba Regional Council	39,284
Western Region Water Corporation	38,257
Townsville City Council	37,383
Shoalhaven City Council	36,787
Central Gippsland Region Water Corporation	34,750
South East Water Corporation	33,149
North East Region Water Corporation	32,614
Coliban Region Water Corporation	29,938

- While there is a clear overlap between the service providers reporting to the Framework and the NGER scheme, reporting under the Framework picks up over 65 service providers who, by virtue of the size of their emissions, are not required to report under the NGER scheme
- **The scale of service provider emissions** – The Australian National Greenhouse Gas inventory estimates total national emissions for 2019–20 to be 521.9 net Mt CO₂-e ⁵⁰

⁵⁰ Department of industry, science and resources, National Greenhouse Gas Inventory Quarterly Update: March 2021, Accessed 16/08/2021 < <https://www.industry.gov.au/data-and-publications/national-greenhouse-gas-inventory-quarterly-update-march-2021> >

As a percentage of total national emissions, the 79 service providers reporting Scope 1 and 2 emissions to the Framework in 2019–20 contributed 0.7% of total estimated net emissions. Significantly, the total net emissions of the service providers who meet the NGER scheme reporting threshold (50 kilotonnes CO₂-e) contribute 74% of the total

- **Data quality and comparability** – Many service providers, particularly those in the small to medium group, find estimating emissions challenging, leading some to question the quality of the data reported and the cost-benefit of doing so—the scope of the Review has not included the quantification of either of these issues.

A spreadsheet calculation tool, produced by NSW DPIE has been used by local water utilities in NSW and more recently Queensland to aid in the estimation of emissions. Several respondents identified the value of this tool in supporting data quality.

Differences between utility operating models, e.g., vertically integrated vs separation of bulk and retail activities, make comparisons between utilities challenging. However, while comparability across service providers is important, it is not, on its own, a reason to retire an indicator. Understanding long-term trends for individual utilities is also of value and interest to stakeholders.

In addition to issues with the comparison between service providers, there are issues between schemes that impact both data quality and comparison between reported data.

Table 7-3 summarises the NGER emission publicly reported by the Clean Energy Council for 2019-20.

Table 8-3 – 2019-20 publicly reported GHG emissions under the NGER scheme

NGER scheme reporting corporations 2019–20 ⁵¹	NGER reported tonnes CO ₂ -e ⁵¹	2019–20 NPR net tonnes CO ₂ -e ⁵²
Water Corporation	760,088	680,084
Melbourne Water Corporation	513,760	513,651
Sydney Water Corporation	351,925	358,538
South Australian Water Corporation	277,723	277,729
Icon Water Limited	220,596	61,484
Power And Water Corporation	201,531	23,939
Queensland Bulk Water Supply Authority	112,843	165,680
Goulburn Valley Region Water Corporation	77,747	77,754
Water NSW	64,822	60,550

With respect to the differences in the emissions reported in Table 7-3, it is noted that under the NGER scheme service providers report total corporate Scope 1 and 2 emissions, while for the Framework Water Corporations report net emissions. A further

⁵¹ Clean Energy Regulator. Corporate emissions and energy data 2019-20. Accessed 16/08/2021, <
<http://www.cleanenergyregulator.gov.au/NGER/National%20greenhouse%20and%20energy%20reporting%20data/Corporate%20emissions%20and%20energy%20data/corporate-emissions-and-energy-data-2019-20>>

⁵² Bureau of Meteorology 2021, *2019–20 National Urban Performance Report – Part B*.

issue impacting comparisons between schemes is the extent of operations covered by reporting. Under the NGER scheme service providers report across all operations while for the Framework some providers only report on part of their operation—For example, the WA Water Corporation only report on schemes with greater than 10,000 connected properties.

Following consideration of these issues the Draft Report (HARC, 2021a) proposed a significant overhaul of emissions reporting by recommending that:

- (i.) The Framework align its reporting with the NGER scheme and only mandate reporting for entities meeting the NGER reporting thresholds
- (ii.) That the Framework align its reporting methodology with the NGER scheme and only seek total corporate emissions (Scope 1 and 2) instead of seeking disaggregated (water, wastewater and other) emissions
- (iii.) The Bureau explores options for sourcing this data directly from the Clean Energy Regulator
- (iv.) The Framework includes an indicator to identify service providers who have set emissions reduction targets and, if practical track progress towards these.

Feedback on the proposed way forward was broadly positive with the recommendations receiving support from several respondents, including technical advisory panel members.

A small number of objections to these recommendations were raised in response to the Draft Report (HARC, 2021a). Citing the renewed focus on greenhouse gas emissions in the public debate following COP26⁵³ it was argued that the removal of these indicators would reduce transparency on emissions.

While this is an acknowledged outcome, the Review has not identified a use case that would justify the Framework setting an emission reporting threshold below that of the established NGER scheme.

Furthermore, it is argued that reporting on the setting of emissions targets, as proposed provides greater insight into performance as it identifies those proactively taking action. While it is initially proposed that the indicator focus on the provision of text describing the service provider's target it is suggested that over time reporting could transition to include progress against that target.

In its submission, WSAA noted their support for reporting both total and net emissions, noting that only total emissions can be sourced from the Clean Energy Regulator.

The Review team remain of the view that aligning reporting with the NGER scheme and introducing an emissions reduction target indicator is the most appropriate way forward

Finally, it is noted that the Bureau should monitor the Clean Energy Regulator's ongoing development and piloting of a Corporate Emissions Reduction Transparency (CERT) report and understands any implications this might have for emissions reporting under the Framework.

⁵³ United Nations Climate Change Conference (COP26) The conference took place from 28-31 October 2021

8.1.3 Recommendations

It is recommended that:

- A “Discharges and emissions” sub-theme be included under the public health and environment theme
- The indicators IE1, E1, IE2, E2, IE3, and E3 be adopted, with the proposed revisions, as the basis for reporting effluent disposals
- The existing GHG emissions indicators IE9, E9, E9.1, IE10, E10, E10.1, IE11, E11, E11.1, IE12, E12, E12.1 be retired
- The Framework align its reporting with the NGER scheme and only mandate reporting for service providers meeting the NGER scheme reporting thresholds
- That Framework align its reporting methodology with the NGER scheme and only seek total corporate emissions (Scope 1 and 2) instead of seeking disaggregated (water, wastewater and other) emissions
- The Bureau explores options for sourcing this data directly from the Clean Energy Regulator
- The Framework includes an indicator to identify service providers who have set emissions reduction targets and if practical track progress towards these.

Table 8-4 – Recommended production indicators

Indicator	Definition
IE1—Volume of wastewater treated to a primary level	The volume of wastewater only treated to a primary level by the service provider, during the reporting year in megalitres (ML).
IE2—Volume of wastewater treated to a secondary level	The volume of wastewater only treated to a secondary level by the service provider, during the reporting year in megalitres (ML).
IE3—Volume of wastewater treated to a tertiary level	The volume of wastewater only treated to a tertiary level by the service provider, during the reporting year in megalitres (ML).
E1—Percentage of wastewater treated to a primary level	The percentage of the total wastewater collected by the service provider that receives only treated to a primary level, during the reporting year (%).
E2—Percentage of wastewater treated to a secondary level	The percentage of the total wastewater collected by the service provider that is only treated to a secondary level, during the reporting year (%).
E3—Percentage of wastewater treated to a tertiary level	The percentage of the total wastewater collected by the service provider that is only treated to a tertiary level, during the reporting year (%).
HE_N1—Total greenhouse gas emissions reported under the NGER scheme	The total Scope 1 and 2 greenhouse gas emissions reported by the service provider for the reporting year under the National Greenhouse and Energy Reporting (NGER) scheme (t CO2 equivalents).
HE_N2—GHG emissions reduction target	The adopted GHG emissions target for the service provider
^ Orange text denotes proposed changes to the indicator name and definition. Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

8.1.4 Unresolved questions

The following unresolved matters require further consideration, indicator development and testing with the TAPs, TRG and other jurisdictional representatives:

- **Reporting net GHG emissions** – Reporting net emissions in addition to sourcing total emissions was proposed by WSAA. This proposal has not been tested by is supported by the review team. It is anticipated that the threshold for reporting net emissions would be participation in the NGER scheme.
- **Voluntary reporting of GHG emissions** – It was proposed that service providers who do not meet the NGER scheme threshold may still wish to voluntarily report on total and net GHG emissions. This proposal has not been explicitly tested, however voluntary reporting of indicators was not broadly supported during the pop-up workshops run by the Review team.

8.2 Water efficiency and reuse

Water efficiency and reuse indicators support the transparency and accountability of service providers and can provide insight into the impacts they have on the environment and the effectiveness of their management practices. These insights can inform an understanding of the alignment between customer and community expectations and service provider practices as well as informing livability outcomes.

8.2.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 8-5.

Table 8-5 – Proposed efficiency and reuse indicators

Indicator	Definition
##—Volume of water saved from efficiency measures	The current volume of water saved as a result of water conservation/demand management
##—Investment in water efficiency	The annual investment in water conservation/demand management (\$)
E8—Percentage of biosolids reused	The percentage of dry weight biosolids reused during the reporting year (%).
W27— Recycled water as a percentage of total wastewater collected	The volume of recycled water supplied by the utility as a percentage of the total wastewater collected during the reporting year (%).
^ Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

8.2.2 Matters considered and Feedback received

The water efficiency and reuse sub-theme received support from review respondents including those responding to the *Draft recommendations report* (HARC, 2021a). While the biosolids reuse and recycled water indicators were supported the proposed efficiency indicators received qualified support.

Water efficiency

While the Framework includes network efficiency indicators in the form of potable supply system losses and non-revenue water it does not currently include insights into efforts by service providers to improve water efficiency.

The Review found that:

- Water efficiency is an important issue for both industry and policy agency stakeholders
- The current efficiency indicators provide a limited view of performance with respect to the investment in, and impact of, water efficiency measures

In response, the Draft recommendations (HARC, 2021a) proposed the inclusion of two new indicators to capture the investment in and volume of water saved as a result of efficiency measures.

While submissions and feedback were, by and large, supportive of the water efficiency sub-themes the majority of respondents questioned the practicality of the proposed indicators. Notably, questions were raised around the ability of service providers to produce meaningful (quality) estimates of water saved from efficiency measures.

Noting the clear articulation of support for the inclusion of water efficiency the Review team believe that it remains an important and valued inclusion. As such, it is recommended that the BoM engage with the Specialist Network and other industry members to refine the proposed methodology into a workable solution for water efficiency reporting.

8.2.3 Recommendations

It is recommended that:

- A “Water efficiency and reuse” sub-theme be included under the Public health and environment theme
- The indicators E8 and W27 be included under the sub-theme, with the proposed revisions—Table 8-6
- The Bureau engages with the AWA Specialist Network and other industry members to refine the proposed water efficiency indicators (discussed in Section 8.2.4) into a workable solution for reporting.

Table 8-6 – Recommended efficiency and reuse indicators

Indicator	Definition
E8—Percentage of biosolids reused	The percentage of dry weight biosolids reused during the reporting year (%).
W27—The percentage of treated effluent supplied as recycled water	The volume of recycled water supplied by the service provider as a percentage of the total wastewater collected during the reporting year (%).
^ Orange text denotes proposed changes to the indicator name and definition. Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

8.2.4 Unresolved questions and the pathway forward

A potential way forward on water efficiency reporting has been discussed with members of the Australian Water Association's (AWA) Water Efficiency Specialist Network (Specialist Network). Detailed in a Review submission on behalf of the Specialist Network, the proposed methodology⁵⁴ splits the single water efficiency indicator into a list of "water efficiency program details" which are addressed against program categories. For each program category the Framework would request the following:

- (a) Do you have a program Yes/No
- (b) What is the annual financial investment allocated to this program?
- (c) What is the budgeted water savings target?

As part of their submission the Specialist Network collated a potential list of program categories that they believe could be included:

- Demand management or optimisation strategy development
- Marketing that involves some water efficiency messaging
- Customer education and water literacy
- Residential leak identification and on-site repair support
- Residential incentives and retrofits
- Residential alternate supply incentives (e.g., rainwater tanks or on-site reuse)
- Non-revenue (e.g., network) leak tracking and repairs
- Non-residential customer Water Efficiency Management Plans (or equivalent)
- Non-residential customer efficiency audits
- Non-residential incentives and retrofits
- Non-residential leak identification and on-site repair support
- Innovation - including:
 - i. piloting of water efficiency programs without an established evidence base,
 - ii. development of insights such as analytics, benchmarks and best-practice guidelines,
 - iii. an innovation fund to facilitate customers in developing novel efficiency technologies, techniques and insights.
- Advocacy in regulation change to improve the system and market water efficiency

Importantly the Specialist Network has offered to collaborate with the Bureau and industry to refine their proposed methodology.

⁵⁴ Australian Water Association Water Efficiency Specialist Network, 2021. *Submission for Draft Indicators Recommendations – Water Efficiency Indicators 29/11/2021*.

8.2.5 Water quality risk management

Collecting and reporting on water quality risk management will provide a lead understanding of water quality reliability and provides insights into water security outcomes and in turn customer, community and liability outcomes.

8.2.6 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 8-7Table 8-1.

Table 8-7 – Proposed water quality risk management indicators

Indicator	Definition
H1—Water quality guidelines	The water quality guidelines (standard) specified in the utility's licence (or franchise agreement) or required by the health regulatory agency or government against which the water utility measures verification of water quality.
H5—Risk-based drinking water management plan externally assessed	The risk-based drinking water management plan was externally assessed.
H5.1—Date of last external assessment	The date of the last external assessment of the service provider risk-based management plan
H5.2— The type of assessment	The type of external assessment undertaken
H5.3—Are audit findings made public	Are water quality management plan audit findings made public?
##—Water quality research investment	The total investment, in dollars, in research and development supporting water quality management within the financial year (\$)

8.2.7 Feedback received and matters considered

The water quality risk management sub-theme received support from review respondents including those responding to the Draft Report (HARC, 2021a). The proposed indicators seek to provide insight into drinking water risk management

focuses on a service provider's management of drinking water risks to public health through their development and maintenance of risk-based management plans.

The relevance of H1, the guidelines used in the preparation of a risk-based management plan

A number of respondents questioned the value of H1 as risk-based management plans should be based on the latest drinking water guidelines. It was also noted that there is not a demonstrated use case with respect to service provider compliance or regulation.

An analysis of reported data suggests that in practice there is variation in the guidelines being used, though data quality issues make a comprehensive assessment challenging (there is a lack of standardisation in the naming of guidelines and in many cases the specific version is not provided).

However, it was noted in the [indicator survey](#) that H1 provides transparency and supports confidence in drinking water supplies. Given this and the minimal effort required to collect and

report this indicator, the Review team believe that H1 remains relevant to the objectives of the Framework.

The collection of indicators H1, H5 for drinking water and recycled water systems

Although aligned with the interest of policy agencies expressing a desire for increased coverage of alternative supplies, the extension of H1 and H5 to recycled water received mixed support. The primary challenge identified with this proposal was the issue that service providers can operate multiple recycled water schemes, often with each scheme supplying a different class of recycled water. As such, service providers can have multiple management plans, or in some cases, are not required, by law, to have one.

Consequently, data collection would need to cover all schemes operated by a service provider for which management plans exist. This would require scheme scale data capture, which was not supported by Review participants.

