



Engineering

Technical Standard

TS 0107 – Sustainability by Design

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**Government of
South Australia**

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There are no documents superseded by TS 0107.

Significant/major changes incorporated in this edition

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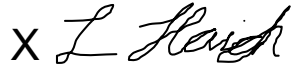
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Approvers

Approver Name	Approver Role	Signature
Lana Haigh	Responsible Discipline Lead	29/09/2025 X  Lana Haigh Lead Sustainability in Design Signed by: HA003652
Matthew Davis	Manager Engineering Quality and Innovation	29/09/2025 X  Matthew Davis Manager Engineering Quality and Innovation Signed by: DA003681
Sofia Chouli	Senior Manager Engineering	7/10/2025 X  Sofia Chouli Senior Manager Engineering Signed by: CH005288

Reviewers

Name	Role	Version	Review Date
Lana Haigh	Lead Sustainability in Design	1.0	22/09/2025
Neil Smith	Senior Standards Engineer	1.0	22/09/2025

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1 Introduction

SA Water's Sustainability by Design (SubD) process drives sustainability outcomes across the project lifecycle through a systematic approach that:

- Aligns with SA Water's strategic commitments and reporting requirements.
- Supports SA Water's sustainability objectives.
- Integrates sustainability considerations into existing design processes (for example, value management (VM), Safety in Design (SiD)) across the asset lifecycle.
- Details an approach for assessing material sustainability categories relevant to a project.
- Demonstrates how sustainability categories, such as emissions, climate risk and resilience, stakeholder and community engagement and sustainable procurement, are to be applied across initiation, planning, design, procurement and construction in a project lifecycle.

The SubD Technical Standard is process and delivery model agnostic and can be integrated into both CPMM 2.0 and CPMM 3.0 at any stage of the project lifecycle.

1.1 Purpose

The purpose of this Technical Standard is to detail the minimum requirements to support sustainability of assets throughout their lifecycle, from initiation through to design, construction, operation and end of life, in a consistent and integrated approach.

This Technical Standard has been developed to guide SA Water and partners through SubD requirements, showing how these requirements align with SA Water's planning, design, delivery, operation and decommissioning processes.

Users can refer to the relevant sections based on their needs to identify and implement activities prescribed in this Standard.

1.2 Glossary

Terms and Abbreviations utilised in this Standard are included in the following sections. The definitions presented below are to be used when interpreting this Standard and actions undertaken in relation to this Standard. Where a conflict exists, clarification is to be sought from SA Water.

1.2.1 Terms and definitions

The following is a list of terms applicable to this document:

Term	Description
Accepted	Determined to be satisfactory by SA Water's Representative.
AquaNet	SA Waters intranet.
Capital Project Locker	SA Water's Project Document Management server solution.
Circular Economy	A systems approach to mitigate our impact on the environment and eliminate waste produced by SA Water by re-purposing and re-directing waste and circulating it as a resource at its highest value
Climate Vulnerability Check	Process used to identify exposure to climate hazards and its sensitivities to those hazards.
CPMM 3.0	Corporate Project Management Methodology 3.0 also known as the Project lifecycle, which oversees and governs the execution of all SA Water's capital investment projects. It begins with the identification of a need as part of the asset planning process and concludes with the handover of a new or renewed asset to the Operations and Maintenance teams.
Constructor	The organisation responsible for constructing and installing infrastructure for SA Water whether it be a third party under contract to SA Water or an in-house entity.
Contract	A set of documents supplied to Constructor as the basis for construction; these documents contain contract forms, contract conditions, specifications, drawings, addenda, and contract change.
Designer	The organisation responsible for designing infrastructure for SA Water whether it be a third party under contract to SA Water or a Constructor, or an in-house entity. A Designer is a person who effects design, produces designs or undertakes design activities as defined in the <i>Work Health and Safety Act 2012 (SA)</i> .
Emissions	Greenhouse gas emissions that are released into the air as a result of activities or the consumption of energy. SA Water emissions are released from our products, processes and services both directly and indirectly. They include carbon dioxide, methane and nitrous oxide.
EnviroCheck	EnviroCheck is the mechanism used to initiate engagement with the Environment and Heritage Expertise team by lodging an EnviroCheck form, which triggers a preliminary desktop-based environmental and heritage assessment of the project.
Lead Sustainability by Design (Lead SubD)	SA Water's internal position title, the leader of SA Water's Sustainability by Design Team. It is different from the Sustainability by Design Lead.
Must	See Shall.
Needs	A need is a systems engineering artefact which is used to define a success criterion for a project. The total register of needs represents the minimum success criteria for a project. Sustainability Needs are specific type of project needs that define the sustainability success criteria to be achieved across the asset lifecycle.
Person/s	Each word implying a person, or persons shall, where appropriate, also be construed as including corporations.

Term	Description
Project Lead	An appropriately qualified person who has been given the responsibility to manage an asset design or modification. The Project Lead may delegate these activities however remains responsible. This role is typically fulfilled by the Project Manager or Design Manager but where these positions are not yet allocated, the term "Project Lead" is used.
Project Phase	The highest level of the CPMM 3.0 project lifecycle chart, divided into five phases: Initiate, Develop, Establish, Deliver, and Close. Phases define the overall progression of a project from inception to completion. Project Phases are not referenced further in this Technical Standard.
Project Stage	A subdivision within a phase that identifies the core actions, inputs, outputs, and approvals required to progress to the next stage. Project Stages are shown as blue boxes in the CPMM 3.0 project lifecycle chart (see Figure 6).
Project Step	The further breakdown of a stage, describing specific tasks, deliverables, or decision points that must be completed to achieve a project milestone. Project Steps are shown as green boxes in the CPMM 3.0 project lifecycle chart and are used to mark progressions in this Technical Standard (see Figure 6).
Responsible Discipline Lead	The engineering discipline expert identified in the 'Approvers' table (via SA Water's Representative).
RIVER	RIVER is the official electronic records system for SA Water.
SA Water Representative	The SA Water representative with delegated authority under a Contract or engagement, including (as applicable): • Superintendent's Representative (for example, AS 4300 and AS 2124 etcetera.) • SA Water Project Manager • SA Water nominated contact person
Shall	Indicates a requirement that is to be adopted in order to comply with the Standard.
Should	Indicates practices which are advised or recommended but are not mandatory.
Stakeholder Check	A process to identify and register key stakeholders for engagement plan in the early stage of a project. Following the Stakeholder Check, the Stakeholder Engagement Plan will be formed as a structured process that supports a project in developing and delivering an impactful engagement strategy by mitigating risks, building relationships, collating feedback, enhancing transparency, building support, applying best practice engagement methods and effectively managing stakeholder concerns.
Supplier	A person, group or company that provides goods for use in SA Water infrastructure.
Sustainability	Sustainability refers to the development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainability at SA Water builds on our history of environmental action, customer and community care and responsible operations. By integrating sustainability across all aspects of our operations, including our partners and supply chain, SA Water seeks to create a lasting and positive legacy of a resilient, thriving, and equitable water future for South Australia.
Sustainability by Design	Sustainability by Design aims to embed sustainable principles throughout the asset lifecycle to unlock innovative solutions that advance environmental stewardship, economic and social prosperity—driving a more resilient and sustainable future.

Term	Description
Sustainability by Design Lead (SubD Lead)	The person responsible for executing the SubD process. The SubD Lead will have experience appropriate to the scale, scope and complexity of the work. Depending on project size, this may include: • Smaller designs: Designer/Project Manager or Design Lead. • Larger projects: Senior/Principal/Head Designer or Design Manager. Refer to Section 5.1 for more details. It is different from the Lead Sustainability by Design as above.
Sustainability by Design Management Plan (SubD Management Plan)	A project plan prepared by the SubD Lead with key personnel that outlines sustainability actions, assessments, and requirements across all project steps, and is reviewed and updated throughout the lifecycle (see section 5.5).
Sustainability by Design Report (SubD Report)	A document prepared at each project step that records sustainability materiality assessments, initiatives, and decisions to demonstrate application of the SubD process (see 5.6).
Sustainability by Design Team (SubD Team)	SA Water's internal team, structured under the Engineering Department, Delivery portfolio.
Sustainability Categories	A group of related sustainability aspects. Sustainability category is structured under a taxonomy-based sustainability categorisation methodology, organising sustainability aspects hierarchically, starting from a high-level pillar and breaking down into more specific categories and subcategories. See Appendix D E, F & G for context and descriptions of sustainability categories.
Sustainability Materiality Assessment	An assessment used to identify and prioritise the sustainability categories most relevant to each project (see Section 5.2)
Technical Dispensation Request Form	This form is part of SA Water's Technical Dispensation Request Procedure which details the process by which those required to comply, or ensure compliance, with SA Water's technical requirements may seek dispensation from those requirements.
Value Management	A process designed to maximise the value delivered over the asset lifecycle across all capital projects. Through systematic analysis and stakeholder collaboration, value management (VM) ensures asset projects align with business needs, reduce unnecessary scope, and improve outcomes across the asset lifecycle including sustainability.
Work	Elements of a project which require design and/or construction.

1.2.2 Abbreviations

The following is a list of Abbreviations, Acronyms and Initialisms used in this document:

Abbreviation	Description
CAPEX	Capital Expenditure
CBA	Cost-benefit Analysis
CPMM	Corporate Project Management Methodology
DEI	Diversity, Equity and Inclusion
DM	Design Manager
E&H	Environment and Heritage
EIP	Environment Improvement Program
EPD	Environmental Product Declarations
ESCOSA	Essential Services Commission of South Australia
FUSP	Functional Specifications
GBCA	Green Building Council of Australia
GECA	Good Environmental Choice Australia
GHG	Greenhouse Gas
GWP	Global Warming Potential
HAZID	Hazard Identification
IFC	Issued for Construction
ISC	Infrastructure Sustainability Council
Lead SubD	Lead Sustainability by Design (Lead SubD)
LOPA	Layers of Protection Analysis
MCA	Multi-criteria assessment
NPV	Net Present Value
OE	Owner's Engineer
OPEX	Operational Expenditure
PAG	Program Advisory Group
PCF	Product Carbon Footprint
PEF	Product Environmental Footprint
PM	Project Manager
RFEE	Request for engineering engagement
RFI	Request for Information
S&E	Stakeholder and Engagement
SA Water	South Australian Water Corporation
SAF	Service Agreement Form (internal SA Water Engineering document)
SiD	Safety in Design
SMA	Sustainability Materiality Assessment
SME	Subject Mater Expert
SubD	Sustainability by Design
TDRF	Technical Dispensation Request Form
TOTEX	Total Expenditure

Abbreviation	Description
TS	SA Water Technical Standard
VM	Value Management
WSUD	Water Sensitive Urban Design

1.2.3 Terminology

The following is a list of specific interpretations for Terminology used in this standard.

- Where a submission, request, proposal is required and it is not stated who the recipient should be, it is to be provided to SA Water's Representative for review.
- Each word imparting the plural shall be construed as if the said word were preceded by the word "all".
- "Authorised", "approval", "approved", "selected", "directed" and similar words shall be construed as referring to the authorisation, approval, selection or direction of SA Water's Representative in writing.
- "Submit" means "submit to the SA Water Representative or their nominated delegate".
- Unless noted otherwise, submissions, requests, proposals are to be provided at least 10 business days prior to work commencing or material ordering (unless noted otherwise).

1.3 References

1.3.1 Australian and international standards

The following table identifies Australian and International standards and other similar documents referenced in this document:

Reference	Title
AS 1428 (series)	Design for access and mobility
AS 2124	General conditions of contract
AS 4300	General conditions of contract for design and construct
	Water sensitive urban design guidelines, Water Sensitive SA
EN 15804	Sustainability of construction works – Environmental Product Declarations – Core rules for the product category of construction products
GHG Protocol	“The Greenhouse Gas Protocol”, World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD), international
ISC TM	‘Technical Manual’, Infrastructure Sustainability Council, international
ISO 14001	Environmental management systems — Requirements with guidance for use
ISO 20400	Sustainable procurement – guidance
ISO 45001	Occupational health and safety management systems — Requirements with guidance for use
PAS 2080	Carbon management in buildings and infrastructure
	South Australian Water Corporation Act 1994 (SA)
	Water Industry Act 2012 (SA)
	National Greenhouse and Energy Reporting Act 2007 (Cth)
	Disability Discrimination Act 1992 (Cth)
	Modern Slavery Act 2018 (Cth)
	Copyright Act 1968 (Cth)
	Water Industry Regulations 2012 (SA)

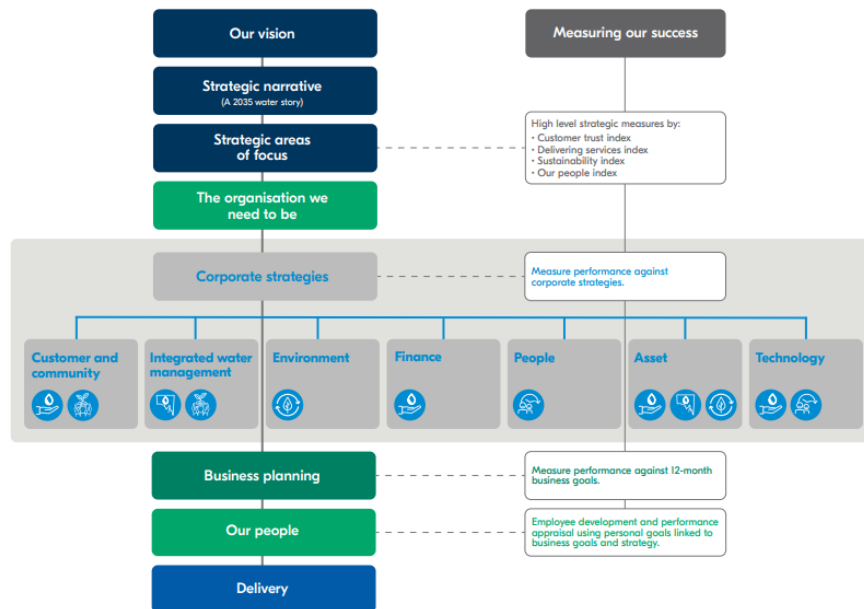
1.3.2 SA Water documents

The following table identifies the SA Water standards and other similar documents referenced in this document. Please contact SA Water representative to support access if required:

Reference	Title
CPMM 3.0	Corporate Project Management Methodology 3.0
DAIP 2020-2022	Disability Access and Inclusion Plan 2020-2022
DEISP 2023-2030	Diversity, Equity and Inclusion Strategic Plan 2023-30
Our Strategy 2020-2025	SA Water Corporate Strategy 2020-2025: Delivering trusted water services for a sustainable and healthy South Australia • Environment Corporate Strategy • Customer and Community Corporate Strategy • People and Safety Corporate Strategy • Finance Corporate Strategy
PROC94450Z	Procurement Framework
RAP 2024-2027	Stretch Reconciliation Action Plan 2024-2027
SAWC-CMP-0003	Privacy Policy
SAWC-COR-0001	Governance Policy
SAWC-COR-0006	Health and Safety Policy
SAWG-PM-0086	Project Tiering Framework
SAWG-PM-0111	Lessons Learned Management Plan
SAWG-RM-0001	Risk Management Framework
SAWP-CS-0018	Customer Complaints, Compliments & Suggestions Procedure
SAWP-ENV-0053	Environment and Heritage Management Framework
SAWP-ENV-0054	Preliminary Environment and Heritage Assessment Procedure
SAWP-SEC-0001	Security Procedure
SAW-SEC-0001	Security Risk Assessment
SAWT-ENG-0015	Technical Dispensation Request Procedure
TS 0101	TS 0101: Safety in design
TS 0104	TS 0104: Design quality management

2 SA Water Sustainability Commitment

SA Water has a vision to be global leaders in the water sector for proactive environmental stewardship and fostering healthy communities, as outlined in *Our Strategy 2020 – 2025 (V2.0 14 May 2024)*. Various corporate strategies sit under this strategy to measure performance and describe specific actions aligned to the strategic areas of focus. SA Water's strategic framework is illustrated in Figure 1.



source: SA Water's strategy 2020 - 2025

Figure 1: SA Water's strategic framework

These corporate strategies include SA Water's commitments with regards to sustainability. This technical standard is guided by SA Water's strategy and ensures this standard contributes to the achievement of strategic goals.

Table 1 below summarises SA Water's sustainability commitments and its relevance to sustainability themes.

Table 1: SA Water's sustainability commitments and relevant sustainability by design themes

Corporate Strategy	Strategy objectives	Strategic horizon	Sustainability themes
People and safety corporate strategy	Genuine diversity, equity and inclusion	- Diversity, equity, and inclusion (DEI) practices embedded in business practices and decision making by 2025. - Measures of employee engagement and psychosocial safety are high and demonstrate an inclusive workplace by 2030.	Diversity and inclusion
Customer and community corporate strategy	Meaningful community partnerships	- Increased community and Aboriginal partnerships. Social measures and greening strategies are established by 2025. - SA Water is a leader in water sensitive urban design (WSUD). Leading in reconciliation in the South Australian community by 2030.	- Water sensitive urban design - Community and Aboriginal partnerships - Nature

Corporate Strategy	Strategy objectives	Strategic horizon	Sustainability themes
Environment corporate strategy	Environmental leadership and accountability	• Triple bottom line framework is routinely applied in business decision making by 2025. • Influence and collaborate to raise environmental performance and recognised internationally by 2030. • SA Water supports global sustainability ambitions by 2040.	• Governance • Environmental compliance
	Liveable places and revitalised ecosystems	• Increase greening, Aboriginal cultural connection, and protection of ecological and biodiversity assets by 2025. • Yearly improvement in biodiversity of land holdings and improve catchment and ecosystem health through partnerships by 2030. • Maintain ongoing ecological health in a changing climate by 2040.	• Indigenous culture and knowledge • Nature
	Net zero emissions	• Emissions across all scopes are reducing and improved monitoring by 2025. • Net zero operational emissions on all new infrastructure post-2024 and apply low emission construction methods by 2030. • Explore opportunities to be carbon positive by 2040.	• Carbon
	Adapting to climate change	• Up-to-date scenarios and trigger points inform adaptation of SA Water's infrastructure and operations by 2025. • Apply climate adaptive pathways to improve resilience by 2030. • SA Water uses a resilient and agile approach to the emerging climate and its effects by 2040.	• Climate Change
	Efficient and balanced energy	• Efficiency and optimisation to reduce energy consumption. Emissions-free energy is increasingly sourced by 2025. • Majority of energy consumption comes from emissions-free sources and opportunities for energy partnerships are identified by 2030. • SA Water plays a greater role in generating emissions-free energy that aligns with the business model by 2040.	• Carbon
	Maximising the value of our resources	• Circular economy principles underpin decision making. Material efficiency and resource recovery embedded in procurement processes by 2025. • Alternative options for recoverable resources are being realised by 2030. • Designed out waste and become a net zero waste organisation by 2040.	• Circular economy

3 Scope

3.1 Scope and application of this Technical Standard

This Technical Standard specifies the minimum mandatory requirements of SA Water's Sustainability by Design (SubD) process to drive sustainability outcomes on projects through a systematic approach, to minimise impact on future generations and support the goals of the Corporate Strategy.

This Standard is applicable to all design projects including those delivered in the capital and major projects space, including any directions given under Section 6 of the Water Act ("Section 6 projects"). It is applicable for infrastructure designed, constructed, modified, decommissioned or demolished by or for SA Water. It applies to project delivery, either internal or external to SA Water and infrastructure including structures, plant and equipment, permanent, temporary, fixed or mobile. Refer to Section 3.3 for works that this Technical Standard does not apply to.



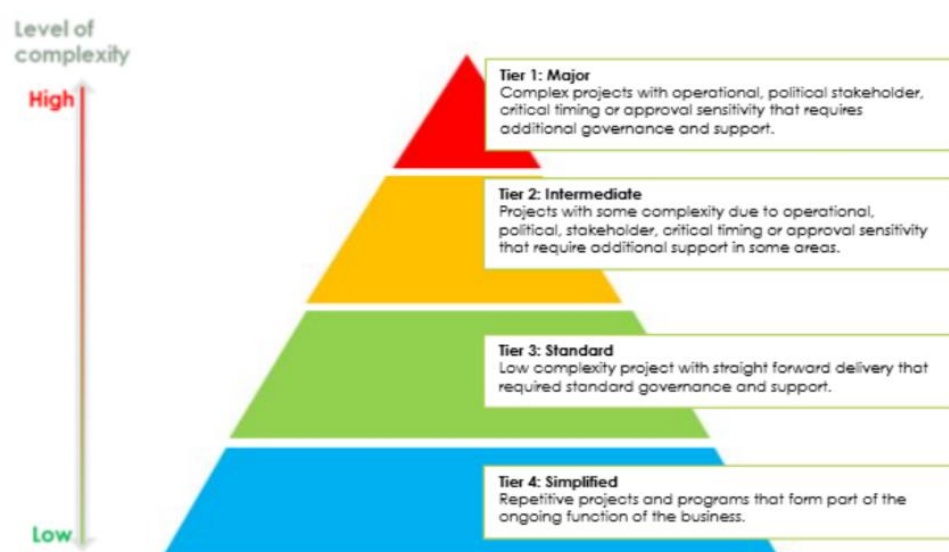
Figure 2: Typical life cycle of an asset

Compliance with this Standard does not constitute compliance with applicable laws, regulations, or SA Water corporate requirements. Responsibility for ensuring compliance with relevant regulatory and corporate obligations rests with the designer in collaboration with the project manager, design manager, and other relevant stakeholders across the project lifecycle.

3.2 Project hierarchy

SA Water projects are classified into four tiers. Tier 1 and Tier 2 projects are subject to greater scrutiny and require additional governance compared to Tier 3 and Tier 4 projects. Refer to SAWG-PM-0086 Project Tying Framework for further details on project tying.

Figure 3 demonstrates the tiering hierarchy of the Project Tying Framework.



source: SA Water Project Tying Framework

Figure 3: Project tiering hierarchy

3.2.1 Tier 1 to Tier 3

For all projects from Tier 1 through to Tier 3 the requirements of TS 0107 apply. This includes undertaking a project-specific Sustainability Materiality Assessment (SMA) (an assessment used to identify and prioritise the sustainability categories most relevant to each project, see Section 4.3) to inform the Sustainability Needs, the assessments to be completed and the requirements to be included in contracts for the project. Refer to Section 5.2 for details of how and when to conduct the materiality assessment(s).

3.2.2 Tier 4 projects (programs of work)

Where a project is categorised as a Tier 4 project, a program approach to SubD is to be developed in consultation with and approved by the SA Water SubD Team. This will support realisation of sustainability opportunities on the broader scale and level of effectiveness that would not be realised if managed as multiple small package projects.

The materiality assessment (refer to Section 5.2) is to be applied to the Program of works and site-specific opportunities.

3.2.3 Typical and standard designs

Typical or Standard designs may be the basis or form part of any project in any tier. The relevant SubD activities and process must be applied for the corresponding tier.

3.3 Works not in scope

Major Land Developments (MLD) reticulation networks delivered by a Developer, and Major Third-party Projects, are currently except from this Technical Standard. This does not include SA Water projects supporting a Land Development.

3.4 Technical dispensation

SA Water welcomes engagement on opportunities that can enhance sustainability. SA Water continues to improve the sustainability of its assets, operations and construction practices. It is recognised that existing Technical Standards, Guidelines, and Standard and Typical Drawings are sometimes perceived as barriers to innovation.

Opportunities may exist to adopt approaches that are considered business-as-usual in other utilities or industries, as well as to explore the application of emerging technologies and practices. SA Water welcomes engagement on such initiatives and is committed to evaluating their suitability within the context of our operations through [SAWT-ENG-0015 Technical Dispensation Request Procedure](#) available from SA Water Website.

