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Environmental Impact Statement – Chapter 23: Sustainability

Warragamba Dam Raising

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23 Sustainability

This chapter provides an assessment of sustainability during construction and operation of the Warragamba Dam Raising. The relevant Secretary's Environmental Assessment Requirements (SEARs) are shown in Table 23-1.

The Project environment and sustainability policy and Project sustainability strategy will guide future stages of the Project.

Table 23-1. Secretary's Environmental Assessment Requirements: Sustainability

Desired performance outcomes	Secretary's Environmental Assessment Requirements[1]	Where addressed
16. Sustainability Desired performance outcome: The project reduces the NSW Government's operating costs and ensures the effective and efficient use of resources.	1. The Proponent must assess the sustainability of the project in accordance with the Infrastructure Sustainability Council of Australia (ISCA) Infrastructure Sustainability Rating Tool and recommend an appropriate target rating for the project.	Section 23.3.1
Conservation of natural resources is maximised.	2. The Proponent must assess the project against the current guidelines including targets and strategies to improve Government efficiency in use of water, energy and transport.	This chapter

1 Note: this chapter specifically addresses SEAR 16 in addition to those general requirements of the SEARs applicable to all chapters and as identified as such in Chapter 1 (Section 1.5, Table 1-1).

23.1 Background

Ecologically sustainable development (ESD) is described as using, conserving and enhancing the community's environmental resources in a manner that sustains and improves ecological processes, and hence the quality of life, for present and future generations.

The principles of ESD in conjunction with the Infrastructure Sustainability Council of Australia (ISCA) Infrastructure Sustainability Rating Tool V1.2 (IS Rating Tool V1.2) and Transport for NSW (TfNSW) *Sustainable Design Guidelines* Version 4.0 (SDG V4) have been used for the sustainability assessment[1]. A gap analysis and consistency check were undertaken to ensure that the objectives and targets of the NSW *Government Resource Efficiency Policy* (GREP) aligned with the IS Rating Tool V1.2.

This sustainability assessment process involved the development of a Project environment and sustainability policy and a Project sustainability strategy. The Project sustainability strategy identifies key potential sustainability initiatives that aim to maximise the conservation of natural resources, provide energy and water efficient design and construction methodologies, and reduce the generation of waste.

The assessment and rating at this time is preliminary in nature and cannot accurately be determined until later in the design development process. The Project environment and sustainability policy and Project sustainability strategy will be used to inform sustainability practices for design and construction of the Project, and a detailed assessment will be undertaken at later stages of the Project.

The Project sustainability strategy would be used to develop a sustainability management plan (SMP) for the design, construction and operation of the Project. The SMP will provide the sustainability requirements for the delivery of the Project.

1 The SEARs refer to the TfNSW Sustainable Design Guideline V3.0. This version has been superseded by SDG V4.0.

23.1.1 Legislative context

The Project has been assessed against the principles of ESD in line with the objects of relevant environmental legislation for the Project including:

- *Protection of the Environment Administration Act 1991* (POEA Act)
- *Environmental Planning and Assessment Act 1979* (EP&A Act)
- Environmental Planning and Assessment Regulation 2000 (EP&A Reg)
- *Water Management Act 2000* (WM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Commonwealth)
- *National Greenhouse and Energy Reporting Act 2007* (NGER Act) (Commonwealth).

23.1.1.1 Protection of the Environment Administration Act 1991

Section 6(2) of the POEA Act defines four principles for ESD as follows:

1. The precautionary principle: If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation
2. Inter-generational equity: The present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations
3. Conservation of biological diversity and ecological integrity should be a fundamental consideration of the decision to undertake the activity
4. Improved valuation, pricing and incentive mechanisms: The users of goods and services should pay prices that include the use of natural resources and assets and the ultimate disposal of any waste generated by the provision of that good or service, and that environmental goals, having been established, should be pursued in the most cost effective way.

These principles align with the IS Rating Tool V1.2. Biodiversity is discussed in Chapters 8, 9 and 10, and waste management is discussed in Chapter 26.