Reporting could be limited to schemes supplying a given class of water or with those with a high exposure risk but the specific use case for this information has not been established or supported by Review respondents to date. As such, there is not a clear case to support the extension of H1 and H5 to recycled water services at this point in time.

Increasing the level of detail collected on the external assessment of plans

Views on extending the information collected on the auditing of risk-based management plans were generally supportive, however, it was noted that audit frequency is typically set by or at least in conjunction with the regulator.

Further, it was noted that not every jurisdiction requires annual audits and therefore the additional data captured should only be the date of the last independent/external/statutory audit of the risk management plan.

With respect to the proposed “type of assessment” indicator H5.2 and the “publication of audit findings” indicator H5.3, it is noted that while the indicators support transparency and received early support from Review participants they do not measure or report on elements of performance that are necessarily within the control of service providers. Typically, the requirement for, and method of, reporting on audit findings is set by the regulator. As such the inclusion of the proposed indicators, H5.2 and H5.3 are not supported with a utility performance reporting framework.

The inclusion of an indicator to capture water quality research investment.

Research and development is an explicit element (Element 9) of the Australian Drinking Water Guidelines (2011) framework for managing water quality. Research investment was, therefore, put forward as a lead indicator of water quality risk management.

Feedback identified limited support for the proposed indicator. While some considered that it may be an appropriate leading indicator, others questioned the link between individual utility research and their water quality performance.

While Water Research Australia (WRA) remain a strong advocate of a research investment indicator its fit within an urban water utility performance reporting framework is not clear and as such it is not recommended that the proposed indicator be included in the final indicator set.

8.2.8 Recommendations

It is recommended that:

- A “water quality risk management” sub-theme be included under the public health and environment theme
- The indicators H1 and H5 be retained, with updated definitions and supporting notes—Table 8-8
- The proposed indicator H5.1—date of last drinking water quality management plan assessment be added to the Framework—Table 8-8.

Table 8-8 – Recommended water quality risk management indicators ^

Indicator	Definition
H1—Water quality risk management guidelines	The water quality guidelines (standard) specified in the service provider’s licence (or franchise agreement) or required by the health regulatory agency or government against which the water utility measures verification of water quality.
H5— External assessment of risk-based drinking water management plan	The risk-based drinking water management plan was externally assessed.
HE_N3 — Date of last drinking water quality systems audit	The date of the last independent/external/statutory audit of the service provider’s water quality systems (dd/mm/yyyy).
^ Orange text denotes proposed changes to the indicator name and definition.	

8.3 Water quality compliance

Collecting and reporting on water quality compliance provides a lag understanding of water quality reliability and security. This sub-theme can support the transparency and accountability of service providers and can provide insight into their impacts on public health.

8.3.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 8-1.

Table 8-9 – Proposed water quality compliance indicators

Indicator	Definition
H3—Percentage of the population where microbiological compliance was achieved	The population, as a percentage, where microbiological compliance was achieved within the financial year (%)
H4— Percentage of the population provided with chemically compliant drinking water	The population, as a percentage, who were provided with chemically compliant drinking water within the financial year (%)
##—Number of boil water alerts	The total number of boil water alerts issued by the service provider

Indicator	Definition
##—Number of do not drink notices for a period greater than x hours/days	The total number of do not drink notices for a period greater than x hours/days

8.3.2 Feedback received and matters considered

The water quality risk management sub-theme received mixed support from review respondents including those responding to the Draft Report (HARC, 2021a).

However, while the sub-theme is supported, views expressed on the individual indicators are mixed. The following summaries present the matters considered, feedback received and the proposed way forward.

Definitional issues

A number of definitional issues were raised in the feedback, submission and testing processes. These were:

- The need to simplify terminology to aid in the understanding of indicators
- Updating references remove superseded versions and ensure alignment with contemporary versions
- The need for a clearer definition of a water supply zone and its role in calculating the percentage of the population for which compliance was achieved.

These issues have been addressed in the revised definitions and supporting notes developed by the Review team.

Duplication and alignment with jurisdictional regulatory reporting

A small number of respondents raised concerns over the relevance of water quality compliance reporting, noting that it was duplicating jurisdictional regulatory reporting requirements.

In considering this issue the Review found that

- Publicly and transparently reporting on water quality supports confidence in drinking water supplies, aligns with the Frameworks vision and objectives and supports insights into three of the four outcome areas that it seeks to inform
- Large SOCs typically published water quality results and reports as part of their regulatory or licences conditions. However, many smaller service providers are not subject to the same publication requirements—For example, in South Australia, only SA Water is required to publicly publish water quality data while smaller service providers are only required to make their results available to the public on request.
- While there are many commonalities in water quality compliance reporting across jurisdictions, differences do exist. The indicators adopted by the Framework seek to provide a common basis for expressing compliance and, therefore, differ from jurisdictional expressions of compliance—in the view of some this is a source of confusion

- The inclusion of microbiological and chemical compliance reporting provides a single, transparent source of information that would not exist without its inclusion in the Framework

As a fundamental objective of service providers, the provision of safe drinking is central to an assessment of service performance. In the context of the Framework, the value of public disclosure is in supporting confidence. Therefore, even if compliance is consistently reported as 100% for all service providers there is significant value in reporting this result.

The basis for reporting compliance

Under the current Framework definitions, microbiological compliance is reported as a percentage of the total population where compliance is achieved. Conversely, chemical compliance is reported as the number of compliant supply zones.

Review submissions noted the need for consistency in the definition of these indicators.

Expressing compliance in terms of population, supply zones and connections were all considered by the Review. It was found that their expression as a percentage of the total population where compliance is achieved provides the strongest alignment with the public health focus of the indicators.

Therefore, the draft recommendations proposed adopting a consistent, percentage of the total population, basis for expressing microbiological and chemical compliance.

Response to the Draft Report (HARC, 2021a) did not explicitly address this proposal, however, feedback from the public health TAP has supported the proposed change.

Boil water alerts and do not drink notices

Participants in the public health indicator workshops identified reporting on boil water alerts and do not drink notices as a valuable extension of the Framework's indicators set.

In response, the Review explored and tested the scope and framing of indicators to facilitate reporting. Based on feedback from this process the draft recommendations proposed the inclusion of two new indicators quantifying the total number of boil water alerts issued by the service provider and the number of do not drink notices in place for a period greater than a threshold.

Responses to the Draft Report (HARC, 2021a) did not explicitly address this proposal. Feedback from public health TAP members supported the proposed changes and recommended:

- Removing the threshold for including a do not drink notice in reporting
- Requiring service providers to include information on the contaminant or contamination that lead to the do not drink or do not use alert in reported the footnote.

These TAP recommendations have been adopted and incorporated in the proposed final definitions and supporting notes.

8.3.3 Recommendations

It is recommended that:

- A “water quality compliance” sub-theme be included under the Public health and environment theme
- The microbiological compliance indicator (H3) and chemical compliance indicator H4 are both expressed as a percentage of the total population where compliance is achieved.
- The number of supply zones indicator H4a be retired
- Two new indicators are included in the compliance sub-theme to facilitate reporting on the number of boil water alerts and do not drink notices issued by service providers— Table 8-4.

Table 8-10 – Recommended water quality compliance indicators

Indicator	Definition
H3 —Percentage of the population where microbiological compliance was achieved	The population, as a percentage, where microbiological compliance was achieved within the reporting year (%)
H4 — Percentage of the population provided with chemically compliant drinking water	The population, as a percentage, who were provided with chemically compliant drinking water within the reporting year (%)
HE_N4 —Number of boil water alerts issued	The total number of boil water alerts issued by the service provider
HE_N5 —Number of do not drink notices issued	The total number of do not drink notices issued by the service provider
^ Orange text denotes proposed changes to the indicator name and definition.	

8.4 A summary of the public health and environment pathway

The following summary presents the changes recommended under the public health and environment theme. It is recommended that:

- A “discharges and emissions” sub-theme be included under the Public health and environment theme
- The indicators IE1, E1, IE2, E2, IE3, and E3 be adopted, with the proposed revisions, as the basis for reporting effluent disposals under discharges and emission sub-theme— Table 8 2
- The existing GHG emissions indicators IE9, E9, E9.1, IE10, E10, E10.1, IE11, E11, E11.1, IE12, E12, E12.1 be retired
- The Framework aligns its GHG reporting with the NGER scheme and only mandates reporting of total emission for entities meeting the NGER reporting thresholds
- The Framework aligns its reporting methodology with the NGER scheme and only seek total corporate emissions (Scope 1 and 2) instead of seeking disaggregated (water, wastewater and other) emissions and options for sourcing this data directly from the Clean Energy Regulator

- The Framework includes an indicator to identify service providers who have set emissions reduction targets and, if practical track progress towards these.
- A “Water efficiency and reuse” sub-theme be included under the Public health and environment theme and existing indicators E8 and W27 be included under the sub-theme, with the proposed revisions defined in Table 8-2
- The Bureau engages with the AWA Specialist Network and other industry members to refine the proposed water efficiency indicators (Section 8.2.4) into a workable solution for reporting.
- A “water quality risk management” sub-theme be included under the Public health and environment theme and existing indicators H1 and H5 be retained, with updated definitions and supporting notes as the basis of reporting
- The proposed indicator H5.1—date of last drinking water quality management plan assessment be added to the Framework under the water quality risk management sub-theme
- A “water quality compliance” sub-theme be included under the Public health and environment theme and the microbiological compliance indicator H3 and chemical compliance indicator H4 be retained, with updated definitions and supporting notes as the basis of reporting
- The number of supply zones indicator H4a be retired
- Two new indicators are included in the water quality compliance sub-theme to facilitate reporting on the number of boil water alerts and do not drink notices issued by service providers—Table 7-4

Table 8-11 summarises the final indicator recommendations along with updated recommendations on the service providers who should report them. The updated reporting requirements are based on feedback from the Technical Advisory Panels as well as feedback from the indicator testing activity (Deliverable 8).

Table 8-11 – Recommended public health and environment indicators ^

	Indicator	<10,000	>10,000	Bulk
Discharges and emissions	IE1—Volume of wastewater treated to a primary level	✓	✓	
	IE2—Volume of wastewater treated to a secondary level	✓	✓	
	IE3—Volume of wastewater treated to a tertiary level	✓	✓	
	E1—Percentage of wastewater treated to a primary level			
	E2—Percentage of wastewater treated to a secondary level			
	E3—Percentage of wastewater treated to a tertiary level			
	HE_N1—Total greenhouse gas emissions reported under the NGER scheme			
	HE_N2—GHG emissions reduction target/s		✓	

	Indicator	<10,000	>10,000	Bulk
Efficiency	E8—Percentage of biosolids reused	✓	✓	
	W27—The percentage of treated effluent supplied as recycled water			
Water quality risk management	H1—Water quality risk management guidelines	✓	✓	
	H5—External assessment of risk-based drinking water management plan	✓	✓	
	HE_N3—Date of last drinking water quality systems audit	✓	✓	
Water quality compliance	H3—Percentage of the population where microbiological compliance was achieved	✓	✓	
	H4— Percentage of the population provided with chemically compliant drinking water	✓	✓	
	HE_N4—Number of boil water alerts issued	✓	✓	
	HE_N5—Number of do not drink notices issued	✓	✓	
^ Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.				

9. Water resources

The existing Framework has 39 Water resources indicators (28 reported and 11 derived). These indicators provide insight into:

- Where service providers source water from and the volumes sourced
- The volumes of potable and non-potable water (including recycled water) supplied to customers
- The volume of potable water produced
- The volume of non-revenue water associated with the potable supply system
- The volume of wastewater collected, treated and disposed and reused.

In 2017 the Water resource indicators were aligned with the BoM *Water Regulations* 2008 Category 7 data collection⁵⁵, which supports national assessments of availability and use, including the National Water Account⁵⁶. The water resource indicators are also partially aligned with the Australian Bureau of Statistics' (ABS) Water and Sewerage Services Survey (WSSS).

In considering the Water Resource indicators the Review found that

- The water resources theme and indicators were broadly supported by Review respondents
- The data collected is of interest and value to, multiple stakeholders, including the BoM, ABS and state and territory policy agencies
- Definitional issues, particularly with respect to recycled water, and duplication of data collected by the ABS' WSSS were the primary issues raised in the feedback and submission process.

In response, the Review's draft recommendations (HARC, 2021a) proposed:

- keeping the existing Water resource category as a theme in the revised Framework
- Simplifying the sub-themes under which the indicators are grouped.
- Keeping the existing set of water resource indicators, with the exception of W30—Volume of wastewater losses and spills. W30 was recommended for retirement
- Moving W27—Recycled water as a percentage of total wastewater collected to the water efficiency and reuse sub-theme under the Public health and environment theme
- The addition of a restrictions sub-theme along with three new indicators to collect longitudinal data on the nature and length of residential water restrictions.

⁵⁵ Bureau of Meteorology, 2021. *Water Regulations 2008 – Urban water management information requirements*. [Source: <http://www.bom.gov.au/water/regulations/schedules/urbanWater.shtml>]. Bureau of Meteorology, Australia

⁵⁶ Bureau of Meteorology, 2021. *National Water Account*. [Source: <http://www.bom.gov.au/water/nwa/2021/>]. Bureau of Meteorology, Australia

The following discussion of the proposed sub-themes draws the feedback received and submissions made in response to the Draft Report (HARC, 2021a) together with the detailed indicator insights and issues raised across the course of the Review. It provides a summary of what was proposed in the draft recommendations, what has been considered, recommendations on the way forward and unresolved matters.

9.1 Sources and transfers

The volume of water sourced and transferred from supply sources informs urban water balances including those prepared by the Bureau of Meteorology. The indicators and derived water balances contextualise service provider performance as well as providing insight into water security, system resilience, liveability and customer and community outcomes.

9.1.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 9-1.

Table 9-1 – Proposed sources and transfers indicators ^

Indicator	Definition
W1 —Volume of water sourced from surface water	The gross volume of water taken by the utility from surface water sources during the reporting year, in megalitres (ML).
W2 —Volume of water sourced from groundwater	The gross volume of water sourced by the utility from groundwater during the reporting year, in megalitres (ML).
W3.1 —Volume of water sourced from desalinated marine waters	The net volume of water produced by the utility from the desalination of marine or estuarine water during the reporting year, in megalitres (ML).
W5.3 —Volume of water, excluding recycled water, received from other service providers or operational areas within the urban water supply system	The volume of water, potable and non-potable, excluding recycled water and urban stormwater, received by the utility from other service providers or operational areas within the urban water supply system during the reporting year, in megalitres (ML).
W14.3 —Volume of water, excluding recycled water, exported to other service providers or operational areas within the urban water supply system	The volume of water, potable and non-potable, excluding recycled water and urban stormwater, exported by the utility to other service providers or operational area within the urban water supply system during the reporting year, in megalitres (ML).
W6 —Volume of recycled water received from other service providers or operational areas within the urban water supply system	The volume of recycled water received by the utility from other service providers or operational areas within the urban water system, during the reporting year, in megalitres (ML).
W15 —Volume of recycled water exported to other service providers or operational areas within the urban water supply system	The volume of recycled water exported by the utility to other service providers or operational areas within the urban water system, during the reporting year, in megalitres (ML).
W7 —Total volume of water sourced	The total volume of water, potable and non-potable, sourced by the utility during the reporting year, in megalitres (ML).
W5 —Total volume of water received from other service providers or operational areas within the urban water system	The total volume of water, potable and non-potable, excluding urban stormwater, transferred by the utility to other service providers or operational areas within the urban water system, in megalitres (ML).