Departure from any requirement of this Technical Standard shall require the submission of Technical Dispensation Request Form (TDRF) for the review and approval (or otherwise) of SA Water Responsible Discipline Lead listed in Page 5, on a case-by-case basis.

The Designer shall not proceed to document/incorporate the non-conforming work before the relevant responsible party has approved of the proposed action in writing via the Technical Dispensation Request Form (TDRF).

SA Water requires sufficient information to assess dispensation requests and their potential impact. The onus is therefore on the proponent to justify dispensation request submissions and provide suitable evidence to support them.

Design works that are carried out without being appropriately sanctioned by SA Water shall be liable to rejection by SA Water and retrospective rectification by the Designer / Constructor.

4 Sustainability by Design Principles

"Sustainability refers to meeting the needs of the present without compromising the ability of future generations to meet their own needs."

- The "Our Common Future" by the United Nations Brundtland Commission, 1987

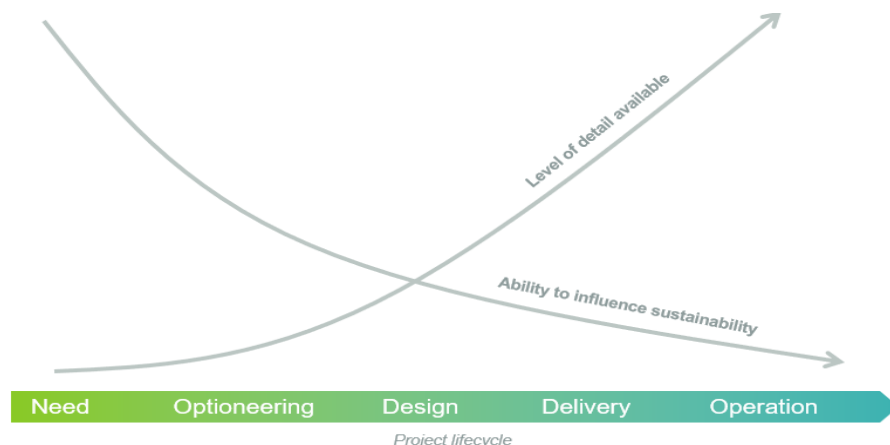
Sustainability at SA Water builds on our history of environmental action, customer and community care and responsible operations. Consistent with our Values and Strategy, we commit to continually enhancing our environment and communities, ensuring our viability now and for future generations, while addressing the increasing external obligations and expectations as they relate to sustainability. By integrating sustainability across all aspects of our operations, including our partners and supply chain, we seek to create a lasting and positive legacy of a resilient, thriving, and equitable water future for South Australia.

The SubD approach closely aligns with the principles promoted by SA Water regulatory body, Essential Services Commission of South Australia (ESCOSA). It reflects the emphasis on a prudent and efficient design: acting with care and foresight for the future, while achieving maximum productivity with minimum waste, effort or expense.

Several SubD principles are used throughout this document some of these key principles are defined in the sub-sections below.

4.1 Project lifecycle and sustainability

The most significant opportunity to achieve sustainable outcomes lies at the earliest steps of a project, where Project Needs are defined and project options and technical options are being assessed. Figure 4 provides a graphical example on the ability to influence sustainable outcomes for typical infrastructure projects throughout their lifecycle.



source: adapted from PAS 2080

Figure 4: Ability to influence sustainability on a typical infrastructure project

4.2 Design for whole-of-life

A whole-of-life approach considers the entire lifecycle of an asset – from early planning and design through to construction, operation and decommissioning, and end of functional life. In the context of sustainability, this approach enables a holistic view of a project's risks and opportunities and environmental, social, and economic impacts in all steps, rather than focusing solely on construction or operations.

Designing for whole of life allows projects to optimise long-term value, minimise lifecycle emissions and resource use, and enhance resilience to future challenges. It supports prudent

and efficient investment by reducing total cost, extending asset life, and enabling more sustainable outcomes across the asset's lifecycle.

4.3 Materiality

Materiality, in the context of SubD, refers to the principle of determining the most important sustainability categories relevant to a project. Materiality considers the scale of impact or influences the project may have from a sustainability perspective and enables prioritisation of critical areas. Material sustainability areas represent risks and opportunities for the project to meaningfully integrate sustainability.

Under the SubD process, material sustainability categories are aligned with SA Water's environmental goals and the corporate strategies (Our strategy 2020-25) (refer to Section 5.2 for details of how to conduct a materiality assessment).

4.4 Sustainability categories

Due to the complexity and scale of design projects, a broad range of expertise is often required to address knowledge gaps and deliver well-rounded outcomes. This may include, but is not limited to, contribution from experts such as ecologists, arborists, climate specialists, engineers, community and stakeholder engagement professionals, supply chain experts, diversity and inclusion advisors, cultural and heritage consultants, and sustainability practitioners.

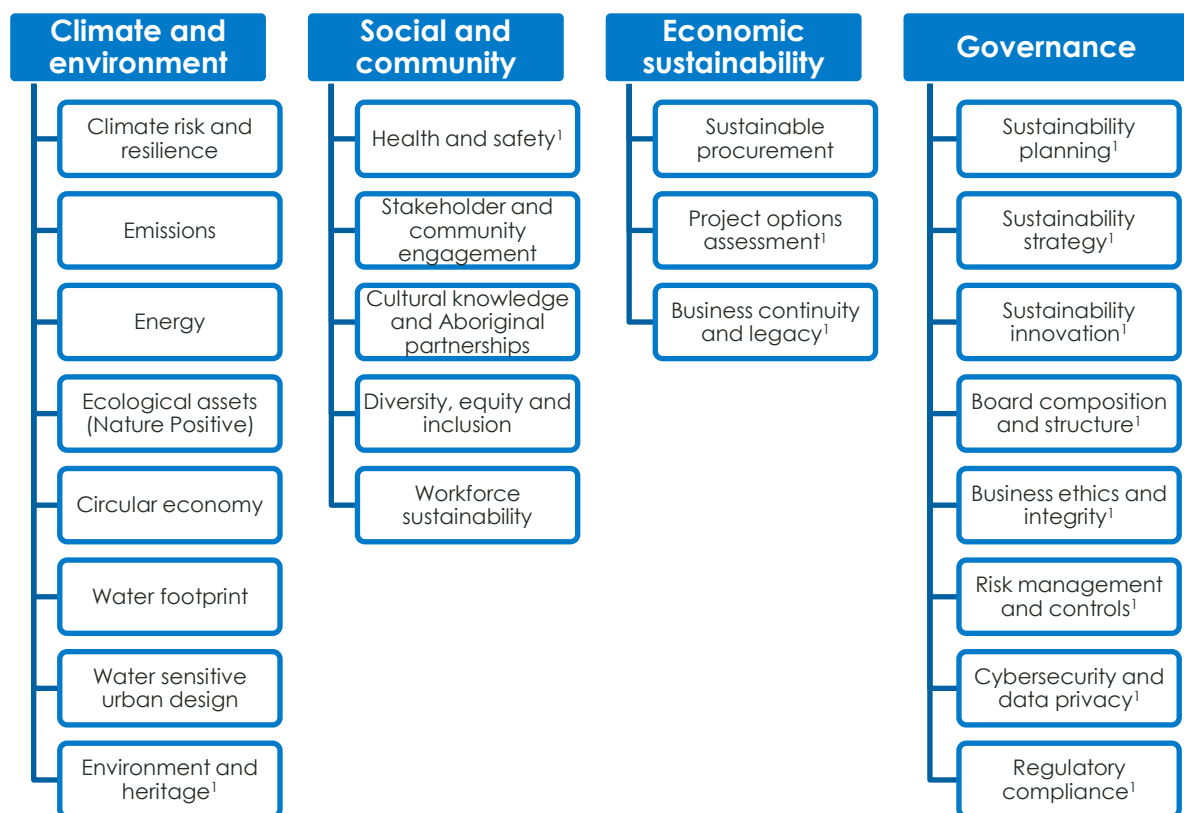


Figure 5: Sustainability categories most relevant to SA Water Projects¹

Figure 5¹ presents the sustainability categories relevant to SA Water projects and operations. To align terminology and scope for sustainability in SA Water's corporate strategies and project delivery, the sustainability categories are organised under four pillars: climate and environment, social and community, economic sustainability, and governance. These categories align with common sustainability frameworks and taxonomies but are not

¹ Marked categories and subcategories refer to common sustainability practices that do not fall under this Technical Standard and are supported by other systems or process.

exhaustive and may evolve alongside global sustainability initiatives. Additional details are provided in the Appendix D E, F & G.

4.4.1 Climate and environment

The climate and environment pillar encompasses a range of interconnected sustainability categories focused on evaluating, mitigating, and adapting to the impacts of climate change, while protecting and enhancing natural systems. This includes identifying and managing climate-related risks and building resilience into infrastructure, operations, and communities. Additionally, fulfilling obligations to protect environmental and heritage values ensures the preservation of natural landscapes, the respectful treatment of cultural heritage and compliance with relevant environmental legislation to support long-term environmental and social stewardship.

While assessing climate risks and opportunities remains a priority, improving asset resilience to reduce vulnerability to extreme weather events is equally critical. In parallel, reducing greenhouse gas emissions is a key objective aligned with SA Water's strategic goals. Through decarbonisation of energy sources, enhanced operational efficiency, and the adoption of low-carbon technologies, SA Water is progressing toward its net zero targets for Scope 1 and 2 emissions and benchmarking its Scope 3 emissions footprint. Closely tied to emissions is the focus on energy, specifically increasing the use of renewable energy, improving energy efficiency, and integrating energy-conscious design into infrastructure and operations.

Ecological assets and the pursuit of achieving a nature positive outcome highlight the importance of conserving, restoring, and enhancing biodiversity and ecosystems within and around SA Water's assets. Projects planning should integrate considerations of ecological risk, nature-based resilience and potential environmental impacts. This aligns with principles of the circular economy, which aim to minimise waste, improve resource recovery, and implement whole-of-life material management strategies, from construction through to decommissioning.

As a water utility, managing SA Water's water footprint, including water withdrawal, consumption, and discharge, is essential. Efficient water use and minimisation of environmental impact must be embedded in all planning and operations. Furthermore, the integration of water sensitive urban design (WSUD) principles supports sustainable management of the urban water cycle, enhances water quality, and promotes green infrastructure to deliver environmental, social, and climate resilience benefits.

Refer to Appendix D for more information.

4.4.2 Social and community

The social and community pillar focuses on creating inclusive, safe, and resilient environments for people, both within the organisation and in the communities SA Water serves. This involves prioritising health and safety, fostering meaningful relationships with stakeholders, promoting cultural understanding, and supporting workforce wellbeing and sustainability. These elements are essential to delivering socially responsible outcomes that build trust, equity, and long-term value for all.

Health and safety are core values embedded across all operations, with a strong emphasis on proactive risk management, compliance with relevant legislation, and fostering a culture of care and accountability. Ensuring the physical and psychological safety of employees, contractors, and the wider community remains a critical priority for sustainable project delivery and ongoing service provision. In project planning, a key component of this approach is the implementation of safety and security in design principles, which integrate hazard identification and risk mitigation early in the project initiate phase to eliminate or minimise safety and security risks throughout the asset lifecycle.

Effective stakeholder and community engagement is essential for transparent, inclusive, and responsive decision making. Early and ongoing collaboration with local communities and stakeholders ensures that projects reflect diverse needs and social impacts. Integral to this process is respecting cultural knowledge and fostering strong Aboriginal partnerships, which

includes acknowledging Traditional Owners, embedding Aboriginal perspectives into planning and design, and supporting opportunities for cultural recognition and economic empowerment. This integrated approach strengthens trust, protects heritage, and delivers socially equitable outcomes.

Workforce sustainability is key to SA Water's long-term success, supported by proactive planning, succession management, and ongoing investment in skills, wellbeing, and leadership. DEI further strengthen this by creating an inclusive culture, addressing barriers, and ensuring equitable access to opportunities. Furthermore, DEI also enhances project delivery through inclusive design, diverse teams, and equitable procurement, which lead to more innovative, effective, and community-driven outcomes.

Refer to Appendix E for more information.

4.4.3 Economic sustainability

Economic sustainability is a core pillar of SA Water's commitment to delivering trusted water services to customers, stakeholders, and communities. It is embedded across strategic procurement, project planning, and operational resilience to ensure financial performance aligns with social and environmental responsibilities.

Sustainable procurement plays a key role, with supplier selection and management processes that address human rights, modern slavery risks, and environmental performance. These strategies are supported by supply chain risk analysis and lifecycle assessment (LCA) verifications, guiding procurement decisions that improve circularity and minimise long-term costs and environmental impacts.

Project planning incorporates materiality assessment, whole-of-life costing, and post-project evaluation to ensure investments deliver lasting value and support continuous improvement. SA Water considers distributional impacts, and benefits identification when evaluating project options, ensuring a balance between financial outcomes, long-term asset reliability, and broader environmental and social value.

Business continuity is supported by strong financial management, long-term planning, and infrastructure investment. SA Water contributes to economic stability by providing reliable, affordable services and by assessing the wider social and environmental impacts of its operations. Through community investment, local employment and tax contributions, SA Water ensures its projects deliver a lasting and positive legacy for South Australian communities.

Refer to Appendix F for more information.

4.4.4 Governance

Strong governance underpins SA Water's ability to deliver sustainable water services while managing risk, meeting compliance obligations, and upholding public trust. Sustainability planning is integrated across the organisation through a strategic commitment and sustainability management planning that set clear priorities. These are supported by regular sustainability reporting and knowledge-sharing to engage staff and stakeholders and align efforts with community expectations.

SA Water's strategies outline a clear vision and objectives, led by a diverse and skilled board and executive leadership team. Innovations that support sustainability are encouraged and systematically registered. The organisation maintains transparency and accountability through audit, assurance, and certification processes, ensuring that progress is both measurable and verifiable.

Risk management and internal controls play a critical role in ensuring organisational resilience and informed decision making. SA Water applies structured frameworks to identify, assess, and mitigate risks across climate, compliance, operations, and emerging trends. This also includes identifying opportunities, such as emissions reduction or resource efficiency, which are embedded into strategic planning and growth decisions.

Governance is further guided by strong business ethics and integrity, underpinned by SA Water's Ethical Standards and Values. Cybersecurity and data privacy are safeguarded through robust systems that protect customer and operational information. Beyond that, SA Water also maintains close collaboration with regulators and government agencies to meet compliance obligations and adapt to evolving legal and policy requirements.

Refer to Appendix G for more information. Note that Governance does not fall under the scope of this Technical Standard.

4.5 Third party certification

Currently, third-party sustainability certification is not generally pursued by SA Water. However, it is recommended to see whether such certification would add value to the project. Certification provides a framework that can be followed in design and operations, as well as assurance that sustainability claims are valid, which can also help with SA Water's reputation regarding sustainability. Such certifications may include Infrastructure Sustainability Council (ISC) rating (projects \$100M+) or ISC Essentials rating (projects \$5-99M) or Green Star ratings for buildings.

4.5.1 Infrastructure Sustainability Council rating

The ISC is a member-based, not-for-profit peak body operating in Australia and globally to drive infrastructure delivery that has environmental, cultural, social and economic benefits. A core function of the organisation is the implementation of the Infrastructure Sustainability (IS) rating scheme.

The IS rating scheme provides a structured framework to support decision makers, planners and designers enhance environmental, social and economic outcomes for infrastructure. The scheme is applicable across all stages of the infrastructure lifecycle (planning, design, construction and operations) and offers an independent assessment and verification process for projects seeking sustainability certification. Certification can be achieved through the standard ISC rating process or through the ISC Essentials rating process that is scaled for smaller projects with an estimated cost of \$5-99 million.

SA Water are members of the ISC. The Murray Bridge wastewater treatment plant, built and commissioned in 2021, is an example of SA Water pursuing third-party certification and achieved an "Excellent" Design v1.2 IS Rating.

4.5.2 Green Star rating

The Green Star rating scheme is an internationally recognised Australian sustainability rating and certification system with the aim of driving delivery of healthy, resilient and positive buildings and places. The rating scheme is administered by the Green Building Council of Australia (GBCA) to independently assess and verify the sustainability performance for buildings projects.

A Green Star rating is similar to the IS rating but for application on building projects rather than infrastructure. There are four Green Star rating tools, providing a means of sustainability certification for building design and construction, buildings' operational performance, fitouts and precinct development.

5 Sustainability by Design Activities

Identifying early opportunities for delivering meaningful sustainability outcomes, and translating these into practical requirements, will support effective and efficient design aligned with SA Water's sustainability objectives.

The following Section explains the key elements of the requirements and activities introduced by this Technical Standard. It is useful to project/design managers and asset owners who will be responsible for initiating and/or coordinating these requirements within their respective projects and understanding when they will be required to engage subject matter experts (SMEs). The timing of the SubD Requirements is stepped out in Section 7.

5.1 Sustainability by Design Lead

At the commencement of any project step, a SubD Lead must be allocated and is accountable for ensuring that the SubD process and prescribed activities, as outlined in this Technical Standard, are implemented. The design group will agree upon the SubD Lead prior to commencing the SubD process.

The SubD Lead is typically the most senior designer and maybe the Project Engineer or Design Manager. For smaller or simpler designs, the Engineer may take on this role, or where the Project Manager is also the Designer, the Project Manager may act as SubD Lead. The appointment will depend on the scale, scope and complexity of the project, but should always be the most senior designer.

The SubD Lead may draw on SME or other relevant resources for support. The individual shall be familiar with this Technical Standard and, where possible, should be a sustainability professional who remains with the project throughout its lifecycle.

5.2 Sustainability Materiality Assessment

Defining sustainability for a project starts with a 'Sustainability Materiality Assessment', which is first conducted in the Initiation & Needs step and determines the areas of sustainability that are most relevant to the project. This is the starting point for developing a project's Sustainability Needs. It also supports the integration of SA Water's Corporate Strategy and Reconciliation Action Plan into capital delivery by considering the specific scope, scale, and context of each project.

The SMA is applied throughout the project lifecycle, with the top five material sustainability categories being compulsory for all projects, supporting sustainability integration at the appropriate points in the process and enabling outcomes to be delivered prudently and efficiently. The application of the SMA is outlined in Table 2.

A sense check should occur on the top five material sustainability categories to confirm their applicability to a project. There is the opportunity to add additional material categories and/or adjust the identified top five material sustainability categories in consultation with the SA Water SubD Team. This will be captured in the SubD SMA Tool.

Where a project has progressed without an SMA, it must be initiated by the step executor. For example, if it is realised in the Concept Design step there is no SMA, the Concept Designer is responsible to contact the SA Water Project Manager to request a copy, or where a project SMA does not yet exist the SA Water Project Manager must engage the SA Water SubD Team for the completion of a step appropriate SMA.

5.2.1 Purpose

The Materiality Assessment helps project teams:

- Deliver SA Water's strategic objectives by aligning sustainability requirements with project execution.
- Identify the most applicable material sustainability categories (minimum of top five) based on project or program characteristics.
- Inform project requirements and scope by identifying key Sustainability Needs.
- Focus resources and effort on the most material opportunities to maximise high value sustainability outcomes.
- Avoid unnecessary assessments of low-material categories and improve efficiency.

5.2.2 How to use

The Materiality Assessment includes a structured set of questions across key material sustainability categories, including:

- **Climate and environment:** Climate risk and resilience; Emissions; Energy; Ecological assets (Nature Positive); Circular economy; Water footprint; Water sensitive urban design.
- **Social and community:** Stakeholder and community engagement; Cultural knowledge and Aboriginal partnerships; Diversity, equity and inclusion; Workforce sustainability.
- **Economic sustainability:** Sustainable procurement; Business continuity and legacy.

The following categories, shown beside their pillars, are either compliance-oriented categories that are consistently material across all projects, or applicable at corporate level rather than a single project or program. These are supported by other processes (see Appendix D E, F & G) and have not been included in the Materiality Assessment:

- **Climate and environment:** Environment and heritage.
- **Social and community:** Health and safety.
- **Economic sustainability:** Project options assessment.
- **Governance:** Sustainability planning; Sustainability strategy; Sustainability innovation; Board composition and structure; Business ethics and integrity; Risk management and controls; Cybersecurity and data privacy; Regulatory compliance.

SA Water's SubD team are responsible for facilitating the Materiality Assessments, working collaboratively with project teams to answer each question using available project information and professional judgement, with input from relevant specialists where required. Material sustainability categories will be mapped against the corresponding SA Water strategic objectives.

The assessment tool will automatically allocate each category with a grade or score to determine its level of materiality. The outcome will inform subsequent sustainability actions, design considerations, and reporting requirements throughout the project steps. At a minimum, the top five material sustainability categories must be addressed within the design.

Alternative materiality ratings for the top five categories or the inclusion of additional categories may be proposed, provided they are supported by clear justification. These will be subject to review and consideration by the SA Water SubD Team.

5.2.3 Sustainability Materiality Assessment pre-requisites

The following activities and documents are pre-requisites for the SMA:

- Environment and Heritage (E&H) Assessment (via EnviroCheck).
Initiated by the Asset Planner/Sponsor and managed by the E&H Expertise Team.
- Stakeholder Check.
Initiated by the Project Lead/PM and managed by the Stakeholder Engagement Team.
- Climate Vulnerability Check.
Completed by SA Water SubD team prior to Materiality Assessment.

Where a check is not available, approval must be granted by the SA Water Lead SubD before proceeding. This must also be documented in the Materiality Assessment output, noting the check was not available.

5.2.4 When to apply

The SMA is undertaken or used at five steps, these can be seen on the process overview in and Table 2:

Table 2: Sustainability Materiality Assessment timing

Materiality Assessment	Timing	Description
SubD ID <i>Identification SMA</i>	• Initiation & Needs step, pre-Needs workshop.	• A high-level review to identify strategic objectives that could be supported by the project. This encourages early consideration of sustainability opportunities.
SubD 0 <i>Options SMA</i>	• SubD 0A: Prefeasibility Study step, once the options are identified and being assessed. • SubD 0B: Technical Investigations step.	• During project and technical optioneering the SMAs are to be used to support identification of the option's sustainability differences and opportunities, as well as feed into the options reports and multi-criteria assessment (MCA) criteria. This assessment considers the different project-specific characteristics and informs sustainability requirements for MCA.
SubD 1 <i>Design SMA</i>	• Planning & Scoping Closeout step, on preferred design (Milestone 1) and before option is approved for definition (Milestone 2).	• Once a preferred option has been selected, a detailed Materiality Assessment is completed using the SMA tool. This assessment considers project-specific characteristics and informs sustainability requirements for concept and detailed design.

Materiality Assessment	Timing	Description
SubD 2 <i>Pre-construction SMA</i>	Following 60% design (as per TS 0104), prior to Issued for Construction (IFC) step, before major construction works commence (Milestone 5).	On the completed 60% design, prior to IFC and construction commencement, a review confirms material categories and identifies any additional sustainability requirements based on design changes or updated project information. Change impacts, risks and opportunities, will be managed via change management processes.
SubD 3 <i>Post-construction /verification and validation SMA</i>	Construction & Commissioning step, post-construction and prior to Practical Completion (Milestone 7).	Post-construction, a review validates material categories and sustainability requirements based on construction. Change impacts, risks and opportunities, will be managed via organisation change management processes.

5.2.5 Outputs

The Materiality Assessment will provide:

- A list of ranking material sustainability categories for the project.
- Identification of the top five material sustainability categories that must be addressed by the project.
- Summary table showing the link between material categories and SA Water's strategic objectives.
- Clear guidance on which sections of this Technical Standard are applicable to the project, and relevant supporting tools (for example, recycled product register, carbon calculator, WSUD guidelines) for design and implementation.