23.1.1.2 Environmental Planning and Assessment Act 1979

One of the objectives of the EP&A Act is to '*to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.*' (section 1.3 (b)).

These principles align with the IS Rating Tool V1.2. Biodiversity is discussed in Chapters 8, 9 and 10.

23.1.1.3 Environmental Planning and Assessment Regulation 2000

The EP&A Reg (Schedule 2, Part 3, clause 7(4)) states

> *The principles of ecologically sustainable development are as follows:*
>
> *(a) the precautionary principle, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:*
>
> *(i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and*
>
> *(ii) an assessment of the risk-weighted consequences of various options,*
>
> *(b) inter-generational equity, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,*
>
> *(c) conservation of biological diversity and ecological integrity, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,*
>
> *(d) improved valuation, pricing and incentive mechanisms, namely, that environmental factors should be included in the valuation of assets and services, such as:*

(i) *polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,*

(ii) *the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,*

(iii) *environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.*

These principles align with the IS Rating Tool V1.2. Biodiversity is discussed in Chapters 8, 9 and 10 and waste management is discussed in Chapter 26.

23.1.1.4 Water Management Act 2000

The sustainability objectives of the WM Act are to '*provide for the sustainable and integrated management of water resources for the State for benefit of both present and future generation*' and to '*apply the principles of ecologically sustainable development*'.

The Project has assessed sustainability using the IS Rating Tool V1.2, GREP and SDGV4. The Project will be undertaken in accordance with a sustainability management plan during detailed design, construction and operation.

23.1.1.5 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act aims to promote ecologically sustainable development through the conservation and ecologically sustainable use of resources. This has been captured through the sustainability assessment and would be implemented through the Project sustainability management plan during detailed design, construction and operation. The sustainability management plan would document the monitoring and reporting requirements to ensure that the sustainability performance targets for the Project are met.

23.1.1.6 National Greenhouse and Energy Reporting (NGER) Act 2007

The NGER Act provides a national framework to report on greenhouse gas emissions, energy production and consumption.

The Project will be undertaken in accordance with a sustainability management plan during detailed design, construction and operation. The sustainability management plan would document the monitoring and reporting requirements to ensure that the sustainability performance targets for the Project are met including greenhouse gas emissions and energy consumption.

23.1.2 National policy framework

National polices applicable to sustainability include:

- the *National Waste Policy: Less Waste, More Resources* (Environment Protection and Heritage Council (EPHC) 2009): the purpose of the policy is to improve waste management nationally. The policy provides a framework for action by government, business and industry. It provides discussion of waste as a resource and the theme of a circular economy. The waste management principles align with the IS Rating Tool V1.2 for example increasing rates of recycling and reduction of embodied energy through the use of materials with recycled content
- *Sustainable Procurement Guide* (Commonwealth of Australia 2013) address the lifecycle of goods and services. Sustainable procurement is a key theme of the IS Rating Tool V1.2.

23.1.3 NSW Government policy framework

Government strategies applicable to sustainability, resource use and energy efficiency include:

- *NSW Climate Change Policy Framework* (OEH 2016a): this facilitates the NSW Government's planning for climate risks, and includes the assessment and management of climate change risks to government owned assets. The IS Rating Tool V1.2 climate adaptation theme addresses climate change risks. Climate change is also discussed in Chapter 14
- *NSW Government Resource Efficiency Policy 2014* (OEH 2014d): the *NSW Government Resource Efficiency Policy* 2014 (GREP 2014) provides leadership in resource efficiency and is aimed at reducing the operating costs of NSW Government agencies. Many of the policy measures align with the IS Rating Tool V1.2 themes covering energy, water, waste and transport

- *NSW Waste and Resource Strategy* (WARR) (NSW Environment Protection Authority (EPA) 2014a): the policy aligns with the NSW Government's waste reforms that encourage innovation and improve recycling behaviour. These principles align with the IS Rating Tool V1.2.