Indicator	Definition
W14—Total volume of water exported to other service providers or operational areas within the urban water supply system	The total volume of water, potable and non-potable, excluding urban stormwater, transferred by the utility to other service providers or operational areas within the urban water system, in megalitres (ML).
^ Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

9.1.2 Matters considered and feedback received

The Supply sources and transfers sub-theme was recognised as relevant and important for the Framework. The proposed indicators were broadly supported by Review respondents, including those responding to the Draft Report (HARC, 2021a).

The following summaries present the matters considered, feedback received and the proposed way forward.

Definitional issues

The definitional issues raised in the feedback, submission and testing processes were:

- The need to simplify terminology to aid in the understanding of indicators
- A discrepancy between the Framework’s definition of surface water and that used in other reporting frameworks
- The need for greater clarity on the definitions of imported and sourced water
- The need to clarify definitions with respect to the inclusion or otherwise of volumes from other service providers
- The need to clarify the handling of raw bore water in the context of reporting on the volume of water sourced from groundwater
- The need for an agreed definition of “recycled water”
- Discrepancies between Framework and ABS WSSS indicator definitions.

In response, these issues have been addressed in the revised definitions and supporting notes developed by the Review team. Key changes include:

- The adoption of the terms “drinking” and “non-drinking” over “potable” and “non-potable” to simplify the language used in the indicator definitions and align with the terminology used in the Australian Drinking Water Guidelines (ADWG)⁵⁷
- The clarification of the scope of the sources included and excluded in W1, W2, W3.1 and W5.3
- The adoption of the National Guidelines for Water Recycling’s definition of recycled water—recycled water is “water generated from sewage, greywater or stormwater systems and treated to a standard that is appropriate for its intended use”. Importantly,

⁵⁷ National Health and Medical Research Council, 2022. *Australian Drinking Water Guidelines (2011) – Updated January 2022*. National Health and Medical Research Council, Canberra

this definition aligns with that used by the ABS’s WSSS, which includes stormwater in its definition of recycled water

- The addition of text to supporting notes to clarify alignment with the WSSS.

A water balance framework

Responding to submissions identifying the need to contextualise the Water resources indicators within a water balance framework the Review looked at industry practice and found that:

- The IWA 'Best Practice' Water Balance (Figure 9-1) is commonly used within the industry and has broad acceptance

Volume from Own Sources	System Input Volume (corrected for known errors)	Water Exported	Authorised Consumption (includes Water Exported)	Water Exported	Billed Water Exported		Revenue Water
		Water Supplied		Other Billed Authorised Consumption	Billed Metered Consumption	Billed Unmetered Consumption	
Water Imported				Water Losses	Unbilled Authorised Consumption	Unbilled Metered Consumption	Non-Revenue Water
		Apparent Losses			Unbilled Unmetered Consumption		
		Real Losses			Unauthorised Consumption		
					Customer Metering Inaccuracies		
					Leakage on Mains		
					Leakage and Overflows at Storages		
	Leakage on Service Connections up to point of customer metering						

Figure 9-1 The IWA Water Balance with additional clarifications ⁵⁸

- Elements of the IWA water balance framework already feature in the water resource indicator supporting notes
- Contextualising the water resources indicators within the IWA water balance framework would aid in a shared understanding of water resource indicators
- To support alignment:
 - › The proposed sources and transfers sub-theme would need to be modified to a “Sources and imports” sub-theme that includes water self-sourced and imported by the service provider.
 - › The water export indicators, W14.3, W15 and W14, included under the draft recommendations (HARC, 2021a) would need to be moved to a “Supply and exports” sub-theme (See Section 9.2).

The inclusion of stormwater in the volume of water sourced

Feedback on testing of the water resource indicators with the TAP highlighted a gap with respect to stormwater harvested and treated for drinking water (potable) supply. For example, Orange Council harvests stormwater from Blackmans Swamp Creek to augment water held in the Suma Park Dam.

⁵⁸ The LEAKsuite Library, 2022, *The IWA Water Balance*. Source: <https://www.leakssuitelibrary.com/iwa-water-balance/> Accessed 15 December 2021.

The review found that

- Neither the existing nor proposed indicators (HARC, 2021a) capture stormwater used for potable supply in the manner described
- The gap could be addressed by including stormwater harvested for indirect potable supply in the definition of W1—Volume of water self-sourced from climate dependant surface water sources
- The inclusion of these stormwater volumes in W1 will ensure that they are captured in the total water self-sourced
- An additional indicator will be required to separately capture and report on the total volume of stormwater harvested for supply (potable and non-potable).

The use case for W6 (recycled water received)

Indicator W6, the volume of recycled water received from other service providers, was identified by the Bureau as no longer being relevant to its information needs.⁵⁹

In exploring the use case for W6 the review found that:

- In 2020–21, the NPR included data for 86 service providers and or schemes.⁶⁰ Of these, only 4 service providers reported importing recycled water
- While the number of service providers and relative volumes of recycled water are small, their exclusion would leave a gap in the Framework’s coverage of alternative water supplies. A decision to retire W6 would not be aligned with the views expressed by Review respondents on the importance of understanding alternative supplies
- The large number of service providers reporting zero volumes against W6 suggest a data quality issue. Service providers are asked to distinguish genuine zero volumes from instances where data is not available or where an indicator is not applicable.

9.1.3 Recommendations

It is recommended that:

- The IWA 'Best Practice' Water Balance (Figure 9-1) be adopted as the basis for contextualising the “Water resources” indicators
- A “Sources and imports” sub-theme be included under the Water resources theme
- The existing indicators W1, W2, W3.1, W5.3, W5, W6, and W7, be adopted, with the proposed revisions, as the basis for reporting sources and imports —Table 9-2
- Harvested stormwater self-sourced to meet potable demand be included in the volume captured by W1

⁵⁹ Personal communication, Bureau of Meteorology 15/11/2021.

⁶⁰ There were 79 unique service providers reporting in 2020–21, Water Corporation reports on 8 separate schemes.

- The water export indicators, W14.3, W15 and W14, included under the proposed “Sources and transfers” sub-theme be moved to a “Supply and exports” sub-theme—Section 9.2.
- Indicator W6 be retained and that the Bureau look into the identified data quality issue, i.e., the validity of the zero volumes being reported.

Table 9-2 – Recommended Sources and imports sub-theme indicators ^

Indicator	Definition
W1 —Volume of water self-sourced from climate-dependant surface water sources	The total volume of water self-sourced by the service provider from climate-dependent surface water sources during the reporting year, in megalitres (ML).
W2 —Volume of water self-sourced from groundwater sources	The total volume of water self-sourced by the service provider from groundwater sources during the reporting year, in megalitres (ML).
W3.1 —Volume of water self-sourced from marine or estuarine water sources	The net volume of water self-sourced by the service provider from the desalination of marine or estuarine water sources during the reporting year, in megalitres (ML).
W5.3 —Volume of drinking and non-drinking water, excluding recycled water, imported from other service providers	The volume of drinking and non-drinking water, excluding recycled water, imported (purchased or received) from other service providers during the reporting year, in megalitres (ML).
W6 —Volume of recycled water imported from other service providers	The volume of recycled water imported (purchased or received) from other service providers during the reporting year, in megalitres (ML).
WR_N1 —Volume of stormwater harvest for supply as recycled water	The volume of stormwater harvested by the service provider for supply as recycled water during the reporting year, in megalitres (ML).
W5 —Total volume of drinking and non-drinking water, including recycled water, imported from other service providers	The total volume of drinking and non-drinking water, including recycled water, imported (purchased or received) from other service providers during the reporting year, in megalitres (ML).
W7 —Total volume of drinking and non-drinking water, excluding recycled water, self-sourced and imported from other service providers	The total volume of drinking, non-drinking water, excluding recycled water, self-sourced and imported (purchased or received) from other service providers during the reporting year, in megalitres (ML).
^ Orange text denotes proposed changes to the indicator name and definition. Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

9.2 Supply

The volume of water supplied informs urban water balances including those prepared by the Bureau of Meteorology. The indicators and derived water balances contextualise service provider performance as well as providing insight into network efficiency, water security, system resilience, and customer and community outcomes.

9.2.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 9-3.

Table 9-3 – Proposed supply indicators ^

Indicator	Definition
W8.3 —Volume of drinking and non-drinking water, excluding recycled water, supplied to residential customers	The volume of water, potable and non-potable, excluding recycled water and urban stormwater supplied by the utility to residential customers during the reporting year, in megalitres (ML).
W9.3 —Volume of water supplied to non-residential customers	The volume of water, potable and non-potable, excluding recycled water and urban stormwater supplied by the utility to non-residential properties during the reporting year, in megalitres (ML).
W31 —Volume of water returned to surface water and groundwater from the urban water supply system	The volume of water, potable and non-potable, returned by the utility to surface water or groundwater from the urban water supply system during the reporting year, in megalitres (ML).
W13 —Volume of water returned as environmental flows from outside of the urban water supply system	The volume of non-potable water returned by the utility to the environment during the reporting year, in megalitres (ML).
W10.1 —Volume of non-revenue water	The volume of non-revenue water associated with the utilities potable water supply system during the reporting year, in megalitres (ML).
W20 —Volume of recycled water supplied to residential customers	The volume of recycled water supplied by the utility to residential customers during the reporting year, in megalitres (ML).
W21 —Volume of recycled water supplied to non-residential customers	The volume of recycled water supplied by the utility to non-residential customers during the reporting year, in megalitres (ML).
W23 —Volume of recycled water supplied as environmental flows	The volume of recycled water supplied by the utility to the environment during the reporting year, in megalitres (ML).
W25.1 —Volume of recycled water supplied to managed aquifer recharge	The volume of recycled water supplied by the utility to managed aquifer recharge during the reporting year, in megalitres (ML).
W28.4 —Volume of urban stormwater supplied to residential customers	The total volume of urban stormwater supplied by the utility to residential customers during the reporting year, in megalitres (ML).
W28.5 —Volume of urban stormwater supplied to non-residential customers	The total volume of urban stormwater supplied by the utility to non-residential customers during the reporting year, in megalitres (ML).
W8 —Total volume of water supplied to residential customers	The total volume of water, potable and non-potable, supplied by the utility to residential properties during the reporting year in megalitres (ML).
W9 —Total volume of water supplied to non-residential customers	The total volume of water, potable and non-potable, supplied by the utility to non-residential properties during the reporting year, in megalitres (ML).
W11 —Total volume of urban water supplied	The total volume of water, potable and non-potable, supplied to residential and non-residential customers by the utility during the reporting year, in megalitres (ML).
W12 —Average volume of residential water supplied per property	The average volume of water, potable and non-potable, supplied to residential properties by the utility during the reporting year, in megalitres per property (ML/property).
W26 —Total volume of recycled water supplied	The total volume of recycled water supplied by the utility during the reporting year, in megalitres (ML).
W27 —Recycled water as a percentage of total wastewater collected	The volume of recycled water supplied by the utility as a percentage of the total wastewater collected during the reporting year (%).
^ Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

9.2.2 Feedback received and matters considered

Supply was recognised as an important sub-theme for the Framework and the proposed indicators were generally supported by Review respondents, including those responding to the *Draft recommendations report* (HARC, 2021a).

The following summaries present the feedback received, matters considered and the proposed way forward.

Definitional issues

A number of definitional issues were raised in the feedback, submission and testing processes. These were:

- The need to simplify terminology to aid in the understanding of indicators
- Discrepancies between the Framework’s definition and those used in other reporting frameworks, including the ABS’s WSSS
- The handling of water for own use, in particular in relation to its distinction from municipal usage where a service provider is a local government
- The need for an agreed definition of “recycled water”
- Recycled water exported to other service providers (W15) is not currently included in the definition of the total volume of recycled water supplied (W26)
- The need to clarify a number of effluent reuse “edge cases” to clarify their classification as either disposal or recycling.

These issues have been addressed in the [revised definitions and supporting notes](#) developed by the Review team. Key changes include:

- The adoption of the terms “drinking” and “non-drinking” over “potable” and “non-potable” to simplify the language used in the indicator definitions and align with the terminology used in the ADWG
- The adoption of the National Guidelines for Water Recycling’s definition of recycled water—recycled water is “*water generated from sewage, greywater or stormwater systems and treated to a standard that is appropriate for its intended use*”. Importantly, this definition aligns with that used by the ABS’s WSSS, which includes stormwater in its definition of recycled water
- The addition of text to supporting notes to clarify alignment with the WSSS.

A water balance framework

As discussed in Section 9.1, Review respondents identified the need to contextualise the Water resources indicators within a water balance framework to aid in their definition and understanding.

In response, the Review found that:

- Contextualising the water resources indicators within the IWA water balance framework (Figure 9-1) would aid in a shared understanding of water resource indicators

- To support alignment with the IWA water balance framework:
 - › The proposed Supply sub-theme would need to be modified to a “Supply and exports”
 - › The water export indicators, W14.3, W15 and W14 proposed in the Draft recommendations (HARC, 2021a) would need to be moved to the “Supply and exports” sub-theme.

The inclusion of non-revenue water in the definition of W9.3

Review submissions questioned the inclusion of non-revenue water (unauthorised consumption and real and apparent losses for the potable and non-potable systems) in the definition of W9.3—Volume of water supplied to non-residential customers.

In exploring this issue the review found that:

- The inclusion of non-revenue water in W9.3 does not align with the intent of the indicator—which is to report on the volume of drinking and non-drinking water supplied to non-residential customers
- The inclusion of non-revenue water in W9.3 does not align with the IWA water balance framework as it does not maintain separation between revenue water and unbilled authorised consumption, unauthorised consumption and real and apparent losses.
- The inclusion of non-revenue water in W9.3 impacts on alignment with the ABS’s WSSS

The use case for derived indicators W8, W9 and W14

The derived indicators W8, W9, and W14 report on the total volume of drinking and non-drink water, including recycled water supplied to residential and non-residential properties and exported to other service providers.

The value of calculating and storing these derived indicators was raised by a number of Review respondents. While the draft recommendations (HARC, 2021a) proposed keeping these indicators, feedback on this the report suggest there is support for their retirement.

In exploring the case for W8, W9 and W14 the review found that:

- W8, W9 and W14 provide little insight into service provider performance and are not central to the development of water balances
- As derived (calculated) indicators, there would be no material loss of information if these were retired from the indicator set—i.e., individuals can still readily calculate the information if required
- Reporting on recycled water as a percentage of total volume of water supplied to residential and/or non-residential customers would be more inciteful than the total volume supplied

The use case for W13

Indicator W13—Volume of water returned as environmental flows from outside of the urban water supply system was identified by the Bureau as no longer being relevant to its information needs.⁶¹

In exploring the value of continuing to collect W13 the Review did not identify any other use case for this indicator.

Alignment between indicator W31 and U6.1

In its submission on the Water resource indicators, the Bureau identified a miss-alignment between indicator W31—Volume of water returned to surface water and groundwater from the urban water supply system) and its Water Regulation 2008 Category 7 counterpart U6.1.