5.2.6 Review and approval

- Materiality Assessment outputs must be reviewed by the SA Water Project Manager or Design Manager (as appropriate to the step), the SA Water Asset Sponsor and the SA Water SubD Team representative prior to finalisation and sign off.
- The assessment outcomes may be revisited if significant project changes occur.
- Alternative materiality ratings for the top five categories may be proposed or the inclusion of additional categories, provided they are supported by clear justification. These will be subject to review and consideration by the SA Water SubD Team.

5.3 Sustainability by Design process minimum requirements

SubD process minimum requirements provide a guidance for projects to support SA Water and state government sustainability goals. Based on the materiality categories, the project tier and project steps, these requirements are summarised in Table 3 and lists the categories that may be identified in the SMA, and the minimum requirements that apply for the identified category.

When a category is identified within the top five material sustainability categories in a SMA, or where the project team elects to progress with additional categories, the corresponding minimum requirement(s) must be applied. The approach must follow the 'Identify – Assess – Record Determination – Implement – Learn/Teach' process.

Following identification and assessment of the sustainability opportunities of a project relating to the material categories, the PM has the opportunity to evaluate the feasibility and impact of each approach to address the sustainability category minimum requirement, and make a determination whether it will be implemented. Where the determination is made not to implement a requirement the determination must be clearly documented in the SubD Report with supporting evidence and justification included in the attachments.

Table 3: Minimum Requirements for Material Sustainability Categories

Pillar	Category	Minimum Requirement for Materiality Category
Climate and environment	Climate risk and resilience	<u>Initiation & Needs step</u> - A climate vulnerability check must be completed prior to the SMA. <u>Technical Investigations step</u> - A climate risk assessment must be completed, and risk mitigation measures must be identified and costed (Tier 1-3). - Climate risk assessment completed at a program level and adaptation measures are identified (Tier 4). <u>Concept Design step</u> - A climate risk assessment must be developed (Tier 1-3). - Mitigation and adaptation measures included in the design to eliminate all high and extreme risks (Tier 1-3). - Adaptive pathways considered to evaluate timing of interventions (Tier 1-3). - Climate risk assessment completed at a program level and adaptation measures are identified (Tier 4). <u>Detail Design step</u> - Further progression of design for mitigation and adaptations measures.
	Emissions	<u>Technical Investigations step</u> - High-level estimate of whole-of-life carbon emissions must be developed (Tier 1-2). - Best practice carbon reduction measures must be identified and evaluated (Tier 3-4). - Comply with SA Water requirements for Scope 1, 2 and 3 emissions recording and calculation. <u>Concept Design step</u> - High-level whole-of-life carbon footprint model must be developed (Tier 1-2). - Best practice carbon reduction measures must be identified and evaluated (Tier 3-4). - A Carbon Management Plan must be developed (Tier 1-3, at program level for Tier 4). - Monetise emissions using the National Carbon Values. - Comply with SA Water requirements for Scope 1, 2 and 3 emissions recording and calculation. <u>Detail Design step</u> - Further progression of design for mitigation and adaptations measures. <u>Construction and commissioning</u> - Mitigation, reduction, and adaptation measures to be included in construction and commissioning methodology and management plans.

Pillar	Category	Minimum Requirement for Materiality Category
	Energy	<u>Each project step</u> Identify and assess opportunities of net energy reduction, including renewable energy source.
	Ecological assets (Nature Positive)	<u>Concept Design step</u> - A detailed assessment of the site must be undertaken to identify biodiversity opportunities (Tier 1-3). - Projects within Metropolitan Adelaide or rural townships must undertake a Green Infrastructure Assessment and identify opportunities for greening (Tier 1-3). - A Green Infrastructure Assessment must be completed at a program level and opportunities for greening identified (Tier 4). <u>Detail Design step</u> - Further progression of design for mitigation and adaptations measures. <u>Construction and commissioning</u> Mitigation, reduction and adaptation measures to be included in construction and commissioning methodology and management plans.
	Circular economy	<u>Each project step</u> Identify and assess opportunities to incorporate circularity principles throughout the entire lifecycle of key construction materials, such as aggregates, concrete, and steel, including the use of recycled or circular alternatives, as well as strategies to maximise reuse, repurposing, or diversion from landfill at end of life.
	Water footprint	<u>Each project step</u> Identify and assess opportunities to reduce the water footprint of the infrastructure project by targeting construction processes, commissioning activities, operations and maintenance or material choices. Implement at least two water-saving measures and achieve a 15% reduction in total water waste.
	Water sensitive urban design	<u>Each project step</u> Identify opportunities to capture and retain the first 10–15mm of stormwater on-site to reduce runoff and improve water quality. Integrate strategies that enhance site greening and cooling while minimising potable water use.
Social and community	Stakeholder and community engagement	<u>Each project step</u> Identify and assess opportunities to meaningfully engage local stakeholders and communities and integrate relevant community knowledge and values into appropriate steps of the project.
	Cultural knowledge and Aboriginal partnerships	<u>Each project step</u> Identify and assess opportunities to meaningfully engage Aboriginal communities and integrate their cultural knowledge into project design, delivery, and ongoing site management knowledge.
	Diversity, equity and inclusion	<u>Each project step</u> Identify and assess opportunities to meaningfully engage diverse communities and integrate inclusive practices and perspectives into project design and delivery.
	Workforce sustainability	<u>Each project step</u> Identify and assess opportunities to support workforce sustainability by promoting employee well-being, skill development, and retention strategies throughout project design and delivery.

Pillar	Category	Minimum Requirement for Materiality Category
Economic sustainability	Sustainable procurement	<u>Contract Award & Procurement and IFC Design steps</u> - Tender sustainability submissions must be evaluated for sustainability and supported by SubD Lead or other SME as required. - Identify sustainability opportunities and requirements within procurement and engage suppliers to propose relevant sustainability actions or contributions as part of their submissions. Assess proposed initiatives for feasibility and alignment. Record determination in the SubD Report. Where implemented, monitor performance to ensure delivery of commitments.
	Business continuity and legacy	Identify and assess opportunities to contribute positively to society or business continuity in one priority issue or opportunity.

5.4 Sustainability initiatives identification

The sustainability initiatives identification process is initiated by the Design Manager and or SubD Lead. All projects shall undertake this process, based on the results of the SMA and project tier (see Appendix C for category tier requirements). Initiatives may be identified through a multi-disciplinary workshop or a desktop study, either as a standalone activity or as part of a Value Management (VM).

Sustainability initiatives can emerge at any step of the project lifecycle and should be captured appropriately, even outside of formal activities. Where projects undertake sustainability workshops, participants must include representatives from multiple disciplines to ensure holistic input. At a minimum, the Design or Project Manager, the SubD Lead and key discipline leads must attend. Additional participants may be included as deemed appropriate.

To inform the process, the SubD Lead shall review (but not limited to):

- Results of the latest SMA.
- The project's Sustainability Needs.
- Outputs from the E&H Assessment, Stakeholder Engagement Plan, Climate Vulnerability Check or other assessments.
- The SubD Plan and most recent SubD Report.
- Climate risk assessments, water sensitive design or green infrastructure assessment (for large projects), circular economy reviews, and available greenhouse gas (GHG) emissions information.
- Stakeholder identification.
- Project, program or general lessons learned or initiatives register for relevant sustainability initiatives.

Where it is a standalone activity, the SubD Lead will compile a Project Sustainability Initiatives Register that captures risks, opportunities and identified initiatives. This register is reviewed during workshops or desktop studies and finalised by the SubD Lead. Priority risks and opportunities shall be integrated into the Project Risk Register. Identified risk control and mitigation measures and opportunities shall be included in options assessments (where applicable) and design for further investigation.

Table 4: Sustainability Initiative Identification

Stage	Sustainability Workshop tasks	Desktop study tasks
Prefeasibility Study and Technical Investigations	- Identify initiatives, risks and opportunities at the through standalone SubD workshop or integrated into VM. The SubD Lead and relevant SME(s) to attend. - Address climate and sustainability risks in risk workshop(s). - Identify sustainability options in options identification activities.	Develop sustainability risks and opportunities for all material sustainability categories in conjunction with the SA Water SubD Team, capturing in the initiative register.
Concept Design and Detail Design	- Identify initiatives, risks and opportunities at the through standalone SubD workshop or integrated into VM. The SubD Lead and relevant SME(s) to attend. - Address climate change risks and adaptation measures where climate vulnerability check indicates, in standalone climate change workshops	- Where workshops are not undertaken, undertake desktop assessments led by designer with input from the SubD Lead and relevant SME(s). - Address climate change risks and adaptation measures where climate vulnerability check indicates.
Construction and Commissioning	Identify initiatives, risks and opportunities at the through standalone SubD workshop or integrated into VM. The SubD Lead and relevant SME(s) to attend.	Where workshops are not undertaken, undertake desktop assessments led by design/construction contractors, with input from the SubD Lead and/or relevant SME(s).

5.5 Sustainability by Design Management Plan

A SubD Management Plan must be prepared for each project by the SubD Lead in collaboration with key project personnel (for example, Asset Planner, Project Manager) using the SubD Management Plan Template. The plan outlines the specific SubD actions and activities to be undertaken across all relevant steps of the project.

The SubD Plan is a live document that is reviewed and updated throughout the project lifecycle to remain aligned with project and the requirements in this technical standard. It may be prepared as a stand-alone document or integrated into the sustainability section of the corresponding step plans.

The SubD Management Plan shall detail:

- The methods used to assess sustainability risks and opportunities, identify potential actions, determine the associated cost (increase or decrease) of these actions, and/or the requirements to meet the project's Sustainability Needs.
 - Refer to Table 3 regarding the minimum assessment requirements, based on the project tier and Sustainability Materiality Assessment results.
- Any additional requirements arising from an Environment Improvement Program (EIP), such as Emissions Management Plans or Climate Adaptation Plans, where applicable.

5.5.1 Sustainability by Design Management Plan in Construction and Commissioning steps

Following Milestone 5 (Major Order Placed) (see Figure 6), the SubD Lead will review and update the SubD Management Plan to align it with sustainability milestones and requirements within the design and/or construction contracts. Any changes in the project scope, Project Needs, Sustainability Needs or project timing must be incorporated.

The updated SubD Management Plan must include:

- A sustainability matrix mapping detailed design and construction deliverables/reports to the relevant material sustainability categories (as identified in SubD 1), and the disciplines or deliverables that can influence them.
- The roles, responsibilities and activities to be undertaken by the design and/or construction contractor and SA Water, with confirmation of responsible persons and appropriate timelines.
- Data management and reporting requirements, aligned to the project sustainability requirements, including details of information required by other SA Water teams/divisions (for example, SAWD-ENV-0199 SA Water Contractor Greenhouse Gas and Energy Reporting), noting clearly timing, frequency and responsibilities. with timing and responsibilities clearly noted.

As part of practical completions SubD3 (verification and validation) is to be completed by the step SubD Lead and included as part of practical completions.

The SubD Management Plan must be reviewed and updated regularly, at least every six months. Where designers or construction contractor have their own overarching Sustainability Management Plans, these shall be aligned with the project-specific SubD Management Plan.

5.6 Sustainability by Design Report

The SubD Report is prepared at each project step to document sustainability outcomes and track progress. It supports Design and Project Managers by capturing relevant sustainability considerations using the SubD Report template.

The SubD report may be standalone or integrated into the sustainability section of the step report. The step SubD Lead coordinates its preparation with input from SMEs, and reviews it to ensure alignment with the Technical Standard and SubD Plan.

The SubD Report must summarise sustainability assessments across the project lifecycle, including the progression of the top five sustainability material categories, their initiatives, and risk mitigations. Each must be indicated as 'implemented' or 'not implemented'. Implemented items are included in project scope and cost estimates; non-implemented items require the determination to be documented with supporting documentation in both the SubD Report and the project decision register.

Section 7 outlines the SubD activities at each lifecycle steps, including information requirements for the SubD Report. Table 5 provides a summary of reporting requirements across project steps.

Table 5: Sustainability by Design Report requirements for project stages

Project stage	SubD report requirements
Prefeasibility <i>(Project Options)</i>	The report shall include as a minimum: • The Sustainability Needs of the project. • The material sustainability categories for the project (minimum agreed top five). • A summary of each option's ability to meet the project's Sustainability Needs and material categories. • A matrix mapping the Sustainability Needs against the options being considered. • A summary of the evaluation of each priority sustainability risk and opportunity for each option, including related dispensation applications. • Analysis of the benefits and costs associated with priority sustainability risk mitigations or opportunities that apply to multiple options. • The initial sustainability risks and opportunities register (as an appendix if applicable). • Other available relevant information or data such as waste, emissions, lifecycle assessment, environmental product disclosures. For projects with new assets the following must also be captured in the prefeasibility section of the SubD report. • Non-build solutions: such as policy, technology or behaviour change that would deliver similar outcomes without requiring the construction of new infrastructure. For example, educating users on water efficiency rather than increasing the size of a water supply line. • Upgrade or repurpose for example, upgrading a section of an existing wastewater treatment plant. • Using assets for multiple purposes: for example, establishing toilet blocks at SA Water facilities that can be used by the local community. Where non-build solutions do not proceed for further design assessment, justification must be provided and documented.
Technical Investigations <i>(Technical Options)</i>	The SubD Report in technical investigations must address the same requirements as the previous step, with content updated to reflect the current step. Information from earlier steps must be retained and built upon, not replaced, to ensure a continuous and cumulative sustainability narrative throughout the project lifecycle.
Concept Design	The report shall be developed by the appointed designer, build on previous SubD reports (where available) and include as a minimum: • The Sustainability Needs of the project. • The material sustainability categories as per SubD 1 (minimum agreed top five). • The results of sustainability assessments (for example, materiality, carbon, materials, and climate risk) undertaken during the concept design. • The results of the SubD workshop and/or VM workshop (sustainability component). • A summary of the analysis of sustainability opportunities and risk mitigations, including related dispensation applications. • The revised sustainability risks and opportunities (as an appendix if applicable). • Recommended sustainability requirements. • The rating pathway, targeted credits and any mandatory levels to be achieved (for projects where third-party certification is required).

Project stage	SubD report requirements
Detailed Design	The Detailed Design SubD report will be developed by the appointed designer and submitted with the corresponding design reports (for example, 60%, 90%, IFC). Reviewing and expanding the Concept Design SubD Report (reviewed and updated) is acceptable and shall include the SubD Report requirements from the previous step and: - Record of determination of sustainability opportunities and risk mitigations, including related dispensation applications. - Sustainability key performance indicators relevant for project construction step (emissions (construction and operations), waste types and impacts, Environmental Product Declarations (EPDs)) where applicable. Where applicable, the SA Water OE shall review the contractor's SubD Report at each agreed design step: - To verify that the sustainability section of design and/or construction reports have been met as per the sustainability matrix of the SubD Management Plan. - To verify that the Sustainability Needs and sustainability requirements stipulated in the contract have been met.
Construction	The SubD Report is based on SubD 2 – SMA and must cover the SubD Report requirements from the previous step and: - Continued reporting of emissions and materials as per SAWD-ENV-0199, SA Water Contractor Greenhouse Gas and Energy Reporting. - Verification that the sustainability section of design and/or construction reports have been met as per the sustainability matrix of the SubD Management Plan. Verification that the Sustainability Needs and sustainability requirements stipulated in the contract have been met.

5.7 Information transfer

Information relating to sustainability is to be recorded and transferred through the project documentation and artefacts to subsequent steps of the lifecycle.

Communicating this information ensures contractors and other parties are aware of sustainability progress and minimise the likelihood of sustainability features incorporated into a design being altered or removed by those engaged in subsequent work. Documents and artefacts include but are not limited to the following:

- Risks and opportunities assessments.
- Registers (Needs, VM, options, Safety in Design (SiD)).
- Project reports (options, design, SubD).
- Sustainability Materiality Assessment (SMA).
- Sustainability initiatives supporting documents.
- SubD Management Plan.

Refer to Section 8 for details of information transfer requirements between SA Water and contractors or designers.

Transfer of information between parties is one of the duties of the PM and DM.

SA Water Project managers (or equivalent) are responsible for the transfer of the relevant phase information into SA Water Project Management Filing system (Capital Project Locker).

All SubD document shall be labelled.

5.8 Third-party sustainability certification

Currently, third-party sustainability certification, such as IS ratings for infrastructure, and Green Star ratings for buildings, is not generally pursued by SA Water, however, it is recommended to assess whether such certification would add value to the project.

Therefore, the Asset Sponsor, SA Water Lead SubD, SA Water Manager Sustainability, SA Water PM (or equivalent) and contractors consider the following when deciding whether certification is required:

- a. What is the size and complexity of the project?
 - Tier 1 projects, being the largest and most complex, are most likely to suit third-party certification.
 - Tier 2 projects may benefit from certification if they have a high public or industry profile.
 - Tier 3 projects, on their own, would not warrant certification. A programme of Tier 3 (or Tier 4) projects, however, might.
- b. Does the project team require sustainability guidance beyond that provided by SA Water?
 - If so, a third-party certification may be of assistance.
- c. Does certification represent value for money?
 - Do the reputational gains make a compelling case for the added investment?
 - Will the benefits that derived from the initiatives and efficiencies outweigh the associated costs?
 - Certification is more likely to deliver tangible benefits and be financially viable for Tier 1 and Tier 2 projects, which typically have the scale and resources to absorb any associated costs. In contrast, Tier 3 projects are less likely to realise meaningful value from certification and may not justify the investment.
- d. Is project funding or other external determinations reliant on achieving third-party certification?

The decision for 3rd party certification and/or verification should occur as early as practicable in the project to ensure early alignment of project approach and information capture. Recommendation for third-party certification must occur prior to option endorsement and be outlined in the project approach for endorsement. Determination of requirements for any additional costing, resources and notification for potential and or contractual partners will be required to ensure a smooth and efficient approach to third-party accreditation.

When third-party certification is pursued, ensure that the credits pursued in the rating and the SA Water Sustainability Needs and requirements for the project are aligned and captured in contracts

Note that depending on the phase of certification, project registration for third-party certification may be required occurs at as early as Investigate stage with notification to the accreditation agency occurring as soon as practicable once the decision has been made.

6 Integration of Sustainability

The following section outlines how the SubD process integrates into relevant key elements of project development and CPMM 3.0 with the intent of prudently incorporating sustainability into projects in a clear and systematic format. This section is particularly relevant to project/design managers and owners of other processes under CPMM 3.0, but also useful for sustainability SMEs and others involved in the execution of projects and SubD activities.

6.1 Project needs

Project Needs must incorporate the material sustainability categories and strategic opportunities identified through the SMA. These must be recorded for opportunity identification, investigation, implementation or determination.

When Project Needs are developed through a Needs Workshop, the SubD Lead and other relevant stakeholders (for example, Environment and Heritage Expertise, Stakeholder and Engagement, Climate Resilience) must be included. The results of the Sustainability Materiality Assessment Identification (SubD ID) will be discussed, and Sustainability Needs statement(s) will be documented. Sustainability-related Project Needs must be captured in the Needs Register, while related stakeholder engagement requirements must be finalised during the workshop and included in the Interface Register.

Where Project Needs are developed through a desktop process, the material sustainability categories must be included for opportunity identification, investigation, implementation or determination.

The SubD Lead is responsible for reviewing all Sustainability Needs statement(s) to ensure alignment with SA Water's corporate environment strategy goals and to confirm that they adequately define the project's sustainability vision.

Table 6: SubD requirements in the Project Needs process

Needs process	SubD requirement
Needs workshop(s)	- The SubD Lead (and other key stakeholders) included in the workshop. - Sustainability Needs statement(s) developed and included in Needs Register from the SMA findings, minimum top five. - Sustainability-related stakeholder engagement requirements finalised and included in the Interface Register.
Desktop needs study	Sustainability Needs statement(s) selected from list of Sustainability Needs/minimum requirements, minimum top five.

6.2 Value Management

A focus area of the VM process is sustainability, promoting a prudent and efficient design through acting with care and thought for the future while achieving maximum productivity with minimum waste, effort, or expense. A SubD representative must be involved in any VM workshop or desktop VM session. The SubD Lead may engage other SMEs as appropriate for the workshop.

The VM facilitator will employ prompts that will support identification of sustainability initiatives that add value to a project. The SubD Lead can support the DM or facilitator with evaluating initiatives to ensure appropriate categorisation and that they are not prematurely dismissed.

6.3 Risk and opportunity assessment

The SubD Lead, and other stakeholders where relevant (for example, E&H Expertise, Stakeholder and Engagement, Climate Resilience), are to be included in a project's risk and opportunity assessment process to provide insights to guide the identification of material sustainability risks and opportunities. At a minimum, these include:

- Climate change risks.
- E&H risks.
- Stakeholder risks.
- Non-alignment or opportunities to align with SA Water corporate sustainability commitments and strategy.

6.4 Options design assessments

Where projects undergo options analysis (including Project Options and Technical Options assessments), the project shall include the assessment of an option's ability to meet the defined Sustainability Needs of the project (as identified during Project Needs, see Section 6.1). The sustainability options assessments will address any mandatory Sustainability Needs, discuss the impact on the material sustainability categories and the sustainability MCA criteria for the project.

The results of the assessments will be documented in a sustainability section of their respective options reports. The SubD Lead will review the Options Assessment or options reports to verify that an option can meet the Sustainability Needs of the project, and that priority sustainability risks and opportunities have been appropriately assessed or justification given.

These assessments and information captured in the reports, will inform the Options Endorsement (Reports A and B) and other such reports and support project approvals, including Public Works Committee review, by demonstrating the project's commitment to sustainability.

The SubD requirements for Project Options and Technical Options design assessments are summarised in Table 7.

Table 7: Options Design Requirements

Stage	SubD requirements
Prefeasibility Study (Project Options)	1. Conduct sustainability assessment on options, including identification of sustainability risks and opportunities for all material sustainability categories. 2. Document findings in sustainability section in Options Design reports and inclusion of sustainability information in the Options Endorsement Report A – prefeasibility Project Options. 3. The SubD Lead reviews the Project Options reports to verify options can meet the project's Sustainability Needs and that material sustainability risks/opportunities are appropriately identified.
Technical Investigations (Technical Options)	1. Conduct sustainability assessment on options, including evaluation of material sustainability risks and opportunities (assign 'implement' or 'not implemented'). Where initiatives are determined 'not implemented', justification must be provided. 2. Document in sustainability section in Technical Options design reports and Options Endorsement Report B – Technical Investigations as well as any Scoping Report. 3. The SubD Lead reviews the Technical Options design reports to verify options can meet the project's Sustainability Needs and that priority sustainability risks/opportunities have been appropriately addressed.

6.5 Options endorsement

The Options Endorsement – Part A and Options Endorsement – Part B reports shall document as a minimum:

- Project approach and decision around Non-build options, Upgrade or repurpose, using assets for multiple purposes.
- SMA approach.
- Sustainability MCA criteria used in the options assessment.
- Material sustainability categories and how these link to each option considered.
- Sustainability advantages and disadvantages of each option.
- Significant sustainability related risks and opportunities associated with each option.
- How sustainability innovation and efficiency has been applied to the preferred option.

The SubD Lead must review the Options Endorsement Report – Part A and Options Endorsement Report - Part B and Project Options report to verify that it accurately reflects the Materiality Assessment results and that the significant sustainability advantages, disadvantages, risks and opportunities of each option are appropriately documented. This information will be used to support project approvals, including Public Works Committee review, by demonstrating the project's commitment to sustainability.