23.1.4 Infrastructure Sustainability Council of Australia Infrastructure Sustainability Rating Scheme

ISCA is a member-based not for profit public and private industry council. The IS rating scheme is a sustainability performance rating tool that guides and evaluates the sustainability of the design, construction and operation phases of an infrastructure asset or project.

ISCA defines sustainable infrastructure as

> '*infrastructure that has been planned, designed and delivered to meet the needs of society whilst enhancing our environment and economy. To have the best infrastructure sustainability outcomes, sustainability needs to be considered as early in the infrastructure life cycle as possible*.' (ISCA 2018; p. 12)

To address the requirements of the SEARs, the sustainability of the Project has been assessed in accordance with the IS Rating Tool V1.2. While the current version of the tool (V2.0) was released on 1 July 2018, after the issue of the SEARs, many projects across Australia and New Zealand are still using V1.2 and therefore it is still a relevant version of the tool to assess the Project sustainability requirements.

23.2 Assessment methodology

The sustainability assessment has been undertaken for the Project to inform the effective and efficient use of resources. The assessment has used the IS Rating Tool V1.2 and included a gap analysis to facilitate alignment of the objectives and targets of the GREP and TfNSW SDG V4.with the IS Rating Tool V1.2. The assessment is supported by investigations, which have been documented in Table 23-2, Table 23-3, Table 23-4 and Table 23-5.

The sustainability assessment involved a three staged approach as follows:

1. development of an environment and sustainability policy (the policy)
2. development of a sustainability strategy (the strategy)
3. development of recommended sustainability initiatives.

The policy and the strategy would be implemented, reviewed and updated as required regularly during the detailed design, construction and operation of the Project. The policy and strategy are underpinned by the principles of ESD.

23.2.1 IS Rating Tool

The sustainability assessment identified initiatives that could be implemented to improve the environmental and sustainability performance of the Project. The assessment using the IS Rating Tool V1.2 assessed the Project against 15 categories that are grouped into the following themes:

- management and governance
- using resources
- emissions, pollution and waste
- ecology
- people and place
- innovation.

The IS Rating Tool V1.2 applies a point score across the 15 categories, each of which addresses a specific aspect of sustainability performance. The IS rating is determined by a score out of 110 and has four rating levels;

1. scores from 25 to <50 points: **Commended** indicates that a project is achieving better than business as usual. Note that Scores <25 points are not eligible to apply for a certified rating
2. scores from 50 to <75 points: **Excellent** indicates that a project is generally achieving best practice in sustainability within Australia
3. scores from 75 to 100 points: **Leading** rating is close to world's best practice
4. score up to 110 points: Bonus 10 points for exceptional practice.

The IS Rating Tool V1.2 can be applied to the design only or both design and construction (As-Built).

A workshop was held on 22 May 2018 with participants from WaterNSW, SMEC and Stantec GHD Joint Venture representing the proponent (asset owner), environmental impact assessors and Project designers respectively. The workshop covered the following:

- introduction to the IS Rating Scheme and IS Rating Tool V1.2
- overview of known environmental constraints
- review and finalisation of the Project environment and sustainability policy
- self-assessment of weightings
- self-assessment of design IS Rating Tool V1.2 scorecard
- review of category credits, credit benchmarks, evidence requirements and potential feasibility for the Project.

IS Rating Tool V1.2 categories are divided into a number of credits that address a specific sustainability issue. The Project was assessed against each potential credit considering the activities required during design, construction and operation. The workshop discussed the business as usual approach that would be applicable to the Project, and then additional benchmarks that would be feasible and practicable. The sustainability benchmarks associated with the credits were reviewed against the environmental and sustainability policy objectives for the Project.

During the workshop, a weightings assessment, feasible credits and credit levels were nominated for the Project and documented in the Design IS Rating Tool V1.2 spreadsheet.

The credits do not have equal scores where each credit is allocated relative scores depending on the materiality of the issue determined during the weighting assessment process.

Each credit has specific benchmark requirements for specific levels. The maximum performance level is unique to each credit and there are associated higher points available for the highest performance level nominated. Each credit has performance levels, that reflects a relative number of points available for each credit. Some credits allocate a score per credit and others are based on a sliding scale. The higher the Level, the higher number of points available for the credit.