In considering this issue the Review found that:

- Removing groundwater from the definition of W31 would resolve the alignment issue
- Doing so would not create any adverse impacts on the information collected.

Non-revenue water (W10.1)

As part of efforts to align the Water resource indicators with the IWA water balance framework, the Review considered the definition of indicator W10.1—Volume of non-revenue water.

The Review found that:

- The inclusion of unbilled (non-revenue) water, authorised metered and unmetered supply and apparent losses and real losses in the definition of W10.1 is consistent with the IWA water balance framework
- The exclusion of non-revenue water non-potable systems does not align with the definition of W8.3 and W9.3, which includes both potable and non-potable systems.
- The absence of a commensurate indicator for the non-potable system means that where a service provider is supplying material volumes of non-potable water (i.e., raw or partially treated), a water balance cannot be developed using the Framework's indicators.
- While this issue is important for many existing service providers, feedback from the indicator testing activity (Deliverable 8) highlighted that many smaller service providers supply significant (in the context of their own operations) volumes of non-potable water
- the ABS's WSSS definition of non-revenue water includes both the potable and non-potable systems.
- Framework indicators A9—Infrastructure leakage index (ILI), A10—Real losses: service connections and A11—Real losses: water mains provide insight into real losses from the drinking water supply system.

⁶¹ Personal communication, Bureau of Meteorology 15/11/2021.

Water supplied for own use

The volume of water supplied for own use, forming part of a service provider's unbilled authorised consumption, is not currently an explicit component of the Framework's water resource indicators. Review respondents identified inconsistencies in the incorporation of own use into the Framework indicators and misalignment between the Framework and the ABS's WSSS.

In exploring this issue, the Review found:

- Under the existing Framework definitions:
 - › Potable water supplied for own use is reported as part of W10.1—Volume of non-revenue water
 - › Potable and non-potable supply for own use is also included in W9.3—Volume of water supplied to non-residential customers, by virtue of the inclusion of non-revenue water in the current definition. It is noted that the Review found the inclusion of non-revenue water in W9.3 to be inconsistent with the intent of the indicator.
- Under the WSSS service providers report their own use sourced from potable and non-potable sources (as a single value under WSSS Question 20) and their own use from recycled water sources (WSSS Question 34).
- The misalignment creates complexity and introduces data quality risks
- The addition of own use indicators to the framework, that are aligned with the WSSS would alleviate this issue
- Reporting on own use would enable an understanding of progress on reuse targets and the identification of reuse opportunities.

Beneficial reuse

Feedback and submission received in response to the Review identified cases of effluent reuse that are not considered recycling under the existing Framework's definitions—e.g., a Class A reuse scheme supplying recycled water to a lake that provides recreational and social benefits. Under the existing definitions, this case is not considered recycling as there is no defined customer and the release is not recognised as an environmental flow. Therefore, the volume would be reported as a disposal under W29—Volume of treated wastewater disposals.

The Review explored this issue through consultation with the water resources TAP and found:

- There is strong support across service providers and policy agencies for the addition of an indicator to quantify beneficial reuse
- There was broad agreement that:
 - › The definition of beneficial reuse should be based on the need for an agreed mutual benefit for both the party providing the recycled effluent/water and the recipient
 - › Recycled effluent used to irrigate woodlots, pasture etc. that are not harvested should not be included in the reported volume.

The volume of urban stormwater supplied (W28.4 and W28.5)

The Review found the need for an explicit and consistent definition of recycled water. In response, the definition used by the National Guidelines for Water Recycling has been recommended.

Recycled water is “*water generated from sewage, greywater or stormwater systems and treated to a standard that is appropriate for its intended use*”

A feature of this definition is its inclusion of harvested stormwater, which importantly was not previously included in the Framework’s recycled water indicators.

If this definition is adopted, harvested stormwater supplied for non-drinking water purposes will be included in the volumes reported under W20—Volume of recycled water supplied to residential customers and W21—Volume of recycled water supplied to non-residential customers.

As such there will no longer be a need to separately report these volumes under W28.4—Volume of urban stormwater supplied to residential customers and W28.5—Volume of urban stormwater supplied to non-residential customers. Given this, there is an opportunity to retire these indicators.

Retiring W28.4 and W28.5 would, however, result in a loss of visibility of the volume of water sourced from stormwater. Given the stated importance of understanding alternative water supplies, there is an opportunity to replace W28.4 and W28.5 with a new indicator quantifying stormwater harvested for recycled water supplies. This volume would not include stormwater harvested for potable supply which has been recommended for inclusion under indicator W1.

9.2.3 Recommendations

It is recommended that:

- A “Supply and exports” sub-theme be included under the Water resources theme
- The existing indicators W8.3, W9.3, W10.3, W14.3, W31, W20, W21, W23, W25.1, W15, W11, W12, W26, W27 be adopted, with the proposed revisions, as the basis for reporting supply and exports —Table 9-4
- Indicator W13 be retired subject to confirmation by the Bureau that it is no longer required.
- The definition of indicator W10.1 be modified to cover both the drinking and non-drinking water supply systems.
- Two new indicators for the quantification of own use are included in the Supply and exports sub-theme, as defined in Table 9-4
- A new indicator for the quantification of beneficial reuse be included in the Supply and exports sub-theme, as defined in Table 8 4
- It is recommended that W8, W9 and W14 are retired
- The Bureau considers reporting on recycled water as a percentage of the total volume of water supplied to residential and/or non-residential customers as part of its Part A performance reporting

- Indicators W28.4 and W28.5 be retired

Table 9-4 – Recommended supply and exports indicators

Indicator	Definition
W8.3 —Volume of drinking and non-drinking water, excluding recycled water , supplied to residential customers	The volume of drinking and non-drinking water, excluding recycled water supplied by the service provider to residential customers during the reporting year, in megalitres (ML).
W9.3 — Volume of drinking and non-drinking water, excluding recycled water , supplied to non-residential customers	The volume of drinking and non-drinking water, excluding recycled water supplied by the service provider to non-residential customers during the reporting year, in megalitres (ML).
WR_N2 —Volume of drinking and non-drinking water, excluding recycled water , supplied for own use	The volume of drinking and non-drinking water, excluding recycled water , supplied by the service provider during the reporting year for its own use, where the water was supplied without a billing arrangement, in megalitres (ML).
W14.3 —Volume of drinking and non-drinking water, excluding recycled water , exported to other service providers	The volume of drinking and non-drinking water, excluding recycled water , exported to other service providers during the reporting year, in megalitres (ML).
W31 —Volume of drinking and non-drinking water, excluding recycled water , returned to surface water	The volume of drinking and non-drinking water, returned by the service provider to surface water during the reporting year, in megalitres (ML).
W10.1 — Volume of non-revenue drinking and non-drinking water, excluding recycled water	The volume of non-revenue water associated with the service provider's drinking and non-drinking, excluding recycled water , water supply system during the reporting year, in megalitres (ML).
W20 —Volume of recycled water supplied to residential customers	The volume of recycled water supplied by the service provider to residential customers during the reporting year, in megalitres (ML).
W21 —Volume of recycled water supplied to non-residential customers	The volume of recycled water supplied by the service provider to non-residential customers during the reporting year, in megalitres (ML).
W15 —Volume of recycled water exported to other service providers	The volume of recycled water exported by the service provider to other service providers, during the reporting year, in megalitres (ML).
WR_N3 — Volume of recycled water supplied for own use	The volume of recycled water used by the service provider during the reporting year, in megalitres (ML).
W_N4 —Volume of recycled water supplied for beneficial reuse	The volume of recycled effluent supplied by the service provider beneficial reuse during the reporting year, in megalitres (ML).
W23 —Volume of recycled water supplied as environmental flows	The volume of recycled water supplied by the service provider as regulator-approved (prescribed) environmental flows during the reporting year, in megalitres (ML).
W25.1 —Volume of recycled water supplied to managed aquifer recharge	The volume of recycled water supplied by the service provider to managed aquifer recharge during the reporting year, in megalitres (ML).
W11 —Total volume of urban water supplied	The total volume of drinking and non-drinking water, excluding recycled water , supplied to residential and non-residential customers by the utility during the reporting year, in megalitres (ML).

W12 —Average volume of residential water supplied per property	The average volume of drinking and non-drinking water, supplied to residential properties by the service provider during the reporting year, in megalitres per property (ML/property).
W26 —Total volume of recycled water supplied	The total volume of recycled water supplied by the service provider during the reporting year, in megalitres (ML).
^ Orange text denotes proposed changes to the indicator name and definition. Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

9.3 Production

The volume of water produced for supply into the drinking water system informs urban water balances including those prepared by the Bureau of Meteorology. The indicator and derived water balances contextualise service provider performance as well as providing insight into a service provider’s network efficiency and an understanding of the relative size of potable and non-potable (raw and partial treated water) operations.

9.3.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 9-5

Table 9-5 – Proposed production indicators

Indicator	Definition
W11.3 —Volume of potable water produced for supply into the urban water supply system	The volume of potable water produced by the utility for supply into the urban water supply system, during the reporting year, in megalitres (ML).

9.3.2 Matters considered and feedback received

Review submissions did not identify any specific issues with indicator W11.3. However, several Review respondents were unclear on the intent of the indicator.

Limited metering, in particular for smaller service providers, was identified as an issue that may also impact data quality.

9.3.3 Recommendations

It is recommended that:

- A “Production” sub-theme be included under the Water resources theme and the existing indicator W11.3, be adopted, with the proposed revisions, as the basis for reporting—Table 9-6

Table 9-6 – Recommended production indicators ^

Indicator	Definition
W11.3 —Volume of drinking water produced for supply into the urban water system	The volume of drinking water produced or imported by the service provider for supply into the urban water system, during the reporting year, in megalitres (ML).
^ Orange text denotes proposed changes to the indicator name and definition.	

9.4 Wastewater

The volume of wastewater collected and reused informs urban water balances including those prepared by the Bureau of Meteorology. The indicators and derived water balances contextualise service provider performance as well as providing insight into trends in recycled water production and use, revenue from wastewater services, wastewater asset performance, and operating costs and capital expenditure.

9.4.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 9-7

Table 9-7 – Proposed wastewater indicators [^]

Indicator	Definition
W16 —Volume of wastewater, excluding trade waste, collected	The volume of wastewater, excluding trade waste collected by the utility during the reporting year, in megalitres (ML).
W17 —Volume of trade waste collected	The volume of trade waste collected by the utility during the reporting year, in megalitres (ML).
W18.1 —Volume of wastewater exported to other service providers or operational areas within the urban wastewater system	The total volume of wastewater exported by the utility to other service providers or operational areas within the urban wastewater system during the reporting year, in megalitres (ML).
W18.2 —Volume of wastewater received from other service providers or operational areas within the urban wastewater system	The total volume of wastewater received by the utility from other service providers or operational areas, within the urban water supply system, during the reporting year, in megalitres (ML).
W18.3 —Volume of wastewater taken through sewer mining	The volume of wastewater extracted through sewer mining by any service provider, from the utility's sewer system during the reporting year, in megalitres (ML).
W18.4 —Volume of wastewater inflow to wastewater treatment plants	The volume of wastewater inflows to the utility's wastewater treatment plants during the reporting year, in megalitres (ML).
W18.5 —Volume of treated effluent outflow from wastewater treatment plants	The volume of treated wastewater (effluent) discharged from a utility's wastewater treatment plants during the reporting year, in megalitres (ML).
W29 —Volume of treated wastewater disposals	Total volume of treated and untreated sewage discharges from a sewage discharge point (ML)
W18 —Total volume of wastewater collected	The total volume of wastewater collected by the utility during the reporting year, in megalitres (ML).
W19 —Average volume of wastewater collected per property	The average volume of wastewater collected by the utility, during the reporting year, in megalitres per property (ML/property)
[^] Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

9.4.2 Matters considered and feedback received

Wastewater was recognised as a relevant and important sub-theme for the Framework. The majority of the proposed indicators were supported; however, a number of definitional issues were raised in the feedback and submission process. These were:

- The need to simplify terminology to aid in the understanding of indicators
- A discrepancy between the Framework’s definition of surface water and that used in other reporting frameworks
- Clarification on the difference between disposals and a discharges
- The need for an agreed definition of “recycled water”.

In response, these issues have been addressed in the [revised definitions and supporting notes](#) developed by the Review team. Key changes include:

- The adoption of the terms “drinking” and “non-drinking” over “potable” and “non-potable” to simplify the language used in the indicator definitions and align with the terminology used in the ADWG
- The adoption of the National Guidelines for Water Recycling’s definition of recycled water—recycled water is “water generated from sewage, greywater or stormwater systems and treated to a standard that is appropriate for its intended use”. Importantly, this definition aligns with that used by the ABS’s WSSS, which includes stormwater in its definition of recycled water.

The use case for W18.2, W18.3, W18.4 and W18.5

The following indicators were identified by the Bureau as non-longer being relevant to its information needs.⁶²

- W18.2—Volume of wastewater received from other service providers or operational areas within the urban wastewater system
- W18.3—Volume of wastewater taken through sewer mining
- W18.4—Volume of wastewater inflow to wastewater treatment plants
- W18.5—Volume of treated effluent outflow from wastewater treatment plants

In response the Review found:

- Indicator W18.2 provides insight into inter-service provider transfers of wastewater and assist with an understanding of treatment costs and revenue from wastewater services
- Indicator W18.3 provides insight into alternative water supply sources. Although the BoM has identified that it no longer has a specific use for 18.3, alternative water sources were identified as a priority area of interest by state and territory policy agencies

⁶² Personal communication, Bureau of Meteorology 15/11/2021.

- Beyond their historical use by the Bureau to quality check wastewater system balances, W18.4 and W18.5 provide little to no insight into the performance of service providers. Additionally, feedback received through the Review demonstrates confusion around the terminology used in the definition of these indicators and a lack of clarity on their relationship to other indicators.

9.4.3 Recommendations

It is recommended that:

- A “Wastewater” sub-theme be included under the Water resources theme
- The existing indicators W16, W17, W18.1, W18.2, W29, W18 and W19 be adopted, with the proposed revisions, as the basis for reporting wastewater—Table 9-8
- Indicators W18.4 and W18.5 be retired subject to confirmation by the Bureau that they are no longer required.

Table 9-8 – Recommended wastewater indicators [^]

Indicator	Definition
W16 —Volume of wastewater, excluding trade wastewater , collected	The volume of wastewater, excluding trade wastewater collected by the service provider during the reporting year, in megalitres (ML).
W17 —Volume of trade wastewater collected	The volume of trade wastewater collected by the service provider during the reporting year, in megalitres (ML).
W18.1 —Volume of wastewater exported to other service providers	The total volume of wastewater exported by the service provider to others during the reporting year, in megalitres (ML).
W18.2 —Volume of wastewater received from other service providers	The total volume of wastewater imported (received) by the service provider from others during the reporting year, in megalitres (ML).
W18.3 —Volume of wastewater taken through sewer mining	The volume of wastewater extracted through sewer mining by any service provider , from the service provider's sewer system during the reporting year, in megalitres (ML).
W29 — Volume of effluent discharged	The volume of effluent discharged by the service provider during the reporting year, in megalitres (ML).
W18 —Total volume of wastewater collected	The total volume of wastewater collected by the service provider during the reporting year, in megalitres (ML).
W19 —Average volume of wastewater collected per property	The average volume of wastewater collected by the service provider , during the reporting year, in megalitres per property (ML/property)
[^] Orange text denotes proposed changes to the indicator name and definition. Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.	