6.6 Cost estimation

Sustainability risk mitigations or opportunities that are required to meet Project or Sustainability Needs must be included in the project's scope of work and therefore cost estimations.

Initiatives that could offer significant contributions to the project's material sustainability categories and assigned 'implement' in options analysis must be included in the project options' cost estimations.

Where a project is recommended for third-party certification and/or verification, the costs associated with the compilation of the submission by the contractor and the verification must be included in the cost estimation, in consultation with the SA Water SubD Team.

Projects should consider monetary metrics to value sustainability, where appropriate. Some examples include shadow carbon prices and biodiversity offsets.

6.7 Multi-criteria Assessment

At the commencement of the Prefeasibility Study step or other times when a MCA is carried out, the SubD Lead and project Lead/DM shall develop criteria that reflect the Sustainability Needs of the project and material sustainability categories and agree the weighting of the criteria and sub-criteria.

All project options must consider sustainability as part of the MCA using the criteria agreed to by the SubD Lead and PM. The SubD Lead must be invited to participate in the MCA workshop and shall review the MCA report to verify that it accurately captures the workshop discussions and reasons for the sustainability scores for each option.

6.8 Systems Engineering including Functional Specification (FUSP)

The SubD Lead will review the project requirements and tracing of requirements to Project Needs to verify that the requirements:

- a. Reflect the SubD 1 SMA completed for the approved/endorsed “go forward case”.
- b. Meet the Sustainability Needs of the project.
- c. Include sustainability minimum requirements, based on the results of the Materiality Assessment categories.
- d. Include any third-party certification requirements.

The SubD Lead will verify that within the Functional Specification (FUSP) verification plan, the sustainability requirements are appropriate. The SubD Lead shall also review the FUSP for the project to verify that it reflects the agreed requirements and verification plan.

6.9 Safety in Design and SiD workshops

The SiD workshops contain sustainability prompts and support identification of sustainability opportunities that can also impact safety of the community, environment and our workers. The SiD process and workshop methodology is outlined in TS 0101 Safety in Design.

6.10 Design reports

There are various design reports created throughout a project's lifecycle. These reports shall include sections on sustainability that will document results of sustainability assessments, support records of decision making and support the sustainability narrative of the project.

Where a designer and/or constructor is engaged, they must deliver a SubD report or include SubD report requirements within the design and/or construction reports and plans.

6.11 Capturing lessons learned and continuous improvement

Capturing of sustainability lessons learned will be through the Project's Lessons Learned process, in accordance with SAWG-PM-0111 Lessons Learned Management Plan. Feedback on this Technical Standard or supporting sustainability/SubD documents should be passed through to the SA Water SubD Team.

Lessons Learned is to reflect both positive feedback and opportunities for improvement of the project. Teams will follow the CPMM 3.0 Lessons Learned process and capture lessons for sustainability for update or inclusion in the Technical Standard or preprocess.

7 Sustainability by Design Process

The following section overlays the SubD activities and details how sustainability and the SubD activities and requirements are integrated across the project lifecycle under CPMM 3.0 – from Identify to Operate & Maintain stage. It consolidates the requirements from above Sections 5 and 6, and outlines process steps, timelines and the individuals responsible for each requirement. For SubD-specific process and responsibilities, refer to the Sustainability by Design Process Flowchart in Appendix A.

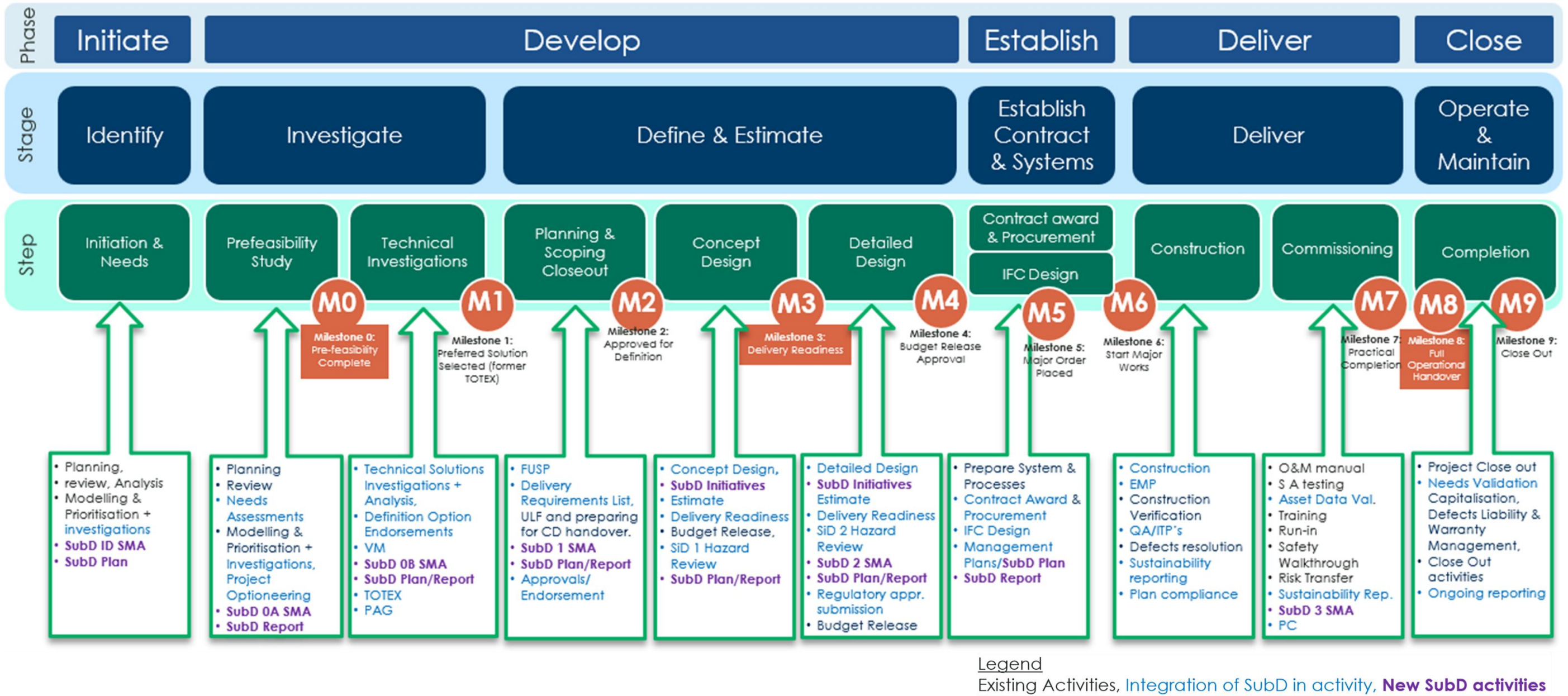


Figure 6: Overview of the CPMM 3.0 and key SubD inputs and activities

7.1 Initiation and Needs

It is important to incorporate sustainability considerations during the Initiation and Needs stage of project development, as this is when Project Needs are defined and what the success of a project will be assessed against. The following activities and actions must occur in the Initiation and Needs stage to support Sustainability by Design.

Table 8: Initiation and Needs Activities

Activity No.	SubD activity	Description	Timing	Role(s) Responsible
7.1.A	Initiate the Request for Engineering Engagement (RFEE)	- SA Water Engineering and SubD Team are engaged through the initiation of an RFEE. - The RFEE owner shall liaise with SA Water SubD Team to identify deliverables for sustainability and coordinate with Project Lead /DMs to allocate times and activities to the SAF. - Project leads and DM are responsible to ensure any SubD requirements are included in SAF schedules and documents.	At project commencement	As per CPMM 3.0
7.1.B	Identify the SubD Lead	The SA Water Lead SubD will allocate a SubD Lead from within the team during the SAF process. Refer to Section 5.1 for information on SubD Lead.	At project commencement	SA Water Lead SubD
7.1.C	Pre-Materiality Assessment Activities	Other supporting activities and information that the SubD process requires include: - E&H Assessment (via EnviroCheck). - Stakeholder Check. - Climate Vulnerability Check. Following the completion of the above process: - Preliminary information will be available for the project. - Where applicable, the results of the above activities will be incorporated into any project risk assessments. - Feeds into the SMA.	Prior to SubD ID	As per CPMM 3.0
7.1.D	Sustainability Materiality Assessment Identification (SubD ID)	The SMA (SubD ID) identifies top five material sustainability categories that are most relevant to SA Water strategies and where effort will have greatest impact. Refer to Section 5.2 for more information.	Prior to Needs workshop	SubD Lead

Activity No.	SubD activity	Description	Timing	Role(s) Responsible
7.1.E	Needs statement development and workshop	The top five material sustainability categories from SubD ID must be captured in the Needs of a project. Refer to Section 6.1 for further information. Where possible the pre-Needs Workshop form should be populated with the above information in preparation for the Needs Workshop (or review). The SubD Lead will attend the Needs workshop.	Following SubD ID	As per CPMM 3.0 with input from SubD Lead
7.1.F	Preliminary SubD Management Plan	Refer to Section 5.5 for further information.	Following completion of project Sustainability Needs	SubD Lead
7.1.G	Other activities	Other activities where sustainability opportunities and risks should be considered include: • Preliminary investigations or condition assessments. • Benefit Assessment • Options and opportunity identification. • Risk assessments. • Lessons learned.	Various throughout the Initiation & Needs step	As per CPMM 3.0 To engage support from the SubD Lead where applicable Responsible parties to consider sustainability in activities

7.2 Prefeasibility Study

During the Prefeasibility Study step, a prefeasibility Project Options study process is undertaken which considers project risks, cost estimations and project options identification and analysis. The format for the options study varies between tiers, with the highest complexity study conducted for Tier 1 projects. Project options set the foundations for the sustainability opportunities and impacts of a project.

The project tier directs the sustainability activities relating project management methodology. Refer to *SAWG-PM-0086 Project Tiering Framework* for more information.

The following activities and actions shall occur in the Prefeasibility Study step to support sustainability effectively considered among available options, risks are mitigated and opportunities advanced.

Where Tier 3 projects differ to Tier 1 and 2 project activities, this will be outlined in the SubD Management Plan and report and reflected in the SAF.

Table 9: Prefeasibility Study Activities

Activity No.	SubD activity	Description	Timing	Role(s) Responsible
7.2.A	Initiate the Prefeasibility RFEE	- SA Water Engineering and SubD Team are engaged through the Prefeasibility RFEE. - The RFEE owner shall liaise with SA Water SubD Team to identify deliverables for sustainability and coordinate with PM/DMs to allocate times and activities to the SAF. - Where Tier 3 projects differ to Tier 1 and 2 project activities, this will be outlined in the SubD Management Plan and Report and reflected in the SAF. - PM/DMs are responsible to ensure any SubD requirements are included in step costing, schedules and documents.	At project commencement	As per CPMM 3.0
7.2.B	Identify the SubD Lead	The SA Water Lead SubD will allocate a SubD Lead from within the team during the SAF process. Refer to Section 5.1 for information on SubD Lead.	At Prefeasibility commencement (through SAF)	SA Water Lead SubD
7.2.C	SubD Management Plan (Prefeasibility review)	- Review the SubD Management Plan developed in the earlier step. Where not already developed, one is to be prepared. - Refer to Section 5.5 for further information.	At commencement of Prefeasibility Study	SubD Lead

Activity No.	SubD activity	Description	Timing	Role(s) Responsible
7.2.D	VM (Workshop or Desktop)	- Identify sustainability opportunities to add value to the project in the VM process. - Refer to Section 6.2 for further information.	During VM assessment, in line with CPMM 3.0	As per CPMM 3.0 SubD Lead must be invited to the workshop
7.2.E	Options development	In accordance with the carbon reduction hierarchy (see Figure 8), the options development process must consider non- and low-build solutions: Non-build solutions: such as policy, technology or behaviour change that would deliver similar outcomes without requiring the construction of new infrastructure. For example, educating users on water efficiency rather than increasing the size of a water supply line. Upgrade or repurpose: for example, upgrading a section of an existing wastewater treatment plant. Using assets for multiple purposes: for example, establishing toilet blocks at SA Water facilities that can be used by the local community. Where non-build solutions do not proceed for further design assessment, justification must be provided and documented in the project "Options Endorsement Report Part A".	At commencement of Prefeasibility Study	As per CPMM 3.0 SubD Lead support as required
7.2.F	Sustainability Materiality Assessment, prefeasibility (SubD 0A)	The SMA must be carried out for each of the options to identify any materiality differences. Where the options do not indicate material difference, a judgment can be made with SMEs and the SubD Lead to support determining the different sustainability considerations of the options. Refer to Section 5.2 for further information.	Prior to Project Options design report completion	SubD Lead
7.2.G	Project Options design reports	Capture the sustainability options, considerations and determinations for the project options in template "Options design report"	Prior to Options Design report finalisation	As per CPMM 3.0 with input from SubD Lead
7.2.H	Risk and opportunity assessment (workshop) (Tier 1-3)	- The SubD Lead is to be involved/invited to the risk and opportunity assessment. - Sustainability risks and opportunities are to be identified in the project assessment. - Refer to Section 0 for further information.	During project options risk assessment, in line with CPMM 3.0	As per CPMM 3.0 with input from SubD Lead
7.2.I	Cost estimation (Tier 1-3)	- It is important that sustainability opportunities are included in the scope and considered in the cost estimate. This will support prudent and efficient delivery. - Refer to Section 6.6 for further information.	During cost estimation, in line with CPMM 3.0	As per CPMM 3.0

Activity No.	SubD activity	Description	Timing	Role(s) Responsible
7.2.J	Operational expenditure (OPEX) and total expenditures (TOTEX) cost estimates and Net Present Value (NPV) Model development (Tier 1-3)	- The Project Lead submits options for both OPEX and TOTEX cost estimates and will receive both estimates for review. - The Project Lead is to ensure sustainability initiatives for whole-of-life are captured or differentiated in these costings appropriately for example, remaining life of asset captured for end of NPV calculations, or number of linings changeout aligned with project durability requirements.	Following MCA and options risk and opportunity assessment	As per CPMM 3.0
7.2.K	MCA (when applicable)	- Inclusion of sustainability in the assessment criteria for project/design options. - Refer to Section 6.7 for further information.	During MCA process, in line with CPMM 3.0	As per CPMM 3.0 with input from SubD Lead
7.2.L	Proposed/endorsed option report	- It is important to capture the sustainability consideration decisions and opportunities implemented to demonstrate prudent and efficient alignment to SA Water and South Australian government strategies. This will be used to support endorsement and approvals internally and externally (Tier 1 and 2). The SubD Lead can support the options endorsement report (Options Endorsement Part A) and must confirm the sustainability component. - Refer to Section 6.5 for further information.	Prior to submitting Options Endorsement Part A report to asset planner for endorsement	As per CPMM 3.0 with input from SubD Lead
7.2.M	SubD Report	- Where a SubD Report exists from previous steps, it will be reviewed and added to. Where a SubD report does not yet exist, one must be developed. - Refer to Section 5.6 for further information.	Prior to Submitting Options Endorsement Part A	SubD Lead
7.2.N	M0 Claimed	- M0 is claimed at the end of the Project Options Prefeasibility Study. Pathway 3 projects (and Tier 1 and Tier 2) identified by the Technical Risk Assessment progress to Technical Investigations step. - Pathway 1 and 2 projects progress directly to Planning & Scoping Closeout.	At completion of Prefeasibility Study step	As per CPMM 3.0

7.3 Technical Investigations

During the Technical Investigations step sustainability continues to be considered. Below outlines the key activities for SubD either specifically or integrated within the activity that shall occur.

Where projects coming from Prefeasibility have been categorised as Pathway 1 and 2 projects, these will progress directly to Planning & Scoping Closeout.

Through the Technical Investigations step, preferred technical option(s) are selected and escalated to senior leadership for TOTEX approval (Milestone 1). For capital projects, the FUSP or standards requirements list is then finalised before the project becomes approved for definition (Milestone 2).

Table 10: Technical Investigations Activities

Activity No.	SubD activity	Description	Timing	Role(s) Responsible
7.3.A	Initiate the Technical Options RFEE	- SA Water Engineering and SubD Team are engaged through the Prefeasibility RFEE. - The RFEE owner shall liaise with SA Water SubD Team to identify deliverables for sustainability and coordinate with PM/DMs to allocate times and activities to the SAF. - Where Tier 3 projects differ to Tier 1 and 2 project activities, this will be outlined in the SubD Management Plan and Report and reflected in the SAF. - PM/DMs are responsible to ensure any SubD requirements are included in SAF schedules and documents.	At Technical Investigations commencement	As per CPMM 3.0 supported by SA Water Lead SubD
7.3.B	SubD Management Plan (Technical Investigations review)	- Review the SubD Management Plan developed in the earlier step. Where not already developed, one is to be developed. - Refer to Section 5.5 for further information.	During SAF completion	SubD Lead
7.3.C	Sustainability initiatives identification	It is prudent and efficient to identify sustainability opportunities and initiatives within a project. Refer to Section 5.4 for further information.	Any point during project	SubD Lead
7.3.D	Update/review VM and Needs	- Update/review sustainability opportunities to add value to the project in the VM process. Refer to Section 6.2 for further information. - Update/review Needs. Refer to Section 6.1 for further information.	During VM assessment/review	As per CPMM 3.0 with input from SubD Lead

Activity No.	SubD activity	Description	Timing	Role(s) Responsible
7.3.E	Technical Options design reports	- Capture the sustainability options, considerations and determinations for the project options in template "Technical Options Design Report". - Refer to Section 6.4 for further information.	Prior to Technical Options design report finalisation	As per CPMM 3.0 with input from SubD Lead
7.3.F	Sustainability Materiality Assessment, Technical Options (SubD 0B)	The SMA must be carried out for each of the options to identify any materiality differences. Where the options do not indicate material difference a judgment can be made with SMEs and the SubD Lead to support determining the different sustainability considerations of the options. Refer to Section 5.2 for further information.	Prior to technical options design report completion	SubD Lead with input from Project Lead or DM
7.3.G	SubD Report	- Where a SubD Report exists from previous steps, it will be reviewed and added to. Where a SubD Report does not yet exist, one must be developed. - Refer to Section 5.6 for further information.	Prior to technical options design report finalisation	SubD Lead
7.3.H	Proposed/endorsed option report	- It is important to capture the sustainability consideration decisions and opportunities implemented to demonstrate prudent and efficient alignment to SA Water and South Australian government strategies. This will be used to support endorsement and approvals internally and externally (Tier 1 and 2). The SubD Lead can support the options endorsement report (Options Endorsement Part B) and must confirm the sustainability component. - Refer to Section 6.5 for further information.	Prior to submitting Options Endorsement Part B report to asset planner for endorsement	As per CPMM 3.0 Reviewed and supported by the SubD Lead
7.3.I	Risk and opportunity update	- Sustainability risks and opportunities must be identified in the project risk assessment. - Refer to Section 0 for further information.	During project options risk assessment, in line with CPMM 3.0	As per CPMM 3.0 with input from SubD Lead
7.3.J	Cost estimation (Capital expenditure (CAPEX), OPEX and NPV)	- Priority sustainability risk mitigations or opportunities will be included in project cost estimations. - Refer to Section 6.6 for further information.	During cost estimation, in line with CPMM 3.0	As per CPMM 3.0
7.3.K	MCA (where required)	- Inclusion of sustainability in determining the assessment criteria for project options. - Refer to Section 6.7 for further information.	During MCA process, in line with CPMM 3.0	As per CPMM 3.0 with input from SubD Lead

Activity No.	SubD activity	Description	Timing	Role(s) Responsible
7.3.L	Climate resilience	- Where Climate Change has been identified as a material category for a project in the Initiation & Needs step, a Climate Risk Assessment shall be undertaken in consultation with SA Water Climate Change SMEs. - The preliminary Climate Vulnerability Check will be carried out by the SA Water SubD Team. in consultation with the DM, relevant Design Leads and other stakeholders as required (Climate Resilience, Stakeholder Engagement). - Where the initial climate risk scan identifies the presence of climate risk, SMEs are to be consulted on the next steps. - Any climate risk and resilience assessments or requirements must be accounted for in the project options and budget estimates.	On selected option	SubD Lead
7.3.M	Carbon and materials assessment	- A preliminary estimate of whole-of-life GHG emissions for the selected option shall be developed in accordance with the greenhouse footprint evaluation in significant capital projects and procurement, or other appropriate frameworks, prior to the sustainability initiative workshop. - A preliminary estimate of the percentage of recycled and reused materials for the project or similar should be developed in consideration of circular economy approach. Information must be included in the SubD Report. - Any updated opportunities are to be included in cost estimates to reflect Initiatives included within the design.	On selected option	SubD Lead
7.3.N	Nature	- Projects within Metropolitan Adelaide or rural townships must determine application of WSUD principles. - Where project scope is broader it may be appropriate to apply the broader Blue Green Infrastructure principles in the assessment. - Information must be included in the SubD Report.	On selected option	SubD Lead
7.3.O	Program Advisory Group (PAG), Steer Co, or other endorsement as required	For projects that meet the requirement for PAG, Steering Committee or external endorsement additional reporting requirements that exist, sustainability information must be included. The sustainability information collated thus far will be used to support the submission. The SubD Lead supports the collation of information for these processes initiated by the PM or Project Lead.	Following confirmation, the options report meets all project objectives. Prior to PAG, Steer Co or external peer approval.	As per CPMM 3.0 with support from SubD Lead

7.4 Planning and Scoping Closeout (M1 through to M2)

The Planning & Scoping Closeout step is a crucial point in defining the sustainability requirements for the selected go-forward case. These requirements set the foundation for delivery in subsequent steps, such as Concept and Detailed Design, and ensure that opportunities are realised and impacts minimised through Construction, Operation and Maintenance. The following SubD and integrated activities apply to this step.

Table 11: Planning and Scoping Closeout Activities

Activity No.	SubD activity	Description	Timing	Role(s) Responsible
7.4.A	Identification of SubD Lead	The Project Lead/PM and Design team will identify the SubD Lead and be captured in the SubD Management Plan.	Prior to commencement of Concept Design	Project Lead/PM and Design Team
7.4.B	SubD Management Plan update	- Review the SubD Management Plan developed in the earlier step. Where not already developed, one is to be developed. - Refer to Section 5.5 for further information.	At commencement of Planning & Scoping Closeout step	SubD Lead
7.4.C	Design SMA (SubD 1)	- Following the selection of the project and technical options, SubD 1 SMA will be completed. The top five material sustainability categories will be identified, as well as additional initiatives for action in the Concept Design step (included in the FUSP). - Refer to Section 5.2 for further information.	Prior to FUSP development	SubD Lead
7.4.D	Project requirements development	- For Pathway 2 and 3 projects, the project requirements are extracted from project documentation and traced to Project Needs, including the material sustainability categories of the SubD 1 SMA and any strategy actions. A verification plan for requirements shall be completed. - The Sustainability Needs and requirements are to be captured in both the project requirements register and the verification plan. Documents are to be reviewed by the SubD Lead.	Prior to Milestone 2	As per CPMM 3.0 with support from SubD Lead

Activity No.	SubD activity	Description	Timing	Role(s) Responsible
7.4.E	FUSP development	- For Tier 1 and 2 projects, the Needs, requirements and verification methods are to be converted to functional performance specifications and recorded in the FUSP including the top five categories output from the SubD 1 SMA and any strategy actions. - The SubD Lead will support the DM in the development or review of the sustainability specifications. - The FUSP is a contractual document that will support the successful delivery and verification of the sustainability specifications. - Refer to Section 0 for further detail.	Following endorsement of the verification plan	As per CPMM 3.0 with support from SubD Lead

7.5 Concept Design

The sustainability approach will be based on the SubD 1 SMA, carried out on the single go-forward option. It is important to ensure sustainability continues to be carried through in Concept Design so that sustainability opportunities and risk mitigations are implemented in the project's design and appropriately allowed for in project resourcing and schedule. The following SubD and integrated activities shall occur for this step.