The assessment was based on the design rating where a 'Commended' rating was recommended. Further assessment of construction specific credits would be undertaken in future stages of the Project. Further discussion on the IS Rating tool is outlined in Section 23.3.1.

23.2.2 Government Resource Efficiency Policy

The Project team assessed the Project against GREP 2014. The aim of the GREP assessment is to assist in reducing WaterNSW's operational costs and to facilitate the efficient use of resources for the Project. WaterNSW, as a state-owned corporation (SOC), is not mandated to comply with the GREP, however SOCs are strongly encouraged to adopt the policy. The GREP assists in delivering more sustainable outcomes in energy usage, water usage, waste generation and air emissions.

An assessment of the policy and alignment with the IS Rating Tool categories and credits is presented in Section 23.4.

23.2.3 Transport for NSW sustainable design guidelines

The sustainability assessment determined the applicable compulsory requirements of the TfNSW SDG V4.0. An alignment assessment of the SDG V4.0 with the IS Rating Tool V1.2 potential credits and levels was undertaken to determine an equivalent SDG V4.0 rating. This identified that the Project's nominated sustainability initiatives would be similar to the SDG V4.0 bronze rating.

23.2.4 Benchmarking

Benchmarking was undertaken using the Enlarged Cotter Dam project, which achieved a 'Commended' As Built V1.0 IS Rating. The Enlarged Cotter Dam project achieved a score of 40.9. Key initiatives of the Enlarged Cotter Dam project that are also relevant to this Project include:

- 100 percent of potable water use replaced with non-potable water where the location of the existing dam provided a readily available source of non-potable water
- UV technology was used to treat dam water to drinking water for site workers and offices
- the increase in fly ash content in concrete and sourcing aggregates from site provided a significant reduction in the lifecycle environmental impact of materials use.

Targeting initiatives to achieving the equivalent to a 'Commended' rating will drive sustainability outcomes of:

- improved sustainability knowledge sharing
- consideration of sustainable products and materials for the lifecycle of the asset
- design and operations, which are resilient to the impacts of climate change
- incorporating water and energy efficiencies into the construction and operation of the asset
- minimisation of potential sources of pollution
- minimisation of the generation of waste
- adopting best practice approaches for stakeholder and community engagement
- promotion and protection of heritage
- adopt best practice urban design principles
- incorporate innovation.

A 'Commended' rating is consistent with achieving GREP obligations and the principles of ESD. The rating would be further assessed in future stages of the Project.

23.3 Assessment results

23.3.1 IS Rating Tool

The assessment identified potential Project credit achievements that would be suitable for the Project, and that would be equivalent to achieving a 'Commended' design rating.

Based on the sustainability assessment using the IS Rating Tool V1.2, the key sustainability issues for the Project are as follows:

- climate change resilience addressed in the design
- pollution control is optimised
- use of previously disturbed land is optimised
- resource use is minimised (energy and carbon, water and materials)
- waste produced during construction is minimised
- protect and promote local heritage through appropriate design, planning and management controls
- engagement with key stakeholders and community
- best practice urban design principles are considered.

The potential sustainability initiatives will be reviewed, assessed and updated as required at the various Project phases.

Table 23-2 identifies potential credits and levels for a 'Commended' ISCA IS Rating, however flexibility should be provided to the detailed design and construction contractors to drive innovation and sustainability improvements while also delivering a cost and time effective solution to the local community and stakeholders. The potential Project credit achievement nominated for the Project was based on the information available at concept design. It should be noted that this is a preliminary assessment and more detailed assessments would be undertaken in future Project stages. High level commentary has been provided about potential avenues for achieving each credit.