9.5 Restrictions

Over time, information about water restrictions can highlight systemic issues and potential water security risks as well as providing insights into customer outcomes.

9.5.1 Proposed indicator/s

Indicators proposed, under the draft recommendations (HARC, 2021a), for inclusion in this sub-theme are shown in Table 9-9.

Table 9-9 – Proposed restrictions indicators

Indicator	Definition
###.1—Number of days spent at level 1 restriction	Total number of days spent at level 1 restriction during the financial year (days)
###.2—Number of days spent at level 2 restriction	Total number of days spent at level 2 restriction during the financial year (days)
###.3—Number of days spent at or greater than level 3 restriction	Total number of days spent at or greater than level 3 restriction during the financial year (days)

9.5.2 Matters considered and feedback received

In its consideration of water security issues, the review found that:

- There is significant interest in the issue from the perspective of how service providers are planning for and managing water security risks, mostly in relation to water quality and water availability risks as a result of climate change, drought, and other emergencies or natural disasters
- **A comprehensive picture of water security** across Australia, however, **requires information at the national, state/territory, service provider and scheme** levels and it is difficult to identify individual quantitative indicators that are appropriate for understanding water security
- Quantitative indicators on relevant system-level performance areas are and can be collected through the Framework and these indicators can inform a broader water security reporting process that draws on other sources of information (such as national and state-level water information and data).⁶³

In response, the draft recommendations (HARC, 2021a) proposed the inclusion of restrictions sub-theme as part of the water resource indicators.

In support of this proposal, the Review noted that:

- Restrictions are a demand management practice carried out in response to a service provider's water resource position. As such, water restrictions information provides insight into a service provider's water security position and the level of service being delivered
- Overtime restrictions information can highlight systemic issues and potential water security risks as well as provide insights into customer outcomes.

⁶³ A framework for holistically reporting on urban water security is undergoing development and trialing by DAWE and the UWRC. The framework aims to provide a more holistic diagnosis and support insights on water security, at the local, state and national level— <https://www.awe.gov.au/sites/default/files/documents/town-city-water-security-definition-diagnostic.pdf>

Submissions and feedback on the draft recommendation received qualified support with Review respondents raising concerns over comparability due to differences in how restrictions are defined across jurisdictions and between service providers.

The Review acknowledges this issue and recognises that restrictions indicators would require appropriate qualifications around comparisons between service providers. However, the Review team still believe that understanding the time spent in restrictions within a financial year provides valuable insight from information that is already being collected, under Category 8 of the *Water Regulations 2008*, for the majority of those reporting under the Framework.

Furthermore, as Category 8 water restriction information is collected for restriction areas it offers a disaggregated view of service provider operations.

9.5.3 Recommendations

It is recommended that:

- A “Restrictions” sub-theme be included under the Water resources theme
- Three new derived indicators detailing the number of days spent at restriction level 1, level 2 and level 3 and above be included as the basis for reporting under the sub-theme.
- Data for the proposed indicators be derived from data collected under Category 8 of the *Water Regulations 2008*.

Table 9-10 – Recommended restrictions indicators

Indicator	Definition
WR_N5—Number of days spent at level 1 restriction	Total number of days spent at level 1 restriction during the financial year (days)
WR_N6—Number of days spent at level 2 restriction	Total number of days spent at level 2 restriction during the financial year (days)
WR_N7—Number of days spent at or greater than level 3 restriction	Total number of days spent at or greater than level 3 restriction during the financial year (days)

9.5.4 Unresolved questions and the pathway forward

While the proposed indicators leverage an existing information source its inclusion in the Framework will require:

- an upgrade of the Category 8 reporting application to support the collection of restrictions information in a manner that supports the derivation of the proposed indicators
- the onboarding of new service providers as named persons who must supply category 8 information—this would include those with less than 10,000 connected properties should the Review’s recommendations be adopted.

The implementation of the recommended water restrictions indicators is predicated on the ongoing reporting of Category 8 water regulations data. It is understood that the Bureau is currently reviewing its water information needs and the information it collects under the regulations.

9.6 A summary of the water resources pathway

The following summary presents the changes recommended under the water resources theme. It is recommended that:

- The IWA 'Best Practice' Water Balance (Figure 9-1) be adopted as the basis for contextualising the "Water resources" indicators
- A "Sources and imports" sub-theme be included under the Water resources theme
- The existing indicators W1, W2, W3.1, W5.3, W5, W6, and W7, be adopted, with the proposed revisions, as the basis for reporting sources and imports—Table 9-2
- Harvested stormwater self-sourced to meet potable demand be included in the volume captured by W1
- A "Supply and exports" sub-theme be included under the Water resources theme
- The existing indicators W8.3, W9.3, W10.3, W14, W14.3, W31, W20, W21, W23, W25.1, W15, W11, W12, W26, W27 be adopted, with the proposed revisions, as the basis for reporting supply and exports
- Indicator W13 be retired subject to confirmation by the Bureau that it is no longer required
- The definition of indicator W10.1 be modified to cover both the drinking and non-drinking water supply systems
- Two new indicators for the quantification of own use are included in the Supply and exports sub-theme, as defined in Table 9-4
- A new indicator for the quantification of beneficial reuse be included in the Supply and exports sub-theme, as defined in Table 8 4
- Indicators W28.4 and W28.5 be retired
- A "Production" sub-theme be included under the Water resources theme and the existing indicator W11.3, be adopted, with the proposed revisions, as the basis for reporting—Table 9-6
- A "Wastewater" sub-theme be included under the Water resources theme
- The existing indicators W16, W17, W18.1, W18.2, W29, W18 and W19 be adopted, with the proposed revisions, as the basis for reporting wastewater—Table 9-8
- Indicator W18.4 W18.5, and W30 be retired subject to confirmation by the Bureau that they is no longer required

Table 9-11 summarises the final indicator recommendations along with updated recommendations on the service providers who should report them. The updated reporting requirements are based on feedback from the Technical Advisory Panels as well as feedback from the indicator testing activity (Deliverable 8).

Table 9-11 – Recommended water resource indicators ^

	Indicator	<10,000	>10,000	Bulk
Sources and imports	W1—Volume of water self-sourced from climate-dependent surface water sources	✓	✓	✓
	W2—Volume of water self-sourced from groundwater sources	✓	✓	✓
	W3.1—Volume of water self-sourced from marine or estuarine water sources	✓	✓	✓
	W5.3—Volume of drinking and non-drinking water, excluding recycled water, imported from other service providers	✓	✓	✓
	W6—Volume of recycled water imported from other service providers	✓	✓	✓
	WR_N1—Volume of stormwater harvest for supply as recycled water	✓	✓	✓
	W5—Total volume of drinking and non-drinking water, including recycled water, imported from other service providers			
	W7—Total volume of drinking and non-drinking water, including recycled water, self-sourced and imported from other service providers			
Supply and exports	W8.3—Volume of drinking and non-drinking water, excluding recycled water, supplied to residential customers	✓	✓	
	W9.3— Volume of drinking and non-drinking water, excluding recycled water, supplied to non-residential customers	✓	✓	
	WR_N2—Volume of drinking and non-drinking water, excluding recycled water, supplied for own use	✓	✓	✓
	W14.3—Volume of drinking and non-drinking water, excluding recycled water, exported to other service providers	✓	✓	✓
	W31—Volume of drinking and non-drinking water, excluding recycled water, returned to surface water	✓	✓	✓
	W10.1— Volume of non-revenue drinking and non-drinking water, excluding recycled water	✓	✓	
	W20—Volume of recycled water supplied to residential customers	✓	✓	
	W21—Volume of recycled water supplied to non-residential customers	✓	✓	✓
	W15—Volume of recycled water exported to other service providers	✓	✓	✓
	WR_N3—Volume of recycled water supplied for own use	✓	✓	✓
	WR_N4—Volume of non-revenue recycled water supplied for beneficial reuse	✓	✓	✓
	W23—Volume of recycled water supplied as environmental flows	✓	✓	✓
	W25.1—Volume of recycled water supplied to managed aquifer recharge	✓	✓	✓
	W11—Total volume of urban water supplied			
W12—Average volume of residential water supplied per property				
W26—Total volume of recycled water supplied				

	Indicator	<10,000	>10,000	Bulk
Production	W11.3 —Volume of drinking water produced for supply into the urban water system	✓	✓	✓
Wastewater	W16 —Volume of wastewater, excluding trade wastewater, collected	✓	✓	✓
	W17 —Volume of trade wastewater collected	✓	✓	✓
	W18.1 —Volume of wastewater exported to other service providers	✓	✓	✓
	W18.2 —Volume of wastewater received from other service providers	✓	✓	✓
	W18.3 —Volume of wastewater taken through sewer mining	✓	✓	✓
	W29 —Volume of effluent discharged	✓	✓	✓
	W18 —Total volume of wastewater collected			
	W19 —Average volume of wastewater collected per property			
Restrictions	WR_N5 —Number of days spent at level 1 restriction			
	WR_N6 —Number of days spent at level 2 restriction			
	WR_N7 —Number of days spent at or greater than level 3 restriction			
^ Grey shading of a row denotes that the indicator is derived from other information and not directly reported by service providers.				

10. NPR data quality framework

The 2019 Framework Review found that the current National Performance Report (NPR) Audit Framework is ineffective in achieving its objectives and that a range of factors are contributing to poor data quality and assurance outcomes that need to be addressed, in addition to audits.

This Review has explored the quality of the existing NPR data set and considered the issues that impact on data quality now as well as ongoing risks.

The proposed data quality framework is presented in detail in the NPR data quality framework paper (HARC, 2021b).

The data quality issues and risks analysis undertaken as part of the data quality frameworks development identified the following priority issues requiring attention.

- Understanding – There is not a consistent and shared understanding or interpretation of the NPR indicator definitions.
- Consistency over time – The NPR data set includes numerous inconsistencies that impact overall data quality.
- Documentation – Interpretation and analysis of the NPR dataset require an understanding of undocumented historical trends and changes within the water sector and knowledge of historical NPR reporting practices.

Additionally, the risk assessment identified the following material risks as priorities for the development of risk treatments.

- Inconsistent interpretation of indicator definitions and supporting notes
- Reporting entities do not have the capacity and/or capability to support reporting
- Poor and/or inadequate data measurement, collection, assessment, storage and submission practices
- Data accuracy errors persist in the data set.

Importantly there are consistent underlying themes that underpin these priority risks and issues. These are:

1. **Understanding and interpretation** – The importance of a shared and consistent understanding and interpretation of the NPR indicators and the processes and procedures that underpin data collection.
2. **Capacity, capability, and process** – The capability and capacity of reporting entities to collect and manage quality data
3. **Open, transparent and trusted data** – The need to implement, communicate and document robust error and outlier identification practices procedures that support confidence in data quality.

These three themes have been used as the basis for developing priority actions and mitigation measures to improve and support data quality. In addition to priority actions and mitigation measures, the review has also documented additional actions that while not a priority, would further improve and support data quality.

10.1 Understanding and interpretation

Clear, consistently understood and accessible indicator definitions are at the core of addressing the identified indicator quality issues and central to mitigating a number of the ongoing data quality risk identified.

The 2019 Review identified access to foundation documents such as the reporting handbook as an important issue for both reporting entities and users of the NPR data.

The NPR Indicator Review will deliver an updated handbook as its final deliverable in 2022. This handbook will address the indicator definition and supporting note issues identified in the course of the Review. However, defining indicators should not be a set and forget process. The experience of the Review has shown that there is an ongoing need to clarify indicators through the refinement of supporting notes and the consideration of specific cases put forward by reporting entities.

The existing business processes around the indicator definitions and supporting notes do not include a review cycle and there is no explicit feedback between issues identified by reporting entities or data users and the updating of the definitions and supporting notes.

10.1.1 Priority actions

- PA1. **Improve access to the NPR indicator handbook** – Publish the *National urban water utility performance reporting framework: Indicators and definitions handbook 2022* in a discoverable and accessible location—ideally this would be on the Bureau of Meteorology’s NPR web page.
- PA2. **Establish a continuous improvement framework for the indicators.** Establish an indicator definition and supporting note feedback process, including an issues register to support continuous improvement. The process should be published on the NPR website and include a contact channel (email) for the submission of issues. The process and register should be owned by the appropriate business unit head (Water Reporting Unit Head).

10.1.2 Risk mitigation

- RM1. **A revised approach to audit** - The audit framework review and recommendations set out in Appendix A of the NPR data quality framework paper (HARC, 2021b) establish the need for a revised approach to reporting entity audits. The proposed audit recommendations seek to balance the issue of cost with the benefits derived from an independent audit by focusing on a subset of service providers and indicators. The audit review and recommendations provide the basis for establishing a revised approach to auditing that is built around continuous improvement and feedback and focusing on known consistency issues as well as new or revised indicators.

The revised approach to audit still seeks to assess the reliability and accuracy of the reported data but also seeks to inform an understanding of the consistency of indicator definition interpretation and reporting across service providers.

Audit recommendations

13. The current jurisdictional based audits should be replaced with a centrally managed audit program.
 14. The objectives of this program should be:
 - iv. To identify accuracy, collection (reliability) and consistency issues impacting data quality
 - v. To support continuous improvement of Framework’s indicators and service provider reporting processes and practices
 - vi. Support capacity building for the good practice collection, collation, storage analysis and reporting of performance data.
 15. The audit program should be supported by a formal commitment from jurisdictions. Possible vehicles include the Urban Water Reform Committee, National Water Reform Committee or a refreshed national water initiative.
 16. The audit program should be funded by jurisdictions on an agreed basis with a minimum of a 3-year funding commitment.
 17. Audits should seek to target 20% (minimum) of reporting entities annually (The final target will be subject to funding commitments and the level of audit adopted—see recommendation 8).
 18. The selection of reporting entities should include both a targeted and random sample of service providers.
 19. Audits should focus on indicators with known data quality issues and recently introduced indicators.
 20. Audits should comply with ASAE 3100 Standard on Assurance Engagements. Note, the election to utilise a limited assurance audit may offer additional cost savings, however, a reasonable assurance engagement will provide greater insight into the process issue that underpin the risks identified.
 21. The fundamentals of the existing audit template are still considered to be fit for purpose and should be used as the basis for capturing audit findings
 22. To support consistency, audits should be undertaken by either a single auditor or a small panel of auditors.
 23. Remote audit technologies should be explored as they have the potential to deliver significant cost savings.
 24. Audit findings should be captured in the NPR database and made public and shared across all reporting entities—noting the need to do so in a manner that manages privacy and confidentiality issues.
- RM2. **Formalise the role of technical advisory panels in addressing future indicator definition and supporting note issues.** While the NPR Technical Reference Group (TRG) plays an important role in advising the Bureau of Meteorology on the operation of the Framework its membership does not include reporting entities nor does its core expertise span the full range of reporting themes. The technical advisory panels have demonstrated the value of including subject matter experts in the resolution of indicator

issues. Their continuation and intergration with the TRG in some form beyond the life of the indicator review would support the mitigation of the issue of inconsistencies in the interpretation of indicator definitions and supporting notes.