Table 12: Concept Design Activities

Activity No.	SubD activity	Description	Timing	Role(s) Responsible
7.5.A	Identification of SubD Lead	- The SubD Lead shall be identified for the project's Concept Design step. The SubD Lead is the person responsible for carrying out and supporting the project in the sustainability space. This person shall be part of the project team and responsible (as indicated) for the execution of the SubD process in this step. - The SubD Lead shall be identified in the SubD Management Plan.	Prior to commencement of Concept design	Project Lead/PM and Design Team
7.5.B	SubD Management Plan update	- A review and update of the SubD Management Plan will occur at the commencement of Concept Design following the identification of the SubD Lead for the project. - Refer to Section 5.5 for further information.	Commencement of Concept Design	SubD Lead
7.5.C	Climate resilience	- An important design and maintenance consideration for SA Water's assets is resilience to future climate conditions. Designing a climate resilient project assists local communities to become more resilient to shocks and stresses by maintaining a safe and operational water and wastewater network. - Where Climate Change has been identified as a material category for a project in the Initiation & Needs step, a Climate Risk Assessment shall be undertaken in consultation with SA Water Climate Change SMEs. - The preliminary climate vulnerability check will be carried out by the SA Water SubD Team in consultation with the Asset Sponsor, DM, relevant Design Leads and other stakeholders as required (Climate Resilience, Stakeholder Engagement). - Where required the Climate Risk Assessment shall be presented in a Climate Risk Workshop at the early steps of Concept Design, to finalise the Climate Risk Register and identify adaptation measures to be incorporated in the concept design. The outcomes of the workshop shall be documented in the Climate Risk Register and mapped to the relevant Concept Design deliverables. Any High or Extreme climate change risks must be included in the Project Risk Register.	Early Concept Design (when applicable)	SubD Lead

Activity No.	SubD activity	Description	Timing	Role(s) Responsible
7.5.D	Carbon and materials assessment	- A preliminary estimate of whole-of-life GHG emissions for the concept design shall be developed in accordance with the greenhouse footprint evaluation in significant capital projects and procurement, or other appropriate frameworks, prior to the sustainability initiatives workshop. - A preliminary estimate of the percentage of recycled and reused materials for the project should be developed in consideration of circular economy approach prior to the sustainability initiatives workshop. - Any updates are to be included in any cost estimate reviews to reflect initiatives included within the design.	During Concept Design	SubD Lead
7.5.E	Nature	- Projects within Metropolitan Adelaide or rural townships must determine application of WSUD principles. - Where project scope is broader it may be appropriate to apply the broader Blue Green Infrastructure principles and an assessment carried out.	During Concept Design	SubD Lead
7.5.F	Sustainability initiatives identification	- A sustainability initiative identification exercise will occur at the commencement of Concept Design to maximise sustainability of the design for construction, operation and whole of life. - Refer to Section 5.4 for further information.	Commencement of Concept Design	As per CPMM 3.0 with support from SubD Lead
7.5.G	Concept design reports	Refer to Section 6.10 for further information.	Prior to Concept Design report finalisation	As per CPMM 3.0
7.5.H	SubD Report	- Where a SubD Report exists from previous steps, it will be reviewed and added to. Where a SubD Report does not yet exist, one must be developed. - Refer to Section 5.6 for further information.	Prior to Concept Design report finalisation	SubD Lead
7.5.I	Cost estimation	- Priority sustainability risk mitigations or opportunities will be included in project cost estimations. - Refer to Section 6.6 for further information.	During cost estimation, in line with CPMM 3.0	As per CPMM 3.0
7.5.J	Regulatory approval submission	- For projects that trigger regulatory approval, dossiers are developed to support the submission, including sustainability information. The SubD Report will support this process, and any additional information should be developed. - Refer to regularity approval information requirements from the project governance and assurance team.	As triggered	As per CPMM 3.0 with support from SA Water SubD Team

Activity No.	SubD activity	Description	Timing	Role(s) Responsible
7.5.K	Development of requirements for delivery	The SubD Lead will work with the DM and the Concept Design team to develop the sustainability requirements for inclusion in the Delivery – Detailed Design tender and/or the Delivery – Construction tender.	Prior to Milestone 3	As per CPMM 3.0 with support from SubD Lead

7.6 Detailed Design

The sustainability approach will be based on the SubD 1 SMA, completed on the single go-forward option. It is important to ensure sustainability continues to be carried through or included in Detailed Design so that sustainability opportunities and risk mitigations are implemented in the project's design. Where design has come directly to Detailed Design, SubD activities still need to occur to prepare for Construction.

The following SubD and integrated activities shall occur for this step as a minimum and build on information and detail developed during prior steps.

Table 13: Detail Design Activities

Activity No.	SubD activity	Description	Timing	Role(s) Responsible
7.6.A	Identification of SubD Lead	- The SubD Lead shall be identified for the project. The SubD Lead is the person responsible for carrying out and supporting the project in the sustainability space. This person shall be part of the project team and responsible (as indicated) for the execution of the SubD process in this phase. - The SubD Lead shall be identified in the SubD Management Plan.	Prior to commencement of Detailed Design	Project Lead/PM and Design Team
7.6.B	Review and update (or creation) of SubD Management Plan	- A review and update of the SubD Management Plan will occur at the commencement of Detailed Design following the identification of the SubD Lead for the project. - Where a SubD Management Plan does not exist, one is to be developed to support the process in this step. - Refer to Section 5.5 for further information.	Commencement of Detailed Design	SubD Lead

Activity No.	SubD activity	Description	Timing	Role(s) Responsible
7.6.C	Climate resilience	- Where Climate Change has been identified as a material category for a project in the Initiation & Needs step, a Climate Risk Assessment shall be undertaken in consultation with SA Water Climate Change SME's. - The preliminary climate vulnerability check will be carried out by the SA Water SubD Team in consultation with the Asset Sponsor, DM, relevant Design Leads and other stakeholders as required (Climate Resilience, Stakeholder Engagement). - Where required the Climate Risk Assessment shall be presented in a Climate Risk Workshop at the early steps of Detailed Design, to finalise the Climate Risk Register and identify adaptation measures to be carried through the design. The outcomes of the workshop shall be documented in the Climate Risk Register and mapped to the relevant deliverables. Any High or Extreme climate change risks must be included in the Project Risk Register.	Early Detailed Design (when applicable)	SubD Lead
7.6.D	Carbon and materials assessment	- A preliminary estimate of whole-of-life GHG emissions for the detailed design shall be developed in accordance with the greenhouse footprint evaluation in significant capital projects and procurement, or other appropriate frameworks, prior to the sustainability initiatives workshop. - A preliminary estimate of the percentage of recycled and reused materials for the project should be developed in consideration of circular economy approach prior to the sustainability initiatives workshop. - Any updates are to be included in any cost estimate reviews to reflect initiatives included within the design.	Early Detailed Design, Prior to Detailed Design completion	SubD Lead
7.6.E	Nature	- Projects within Metropolitan Adelaide or rural townships must determine application of WSUD principles. - Where project scope is broader it may be appropriate to apply the broader Blue Green Infrastructure principles and an assessment carried out.	Prior to Detailed Design completion	SubD Lead
7.6.F	Sustainability initiatives identification	- A sustainability initiative identification exercise will occur at the commencement of Detailed Design to maximise sustainability of the design for construction, operation and whole of life. - Refer to Section 5.4 for further information.	Commencement of Detailed Design	SubD Lead
7.6.G	Detailed design reports	Refer to Section 6.10 for further information.	Prior to Detailed Design report finalisation	As per CPMM 3.0

Activity No.	SubD activity	Description	Timing	Role(s) Responsible
7.6.H	SubD Report	- Where a SubD Report exists from previous steps it will be reviewed and added to. Where a SubD Report does not yet exist, one must be developed. - Refer to Section 5.6 for further information.	Prior to Detailed Design report finalisation	As per CPMM 3.0 with input from SubD Lead
7.6.I	Review (or development) of requirements for delivery	The SubD Lead will work with the DM and the design team to develop the sustainability requirements for inclusion in the Delivery – Detailed Design tender and/or the Delivery – Construction tender.	Prior to Milestone 3	As per CPMM 3.0 with input from SA Water SubD Team
7.6.J	Cost estimation	- Sustainability risk mitigations or opportunities will be included in project cost estimations. This will support prudent and efficient approach. - Refer to Section 6.6 for further information.	During cost estimation, in line with CPMM 3.0	As per CPMM 3.0
7.6.K	Regulatory approval submission	- For projects that trigger regulatory approval, dossiers are developed to support the submission, including sustainability information. The SubD Report will support this process, and any additional information should be developed. - Refer to regularity approval information requirements from the project governance and assurance team.	As triggered prior to Milestone 4 – Budget Release Approval	As per CPMM 3.0 with support from SA Water SubD Team
7.6.L	Sustainability Materiality Assessment, Pre-construction (SubD 2)	- An SMA (SubD 2) shall be completed following 60% design review and before 90% design or major construction works commence. - Refer to Section 5.2 for further information.	On the completed 60% design, prior to 90% design and Construction commencement	SubD Lead with support from SA Water SubD Team.

7.7 Contract Award & Procurement / IFC design (Establish phase)

The Establish phase is where internal controls for contracts and tendering are established, including cost and contract control mechanisms and project management systems. The major order placed (Milestone 5) is claimed when the contract, formal instrument of agreement, purchase order, or service level agreement is in place for all or the majority of the project's scope of work to be delivered.

Table 14: Contract Award and Procurement / IFC Design Activities

Activity No.	SubD activity	Description	Timing	Role(s) Responsible
7.7.A	Identification of SubD Lead	The SubD Lead shall be identified for Contract Award & Procurement and IFC Design steps. The SubD Lead will support as required. Refer to Section 5.1 for further details.	Commencement of step	Project Lead/PM and Design Team
7.7.B	Develop contractual requirements and tender documents	- The SubD Lead shall be engaged to work with the team to develop the sustainability performance indicators and reward mechanisms to be included in the contract for Delivery – Design and/or Delivery – Construction as required. - The SubD Lead shall work with the PM and/or supply chain team to develop the SubD response schedule(s) for the tender and shall consider integration with other existing processes where sensible, such as the GHG reporting guideline for contractors.	During tender/contract development	As per CPMM 3.0 with support from SubD Lead
7.7.C	Documentation for tender	The SubD Lead shall provide relevant information for inclusion in the tender documentation. This should include, where relevant: - Initial SMA. - Latest SubD Report. - Sustainability risks and opportunities register (Excel format). - Climate Risk Register (Excel format). - SubD – Detailed Design and/or SubD – Construction guideline(s). - SA Water SubD Technical Standard	During tender/contract development	As per CPMM 3.0 with support from SubD Lead

Activity No.	SubD activity	Description	Timing	Role(s) Responsible
7.7.D	Evaluate tender	The SubD Lead shall support the evaluation of the sustainability submissions for each tenderer and document the evaluation in-line with the project's evaluation plan and SA Water's tender evaluation process/document. The SubD Lead shall participate in multi-discipline technical evaluation sessions as required and where required engage with SMEs. Should a tender response include 'bid-backs' and/or proposed amendments to the proposed sustainability requirements or performance measures these should be discussed with the PM and the commercial manager to align whether these will be accepted or rejected.	Prior to Milestone 5	As per CPMM 3.0 with support from SubD Lead
7.7.E	Finalise contractual requirements	The SubD Lead shall support the commercial manager or relevant parties to finalise the sustainability performance measures and/or requirements based on the results of the tender evaluation.	Prior to Milestone 5	As per CPMM 3.0 with support from SubD Lead
7.7.F	IFC acceptance	The detailed design is accepted as IFC, including sustainability initiatives. The IFC package shall include the SubD Report, refer to Section 5.6	Prior to major works commence	As per CPMM 3.0
7.7.G	SubD Management Plan (construction/commissioning)	The SubD Management Plan (construction/commissioning) shall be included in construction management plans or a standalone SubD Management Plan and must outline the plan to minimise impact and promote sustainability. This must include as a minimum: - How the SMA (SubD 2), material sustainability categories have been addressed and are to be managed. - Delivery of the SA Water Contractor Greenhouse Gas and Energy Reporting SAWD-ENV-0199. - The sustainability initiatives to reduce impact and uplift sustainability. - Emissions estimate. - Waste estimate and details of how the circular economy principles are to be applied. Refer to Section 5.5 for further information.	In line with submission of construction management plan.	As per CPMM 3.0 with support from SubD Lead

7.8 Construction/Commissioning

Key milestones for the Construction and Commissioning steps include commencement of major works (Milestone 6) and practical completion (Milestone 7).

Table 15: Construction/Commissioning Activities

Activity No.	SubD activity	Description	Timing	Role
7.8.A	Identification of SubD Lead	The SubD Lead shall be identified for the Construction and Commissioning steps. The SubD Lead will support the step to execute the sustainability initiatives identified for this project and support the reporting. Refer to Section 5.1 for further information.	Commencement of step	Construction manager
7.8.B	Sustainability Materiality Assessment, Pre-construction (SubD 2) (if outstanding)	- An SMA (SubD 2) shall be completed following 60% design review gate and before major construction works commence. This assessment will inform the development of the SubD Management Plan (construction and commissioning). If the SMA (SubD2) is not yet available, the SA Water SubD Team must be engaged via the SA Water Project Manager to complete it. - The document is live and should be reviewed following changes to the design or construction methodology that could impact sustainability materiality. - Refer to Section 5.2 for further information.	Prior to Milestone 6	SubD Lead with support from SA Water SubD Team.
7.8.C	Sustainability initiatives identification	- The SubD Lead and/or sustainability SMEs must be invited to participate in all sustainability related workshops (for example, sustainability initiatives, climate risk, stakeholder and engagement) led by the relevant construction and commissioning team. - Refer to Section 5.4 for further information.	Following SubD 2 and prior to starting works	As per CPMM 3.0 with support from SubD Lead

Activity No.	SubD activity	Description	Timing	Role
7.8.D	SubD Management Plan (construction /commissioning) (if outstanding)	The SubD Management Plan is to be developed following Milestone 5 if it is not completed by this step, one must be developed. This must include as a minimum: • How the SMA (SubD 2), material sustainability categories have been addressed and are to be managed. • Delivery of the SA Water Contractor Greenhouse Gas and Energy Reporting SAWD-ENV-0199. • The sustainability initiatives to reduce impact and uplift sustainability. • Emissions estimate. • Waste estimate and details of how the circular economy principles are to be applied. delivery of the SA Water Contractor Greenhouse Gas and Energy Reporting SAWD-ENV-0199 and SubD2 sustainability Material categories. • Refer to Section 5.5 for further information.	Following contract award and prior to starting works	As per CPMM 3.0 with support from SubD Lead
7.8.E	Document reviews	• The SubD Lead shall review the contractor's Sustainability Management Plan (or similar) as well as their SubD Report (or similar). Refer to Section 5.5 for more information. • Where a project has requirement(s) to complete technical sustainability assessment(s) or model(s) in the Design and/or Construction step, these will be reviewed by the SubD Lead and/or SME a minimum of two times (draft and final) with the timing of completion and review established in the contractor's Sustainability Management Plan and documented in the SubD Management Plan.	Prior to respective document finalisation	SubD Lead

Activity No.	SubD activity	Description	Timing	Role
7.8.F	Monitoring and reporting	The SubD Lead will monitor the progress of the design and/or construction contractor with regards to the sustainability requirements of the project through: • Review of designer and/or contractor SubD Reports (for example, monthly progress reports). • Meetings with designers and/or contractor sustainability leads. • Site visits. • The monitoring plan for each project will be documented in the SubD Plan. • The SubD Lead will provide internal progress updates for reporting or as stated in the SubD Management Plan. • Where a project is at risk of not meeting its Sustainability Needs or of a non-compliance with the sustainability project requirements, the SubD Lead will escalate this to the PM and the actions to be taken shall be documented.	Throughout Detailed Design/ Construction	SubD Lead
7.8.G	Auditing	• The designer's and/or construction contractor's sustainability audit requirements shall be detailed in the project sustainability requirements and the relevant SubD Management Plans and must include submission of the emissions and material registers and SA Water Contractor Greenhouse Gas and Energy Reporting SAWD-ENV-0199. • The SubD Lead or nominated representative shall conduct an annual audit of a project's SubD Management Plan and/or sustainability technical requirements, as detailed in the project's SubD Management Plan. Where a project is at risk of not meeting its sustainability requirements, the SubD Lead may conduct an 'out-of-cycle' audit.	Throughout Detailed Design/ Construction	SubD Lead
7.8.H	Request for information (RFI) and variations from contractual requirements	• The SubD Lead and any relevant sustainability SMEs will review designer and/or construction contractor's RFIs and/or clarifications as they arise, through SA Water's RFI/clarification process). • When a designer and/or construction contractor wish to vary the sustainability requirements of the contract they shall submit a request, including supporting documentation, through the dispensation process. and reviewed by the SA Water Lead SubD.	As occurs	As per CPMM 3.0 with support from SA Water Lead SubD

Activity No.	SubD activity	Description	Timing	Role
7.8.1	Sustainability requirements verification/certification (Post-construction SMA SubD 3)	The SubD Lead shall coordinate verification of the sustainability requirements in accordance with the contractual requirements for the project and the approach agreed with the PM in the Contract Award & Procurement step. When a project be required to be certified to an external standard (for example, ISC rating, Greenstar rating), the SubD Lead shall participate in the verification feedback meetings with the verifiers. When a project's SubD and Sustainability in Construction reports be required to be verified by an independent third party or internal SMEs, the SubD Lead shall: • Be responsible for facilitating the SA Water Sustainability Verification Process and communicating updates. • Be responsible for directly liaising with the delivery partner to provide clarifications. • Facilitate and transmit technical queries, verification submission(s) and assessment process(es). • Be responsible for chairing and facilitating Sustainability Verification meetings. The process for documenting the verification outcomes of sustainability project requirements shall be in accordance with verification requirements as per project management methodology or CPMM 3.0.	During cost estimation, in line with CPMM 3.0	SubD Lead

7.9 Completion

In the Completion step, projects have moved into operation and close-out activities are completed. Key tasks for this step include capitalisation of the delivered asset, defects liability and warranty management, operational handover (Milestone 8) and completion of the project closeout checklist (Milestone 9).

Table 16: Completion Activities

Activity No.	SubD activity	Description	Timing	Role(s) Responsible
7.9.A	Handover of sustainability	Sustainability risks and opportunities that relate to the Operate & Maintain stage of the asset's lifecycle shall be documented. Where mitigation measures are to be implemented within the Operate & Maintain stage, the actions to be taken or processes to be followed shall be documented in the operational and maintenance manual(s) and/or the asset risk register. The SubD Lead shall review the handover materials and confirm that the relevant sustainability materials have been provided. This may include but is not limited to: • Environmental monitoring plan. • Climate Risk Register. • Stakeholder and engagement plan. • SubD Management Plans.	Following Milestone 7	As per CPMM 3.0 with support from SubD Lead

8 Documentation and records

8.1 General

SubD records may include (but are not limited to):

- a. SubD Management Plan.
- b. Sustainability Materiality Assessment
- c. SubD Report.
- d. SubD Initiatives Register.
- e. Options investigation, analysis and determinations
- f. Risk assessments, including risk ratings and actions.
- g. SubD (in) meeting minutes (for example, record of design decisions, change management, SubD discussions).
- h. SubD changes identified in the lessons learnt process (refer to Section 6.11 for more details).

All SubD records shall be maintained in accordance with this Technical Standard.

Requirements apply to records created by or on behalf of SA Water, as well as documents returned to SA Water from the partner or third-party designer.

8.2 Design carried out by designers external to SA Water

All designs carried out by external parties, as a minimum, shall comply with this Technical Standard and the requirements of relevant legislation and regulations.

SubD documents will be transferred back to SA Water with the corresponding design packages at the following stages where the PM will transfer the documents to the relevant fling storage Capital Project Locker.

8.3 Sustainability by design templates

The following templates are provided by SA Water for use in support of the SubD process:

Table 17: Sustainability by Design Templates

Number	Title
	Sustainability Materiality Assessment tool
	Sustainability by Design Management Plan template
	Sustainability by Design Report Template

Design and delivery partners should request the most recent templates from the PM or OE, who can access them from the Engineering BMS page.

8.4 Record format

The SA Water templates are available and are to be used where applicable.

Native versions of the files are to be saved and transferred to the next step of design. Due to the live, whole of life nature of Sustainability by Design, the documents are not to be transferred solely as PDFs. It should be clearly noted which phase or step of the project, and which entity, have compiled the information.

8.5 Identification of SubD records

All SubD documents shall be identified using the following naming convention:

- "xxxx-XXX-MUL-SubD-YYYY-ZZZZ".

Where:

- a. xxxx-XXX = Maximo Asset ID number when known or unique output identifier during the project.
- b. YYYY = Unique SubD document number.
- c. ZZZZ = Document description, e.g., SubD_Management_Plan, SubD_OA_SMA, SubD_Report. For example:
 - A0028-1234-MUL-SubD-0301-SubD_Management_Plan
 - A0028-1234-MUL-SubD-0302-SubD_Report
 - MA3235_A0028-1234-MUL-SubD-0303-SubD_OA_SMA

8.6 Location of records

SubD records for all SA Water assets shall be filed, in the project locker under *Manage > Safety in the Planning and Design* folder.

At the handover of Practical Completions, the SubD documents (in native format) shall be included in the O&M Manual Appendix G WHS and Environment.

8.7 Documents modified external to SA Water

An additional version of the SubD documents shall be produced whenever the document is developed or reviewed by parties external to SA Water. Details of who has custody of the live version of the document are to be recorded in the document History prior to it being checked out.

At each design milestone, the current, updated SubD documents are to be issued and uploaded into RIVER.