10.1.3 Additional actions to improve data quality

- AA1. Historical versions of NPR indicator definitions should be collated and made available to support the interpretation and understanding of historical data.
- AA2. Indicator definitions should be version-controlled so that data can be linked to the definition it was reported against. Interpretation of performance data relies on an understanding of the definition of the indicator against which it was captured. Given that indicator definitions have and will continue to evolve, data quality would be enhanced by providing this link.

10.2 Capacity, capability, and process

A key feature of the feedback on the draft recommendation to extend reporting to service providers with less than 10,000 connected properties has been the observation that this cohort will find the collection and reporting of reliable performance data challenging, primarily due to their limited capacity and/or capability to support reporting.

Further, it has also been observed that even amongst the current reporting cohort many of the service providers find data provision challenging. Typically this is also due to capacity and/or capability issues.

The Bureau alone is limited in what it can do to support service providers with their internal process and resourcing issues. Therefore addressing data collection issues and mitigating data collection risks needs to be done in partnership with the sector.

10.2.1 Priority actions

- PA3. **Establish a direct communications channel between the Bureau and reporting entities** – Communication protocols and channels vary across jurisdictions depending on their reporting pathway. Feedback through the Review suggests that direct communication and a clear point of contact is required to support greater consistency and clarity in Framework communications.
- PA4. **Establish an agreed role for data coordinators** – The role and function of a data coordinator was established under the foundation NPR agreement. Under this agreement coordinators not only played a role in data collection but also in data quality assurance, including audit oversight. While data coordinators still feature in the operation of the Framework their role is no longer clear and consistent across jurisdictions. As a priority, the Bureau should seek confirmation and commitment from jurisdictions on their provision of suitably qualified coordinators and establish a clear role description. The coordinator role should at a minimum:
 - › Oversee the delivery of annual performance data and follow up on reporting delays.
 - › Be responsible for communicating delays in reporting due to jurisdictional issues – E.g., a delay due to the timing of a state audit

- › Support data validation checks and follow up on responses to variance issues from reporting entities.
- › Provide jurisdictional context to data and support its interpretation for annual reports
- › As appropriate, build reporting capacity and capability across reporting entities, including the provision of advice and support for data measurement, collection, assessment, storage and submission practices.
- › Support a revised audit framework and ensure that audit findings are addressed.

10.2.2 Risk mitigation

- RM3. **Share ownership and mitigation of capacity, capability and process risks** – Secure agreement from jurisdictions that: capacity and capability to support reporting; and poor or inadequate data measurement, collection, assessment, storage and submission practices are shared risks. Further, that measures to mitigate these risks need to be developed and implemented through collaborations between state and territory agencies, Commonwealth agencies and industry bodies.

This includes securing financial support from the jurisdictions to fund a revised audit process and ensuring that the findings of these audits are shared and feed into continuous improvement activities that include capacity building.

10.2.3 Additional actions to improve data quality

- AA3. **Continue to address duplication where it exists** – Continue efforts to identify and address reporting duplication where it exists. Noting that the indicator review will be recommending changes that will address duplication between the Australian Bureau of Statistics (ABS) Water and Sewerage Survey (WSSS) and the Clean Energy Regulator’s National Greenhouse and Energy Reporting (NGER) Scheme.

10.3 Open, transparent and trusted data

While continuing to improve data validation and outlier identification is important for managing data quality risk it is recommended that priority be given to identifying and resolving persistent errors in the NPR data set. The persistence of these errors has an important and ongoing impact on the confidence of the sector in the NPR data set and consequently diminishes the value of the data (i.e. it does not meet the fit for purpose data quality test).

10.3.1 Priority actions

- PA5. **Develop, publish and implement a policy on correcting historical errors**—ideally, this would be on the Bureau of Meteorology’s NPR web page along with all other data governance policies. This should include a point of contact or channel for reporting issues identified and the provision of feedback on the corrective action taken.
- PA6. **Clean and assure the historical NPR data set** – Undertake a review and quality assurance of historical NPR data to identify and address reporting inconsistencies and errors. Issues should be corrected in keeping with the policy developed under Action PA5.

- PA7. **Develop, publish and implement a policy on when the provision of explanatory footnotes are required for outliers**—ideally, this would be on the Bureau of Meteorology’s NPR web page along with all other data governance policies.
- PA8. **Provide open access to the full historical NPR data set including underlying metadata.** Making this information publicly available will increase transparency and address perceptions of data manipulation.

10.3.2 Risk mitigation

- AA4. **Implement continuous improvement practices around data validation processes** – Undertake systematic and detailed quality checks of the NPR data set to identify and address errors and flag likely outliers. The data validation process should be reviewed annually as part of ongoing continuous improvement activities. This review should include consideration of the percentage variation and z score tolerances used to identify errors and outliers and consider new techniques to improve error and outlier detection.

10.3.3 Additional actions to improve data quality

- AA5. **Share data validation rules** – Publish the rules for the syntactical and semantical checks, preferably via an Application Programming Interface (API) to make it possible for third party data collection tools and processes to implement the same checks as those carried out by the Bureau.

11. Recommendations

Table 11-1 summarises the full set of indicator recommendations. This includes the

- Framework scope and structure recommendations (*FSS1-6*)
- Indicator recommendations (*IR1-75*)
- Scope of reporting recommendations (*SR1-2*)
- Data quality framework recommendations
 - › Priority actions (*PA1-5*)
 - › Risk mitigation measures (*RM1-3*)
 - › Additional actions (*AA1-8*)

Implementation has not been part of the scope of this review. However, suggestions based on the insights from the Review process are present to seed the implementation discussion.

Table 11-1 A summary of review recommendations

	ID	Recommendation	Suggested owner	Suggest year of implementation			Resource considerations/ Comments
				Year 1	Year 2	Year 3 >	
Framework scope and structure recommendations							
Framework scope and structure	FSS1	Both the form and the format of the annual performance reports are reviewed as a key next step of the overarching review process being undertaken by the Bureau of Meteorology. If required, an alternative approach that meets the needs of the stakeholders should be developed.	BoM	✓			This review will require a material resource investment but is broadly supported.
	FSS2	The sector reporting data and information needs identified by the Review be explicitly considered as part of the conversation on a refreshed National Water Initiative, in the context of urban water reform priorities.	DAWE as chair of the UWRC	✓			It is suggested that this activity commence in 2023 but will likely extend across multiple years depending on an NWI refresh timeline The Review identified multiple areas of sector information that stakeholders, including jurisdictional reps, regulators see value in collecting that sits outside of the Frameworks reporting mandate.
	FSS3	The Framework indicator set focuses on core areas of service provider performance and is not expanded to capture wide-ranging insights into broader water sector performance.	BoM	✓			No material impact on resource – May need to be reflected in Framework documentation and future agreements on reporting and/or funding
	FSS4	The Framework indicator set should support an understanding of the following outcome areas: <ul style="list-style-type: none"> - Urban water services are efficient and affordable - Urban water services are resilient and secure - Urban water services are transparent and accountable Urban water services support healthy and liveable communities.	BoM	✓			No material impact on resource – May need to be reflected in Framework documentation and future agreements on reporting and/or funding
	FSS5	The Framework indicator set should adopt the following reporting themes: <i>Contextual information</i> – Defined as information and data that helps interpret and understand service provider performance and sector outcomes. <i>Customers and communities</i> – Defined as information and data informing an understanding and benchmarking of customer service and customer and community outcomes and impacts. <i>Assets and operations</i> – Defined as information and data informing an understanding and benchmarking of infrastructure planning, management and operation and resource planning and risk management. <i>Pricing and finance</i> – Defined as information and data informing an understanding and benchmarking of service pricing, cost and financial performance. <i>Public health and environment</i> – Defined as information and data informing an understanding of public health outcomes, environmental impact and public health and environmental risk management. <i>Water resources</i> – Defined as information and data on the availability and use of water and the delivery of urban water services.	BoM	✓			Minor resource implications to support and test changes to the reporting portal – Straightforward definitional update provide by Review
	FSS6	The Framework should adopt the following sub-themes within each reporting theme: <i>Contextual information:</i> Population; Connections; Pipe network; Treatment plants <i>Customers and communities:</i> Satisfaction †; Complaints; Hardship; Billing <i>Assets and operations:</i> Reliability; Losses; Staff capacity †; Age and condition † <i>Finance and pricing:</i> Tariffs; Bills; Asset base; Revenue; Costs; Performance <i>Public health and environment:</i> Discharges and emissions; Water efficiency and reuse; Water quality compliance; Water quality risk management <i>Water resources:</i> Sources and imports; supply and exports; Production; Wastewater; Restrictions † Recognised and supported gaps to be addressed but further work on an agreed nationally-comparable basis for reporting is required before inclusion	BoM	✓			Minor resource implications to support and test changes to the reporting portal – Straightforward definitional update provide by Review

	ID	Recommendation	Suggested owner	Suggest year of implementation			Resource considerations/ Comments
				Year 1	Year 2	Year 3 >	
Indicator recommendations							
Contextual information	IR01	The population receiving water supply services indicator C1 be retained, with minor definitional amendments, under a population sub-theme as part of the contextual information collected by the Framework	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR02	The definition of C1 is updated such that population estimates are reported to their full precision and rounding is only applied when appropriate in the presentation of data.	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR03	The Bureau of Meteorology consider developing a spatial analysis web service to estimated population based on the intersection of defined service boundaries, ABS population data and population growth projections.	BoM		✓		Would require an investment of \$20-50k to develop and operationalise the service. Ongoing funding for support and maintenance would be required. Would benefit the NPR as well as ABS and PC because of overlap in WSSS and closing the gap reporting. Co-investment is an option
	IR04	A connections sub-theme be included in the contextual information theme and the existing connections indicators C2, C3, C4, C6, C7 and C8, with minor definitional amendments, be adopted as the basis for reporting on connected properties	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR05	Two new indicators capturing residential and non-residential recycled water connections be included in the connections contextual information sub-theme—as defined in Table 4-4	BoM		✓		Minor resource implications to support and test definition changes in the reporting portal
	IR06	The definition of C1, C2, C3, C4, C6, C7 and C8 is updated such that data is reported to its full precision and rounding is only applied when appropriate in the presentation of data	BoM	✓			Minor-moderate resource implications to support and test definition changes in the reporting portal
	IR07	A treatment plants sub-theme be included in the contextual information theme and the existing treatment plants indicators (A1 and A4), with minor definitional amendments, be adopted as the basis for reporting	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR08	A pipe network sub-theme be included in the contextual information theme and the existing treatment plants indicators A2, A3, A5 and A6, be adopted as the basis for reporting.	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
Customers and communities	IR09	A cross-jurisdictional agreement be sought on a national customer satisfaction survey and that this agreement includes a commitment to ongoing funding—It is suggested that this be raised for consideration through a suitable national forum, such as the UWRC	DAWE as chair of the UWRC		Pilot	✓	Would require and investment from jurisdictions to develop a formal proposal and an ongoing commitment to fund the survey
	IR10	The existing water quality complaints indicators IC9, C9 are retained with updated definitions and supporting notes—as defined in Table 5-3	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR11	The existing complaints indicators IC10, C10, IC11, C11, IC12, C12 and IC13 complaints indicators be retained with updated definitions and supporting notes for the 2022-23 reporting year— as defined in Table 5-3	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR12	The Bureau work with the TAP, policy agencies, regulators, and ombudsmen offices to explore the unresolved basis of complaint reporting	DAWE as chair of the UWRC		Pilot	✓	Moderate resource implications – will require staff resources to coordinate the stakeholders and test a final proposal on an agreed basis for complaints reporting
	IR13	The existing indicator C14, percentage of calls answered by an operator within 30 seconds, be retired					Minor resource implications to support and test changes to the reporting portal
	IR14	The existing customer restrictions indicators IC18 and C18 be retained, with updated definitions and supporting notes that address, as part of a billing sub-theme—as defined in Table 5-5	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal

	ID	Recommendation	Suggested owner	Suggest year of implementation			Resource considerations/ Comments
				Year 1	Year 2	Year 3 >	
Customers and communities	IR15	Two new indicators capturing the percentage of customer restrictions removed within 3 days and the percentage of customer restrictions resulting in legal actions be included in the Billing sub-theme—as defined in Table 5-5	BoM	✓			Would require staff resources to coordinate the stakeholders and test a final proposal on an agreed basis for hardship reporting
	IR16	Four new indicators capturing participation in service provider hardship programs be included in a Hardship sub-theme—as defined in Table 5-6	BoM		✓		Minor resource implications – Would require staff resources to coordinate the stakeholders and test a final proposal on an agreed basis for hardship reporting and support and test definition changes in the reporting portal
Assets and operations	IR17	The existing reliability indicators A14, A15, C15, IC17 and C17 with clarified definitions as the basis for the 2022–23 reporting year	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR18	Continue to work with the TAP, TRG as well as jurisdictional policy agencies, regulators and service providers to develop an agreed set of nationally consistent reliability metrics based on those proposed in Table 6-4	DAWE as chair of the UWRC		Pilot	✓	Minor to moderate resource implications – would require staff resources to coordinate the stakeholders and test a final proposal on an agreed basis for complaint reporting
	IR19	A water losses sub-themes be included in the assets and operations theme and existing indicators A9, A10 and A11 be retained with updated definitions and supporting notes that address the issues raised in the course of the Review— as defined in Table 6-6.	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR20	An agreed basis for reporting national relevant indicators of asset age and condition and staff capacity continue to be explored, noting that they are recognised gaps and supported sub-themes.	BoM	Timing would be subject to funding and support			Would require a material investment from jurisdictions to develop a formal proposal and a commitment to fund capacity development to support reporting. Possible partnership with ALGA/IPWEA who report on asset conditions for local government based service providers as part of their NSoA Report
Pricing and finance	IR21	The existing tariff indicators P1, P1.2, P1.3- P1.7, P1.3a- P1.7a, P1.12, P1.13, P4.1–P4.4 be retired and drinking water, wastewater and recycled water tariff information are encapsulated in more concise, single indicator, representations—As described in Appendix M of the Draft Report (HARC, 2021a)	BoM		✓		Minor to moderate resource implications to support and test changes to the reporting portal
	IR22	The Bureau's Framework reporting portal be updated to enable the billing indicators to be derived from reported data	BoM	✓			Minor to moderate resource implications to support and test changes to the reporting portal
	IR23	The existing indicator F9—Written-down value of fixed water supply assets and the F10—Written-down value of fixed wastewater assets be retired from the Framework subject to further feedback from TRG and TAP	BoM		✓		Minor resource implications to: <ul style="list-style-type: none"> › test this recommendation with the TRG and TAP – Could be considered as part of any work to review the Part A and B reporting of the NPR data › support and test changes to the reporting portal
	IR24	A “Revenue” sub-theme be included under the finance and pricing theme	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR25	Existing indicators F4, F5, F5.1, F6, F6.1, F7, F7.1, F11.1, be retired from the Framework	BoM	✓			Minor resource implications to support and test changes to the reporting portal – Could be considered as part of any work to review the Part A and B reporting of the NPR data
	IR26	Existing indicators F1, F2, F3, F8, F25, F26, and F27 be retained with updated definitions and supporting notes that address the issues raised in the course of the Review— as defined in Table 7-7	BoM		✓		Minor resource implications to support and test definition changes in the reporting portal
	IR27	Two new indicators to capture revenue from developer charges (cash and non-cash) are included in the revenue sub-theme as defined in Table 7-7	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal