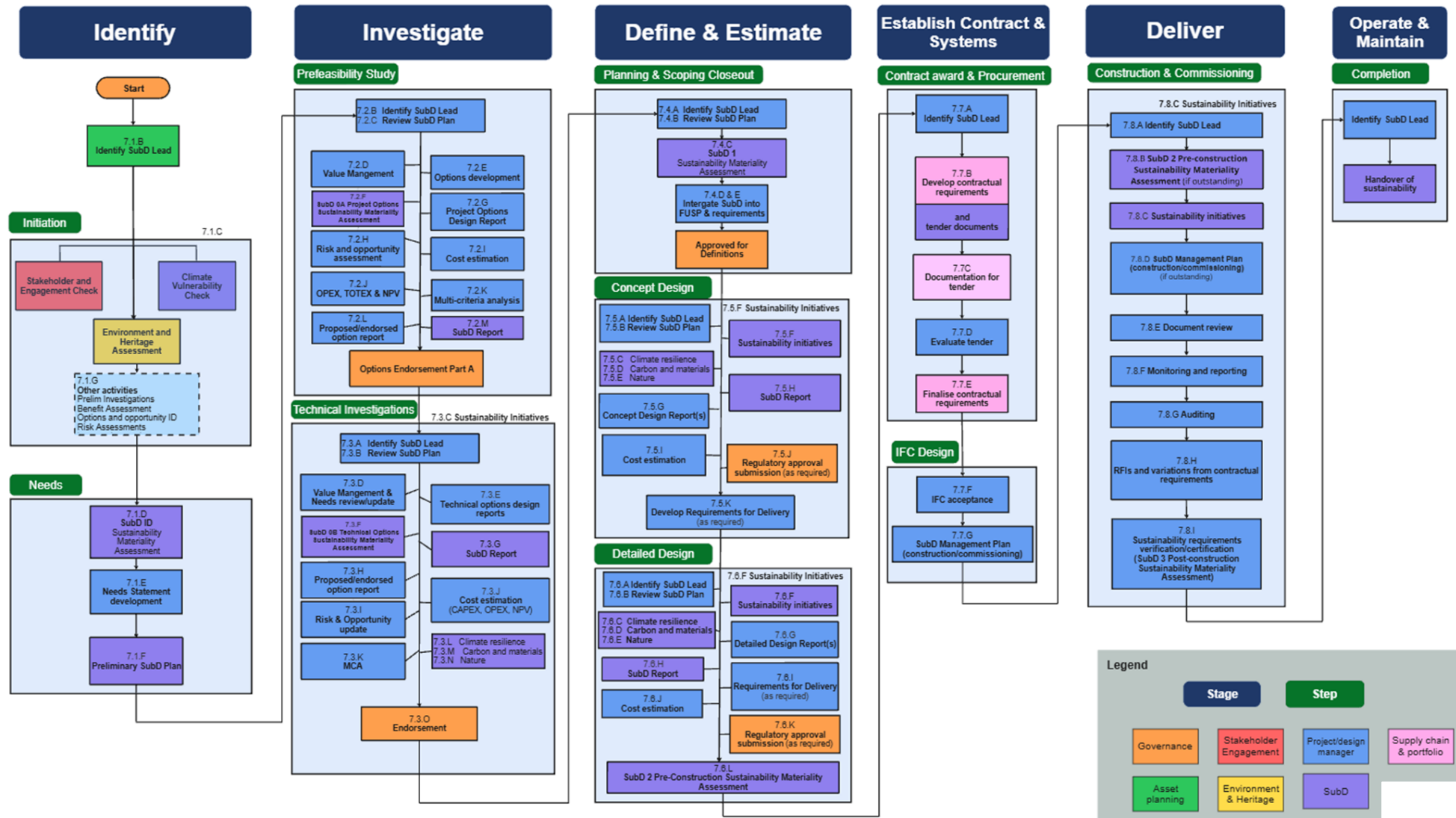
This is required to allow SA Water to record the status of the SubD documents issued to the third-party designer for review and the status of modified documents returned to SA Water by the third-party designer. The SubD documents returned to SA Water supersede the document issued for development by the third-party designer.

The SA Water Project Manager for each contract shall be responsible for managing these documents in accordance with the SA Water CPMM system, with assistance from the SubD Team support in Engineering Services as required.

8.8 Documents modified internal to SA Water

The current version of the SubD documents shall be used as the basis for all SubD reviews undertaken and modified by SA Water for that asset.

A Sustainability by Design Process Flowchart



B Sustainability by Design Responsibility Matrix

This table indicates the responsible parties for each step associated with SubD process. SubD activities are the responsibility of the SubD Lead in each step. While every effort has been made to align with the CPMM framework and recognised project management methodologies, some inconsistencies may remain as the approach continues to evolve. We ask that the underlying intent and guiding principles be applied to support consistent and effective implementation. Red text indicates the introduction of SubD in existing project activities while black text indicates the SubD-specific activities.

Activity No.	Activity	Asset Owner	Asset Planner / Sponsor	Project Lead / PM / CM	SA Water Lead SubD	SubD Lead (step-based)	Designers	Supply chain & portfolio	Cost Intelligence
	Initiation & Needs								
7.1.A	Initiate the RFEE		✓	✓					
7.1.B	Identify the SubD Lead				✓				
7.1.C	Pre-Materiality Assessment Activities			✓					
7.1.D	Sustainability Materiality Identification Assessment (SubD ID)					✓			
7.1.E	Needs statement development			✓					
7.1.F	Preliminary SubD Management Plan					✓			
7.1.G	Other activities		✓	✓			✓		
	Prefeasibility Study								
7.2.A	Initiate the Prefeasibility RFEE			✓					
7.2.B	Identify the SubD Lead				✓				
7.2.C	SubD Management Plan (Prefeasibility review)					✓			
7.2.D	Value management (Workshop or Desktop)						✓		
7.2.E	Options development						✓		
7.2.F	Options sustainability materiality assessment (SubD 0A)				✓				

Activity No.	Activity	Asset Owner	Asset Planner / Sponsor	Project Lead / PM / CM	SA Water Lead SubD	SubD Lead (step-based)	Designers	Supply chain & portfolio	Cost Intelligence
7.2.G	Project options design reports						✓		
7.2.H	Risk and opportunity assessment (workshop) (Tier 1-3)			✓					
7.2.I	Cost estimation (Tier 1-3)			✓					
7.2.J	OPEX and TOTEX cost estimates and NPV Model development (Tier 1-3)								✓
7.2.K	Multi-criteria analysis (MCA), when applicable			✓					
7.2.L	Proposed/endorsed option report			✓					
7.2.M	SubD Report					✓			
7.2.N	M0 Claimed		✓						
	Technical Investigations								
7.3.A	Initiate the Technical Options RFEF			✓					
7.3.B	SubD Management Plan (Technical Investigation review)					✓			
7.3.C	Sustainability initiatives identification					✓			
7.3.D	Update/review Value Management and Needs						✓		
7.3.E	Technical options design reports						✓		
7.3.F	Options sustainability materiality assessment (SubD 0B)					✓			
7.3.G	SubD report					✓			
7.3.H	Proposed/endorsed option report			✓					
7.3.I	Risk and opportunity update			✓					
7.3.J	Cost estimation (CAPEX, OPEX and NPV)								✓
7.3.K	Multi-criteria analysis (MCA) (where required)			✓					

Activity No.	Activity	Asset Owner	Asset Planner / Sponsor	Project Lead / PM / CM	SA Water Lead SubD	SubD Lead (step-based)	Designers	Supply chain & portfolio	Cost Intelligence
7.3.L	Climate resilience					✓			
7.3.M	Carbon and materials assessment					✓			
7.3.N	Nature					✓			
7.3.O	PAG, Steer Co. or other endorsement as required			✓					
	Planning and Scoping Closeout								
7.4.A	Identification of SubD Lead			✓					
7.4.B	SubD Management Plan update					✓			
7.4.C	Design Sustainability Materiality Assessment (SubD 1)					✓			
7.4.D	Project requirements development						✓		
7.4.E	Functional Performance Specification (FUSP) Development						✓		
	Concept Design								
7.5.A	Identification of SubD Lead			✓			✓		
7.5.B	SubD Management Plan update					✓			
7.5.C	Climate resilience					✓			
7.5.D	Carbon and materials assessment					✓			
7.5.E	Nature					✓			
7.5.F	Sustainability initiatives identification						✓		
7.5.G	Concept design reports						✓		
7.5.H	SubD report					✓			
7.5.I	Cost estimation								✓
7.5.J	Regulatory approval submission			✓					

Activity No.	Activity	Asset Owner	Asset Planner / Sponsor	Project Lead / PM / CM	SA Water Lead SubD	SubD Lead (step-based)	Designers	Supply chain & portfolio	Cost Intelligence
7.5.K	Development of Requirements for Delivery		✓						
	Detailed Design								
7.6.A	Identification of SubD Lead			✓			✓		
7.6.B	Review and update (or creation) of SubD Management Plan					✓			
7.6.C	Climate Resilience					✓			
7.6.D	Carbon and Materials assessment					✓			
7.6.E	Nature					✓			
7.6.F	Sustainability initiatives identification					✓			
7.6.G	Detailed design reports						✓		
7.6.H	SubD report					✓			
7.6.I	Review (or development) of requirements for delivery			✓					
7.6.J	Cost estimation								✓
7.6.K	Regulatory approval submission			✓					
7.6.L	SubD 2 Pre-Construction SMA					✓			
	Contract Award & Procurement/IFC Design								
7.7.A	Identification of SubD Lead			✓			✓		
7.7.B	Develop contractual requirements and tender documents							✓	
7.7.C	Documentation for tender			✓					
7.7.D	Evaluate tender							✓	
7.7.E	Finalise contractual requirements							✓	
7.7.F	IFC acceptance			✓					

Activity No.	Activity	Asset Owner	Asset Planner / Sponsor	Project Lead / PM / CM	SA Water Lead SubD	SubD Lead (step-based)	Designers	Supply chain & portfolio	Cost Intelligence
7.7.G	SubD Management Plan (construction/commissioning)			✓		✓			
	Construction/Commissioning								
7.8.A	Identification of SubD Lead			✓					
7.8.B	SubD 2 Pre-construction SMA (if outstanding)					✓			
7.8.C	Sustainability initiatives identification			✓					
7.8.D	SubD Management Plan (construction/commissioning) (if outstanding)					✓			
7.8.E	Document reviews					✓			
7.8.F	Monitoring and reporting					✓			
7.8.G	Auditing					✓			
7.8.H	Request for Information and Variations from contractual requirements			✓					
7.8.I	Sustainability requirements verification/certification (SubD 3)					✓			
	Completion								
7.9.A	Handover of sustainability					✓			

C SubD Tier Alignment

Identifies the SubD activities and their alignment with the approach for the different project tiers.

Table 18: SubD Tier Alignment – Initiation and Needs

	Tier 1	Tier 2	Tier 3	Tier 4
Environment and heritage	An EnviroCheck must be completed prior to the materiality assessment.			Program approach is developed with SA Water SubD Team (consultation with Environment team) and signed off by PM and asset sponsor.
Materiality Assessment (SubD ID)	The Sustainability Materiality Identification Assessment (SubD ID) must be completed prior to the Needs Workshop.			The Sustainability Materiality Identification Assessment (SubD ID) must be completed at a program level.
Sustainability Needs	Sustainability Needs defined during Needs workshop and included in Needs Register.	Sustainability Needs defined from list of Sustainability Needs/ minimum requirements.		Program approach is developed with SA Water SubD Team and signed off by PM and asset sponsor.
SubD Management Plan	A preliminary SubD Management plan must be prepared in consultation with and approved by SA Water SubD Team, following completion of the Sustainability Materiality Identification Assessment (SubD ID).			Program approach is developed with SA Water SubD Team and signed off by PM and asset sponsor.

Table 19: SubD Tier Alignment – Prefeasibility Study

	Tier 1	Tier 2	Tier 3	Tier 4
Materiality Assessment (SubD 0)	An Options SMA is required to be completed. (Tier 3 when applying options/Pathway 3).			Not required.
SubD Management Plan	A SubD Management Plan must be prepared in consultation with and approved by SA Water SubD Team.			Program approach is developed with SA Water SubD Team and signed off by PM and asset sponsor.
MCA (when occurring)	Sustainability material MCA criteria must be developed and included in the MCA.			Not required.
Sustainability initiatives	- Sustainability risks/opportunities identification is integrated into VM workshops and climate risk/resilience into risk workshops. - Risks and opportunities for all material sustainability areas must be identified and evaluated with determination and reasoning recorded.			Program approach is developed with SA Water SubD Team and signed off by PM and asset sponsor.

Table 20: SubD Tier Alignment – Technical investigations

	Tier 1	Tier 2	Tier 3	Tier 4
External Sustainability Rating	ISC/Green Star Accreditation will be considered on a case-by-case basis by the SA Water Lead SubD and PM.		An IS Essentials Rating will not be considered unless it is deemed to add value by SA Water SubD Team and/or PM/DM.	An IS Rating will not be considered.
MCA	Sustainability MCA criteria developed using SubD Materiality Assessment information and included in the MCA (Tier 3 Pathway 3).			Not required.
Sustainability initiatives	- Sustainability risks/opportunities integrated into VM workshop or stand-alone workshop. Climate risk/resilience into risk workshop. - Risks and opportunities for all material sustainability categories must be identified and evaluated with determination and reasoning recorded.		Sustainability risks and opportunities for all material sustainability categories must be developed in conjunction with SA Water SubD Team via a desktop study and considering SA Water's master sustainability initiatives register.	
SubD Plan	The SubD Management Plan is reviewed and updated by the SubD Lead.			

Table 21: SubD Tier Alignment – Planning and Scoping Closeout

	Tier 1	Tier 2	Tier 3	Tier 4
SubD Plan	The SubD Management Plan is reviewed and updated by the SA Water SubD Team.			
Materiality Assessment (SubD 1)	A Design SMA (SubD 1) is required to be completed on the preferred option during concept design.			A Design SMA is required to be completed at a program level.

Table 22. SubD Tier Alignment – Concept Design

	Tier 1	Tier 2	Tier 3	Tier 4
Sustainability initiatives	- Sustainability risks/opportunities integrated into VM workshop and climate risk/resilience into risk workshop. - Risks and opportunities for all material sustainability categories must be identified and evaluated with determination and reasoning recorded.			Sustainability risks and opportunities for all material sustainability categories must be identified and evaluated via desktop study. SubD Lead to validate appropriate analysis has been conducted.
SubD Management Plan	The SubD Management Plan is reviewed and updated by the SubD Lead.			

Table 23: SubD Tier Alignment – Detailed Design

	Tier 1	Tier 2	Tier 3	Tier 4
Sustainability initiatives	- Sustainability risks/opportunities integrated into VM workshop and climate risk/resilience into risk workshop. - Risks and opportunities for all material sustainability categories must be identified and evaluated with determination and reasoning recorded.			Sustainability risks and opportunities for all material sustainability categories must be identified and evaluated via desktop study. SubD Lead to validate appropriate analysis has been conducted.
Materiality Assessment (SubD 2)	A Construction SMA (SubD 2) is required to be completed on the preferred option during concept design.			A Construction SMA is required to be completed at a program level.
SubD Management Plan	The SubD Management Plan is reviewed and updated by the SubD Lead.			

Table 24: SubD Tier Alignment – Contract award, Procurement & IFC

	Tier 1	Tier 2	Tier 3	Tier 4
Develop Sustainability Response schedule(s)	A Sustainability Response schedule must be included in the tender documents.			

Table 25. SubD Tier Alignment – Construction & Commissioning

	Tier 1	Tier 2	Tier 3	Tier 4
Materiality Assessment (SubD 2)	A Materiality Assessment (SubD 2) is used to inform the SubD Management Plan and required to be completed, prior to construction commencement.			A Materiality Assessment (SubD 2) is required to be completed at a program level to inform SubD Management Plan.
SubD Management Plan	A SubD Management Plan must be prepared in consultation with and approved by SA Water SubD Team.			Program approach is developed with SA Water SubD Team and signed off by PM and asset sponsor.
Sustainability initiatives	SubD Lead and other SMEs (where deemed appropriate) to attend sustainability workshops led by design/construction contractors.			
Document reviews	The SubD Lead shall review contractor sustainability documentation.		The SubD Lead shall review contractor sustainability documentation on a project case-by-case basis.	
Reporting	Contractors to comply with SA Water Contractor Greenhouse Gas and Energy Reporting SAWD-ENV-0199.			
Auditing	The project's sustainability audit requirements must be included in the contractor documents/schedules.		Not required.	

Table 26. SubD Tier Alignment – Completion

	Tier 1	Tier 2	Tier 3	Tier 4
Materiality Assessment (SubD 3)	A Materiality Assessment (SubD 3) is required to be completed post-construction to validate sustainability materiality.			A Materiality Assessment (SubD 3) is required to be completed at a program level.

Table 27: SubD Tier Alignment – Close

	Tier 1	Tier 2	Tier 3	Tier 4
Close out of any outstanding items	As required.			

D Sustainability: Climate and environment

This appendix provides an overview of general sustainability category principles and context relating to climate and the environment. It is intended to support a deeper understanding of the sustainability categories and their applications.

Table 28: SA Water Climate and Environment Categories and Subcategories

Category	Subcategory
Climate risk and resilience	Climate resilience
	Climate risks and opportunities
	Climate change mitigation and adaptation
Emissions	GHG emissions
	Scope 1 & 2 emissions reduction
	Net Zero emissions (including Scope 3)
	Carbon reduction hierarchy
	Lifecycle modules
Energy	Energy efficiency
	Energy source and generation (renewable energy)
Ecological assets (Nature Positive)	Biodiversity conservation
	Ecosystem restoration
	Natural risk assessment and management ²
	Natural resilience planning
Circular economy	Waste avoidance and resource recovery
	Resource strategy and material life cycle management
	Decommission and adaptability
Water footprint	Water withdrawal and discharge
	Water consumption reduction
	Appropriate use of water sources
Water sensitive urban design	Water sensitive urban design
	Blue-green infrastructure
Environment and heritage²	Environmental assessment and management ²
	Heritage assessment and monitoring ²
	Heritage protection and enhancement ²
	Water quality monitoring and management ²
	Noise ²
	Vibration ²
	Air quality ²
	Light pollution ²
	Contaminated material management ²
	Acid sulfate soil management ²

² Marked categories and subcategories refer to common sustainability practices that do not fall under this Technical Standard and are supported by other systems or process.

D1 Climate risk and resilience

D1.1 Climate resilience

Climate change is affecting water and wastewater infrastructure systems, by introducing challenges such as:

- Increased frequency of extreme weather events.
- Increased flooding risk.
- Change in precipitation patterns.
- Sea level rise.
- Coastal and inland inundation.
- Increased bushfire risk.
- Elevated temperatures.

By assessing climate-related risks and incorporating potential impacts into planning and design, infrastructure can be adapted to either eliminate vulnerabilities or enhance resilience to climate change.

SA Water has been named as a Phase one implementor for the South Australian Department of the Premier and Cabinet PC007 – Climate Ready Government.

D1.2 Climate risks and opportunities

SA Water recognises climate change as a significant risk to water security, infrastructure, and service reliability. At the same time, climate action presents opportunities for innovation and sustainability leadership, where SA Water is advancing water reuse, circular economy practices, and sustainable procurement.

SA Water is legislated to report annually on energy consumption, energy generation, and Scope 1 and 2 GHG emissions related to our energy portfolio, as per the [National Greenhouse and Energy Reporting Act 2007 \(Cth\)](#). Meanwhile, SA Water must comply with the [Premier and Cabinet Circular PC 007 – Climate Ready Government](#). The circular mandates climate risk assessment and reporting requirements for all South Australian public sector agencies. As an SA Government-owned entity, SA Water has the opportunity to obtain and report on an allocation of proceeds from the [Sustainability Bond Framework](#) launched by South Australian Government Financing Authority.

D1.3 Climate change mitigation and adaptation

To mitigate the impacts and risks of climate change, SA Water has developed an Environment Corporate Strategy focused on reducing GHG emissions, improving energy efficiency, investing in renewable energy, and working towards net zero emissions. In parallel, adaptation measures include investments in climate-resilient infrastructure, nature-based solutions, and long-term scenario planning. These actions are designed to safeguard SA Water's operations and ensure reliable service delivery under changing climate conditions.

D2 Emissions

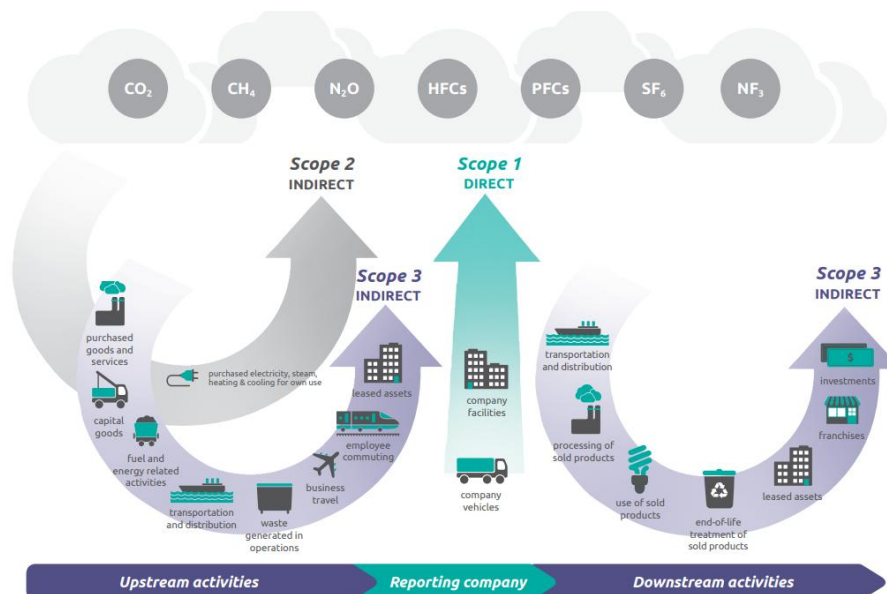
D2.1 GHG emissions

GHG emissions are gases in the earth's atmosphere that trap heat. Carbon dioxide Equivalent, or CO₂ Equivalent (CO₂e) is a metric used to compare the emissions from various [greenhouse gases](#) on the basis of their [global warming potential \(GWP\)](#), by converting amounts of other gases to the amount of carbon dioxide that would have an equivalent impact.

The internationally recognised Greenhouse Gas Protocol classifies emissions into three categories or 'Scopes':

- **Scope 1** - Direct emissions of GHG from sources owned or operated by the reporting organisation, such as the combustion of diesel in company-owned vehicles or on-site equipment.
- **Scope 2** - Indirect emissions from imported energy, including electricity from the grid or other forms of external heat/cooling.
- **Scope 3** – All other indirect emissions that are not from energy imports but are a direct result of the organisation's operations. These arise from sources not owned or operated by the organisation and include upstream or downstream activities, such as emissions linked to the extraction, production, and transportation of purchased construction materials, as well as business travel by modes like air, rail, or ship.

Figure 7 illustrates various emission sources and the relevant 'scope' they fall under.



source: GHG Protocol, 2013

Figure 7: Direct and indirect emissions as defined by the GHG protocol

D2.2 Scope 1 & 2 emissions reduction

SA Water is embedding emissions reduction principles in the design, construction and operation of infrastructure. SA Water Environment strategy calls out all new infrastructure funded post-2024 must be designed for operational net zero emissions. Designs must prioritise low-emission construction materials, integrate renewable energy solutions, and maximise energy efficiency.

Projects must support electrification of the vehicle fleet, reduce reliance on fossil fuels, and enable digital solutions that minimise travel. Biogas and biomethane recovery should be integrated where feasible in treatment processes.

All capital works must include emissions impact assessments and demonstrate application of low-carbon solutions. Designs should align with SA Water's 2030 net zero emissions target.

D2.3 Net Zero emissions (including Scope 3)

Net Zero refers to achieving a balance between greenhouse gas emissions produced and the amount removed from the atmosphere. Net zero places a focus on reducing carbon emissions as much as possible first, and only offsetting unavoidable, residual CO₂ as a last resort.

SA Water has committed to achieving the following reduction in emissions:

- Net zero operational emissions and minimising embodied emissions for all new infrastructure projects (post-2024), as outlined in the Environment Corporate Strategy.
- [Net zero emissions by 2030](#) (Scope 1 & 2 emissions).

SA Water must comply with the [Premier and Cabinet Circular PC 007 – Climate Ready Government](#). The circular mandates GHG emissions reductions and reporting requirements for all South Australian public sector agencies.

Furthermore, The South Australian Government has committed to net zero emissions by 2050, with a goal of achieving net zero emissions in government operations prior to 2050 where feasible.

It is critical for decision makers, asset planners and all members of the delivery value chain to prioritise net zero and low-carbon options to ensure compliance with PC 007 and alignment with both the state government's and SA Water's net zero strategies.

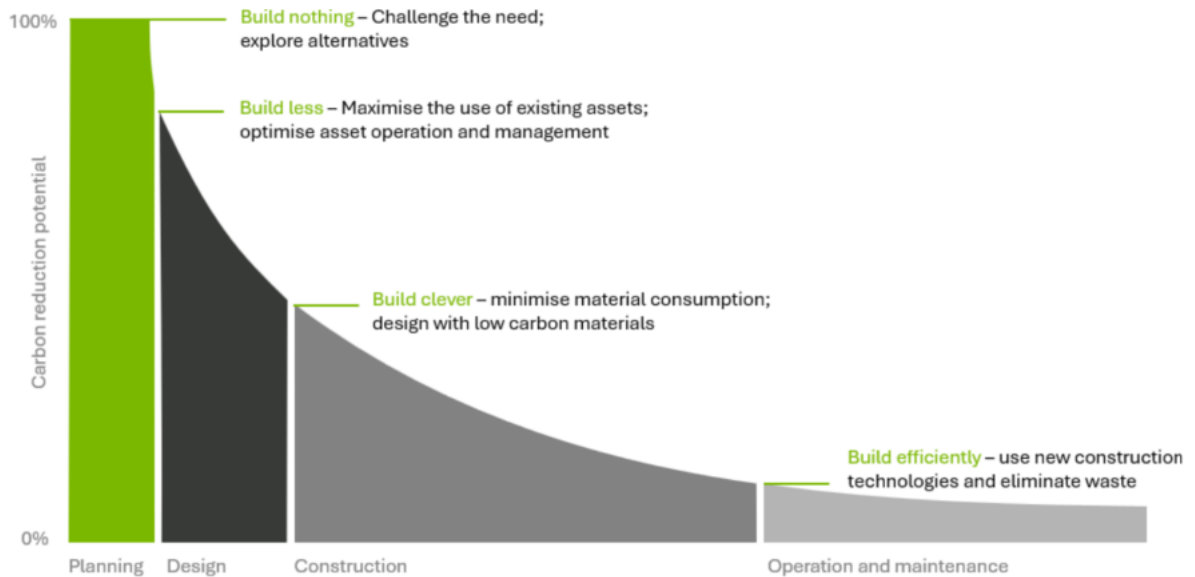
Alignment with the Net Zero strategy is defined as follows:

- **Net zero aligned** – The action would result in a material reduction in GHG emissions and/or positively contributes to achieving net zero targets.
- **Net zero agnostic** – The action will neither contribute to nor hinder the pathway to net zero targets.
- **Not net zero aligned** – The action would result in a material increase in GHG emissions and/or hinders progress towards net zero targets.

D2.4 Carbon Reduction Hierarchy

The carbon management principles in this standard have been aligned with industry best practice and the [PAS 2080 'Carbon Management in Infrastructure and Build Environment'](#) standard.

The carbon reduction hierarchy (Figure 8 below) is a structured approach for decision makers to prioritise strategies in carbon management through an asset's lifecycle. This approach is important for SA Water to achieve its Net Zero greenhouse gas emissions target, in line with the Environment Corporate Strategy. The general carbon reduction hierarchy shown in Figure 9 is an alternative way to identify opportunities to reduce carbon emissions. Using the two concepts together (for example, considering how to avoid and reduce carbon emissions in the planning phase) will likely yield the greatest reductions and most cost-effective solutions.



source: adapted from CEFC, 2021

Figure 8: Carbon reduction hierarchy for buildings and infrastructure

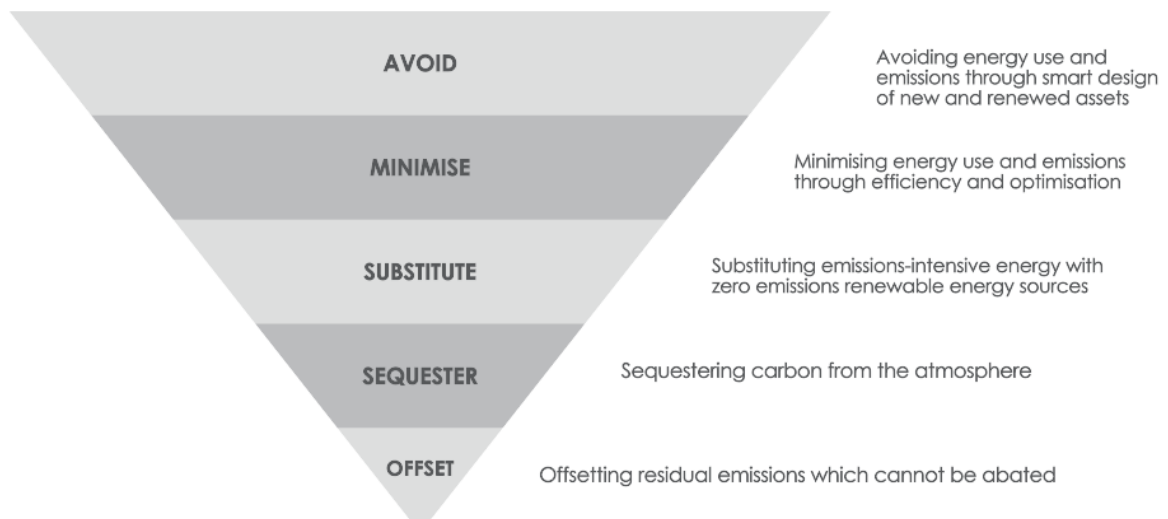
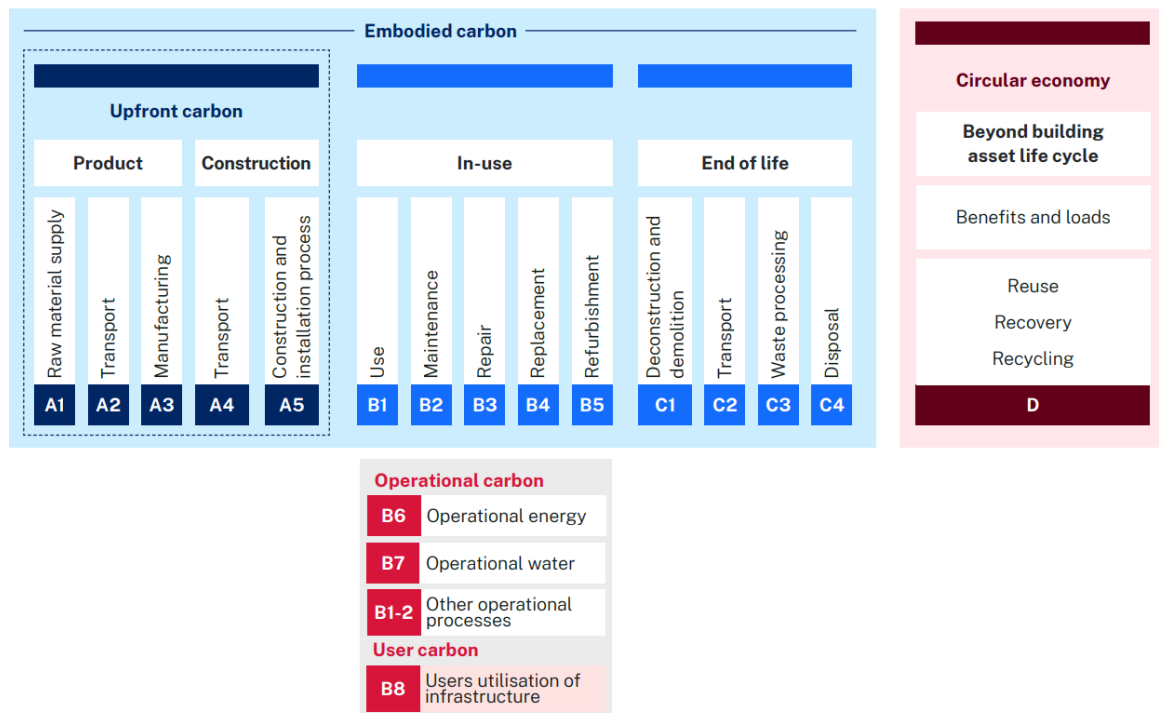


Figure 9: General carbon reduction hierarchy

D2.5 Lifecycle modules

Lifecycle modules provide a standardised framework that outline key steps of an asset for GHG assessments. This is helpful for defining an asset's system boundaries – with respect to GHG assessment – that defines which emission sources are included or excluded, based on their significance.

The European Union EN 15804 for creating EPDs is an internationally recognised reporting standard in the construction and infrastructure industry. The standard outlines various steps or 'lifecycle modules' of a product for example, A1 "Upfront emissions, Product, Raw material supply or B2, "in-use emissions" maintenance.



source: Department for Infrastructure and Transport

Figure 10: Emission sources throughout the asset lifecycle and associated lifecycle modules

D3 Energy

D3.1 Energy efficiency

Energy efficiency is a core focus of SA Water's Environment Corporate Strategy and Energy Strategy and a key driver in reducing both GHG emissions and operational costs. It involves minimising energy consumption through effective planning and design, while maintaining the required level of service, performance or output.

Projects should prioritise energy-efficient systems, technologies and design strategies, such as optimising equipment sizing, reducing energy losses, and incorporating automation, monitoring, and smart controls.

D3.2 Energy source and generation (renewable energy)

Energy generation remains a major contributor to GHG emissions globally and is the largest source of emissions in Australia, primarily due to the continued use of fossil fuels for electricity, heat, and transport. Transitioning to cleaner energy sources is critical to reducing the carbon footprint of infrastructure assets.

Shifting to renewable energy sources, such as solar, wind, and biogas, offers a significant opportunity to reduce operational emissions. South Australia is a national leader in renewable energy, generating over 70% of its electricity from renewables in 2023 and aiming for 100% net renewable generation by 2027.

D4 Ecological assets (Nature Positive)

D4.1 Biodiversity conservation

The United Nations defines biodiversity as the variety of life on Earth, in all its forms, from genes and bacteria to entire ecosystems, such as forests or aquatic environments. Biodiversity is crucial for the functioning of various ecosystems and provides numerous ecosystem benefits to humans, such as clean air and water, food, medicine and cultural and spiritual well-being.

A natural habitat refers to the specific environment where flora and fauna naturally lives and thrives. A natural habitat provides crucial resources such as food, water, shelter and space for the survival of these beings. It encompasses both living (or biotic) and non-living (or abiotic) components that supports life for the inhabitants.

SA Water has a vision of improving biodiversity and ecological health as a key environment objective, as identified in the Environment Corporate Strategy.

D4.2 Ecosystem restoration

Ecosystem restoration is central to SA Water's commitment to creating liveable places and revitalised environments. Design and operational decisions must prioritise the protection and rehabilitation of native vegetation, habitats, and waterways across our land holdings and areas of influence. Projects are to integrate cooling and greening techniques, enhance biodiversity, and avoid or minimise land disturbance wherever possible. Where disturbance is unavoidable, effective offset strategies must be implemented, with preference given to on-site restoration using native species.

Partnerships with Aboriginal communities, landholders, and environmental organisations are essential to guide culturally informed land and water management practices. Restoration activities must embed Aboriginal knowledge systems and consider the role of cultural flows to strengthen spiritual, environmental, and social outcomes. All designs should aim for year-on-year net improvements in biodiversity and support broader ecological resilience in a changing climate.

D4.3 Natural risk assessment and management

SA Water proactively incorporates environmental and heritage assessments into the planning of capital projects to identify potential impacts on ecosystems, catchments, and biodiversity at the earliest stage. This approach ensures that nature-related risks and dependencies are considered alongside climate risks within SA Water's enterprise risk and environmental management frameworks.

Building on these assessments, SA Water evaluates and prioritises the materiality of nature-related risks and opportunities, integrating mitigation measures into strategic planning. The Taskforce on Nature-related Financial Disclosure's [Locate, Evaluate, Assess, Prepare \(LEAP\)](#) framework provides a useful structure to guide this process, supporting regulatory compliance, ecosystem protection, and the achievement of nature-positive outcomes.

D4.4 Natural resilience planning

Natural resilience planning focuses on protecting and enhancing the capacity of ecosystems to absorb stress and adapt to environmental change. Through integrated water management, land stewardship, and biodiversity initiatives, projects should aim to maintain the long-term functionality of catchments, wetlands, and other natural assets critical to water quality and service continuity. Nature-based solutions, such as vegetated buffers, wetland restoration, and green infrastructure, should be prioritised to reduce vulnerability to climate extremes and improve overall ecological health.

D5 Circular economy

D5.1 Waste avoidance and resource recovery

The circular economy is a framework to design systems that have minimal waste and pollution, keep assets and materials at their highest value for as long as possible, and have a positive impact on nature. Circular systems:

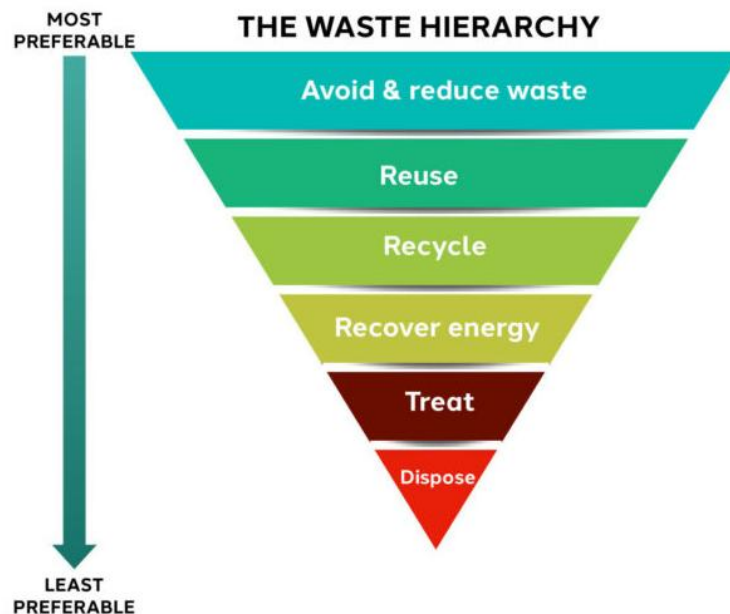
- Use fewer finite resources, generate less waste, and are more resilient.
- Unlock economic benefits through cost efficiencies and creating new value streams.
- Can make a significant contribution to embodied (carbon) emissions reductions through circular interventions such as material reduction and reuse.



source: European Parliament Research Service

Figure 11: The circular economy model

The waste hierarchy (Figure 12) is a globally adopted approach for guiding waste management strategies with the goal of encouraging a more circular economy, away from the traditional 'take-make-dispose' model. The waste hierarchy outlines an order of importance for waste management practices that can be applied throughout the infrastructure lifecycle.



source: Resource Recovery Australia

Figure 12: The waste management hierarchy

D5.2 Resource strategy and material life cycle management

Central to the waste hierarchy and the circular economy model is the principle that the greatest value is achieved by avoiding and reducing waste through intentional design, rather than managing waste as an afterthought. Infrastructure projects are uniquely positioned to lead in circular economy outcomes by implementing circular design principles, reducing material use through design optimisation, maximising reuse and recycling of materials, and supporting the uptake of circular products through sustainable procurement.

To maximise circularity, projects should apply whole-of-life thinking to assess the environmental impact of material choices and design decisions. Lifecycle assessments, material flow data and design optimisation should guide design, procurement, and construction practices, embedding efficiency and minimising material use across the asset lifecycle. Circular economy goals must be enabled by early engagement with suppliers, the use of verified recycled materials, and clear targets for material recovery and reuse. Where feasible, infrastructure should be designed for disassembly, adaptability and repurposing, extending asset life while reducing demand for raw materials.

Circular economy principles shall be considered to develop the resource strategy as shown in Table 29.

Table 29: Circular Economy Principles

Circular Economy Principle	Examples designing out waste opportunities
Prevention	Design for sequential access to relevant services to prevent material damage during maintenance or repair
Share	Allow flexibility within design to acquire unconventional items if necessary and to allow for the potential for material exchange
Life Extension	Design to use durable components and fittings or be able to change out high failure component.
Re-Use	Prioritise the sources and use of re-used materials (SA Water recycled content product list available the AquaMap)
Refurbishment / remanufacture	Consider the use of temporary or relocatable structures
Open loop recycling	Design to specify the use of recycle materials where possible.

D5.3 Decommission and adaptability

Project designers and asset owners shall determine ways to implement circular economy principles from the earliest steps of design. This includes selecting components that support ease of disassembly at end of life, enabling efficient resource recovery, and eliminating problematic waste streams through proactive design choices. For projects that involve decommissioning an existing asset, project designers and asset owners determine ways to reuse, repurpose or recycle decommissioned assets, in accordance with the SA Water approach to decommissioning. Designs should also consider adaptability to extend asset life, reduce waste, and support future upgrades or changes in use.

D6 Water footprint

D6.1 Water withdrawal and discharge

Projects must assess and manage water use across all steps of the asset lifecycle. Water withdrawals should be efficient, justified, and, where possible, substituted with non-potable alternatives such as rainwater or recycled water, particularly during construction. Smart metering and monitoring systems shall be integrated to track water use and identify opportunities for optimisation.

Drain down, commissioning and testing of our assets are often high-water consumption and opportunities to minimise water discharge to the environment are to be determined. Examples of minimising water discharge include reuse of test water for multiple sections, transferring water to local storage, and liaising with neighbouring properties and stakeholders to determine other opportunities.

Discharges must comply with environmental regulations and be managed to minimise impacts on receiving environments. This includes controlling discharge quality, flow regimes, and thermal or chemical loads. Where feasible, projects should incorporate on-site treatment, water reuse systems, or zero-discharge solutions. Alignment with recognised frameworks such as [ISO 46001 – Water Efficiency Management Systems](#), [Green Star – Design & As Built](#), and the [Infrastructure Sustainability Council \(ISC\) Design & As-Built Rating](#) scheme is strongly encouraged.

D6.2 Water consumption reduction

All projects must prioritise the reduction of water consumption during design, construction, operation and maintenance. This includes the selection of water-efficient fixtures, fittings, and systems in line with the [Water Efficiency Labelling and Standards \(WELS\)](#) scheme. Projects should incorporate technologies that minimise water use, avoid losses, and reduce reliance on potable water sources.

Water reduction strategies must be considered early in project planning and embedded in procurement and design decisions. Where applicable, performance targets should be established and supported by smart monitoring systems to track consumption over time and enable continuous improvement. Projects aiming for high sustainability performance are encouraged to align with relevant rating tools and industry best practices.

D6.3 Appropriate use of water sources

The [Water Footprint Network](#) defines a water footprint as the total volume of freshwater consumed or polluted to produce a specific product or activity. Unlike gross withdrawal metrics, a water footprint focuses on net consumption and impact. While SA Water's core services rely on water provisioning, projects that do not directly support service delivery should aim to minimise their water footprint.

Designers and asset planners should consider the most appropriate water sources for each application. This includes reducing reliance on potable water by using recycled, harvested, or other alternative sources where suitable. Opportunities include improving desalination efficiency, minimising evaporation losses, and substituting potable water during construction processes. Where relevant, assessments should be aligned with [ISO 14046 – Environmental Management: Water Footprint](#) to support informed decision making and sustainable design outcomes.

D7 Water sensitive urban design (WSUD)

D7.1 Water sensitive urban design

[Water Sensitive SA](#) defines WSUD as an approach to the planning and design of urban environments focused on integrating the urban water cycle (including potable water, wastewater and stormwater) with the built and natural urban landscape. It is linked to ecologically sustainable development, with a focus on the sustainable management of urban water resources and environmental protection, and the enhancement of socio-cultural conditions.

WSUD measures and technologies can be applied to residential, commercial and industrial developments and buildings. They range from the storage, treatment and use of runoff to water-efficient landscaping. WSUD can help communities achieve greater water sustainability and become more pleasant places to live and work.

Principles of WSUD:

- Re-integrate water back into urban landscape – create microclimate.
- Reuse of water at source (or as close as possible).
- Protect sensitive receiving environments (streams, soils, groundwater and marine).
- Fit-for-purpose water use.

[Water Sensitive SA](#) have a variety of resources to support evaluation, design and implementation of WSUD principles.

D7.2 Blue-green Infrastructure

Green Infrastructure refers to both natural and engineered ecological systems (for example, trees and other landscaped areas, stormwater detention basins) that deliver a range of ecosystem services and community benefits, such as:

- Shade/respice for pedestrians and cyclists.
- Improved liveability and amenity.
- Improved community health and wellbeing.
- Mitigation of urban heat island effect/increased resilience to extreme heat.
- Reduction in stormwater run-off.
- Water and air quality improvement.
- Increased property values for adjacent landowners.
- Increased habitat/biodiversity.
- Reduced demand on downstream drainage infrastructure.
- Carbon sequestration.

Blue-green infrastructure refers to an interconnected network of natural and engineered systems in urban areas, combining green infrastructure with the 'blue' aspect of water bodies. Blue-green infrastructure is regarded as a more nature-friendly means of water and biodiversity management in urban spaces.

Blue-green infrastructure is a key component for SA Water in achieving its 'liveable places and revitalised ecosystems' objective, as outlined in the Environment Corporate Strategy.

D8 Environment and heritage

SA Water must adhere to the relevant environmental laws and regulations throughout project planning, design and delivery. These often relate to managing E&H risks, for example, those related to vegetation, heritage (Aboriginal and non-Aboriginal), site contamination, or waste. These components fall under the broad lens of sustainability but are out of scope of this Technical Standard as they are managed through the E&H framework and assessed in the E&H Assessment. Refer to the *SAWP-ENV-0053 Environment and Heritage Management Framework* and *SAWP-ENV-0054 Preliminary Environment and Heritage Assessment Procedure* for further details.

E Sustainability: Social and community

This appendix provides an overview of general sustainability category principles and context relating to social and community. It is intended to support a deeper understanding of the sustainability categories and their applications.

Table 30: SA Water Social and Community Categories and Subcategories

Category	Subcategory
Health and safety³	SiD ³
	Security in Design ³
	Process safety ³
	Health and safety management and education ³
Stakeholder and community engagement	Stakeholder engagement strategy and risk assessment
	Community engagement and impacts
	Customer feedback and implementation
Cultural knowledge and Aboriginal partnerships	Aboriginal community engagement
	Reconciliation and cultural knowledge
Diversity, equity and inclusion	DEI ³
	Sustainable site facilities
Workforce sustainability	Workforce planning
	Workforce capacity development
	Workforce culture and wellbeing

E1 Health and safety

Safety is a core value in SA Water's business. SA Water is committed to the safe delivery of trusted water services and the health and safety of their people, partners, customers and the community. SA Water follows an approach that is people focused, risk centred, and systems driven, creating an environment that promotes physical and psychological wellbeing. Health and safety is governed at SA Water in accordance with Health and Safety Policy. This process does not fall under the scope of this Technical Standard – a definition is simply introduced here for context as it pertains to social sustainability.

E1.1 Safety in Design

Safe design means the integration of control measures early in the design process to eliminate or, if this is not reasonably practicable, to minimise risks to health and safety throughout the life of the structure being designed.

SA Water implements safe design through the SiD process. Refer to [TS 0101 Safety in Design](#) for further details.

³ Marked categories and subcategories refer to common sustainability practices that do not fall under this Technical Standard and are supported by other systems or process.

E1.2 Security in Design

SA Water, as a supplier of an essential service, operator of critical infrastructure, holder of sensitive information and part of the South Australian Government, has a responsibility to ensure appropriate security arrangements are in place.

SA Water manages the assessment and design of security measures through the SiD process and a security risk assessment. Refer to [TS 0101 Safety in Design](#), Security Risk Assessment, and Security Procedure for further details.

E1.3 Process safety

Process safety aims to prevent incidents involving hazardous materials, energy, or system failures that could lead to harm or environmental damage. Good practice involves applying structured risk assessment tools such as HAZID (Hazard Identification), HAZOP (Hazard and Operability Study), and Layers of Protection Analysis (LOPA), as well as designing for containment, control, and system reliability. Ongoing training, routine risk reviews, and alignment with standards such as [ISO 45001](#), and local water safety regulations are critical to ensuring the safe and reliable operation of water and wastewater infrastructure.