	ID	Recommendation	Suggested owner	Suggest year of implementation			Resource considerations/ Comments
				Year 1	Year 2	Year 3 >	
Pricing and finance	IR28	A “costs” sub-theme be included under the Finance and pricing theme	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR29	Three new indicators capturing bulk water costs be included as part of the costs sub-theme—as defined in Table 7-9.	BoM		✓		Minor resource implications to support and test definition changes in the reporting portal
	IR30a	The existing operating costs per property indicators F11 and F12 are redefined to exclude bulk water charges (as defined in Table 7-9.	BoM		✓		Minor resource implications to support and test definition changes in the reporting portal
	IR30b	The existing operating costs per mega litre indicator F11.1, F12.1 and combined operating cost indicators F13 and F13.1 are retired.	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR31	F16—Total capital expenditure for water supply and wastewater should be transitioned from a derived (calculated) indicator to a reported value that includes non-network (corporate) capex, such that F16 would reflect the total capex as reported in the service provider’s annual report	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR32	The definition of F14 and F15 be updated to exclude corporate capex	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR33	The proposed capital renewal expenditure indicators, for water supply and wastewater, should be included in the Framework as part of the costs sub-theme—as defined in Table 7-9.	BoM		✓		Minor resource implications to support and test definition changes in the reporting portal
	IR34	The capital expenditure per megalitre indicators F28.1, F29.1 are retired from the Framework.	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR35	A “performance” sub-theme be included under the finance and pricing theme	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR36	Existing indicators F17, F18, F19, F21, F23 are retired from the Framework	BoM		✓		Minor resource implications to support and test definition changes in the reporting portal
	IR37	The proposed EBITDA, Debt to assets, return on assets, Return on equity, FFO to net debt, and FFO to interest expense indicators are included under the performance sub-theme—as defined in Table 7-11	BoM		✓		Minor resource implications to support and test definition changes in the reporting portal
	IR38	The proposal for major, and potentially large, service providers to report a summary of their annual Profit and Loss, Balance Sheet and Cashflow statements in addition to the Frameworks performance metrics is explored in partnership with the TRG, TAP and other stakeholders with a view to piloting a trial in 2023–24	BoM				Moderate resource implications – Would require staff resources to coordinate the stakeholders and test a final proposal on an agreed basis for reporting
Public health and the environment	IR39	A “discharges and emissions” sub-theme be included under the Public health and environment theme	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR40	The indicators IE1, E1, IE2, E2, IE3, and E3 be adopted, with the proposed revisions, as the basis for reporting effluent disposals under discharges and emission sub-theme—Table 8 2	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR41	The existing GHG emissions indicators IE9, E9, E9.1, IE10, E10, E10.1, IE11, E11, E11.1, IE12, E12, E12.1 be retired	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR42	The Framework aligns its GHG reporting with the NGER scheme and only mandates reporting of total emission for entities meeting the NGER reporting thresholds	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR43	The Framework aligns its reporting methodology with the NGER scheme and only seek total corporate emissions (Scope 1 and 2) instead of seeking disaggregated (water, wastewater and other) emissions and	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal

	ID	Recommendation	Suggested owner	Suggest year of implementation			Resource considerations/ Comments
				Year 1	Year 2	Year 3 >	
Public health and the environment	IR44	Options for sourcing GHG emissions data directly from the Clean Energy Regulator are explored	BoM		✓		Minor to moderate resource implications – Would require staff resources to coordinate the stakeholders and test a reporting pathway
	IR45	The Framework includes an indicator to identify service providers who have set emissions reduction targets and, if practical track progress towards these.	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR46	A “Water efficiency and reuse” sub-theme be included under the Public health and environment theme and existing indicators E8 and W27 be included under the sub-theme, with the proposed revisions defined in Table 8-2	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR47	The Bureau engages with the AWA Specialist Network and other industry members to refine the proposed water efficiency indicators (Section 8.2.4) into a workable solution for reporting.	BoM		Pilot	✓	Moderate resource implications – Would require staff resources to coordinate the stakeholders and test a final proposal on an agreed basis for reporting on water efficiency
	IR48	A “water quality risk management” sub-theme be included under the Public health and environment theme and existing indicators H1 and H5 be retained, with updated definitions and supporting notes as the basis of reporting	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR49	The proposed indicator H5.1—date of last drinking water quality management plan assessment be added to the Framework under the water quality risk management sub-theme	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR50	A “water quality compliance” sub-theme be included under the Public health and environment theme and the microbiological compliance indicator H3 and chemical compliance indicator H4 be retained, with updated definitions and supporting notes as the basis of reporting	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR51	The number of supply zones indicator H4a be retired	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR52	Two new indicators are included in the water quality compliance sub-theme to facilitate reporting on the number of boil water alerts and do not drink notices issued by service providers—Table 8-4	BoM		✓		Minor resource implications to support and test definition changes in the reporting portal
Water resources	IR53	The IWA 'Best Practice' Water Balance be adopted as the basis for contextualising the “Water resources” indicators	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR54	A “Sources and imports” sub-theme be included under the Water resources theme	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR55	The existing indicators W1, W2, W3.1, W5.3, W5, W6, and W7, be adopted, with the proposed revisions, as the basis for reporting sources and imports —Table 9-2	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR56	Harvested stormwater self-sourced to meet potable demand be included in the volume captured by W1	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR57	The water export indicators, W14.3, W15 and W14, included under the proposed “Sources and transfers” sub-theme be moved to a “Supply and exports” sub-theme—Section 9.2.	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR58	Indicator W6 be retained and that the Bureau look into the identified data quality issue, i.e., the validity of the zero volumes being reported.	BoM	✓			Minor to moderate resource implications – Would require staff resources to explore data quality issues
	IR59	A “Supply and exports” sub-theme be included under the Water resources theme	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal

	ID	Recommendation	Suggested owner	Suggest year of implementation			Resource considerations/ Comments
				Year 1	Year 2	Year 3 >	
Water resources	IR60	The existing indicators W8.3, W9.3, W10.3, W14.3, W31, W20, W21, W23, W25.1, W15, W11, W12, W26, W27 be adopted, with the proposed revisions, as the basis for reporting supply and exports — Table 8-4	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR61	Indicator W13 be retired subject to confirmation by the Bureau that it is no longer required.	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR62	The definition of indicator W10.1 be modified to cover both the drinking and non-drinking water supply systems.	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR63	Two new indicators for the quantification of own use are included in the Supply and exports sub-theme, as defined in Table 8-4	BoM		✓		Minor resource implications to support and test definition changes in the reporting portal
	IR64	A new indicator for the quantification of beneficial reuse be included in the Supply and exports sub-theme, as defined in Table 8-4	BoM		✓		Minor resource implications to support and test definition changes in the reporting portal
	IR65	It is recommended that indicators W8, W9 and W14 are retired	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR66	The Bureau considers reporting on recycled water as a percentage of the total volume of water supplied to residential and/or non-residential customers as part of its Part A performance reporting	BoM		✓		Minor to moderate resource implications – Would require staff resources to explore data quality issues
	IR67	Indicators W28.4 and W28.5 be retired	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR68	A “Production” sub-theme be included under the Water resources theme and the existing indicator W11.3, be adopted, with the proposed revisions, as the basis for reporting—as defined in Table 8-6	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR69	A “Wastewater” sub-theme be included under the Water resources theme	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR70	The existing indicators W16, W17, W18.1, W18.2, W29, W18 and W19 be adopted, with the proposed revisions, as the basis for reporting wastewater—as defined in Table 8-8	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
	IR71	Indicator W18.4 W18.5, and W30 be retired subject to confirmation by the Bureau that they are no longer required	BoM	✓			Minor resource implications to support and test definition changes in the reporting portal
IR72	A “Restrictions” sub-theme be included under the Water resources theme is added along with three new derived indicators detailing the number of days spent at restriction level 1, level 2 and level 3 and above be included as the basis for reporting under the sub-theme.	BoM		Pilot	✓	<p>Would require an investment of \$50-100k to redevelop the Category 8 portal and operationalise the service. Ongoing funding for support and maintenance would be required.</p> <p>Data for the proposed indicators would be derived from data collected under Category 8 of the Water Regulations 2008. There would be a cost associated with the addition of named persons to the Regs to support reporting</p>	

ID	Recommendation	Suggested owner	Suggest year of implementation			Resource considerations/ Comments
			Year 1	Year 2	Year 3 >	
Scope of reporting recommendations						
SR1	All local government and SOC service providers, regardless of their number of connections, report under the Framework	DAWE as chair of the UWRC		Pilot	✓	<p>Significant resource implications – The recommended addition of over 180 new service providers will significantly increase the administration and support workload of the Bureau’s reporting team as well as jurisdictional data coordinators in the states and territories impacted by the increased coverage (South Australia, Queensland, New South Wales and Western Australia).</p> <p>In particular, additional effort will be required to respond to reporting and indicator queries, and for quality checking of data from new reporting entities.</p> <p>Additionally, Commonwealth and jurisdictional reporting portals will need to be assessed to determine their ability to accommodate the Review’s recommendations. In some instances, these portals may require additional development to support the adoption of the Review’s recommendations.</p>
SR2	The Framework adopts a tiered reporting approach to reporting, such that small providers are only required to report on a subset of the indicators—The recommended subsets are identified in the reporting theme pathway summaries Tables 3-9, 4-8, 5-8, 6-12, 7-11 and 8-11.	BoM		Pilot	✓	Moderate resource implications – Implementation will require changes to the Bureau’s reporting portal to facilitate reporting customised indicator sub-sets
Data quality framework recommendations (HARC, 2021b)						
Priority actions	PA1	Improve access to the NPR indicator handbook – Publish the <i>National urban water utility performance reporting framework: Indicators and definitions handbook 2022</i> in a discoverable and accessible location—ideally this would be on the Bureau of Meteorology’s NPR web page.	BoM	✓		Minor resource implications to publish handbook on the NPR website
	PA2	Establish a continuous improvement framework for the indicators. Establish an indicator definition and supporting note feedback process, including an issues register to support continuous improvement. The process should be published on the NPR website and include a contact channel (email) for the submission of issues. The process and register should be owned by the appropriate business unit head (Water Reporting Unit Head).	BoM	✓		<p>Minor to moderate resource implications – resource implications are in part a function of how the framework is established</p> <p>Support of the framework will need to be owned by a position within the Bureau be and part of that position’s BAU functions</p>
	PA3	Establish a direct communications channel between the Bureau and reporting entities – Communication protocols and channels vary across jurisdictions depending on their reporting pathway. Feedback through the Review suggests that direct communication and a clear point of contact is required to support greater consistency and clarity in Framework communications.	BoM	✓		Minor to moderate resource implications – The communications role will need to be owned by a position within the Bureau be and part of that position’s BAU functions
	PA4	<p>Establish an agreed role for data coordinators – The role and function of a data coordinator was established under the foundation NPR agreement. Under this agreement coordinators not only played a role in data collection but also in data quality assurance, including audit oversight. While data coordinators still feature in the operation of the Framework their role is no longer clear and consistent across jurisdictions. As a priority, the Bureau should seek confirmation and commitment from jurisdictions on their provision of suitably qualified coordinators and establish a clear role description. The coordinator role should at a minimum:</p> <ul style="list-style-type: none"> › Oversee the delivery of annual performance data and follow up on reporting delays. › Be responsible for communicating delays in reporting due to jurisdictional issues – E.g., a delay due to the timing of a state audit › Support data validation checks and follow up on responses to variance issues from reporting entities. › Provide jurisdictional context to data and support its interpretation for annual reports › As appropriate, build reporting capacity and capability across reporting entities, including the provision of advice and support for data measurement, collection, assessment, storage and submission practices. › Support a revised audit framework and ensure that audit findings are addressed. 	DAWE as chair of the UWRC	✓		Would require and investment of staff resource from the Bureau and jurisdictions to develop an agreed role and resourcing commitment for data coordinators

	ID	Recommendation	Suggested owner	Suggest year of implementation			Resource considerations/ Comments
				Year 1	Year 2	Year 3 >	
Priority actions	PA5	Develop, publish and implement a policy on correcting historical errors —ideally, this would be on the Bureau of Meteorology’s NPR web page along with all other data governance policies. This should include a point of contact or channel for reporting issues identified and the provision of feedback on the corrective action taken.	BoM	✓			Minor to moderate resource implications – Would require staff resources to explore and coordinate policy development and test with stakeholders
	PA6	Clean and assure the historical NPR data set – Undertake a review and quality assurance of historical NPR data to identify and address reporting inconsistencies and errors. Issues should be corrected in keeping with the policy developed under Action PA5.	BoM		✓		Moderate to significant – Data quality issues could be addressed as part of any future move to a dashboard delivery of the performance data and while requiring significant effort there are opportunities to automate outlier detection to reduce the cost of data cleanup
	PA7	Develop, publish and implement a policy on when the provision of explanatory footnotes are required for outliers —ideally, this would be on the Bureau of Meteorology’s NPR web page along with all other data governance policies.	BoM	✓			Minor to moderate resource implications – Would require staff resources to explore and coordinate policy development and test with stakeholders
	PA8	Provide open access to the full historical NPR data set including underlying metadata. Making this information publicly available will increase transparency and address perceptions of data manipulation.	BoM	✓			Minor resource implications to publish data via a web service
Risk management measures	RM1	A revised approach to audit - The audit framework review and recommendations set out in Appendix A of the NPR data quality framework paper (HARC, 2021b) establish the need for a revised approach to reporting entity audits. The proposed audit recommendations seek to balance the issue of cost with the benefits derived from an independent audit by focusing on a subset of service providers and indicators. The audit review and recommendations provide the basis for establishing a revised approach to auditing that is built around continuous improvement and feedback and focusing on known consistency issues as well as new or revised indicators. The revised approach to audit still seeks to assess the reliability and accuracy of the reported data but also seeks to inform an understanding of the consistency of indicator definition interpretation and reporting across service providers.	DAWE as chair of the UWRC		✓		Significant resource implications – Implementing the revised approach to audit will require an investment of staff resources from the Bureau and jurisdictions as well a commitment of ongoing funding to support annual audits
	RM2	Formalise the role of technical advisory panels in addressing future indicator definition and supporting note issues. While the NPR Technical Reference Group (TRG) plays an important role in advising the Bureau of Meteorology on the operation of the Framework its membership does not include reporting entities nor does its core expertise span the full range of reporting themes. The technical advisory panels have demonstrated the value of including subject matter experts in the resolution of indicator issues. Their continuation in some form beyond the life of the indicator review would support the mitigation of the issue of inconsistencies in the interpretation of indicator definitions and supporting notes.	BoM	✓			Moderate resource implications – Would require staff resources to explore coordinate TAP members
	RM3	Share ownership and mitigation of capacity, capability and process risks – Secure agreement from jurisdictions that: capacity and capability to support reporting; and poor or inadequate data measurement, collection, assessment, storage and submission practices are shared risks. Further, that measures to mitigate these risks need to be developed and implemented through collaborations between state and territory agencies, Commonwealth agencies and industry bodies. This includes securing financial support from the jurisdictions to fund a revised audit process and ensuring that the findings of these audits are shared and feed into continuous improvement activities that include capacity building.	DAWE as chair of the UWRC		✓		Data quality risks need to be owned and managed by all jurisdictions. Shifting the focus to the quality of the data collected and the provision of support for the service providers to build capability and capacity is central to improving data quality.
Additional actions to support data quality	AA1	Historical versions of NPR indicator definitions should be collated and made available to support the interpretation and understanding of historical data.	BoM			✓	Minor resource implications to publish collated definitions on the NPR website
	AA2	Indicator definitions should be version-controlled so that data can be linked to the definition it was reported against. Interpretation of performance data relies on an understanding of the definition of the indicator against which it was captured. Given that indicator definitions have and will continue to evolve, data quality would be enhanced by providing this link.	BoM	✓			Minor resource implications to implement and test support for definition versioning in the reporting portal
	AA3	Continue to address duplication where it exists – Continue efforts to identify and address reporting duplication where it exists. Noting that the indicator review will be recommending changes that will address duplication between the Australian Bureau of Statistics (ABS) Water and Sewerage Survey (WSSS) and the Clean Energy Regulator’s National Greenhouse and Energy Reporting (NGER) Scheme.	BoM	✓			Minor to moderate resource implications – The primary activity that is needed to support this action is liaising with the ABS and PC on data collection and duplication issues
	AA4	Implement continuous improvement practices around data validation processes –Undertake systematic and detailed quality checks of the NPR data set to identify and address errors and flag likely outliers. The data validation process should be reviewed annually as part of ongoing continuous improvement activities. This review should include consideration of the percentage variation and z score tolerances used to identify errors and outliers and consider new techniques to improve error and outlier detection.	BoM	✓			Minor to moderate resource implications – This role will need to be owned by a position within the Bureau be and part of that position’s BAU functions

	ID	Recommendation	Suggested owner	Suggest year of implementation			Resource considerations/ Comments
				Year 1	Year 2	Year 3 >	
	AA5	Share data validation rules – Publish the rules for the syntactical and semantical checks, preferably via an Application Programming Interface (API) to make it possible for third party data collection tools and processes to implement the same checks as those carried out by the Bureau.	BoM	✓			Minor resource implications to publish and update data validation rules on the Bureau's NPR website

Appendix A Testing outcomes

The following summaries present the key insights arising from the indicator testing carried out with service providers with less than 10,000 connections.