E1.4 Health and safety management and education

SA Water is committed to maintaining a safe and healthy workplace and extending this commitment to the broader community through a proactive and integrated approach to health and safety management. In line with the People and Safety Corporate Strategy, this includes implementing certified systems such as [ISO 45001](#), conducting regular risk assessments, and fostering a strong safety culture. Ongoing education and training are essential and must be tailored to specific roles and risk profiles, supporting both physical and psychological wellbeing. Health and safety practices must also consider the community, with appropriate planning and controls in place to protect public wellbeing around worksites, infrastructure, and service delivery areas.

E2 Stakeholder and community engagement

E2.1 Stakeholder engagement strategy and risk assessment

SA Water defines community and stakeholder engagement as a process of actively involving customers, community members, regulators and other relevant groups in decision-making processes related to water and wastewater services. Engagement must occur across all steps of project delivery whenever possible, from planning and approvals through to design, construction, and operations.

Effective stakeholder engagement is critical to understand diverse needs, preferences and concerns, and for supporting risk management by mitigating potential opposition, delays or reputational harm. It also plays a vital role in securing and maintaining a social license to operate. Engagement strategies should be proportionate to the scale and impact of the project and informed by early risk assessments.

Outcomes from stakeholder engagement shall include:

- Improved understanding of customer needs.
- Increased transparency.
- Positive community impact.
- Stakeholder input influencing project decision-making.
- Enhanced service delivery and project outcomes.

These outcomes contribute to long-term relationships and should be revisited and updated as the project progresses through its lifecycle.

E2.2 Community engagement and impacts

Community engagement is a process to understand and respond to the expectations, experiences, and aspirations of the communities affected by a project. Guided by the Customer and Community Corporate Strategy, engagement should be inclusive, culturally respectful, and tailored to the social context of the area. This includes early engagement with Aboriginal communities and other priority groups to ensure cultural values, land use, and social impact are considered in planning and design.

Projects must assess and manage potential community impacts, such as noise, dust, access disruption, and safety risks, through transparent communication and mitigation strategies. Where possible, projects should deliver social value through co-designed community benefits, educational initiatives, or legacy infrastructure. These actions strengthen trust and ensure that water infrastructure contributes positively to community wellbeing.

E2.3 Customer feedback and implementation

Customer feedback is a valuable input for shaping project delivery, service design, and continuous improvement. In line with the Customer and Community Corporate Strategy, feedback mechanisms should be accessible, responsive, and embedded into decision-making processes. This includes capturing complaints, compliments, and suggestions in accordance with *Customer Complaints, Compliments & Suggestions Procedure* through consultation activities, surveys, digital platforms, formal complaints handling processes, and post-engagement evaluations.

To enhance customer satisfaction, improve service experience and meet regulatory requirements, SA Water produces Customer Experience and Customer Satisfaction Reports on a quarterly and annual basis. Customer satisfaction is also tracked as a key performance indicator within the Corporate Performance Reports. Feedback insights and lessons learned must be used to inform future planning and delivery, ensuring community and customer voices continue to influence outcomes at both the project and enterprise level.

E3 Cultural knowledge and Aboriginal partnerships

E3.1 Aboriginal community engagement

SA Water must adhere to all applicable laws and regulations governing the protection of Aboriginal and non-Aboriginal heritage sites. Heritage risks and approvals on projects are managed through the Preliminary Environment and Heritage Assessment Procedure.

In line with the Customer and Community Corporate Strategy, SA Water is committed to early and ongoing engagement with Aboriginal communities to ensure cultural values, knowledge, and priorities are understood and respected. Projects should enable Aboriginal voices to be meaningfully involved in decisions affecting land, water, and heritage, while supporting culturally safe, inclusive, and positive outcomes for community wellbeing.

E3.2 Reconciliation and cultural knowledge

SA Water's [Stretch Reconciliation Action Plan 2024–2027](#) outlines its commitment to strengthening relationships with Aboriginal and Torres Strait Islander peoples, communities, and organisations. Projects must support the sharing and application of cultural knowledge by creating space for Aboriginal perspectives in planning, design, and delivery. This includes partnering with Traditional Owners, embedding cultural heritage awareness, and supporting employment and procurement opportunities for Aboriginal businesses and individuals. These actions contribute to reconciliation, improve cultural safety, and deliver projects that honour and reflect Country, history, and cultural identity.

E4 Diversity, Equity and Inclusion

E4.1 Diversity, Equity and Inclusion

SA Water are committed to creating a diverse, equitable and inclusive workforce and community, as reflected in the Diversity, Equity and Inclusion (DEI) Strategic Plan 2023-2030. SA Water defines DEI as:

- **Diversity** is about the difference in people. It is about recognising, valuing and respecting the diversity of backgrounds, cultures, beliefs, upbringings, personalities, abilities that people bring.
- **Equity** is about providing everyone with the same opportunities. It does not mean treating everyone the same because everyone is different and therefore, different support or treatment is sometimes necessary to provide everyone with the same chances to fulfill their potential.
- **Inclusion** is about celebrating the diversity of people by bringing them together, making everyone feel heard and seen so they can bring their whole self to work.

E4.2 Sustainable site facilities

Site facilities must be designed and managed to support the health, dignity, and inclusion of all workers and visitors. This includes providing equitable access to clean, safe, and appropriately located amenities such as toilets, handwashing stations, rest areas, and changerooms. In alignment with diversity and inclusion goals, facilities should consider the needs of people of all genders, cultural backgrounds, and physical abilities. Best practice includes gender-neutral options, accessible amenities in accordance with the *Disability Discrimination Act 1992* (Cth), [AS 1428](#), and SA Water Disability Access and Inclusion Plan 2020-2022, and culturally appropriate spaces where relevant.

E5 Workforce sustainability

E5.1 Workforce planning

SA Water's workforce planning is guided by the People and Safety Corporate Strategy and aims to build a future-ready, diverse, and capable workforce. Planning processes must anticipate evolving service demands, emerging risks, and critical capability needs, particularly in digital transformation, environmental resilience, sustainability and infrastructure delivery. To support long-term workforce sustainability, projects and business units should proactively assess future workforce needs, identify gaps, and implement strategies for talent acquisition, succession planning, and knowledge transfer to build a sustainable and agile workforce. SA Water offers a range of entry-level pathways, including graduate programs, traineeships, apprenticeships, cadetships, and student placements, that attract and develop early-career talent across disciplines.

E5.2 Workforce capacity development

Developing internal capability is essential to sustaining high performance and enabling innovation. SA Water invests in continuous learning through formal training, mentoring, on-the-job development, and structured programs that support employees to grow, adapt, and contribute over the long term. Initiatives such as the graduate program, apprenticeships, and cadetships are aligned with the organisation's future skills strategy, ensuring the workforce is equipped to lead and deliver effective outcomes for customers, communities, and a changing operating environment.

E5.3 Workforce culture and wellbeing

SA Water is committed to fostering a safe, inclusive, and supportive workplace culture that promotes both physical and psychological wellbeing. Flexible work arrangements, wellbeing initiatives, and inclusive policies are designed to reflect the diverse needs of the workforce and support a healthy, high-performing environment. Employees have access to the Employee Assistance Program, injury recovery support, and targeted programs that promote mental health and resilience. Entry-level programs also prioritise cultural safety and a strong sense of belonging, ensuring all participants feel valued, supported, and connected throughout their career journey at SA Water.

F Sustainability: Economic sustainability

This appendix provides an overview of general sustainability category principles and context relating to economic sustainability. It is intended to support a deeper understanding of the sustainability categories and their applications.

Table 31: SA Water Economic Sustainability Categories and Subcategories

Category	Subcategory
Sustainable procurement	Supplier assessment and management
	Human rights and modern slavery ⁴
	Supply chain risk and procurement strategy
	Life cycle assessment verifications
Project options assessment⁴	Materiality assessment
	Whole-of-life costing
	Carbon market and costing ⁴
	Equity and distributional impacts ⁴
	Benefits mapping ⁴
	Post project evaluation
Business continuity and legacy	Community investment ⁴
	Tax contribution ⁴
	Society and environment contribution assessment

F1 Sustainable procurement

F1.1 Supplier assessment and management

SA Water selects suppliers through rigorous, competitive tender processes, partnering with over 3,000 local businesses, including Aboriginal-owned enterprises, to deliver services safely, on-time, on budget, and to high quality standards. Supplier evaluation includes not only technical capability, but also performance in social responsibility, economic efficiency and environment performance, consistent with SA Water's Finance Corporate Strategy and Sustainable Procurement Position Statement.

Assessment extends into supplier management, with ongoing performance monitoring, risk mitigation actions, and collaborative engagement to build capacity and innovative outcomes. This approach aligns with SA Water's Procurement Framework and panel-based contracting model, supporting strategic, long-term supplier relationships across categories such as operational services, capital construction, and information technology.

F1.2 Human rights and modern slavery

Modern slavery involves the use of power over an individual to control or use them for their own benefit. It takes away someone's freedom to make choices for themselves. There are many forms of modern slavery such as human trafficking, forced marriage and forced labour. With respects to the workplace, modern slavery practices include when workers do not feel they have a choice about where and when they work, what they do or how long they work for.

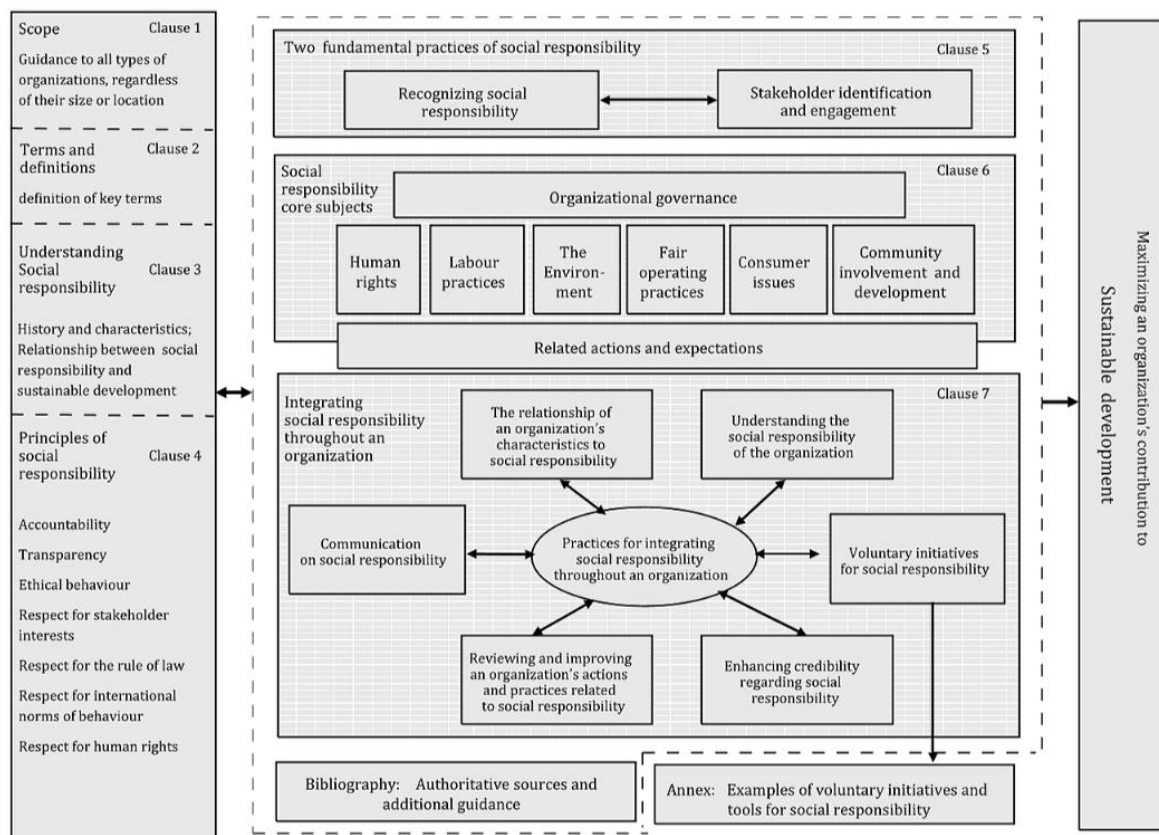
⁴ Marked categories and subcategories refer to common sustainability practices that do not fall under this Technical Standard and are supported by other systems or process.

At SA Water, modern slavery risk management, compliance and reporting are managed at a corporate level, the responsibility of which falls outside this Technical Standard. Projects should consider modern slavery risks and compliance with relevant SA Water policies and procedures when procuring goods and services to reduce the likelihood of modern slavery practices being used in SA Water's supply chain. SA Water aligns with the *Modern Slavery Act 2018* (Cth) which requires large businesses and government entities (consolidated annual revenue of \$100M or more) to report on their efforts to identify and address modern slavery risks in their operations and supply chains.

F1.3 Supply chain risk and procurement strategy

The ISO 20400 'Sustainable Procurement – Guidance' standard defines sustainable procurement as "procurement that has the most positive environmental, social and economic impacts possible over the entire lifecycle". Figure 13 below provides an overview of the ISO 20400 sustainable procurement framework.

The procurement process is intricate and involves numerous players across the whole value chain. As a result, there is no single 'correct' approach as projects can vary greatly from one another. A tailored approach is often required to achieve sustainable procurement outcomes on a project. Designers, asset planners and decision makers are uniquely positioned to drive uptake of sustainable procurement by preferencing sustainable products, including sustainable products in designs and collaborating with suppliers.



source: ISO 20400:2010

Figure 13: Overview of the [ISO 20400](#) sustainable procurement framework

F1.4 Life Cycle Assessment Verifications

The demand for environmental transparency and accuracy in sustainability claims is increasing. As a business, if we understand the environmental impact of a product, we can make more informed choices around sustainable products and processes. Lifecycle Assessment (LCA) Verifications are a method for evaluating the environmental impacts of a product, process, or service across its entire lifecycle. This includes the extraction of raw materials, production, use, and post-use stages. Each of these lifecycle stages can impact the environment in various ways.

Below are examples of different scopes and levels of detail in assessing a product's environmental impact.

- **EPDs** - EPDs are a declaration that quantifies environmental information about the lifecycle of a product.
- **LCAs** - LCAs are comprehensive assessments that evaluate the environmental impacts of a product or service throughout its entire lifecycle, from raw material extraction to disposal. They serve as the foundation for EPDs.
- **Product Carbon Footprints (PCF)** - PCFs focus specifically on the GHG emissions associated with a product or service's lifecycle. While EPDs can include PCF data, PCFs themselves are a narrower assessment.
- **Product Environmental Footprints (PEF)** - PEFs, like EPDs, are a standardised way to communicate environmental information about products. However, EPDs are often favoured for construction products due to their scalability and fitness for purpose.
- **Ecolabels** - Ecolabels, such as the Good Environmental Choice Australia (GECA) label, provide a broader assessment of sustainability, including social and ethical criteria, in addition to environmental impacts. They can offer a more holistic view of a product's sustainability credentials.

F2 Project options assessment

F2.1 Materiality assessment

Projects must apply a materiality assessment early from the Initiate phase throughout the project lifecycle to identify the most significant environmental, social, and economic impacts. The assessment should engage internal and external stakeholders and inform the selection and refinement of project options. Refer to Section 5.2 for more information.

F2.2 Whole-of-life costing

Whole-of-life costing must be applied during the options assessment process to evaluate the full financial, environmental, and operational impacts over an asset's lifecycle. This includes capital expenditure, operational expenditure, maintenance, emissions costs, residual value, and end-of-life treatment. Whole-of-life assessments support transparent, value-based decision making, consistent with ISC requirements and SA Water's prudent and efficient investment principles. Refer to Section 4.2 for more information.

F2.3 Carbon market and costing

Projects should assess carbon impacts across the lifecycle and incorporate relevant carbon pricing or market mechanisms into financial evaluations. This includes identifying emissions reduction opportunities, estimating Scope 1 and 2 emissions, and understanding the cost implications of offsets or abatement. Projects may also explore carbon credit generation or voluntary offsetting as part of broader decarbonisation strategies.

F2.4 Equity and distributional impacts

In line with ISC criteria, project options shall be assessed for their distributional impacts, which refers to how benefits, risks, and costs affect different groups. Particular attention should be given to impacts on vulnerable or disadvantaged communities. Assessment should explore spatial, demographic, and temporal equity and be supported by stakeholder engagement. Actions to mitigate adverse impacts or enhance positive outcomes should be integrated into project planning.

F2.5 Benefits mapping

Projects should establish a clear benefits map to identify and align project outcomes with strategic objectives. This includes defining measurable sustainability, social, and economic benefits, and linking them to specific activities or initiatives within the project. Benefits mapping should be developed collaboratively, updated during project steps, and used to guide delivery and performance reporting.

F2.6 Post project evaluation

For projects seeking external accreditation or internal continuous improvement, a post-project evaluation should be conducted to assess actual outcomes against projected benefits, costs, and sustainability targets. This process encourages lessons learned, benefit realisation, and stakeholder feedback as part of a continuous improvement approach. Evaluations should inform future projects and refine planning, delivery, and operational practices.

F3 Business continuity and legacy

F3.1 Community investment

Projects should identify opportunities to generate lasting value for local communities through targeted community investment. This may include co-investment in community infrastructure, educational initiatives, training and employment programs, or other co-benefits aligned with local priorities. Investment decisions should be guided by stakeholder engagement and aligned with the project's broader social impact and legacy goals.

F3.2 Tax contribution

Economic sustainability includes transparent and responsible financial practices, including the payment of taxes and fees that support public services and infrastructure. Projects should ensure compliance with all relevant tax regulations and consider how procurement, workforce, and delivery models contribute to local and national tax bases. Transparent reporting of direct and indirect tax contributions can enhance trust and demonstrate good corporate citizenship of an organisation.

F3.3 Society and environment contribution assessment

Projects should assess their broader contribution to society and the environment, going beyond compliance to measure positive externalities such as improved public health, access to essential services, biodiversity outcomes, or regional economic uplift. Assessment tools may include social return on investment, cost-benefit analysis (CBA), or triple bottom line frameworks. These assessments inform strategic decisions, demonstrate public value, and align with sustainable finance and investment principles.

G Sustainability: Governance

This appendix provides an overview of general sustainability category principles and context relating to governance. It is intended to support a deeper understanding of the sustainability categories and their applications.

Governance categories and subcategories refer to common sustainability practices that does not fall under this Technical Standard and are supported by other systems or process.

Table 32. SA Water Governance Categories and Subcategories

Category	Subcategory	Description	Reference
Sustainability planning	Sustainability commitment	SA Water demonstrates its sustainability commitment through its corporate strategies and public goals, with a focus on delivering long-term value for customers, communities, and the environment. This includes addressing climate change, supporting biodiversity, reducing emissions, and promoting social equity. Clear leadership direction and integration into corporate planning ensure sustainability is embedded across the organisation.	
	Sustainability management planning	Sustainability management planning outlines how sustainability objectives will be achieved throughout project delivery. This includes assigning responsibilities, setting performance targets, and detailing management actions aligned with environmental and social priorities. It ensures sustainability actions are clear, measurable, and aligned with internal policies and external obligations.	
	Sustainability reporting	Transparent reporting is essential to tracking progress and building stakeholder confidence. SA Water reports on environmental, social, and financial performance through a range of publications, including corporate reports and customer updates. These reports help monitor trends, demonstrate accountability, and inform continuous improvement in sustainability practices.	
	Sustainability knowledge and consultation	Sustainability planning is supported by building organisational capability and engaging with relevant stakeholders. SA Water provides training to staff and incorporates community and expert feedback into its planning and delivery processes. This helps ensure that sustainability decisions reflect both internal expertise and the values of the broader community.	

Category	Subcategory	Description	Reference
Sustainability strategy	Strategic vision and objectives	A strong sustainability strategy sets out the organisation's long-term vision, priorities, and measurable objectives across key environmental, social, and governance areas. These objectives should be integrated into business planning, risk management, and investment decisions to drive sustainable outcomes across projects and operations.	
	Sustainability leadership	Visible leadership is critical for embedding sustainability into organisational culture and delivery. Senior leaders and project managers should actively champion sustainability priorities, allocate appropriate resources, and ensure alignment between strategic goals and day-to-day implementation.	
	Audit, assurance and certification	Regular audit and assurance processes help verify sustainability performance, ensure compliance, and identify improvement opportunities. Third-party certifications, where applicable, provide external validation and demonstrate commitment to recognised standards in environmental management, governance, and responsible business practices.	SA Water Assurance Framework
Sustainability innovation		Innovation plays a key role in advancing sustainability outcomes by improving efficiency, reducing impact, and enhancing community value. SA Water supports a culture of innovation by trialling new technologies, partnering on research, and embedding continuous improvement into project delivery and operations.	
Board composition and structure		Effective board composition and structure are crucial for integrating sustainability into corporate strategy and ensuring long-term value creation. Boards need to ensure they have the right expertise, diversity and process in place to oversee sustainability risks and opportunities, as well as guide sustainable strategic direction. This includes consideration for appropriate governance models, establishing clear roles and responsibilities for sustainability and fostering effective communication and accountability.	- South Australian Water Corporation Charter - SA Water Governance Framework - SA Water Governance Policy
Business ethics and integrity		Business ethics and integrity are essential for building trust and ensuring responsible and sustainable business practices. It is important for SA Water to integrate ethical considerations into core business strategies to continue strengthening its strong reputation and mitigate risks.	SA Water Ethical Standards Procedure

Category	Subcategory	Description	Reference
Risk management and controls	Risk identification and assessment	Effective risk management begins with the early and systematic identification of risks that could affect project delivery, organisational objectives, or operational continuity. This includes financial, operational, environmental, social, legal, and reputational risks. In SA Water, a structured risk assessment process is integrated into business and project planning to prioritise risks based on their likelihood and impact.	SA Water Risk Management Framework
	Risk control and mitigation	Once risks are identified, appropriate controls must be developed and implemented to eliminate, reduce, or manage them. Controls may be technical, procedural, contractual, or behavioural in nature. Ongoing monitoring and review are essential to ensure that mitigation strategies remain effective and responsive to emerging or changing risks throughout the lifecycle of a project or business function.	
	Opportunity identification and implementation	Alongside risk management, organisations should actively seek to identify and implement opportunities that can enhance value, improve performance, or drive innovation. These may arise through risk analysis, stakeholder engagement, or business planning. Capturing opportunities alongside managing risks enables better-informed decision-making and long-term strategic outcomes.	
Cybersecurity and data privacy		Cyber security is the practice of protecting computer systems, networks and data from digital attacks and unauthorised access. As an organisation with over 1 million customers across South Australia, SA Water has a responsibility to manage cyber security risks for our business and customers. At SA Water, personal data that is collected, used, disclosed and stored meets legislative requirements, community expectations and the state government's Information Privacy Principles.	- SA Water Data and AI Governance Framework - SA Water Privacy Policy - SA Water Document Security Classification Guidelines - SA Water Security Procedure

Category	Subcategory	Description	Reference
Regulatory compliance		Compliance is the process of ensuring that SA Water follows all applicable laws, standards, and ethical practices in its daily operations. It requires a collaborative, coordinated, and transparent approach, supported by an ongoing commitment across the organisation to meet regulatory and community expectations SA Water operates within a strong regulatory framework governed by agencies such as Essential Services Commission of South Australia (ESCOSA), SA Health, and the Department for Environment and Water. These bodies oversee service standards, water quality, and resource management to ensure the organisation complies with legal and environmental obligations.	SA Water Corporate Compliance Framework