Terminology

1. Differences in inter-jurisdictional terminology and interpretation of definitions has always been an issue for the NPR. The data quality framework delivered as part of this indicator review identified this issue as a significant contributor to existing data quality issues as well as an ongoing risk.
2. Feedback from the testing process reinforced this finding and the importance of clear and consistent terminology in indicator definitions and supporting notes.
3. Questions raised by service providers taking part in the testing process highlighted the need to manage this risk in the onboarding of service providers, particularly those not previously exposed to the Framework.
4. The definition of raw water, potable and non-potable water supply, recycled water, bulk water were highlighted as needing definition.

Scope of the indicators

5. Participants in the testing process highlighted the need for definitions to set out the scope of indicators. i.e., the system or systems to which they apply. This was particularly important for service providers who are providing a single service—e.g., only wastewater and not drinking water.

Indicator applicability

6. In many instances, the scope of the services delivered by smaller service providers (i.e., less than 10,000 connected properties) limits the applicability of many NPR indicators. While the reporting process supports service providers to identify indicators as not applicable there is a resource overhead associated with this assessment.
7. It was noted that given the limited resources of small service providers this overhead is not without impact.
8. Where ever possible efforts should be made to only present service providers with the indicators that apply to their operations.

Duplication and scale of reporting

9. Given the scale of state and commonwealth reporting undertaken by service providers, duplication or even perceived duplication is a reoccurring issue. While this indicator review is working to address duplication with the Australian Bureau of Statistics Water and Sewerage Service Survey (WSSS) there remain areas, particularly at the state level, where real or perceived duplication needs to be addressed.
10. In particular, reforms being undertaken by the Essential Services Commission of South Australia (ESCOSA) aimed at reducing the performance reporting requirements of small network service

providers⁶⁴ is in contrast with the proposed introduction of NPR reporting requirements for small service providers.

11. ESCOSA is yet to finalise its performance reporting requirements for small network service providers under this regulatory approach. However, based on the available information and consultation with the Office of the Technical Regulator and small service providers it is clear that the extension of NPR reporting to small-network service providers will mean the reduction in reporting anticipated by these service providers will not take place.
12. While concerns around this have been raised the SA Department of Environment and the Office of the technical Regulator have been clear in their support for the extension of NPR reporting. As it is seen as a replacement for the valued performance data that will no longer be collected by ESCOSA.
13. While this is primarily an issue for resolution within South Australia it does have implications for the proposed extension of the NPR to service providers with less than 10,000 connected properties. Consideration of this issue will need to be made in the implementation and onboarding of new service providers.
14. The SA Office of the Technical Regulator is trialling the Queensland Water Directorate's web-based SWIM data collection and management application. If successful, the implementation of the SWIM application will provide a central point for data collection within SA that can provide a conduit for NPR data.

Relevance of indicators being collected

15. In a number of instances parties participating in the testing process expressed the view that they did not see the relevance of a number of the indicators.
16. Perceptions of relevance has been a longstanding issue for the NPR as in many cases those collecting and reporting the data are not the primary audience.
17. Communicating the intent and role of indicators remains an important activity to address this understanding and perception of relevance.

Dealing with edge cases

18. While there are a number of measures outlined in the proposed data quality framework (Deliverable 10) that address the risks associated with differences in interpretation of indicator definitions it is not possible to address every possible edge case or consideration in the indicator definitions. There will always be a need for the provision of advice on individual cases and how they should be dealt with in the context of reporting.
19. What is clear from the testing process is that the limited availability of resources and subject matter experts within smaller service providers and the variability in the way these services are delivered will mean an increase in the number of issues and questions. This increase will have important resourcing implications for the Bureau of Meteorology as there is likely to be an increased workload associated with responding to the issues and questions that are raised.
20. Importantly there is not currently an explicit process or mechanism to collect and address issues with indicator definitions or supporting notes raised by service providers and feed these back into a publicly accessible repository of knowledge around reporting.

⁶⁴ <https://www.escosa.sa.gov.au/news/corporate-news/oct21-news-2021-c-vta-ssn-initiate>

Appendix B Reliability indicators collected by jurisdictional performance reporting

The following table summarises the water and wastewater network reliability metrics that are reported by service providers as part of their jurisdictional performance reporting requirements (Orange – Aligned with NPR reporting, Purple – Partially aligned with NPR reporting).

	NPR	NSW (DPIE)	NSW (IPART)	Vic	Qld	Tas	SA	ACT	WA/NT
Water supply mains breaks	IA8–Number of water main breaks, bursts, and leaks	WB104–Main Breaks - Total - WS	Percentage of Priority 4, 5, 6 breaks/leaks in drinking water mains	REW1–Number of bursts and leaks (No)–Disaggregated by priority level (1, 2, 3)	IQG4.5–Number of water main breaks, bursts and leaks (total).		OP3.1–Water infrastructure reliability-drinking–Total number of water main breaks		IA8–Number of water main breaks, bursts, and leaks
	A8–Number of water main breaks, bursts, and leaks, per 100 km of water mains	WB2020–Main Breaks per 100 Km - WS			QG4.5–Number of water main breaks per 100 km water main.	CSC2–Water main breaks (no. per 100 km of water main) - As per the definition for NPR indicator A8			A8–Number of water main breaks, bursts, and leaks, per 100 km of water mains
				REW2–Average minutes to respond to priority 1, 2 and 3 bursts and leaks				CSC1.1–3–Time taken to attend bursts and leaks – water (minutes)	
				REW3–Total minutes to rectify priority 1, 2 and 3 bursts and leaks (Minutes)					
Water supply planned Interruptions				REW 5–Number of water supply interruptions (No) : Planned Performance measure–Water supply interruptions per 100km of water main		CSC3.2–Incidence of planned interruptions - water (no. per 1 000 properties)	OP3.1–Water infrastructure reliability-drinking–Total number of planned interruptions	Number of planned interruptions to water supply	
						CSC4.2–Average duration of a planned interruption - water		Average planned interruption duration to water supply (minutes per property)	
				REW 6–Number and % of water supply interruptions restored within 5 hours (No): Planned		CSC6.2–Percentage of water supply interruptions restored within 5 hours			
				REW7–Number of water supply customer interruptions (No): Planned				Number of premises where water supply not restored within 12 hours of a planned interruption	
				REW 10–Number of residential water customer interruptions exceeding 5 hours (No): Planned					

	NPR	NSW (DPIE)	NSW (IPART)	Vic	Qld	Tas	SA	ACT	WA/NT	
				Number of planned residential water customer interruptions during peak hours (5am-9am and 5pm-11pm) (No)						
								Number of premises not given at least 2 business days' notice of a planned interruption to water supply		
Water supply unplanned Interruptions	IC17–Number of unplanned interruptions: water supply	WB106–Unplanned supply interruptions - Incidence - WS	Total number of unplanned interruptions – water supply	REW 5–Number of water supply interruptions (No): Unplanned Performance measure–Water supply interruptions per 100km of water main	IQG4.7–Number of customers affected by unplanned water interruptions. (Potable only)		OP3.1–Water infrastructure reliability-drinking–Total number of unplanned interruptions	OP3.1–Water infrastructure reliability-non drinking–Total number of unplanned interruptions	Number of unplanned interruptions to water supply	IC17–Number of unplanned interruptions: water supply
	C17–Number of unplanned interruptions per 1,000 properties	WB1066–Incidence of Unplanned Interruptions			QG4.7– Average frequency of unplanned potable water supply interruptions per 1000 properties. (Potable only)	CSC3.1–Incidence of unplanned interruptions - water no. per 1 000 properties) As per the definition for NPR indicator C17.				C17–Number of unplanned interruptions per 1,000 properties
	C15–Average duration of an unplanned interruption: water supply	WB107–Average Duration of an Unplanned Interruption (mins) - WS	Average duration of unplanned water interruptions – water supply (minutes)	REW 8–Total customer minutes to restore water supply (Minutes): Unplanned		CSC4.1–Average duration of an unplanned interruption - water (minutes)	OP3.1–Water infrastructure reliability-drinking–Average duration of unplanned interruptions (minutes) – annual	OP3.1–Water infrastructure reliability-non drinking–Average duration of unplanned interruptions (minutes) – annual	Average unplanned interruption duration to water supply (minutes per property)	C15–Average duration of an unplanned interruption: water supply
			Number of properties that experience three or more unplanned water interruptions that each lasts for more than one hour Number of properties in a financial year experience one or more planned water interruptions or an unplanned water interruptions which taken together have a cumulative duration exceeding 5 hours.	REW 6–Number and % of water supply interruptions restored within 5 hours (No): Unplanned		CSC6.2–Percentage of water supply interruptions restored within 5 hours			Number of premises where water supply not restored within 12 hours of an unplanned interruption	

	NPR	NSW (DPIE)	NSW (IPART)	Vic	Qld	Tas	SA	ACT	WA/NT
			<p>Number of properties that experience three or more unplanned water interruptions exceeding one hour, in the preceding financial year</p> <p>Number of properties that experience an unplanned water interruption that lasts for more than five continuous hours</p>	REW9– Number of customers receiving 1, 2, 3, 4, 5, and 6+ unplanned water supply interruption/s in the year (No)			<p>OP3.1–Water infrastructure reliability- drinking–Number of customers with 3 or more unplanned interruptions per year - annual</p> <p>OP3.1–Water infrastructure reliability- non drinking–Number of customers with 3 or more unplanned interruptions per year - annual</p>		
				REW7–Number of water supply customer interruptions (No): Unplanned			<p>OP3.1–Water infrastructure reliability- non drinking–Number of customers affected by unplanned interruptions</p> <p>OP3.1–Water infrastructure reliability- non drinking–Number of customers affected by unplanned interruptions</p>		
				REW 10–Number of residential water customer interruptions exceeding 5 hours (No): Unplanned					
			Number of properties that experience a water pressure failure (as defined in the water utility's license)						
					Percentage of water service incidents (including bursts and leaks) that were responded to that met the times detailed within your Customer Service Standard Targets.				
Sewer breaks and chokes				RES1–Number of sewer blockages (No)	IQC4.6– Number of sewerage mains breaks and chokes.		OP3.2 Sewerage infrastructure reliability – Total Number of sewerage mains breaks and chokes		
	A14—Number of sewer mains breaks and chokes per 100 km	<p>SB2015—Breaks and Chokes per 100 Km</p> <p>Split into</p> <p>(i) SB64–Gravity (reticulation) main chokes and breaks</p> <p>(ii) SB65–Rising (pressure) main chokes and breaks</p>		RES1–Sewer main blockages per 100 km of sewer main	QC4.6–Number of sewerage mains breaks and chokes per 100 km sewer main	CSC9–Sewerage mains breaks and chokes (no. per 100 km of sewer main) As per the definition for NPR indicator A14.		<p>Number of sewer main breaks and chokes</p> <p>Number of sewer main breaks and chokes caused by tree roots</p>	A14—Number of sewer mains breaks and chokes per 100 km

	NPR	NSW (DPIE)	NSW (IPART)	Vic	Qld	Tas	SA	ACT	WA/NT
	A15—Number of property connection sewer breaks and chokes per 1,000 properties	SB2015—Property connection sewer breaks and chokes per 1,000 properties SB67—Chokes or breaks in property connections (No)						Total number of property connection sewer breaks and chokes	A15—Number of property connection sewer breaks and chokes per 1,000 properties
		WB1065—Property service connection failures (percent of connections) - WS							
Sewer blockages, spill and overflows			Number of properties (other than public properties) that experience an uncontrolled wastewater overflow in dry weather						
			Number of properties (other than public properties) that experience three or more uncontrolled wastewater overflows in dry weather						
							CSC10—Percentage of sewage spills contained within 5 hours		
				RES2—Total minutes to respond to reported sewer blockage/spill (Minutes)			CSC11—Time to attend sewer spills, breaks and chokes (minutes)		
				RES 5 Number of customers receiving 3 or more sewer blockages in the year (No)					
				RES6—Number of sewage spills from reticulation and branch sewers (No)					
				RES7—Number of sewage spills from reticulation and branch sewers fully contained within 5 hours (No)					

	NPR	NSW (DPIE)	NSW (IPART)	Vic	Qld	Tas	SA	ACT	WA/NT
				RES8-Number of sewage spills to customer properties (No)					
				RES 10-Number of sewer spills within a house (No)			OP3.2 Sewerage infrastructure reliability – Total number of inside building overflow events OP3.2 Sewerage infrastructure reliability – Total number of outside building (on customer’s property) overflow events		
				Percentage of sewerage incidents (including main breaks and chokes) that were responded to that met the times detailed within your Customer Service Standard Targets.					
Sewer interruptions							OP3.2 Sewerage infrastructure reliability - Total number of unplanned interruptions	Number of unplanned interruptions to sewerage service	
							OP3.2 Sewerage infrastructure reliability – Number of customers with 3 or more unplanned full loss events per year		
				RES 9-Number of residential sewer supply customer interruptions restored within X hours (No.)			OP3.2 Sewerage infrastructure reliability – Total duration of unplanned sewerage interruption (minutes)	Number of premises where sewerage services not restored within 12 hours of an unplanned interruption	
							OP3.2 Sewerage infrastructure reliability – Total Number of sewerage service outage events		