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Table 23-2. Potential Project credit achievement

Credit	Description	Potential level	General Project comment	Project phase(s)
Man-1	Sustainability Leadership and commitment	1	Sustainability objectives and targets were discussed in a working group forum and a Project environmental and sustainability policy and strategy developed. The environmental and sustainability policy and strategy will inform future Project stages. Future commitments to targets may assist in achieving sustainability outcomes.	Planning, concept design, detailed design and construction.
Man-2	Risk and opportunity management	2	The environmental and social impacts of the Project are being assessed in the EIS. The assessment of environmental, social and economic risks and opportunities may assist in reducing Project risks and provide benefits to the Project and stakeholders.	Planning, concept design, detailed design and construction.
Man-3	Ongoing organisational structure, roles and responsibilities	0	The Project will align with WaterNSW environmental governance structure. Having sustainability responsibilities would enhance sustainability outcomes.	Planning, concept design, detailed design and construction.
Man-4	Inspections and auditing	1	The Project will align with WaterNSW environmental governance structure. Regular inspections and auditing assists in identifying issues for rectification.	Detailed design and construction.
Man-5	Reporting and review	2	Regular sustainability performance reporting assists in communicating with stakeholders and identifying issues for rectification.	Detailed design and construction.
Man-6	Knowledge sharing	2	Corporate sustainability knowledge is increased. Project knowledge is or may be shared with the wider infrastructure industry.	Detailed design and construction.
Man-7	Decision making	1	Evaluating options considering environmental, social and economic assessment provides a structured and consistent process for decision making.	Detailed design and construction.
Pro-1	Commitment to sustainable procurement	2	Develop a sustainable procurement policy and sustainability management plan to improve sustainability outcomes.	Detailed design and construction.
Pro-2	Identification of suppliers	2	Develop a sustainable procurement policy and sustainability management plan to improve sustainability outcomes.	Detailed design and construction.
Pro-3	Supplier evaluation and contract award	1	Develop a sustainable procurement policy and sustainability management plan to improve sustainability outcomes.	Detailed design and construction.
Pro-4	Managing supplier performance	1	Develop a sustainable procurement policy and sustainability management plan to improve sustainability outcomes.	Detailed design and construction.

Credit	Description	Potential level	General Project comment	Project phase(s)
Cli-1	Climate change risk assessment	3	A climate change risk workshop was undertaken as part of the EIS process.	Planning, reference design, detailed design and construction.
Cli-2	Adaptation options	2	Extreme, high and medium priority climate change risks were identified and discussed in Chapter 14.	Planning, reference design, detailed design and construction.
Ene-1	Energy and carbon monitoring and reduction	0	Monitoring of energy use and greenhouse gas emissions is good practice and may contribute to savings in concrete, steel and transport costs. Modelling can be used to influence design and construction.	Detailed design and construction.
Ene-2	Renewable energy	1	Investigate options for renewable energy.	Detailed design and construction.
Wat-1	Water use monitoring and reduction	1	Large volumes of water will be required in the concrete batching process. The modelling will assist in identifying areas to target water saving initiatives.	Detailed design and construction.
Wat-2	Replace potable water	2	Options for reducing potable water will be investigated.	Detailed design and construction.
Mat-1	Material footprint measurement and reduction	0	Reducing the volume of materials will provide Project cost savings and should be considered.	Detailed design and construction.
Mat-2	Environmentally labelled products and supply chains	1	Use of environmentally labelled products.	Detailed design and construction.
Dis-1	Receiving water quality	3	Environmental compliance.	Detailed design and construction.
Dis-2	Noise	2	Environmental compliance and improved relationship with the surrounding community.	Detailed design and construction.
Dis-3	Vibration	3	Environmental compliance and improved relationship with the surrounding community.	Detailed design and construction.
Dis-4	Air quality	1	Environmental compliance and improved relationship with the surrounding community.	Detailed design and construction.

Credit	Description	Potential level	General Project comment	Project phase(s)
Dis-5	Light pollution	Scoped out	The weightings assessment scoped out this credit during design. Measures to prevent light spill during construction may be considered.	Construction
Lan-1	Previous land use	3	The land used for the existing asset is used in the previously used land and is being altered through the raising of the dam height.	Detailed design and construction.
Lan-2	Conservation of onsite resources	2	Easily incorporated into soil management plans. It is noted that the majority of the Project is on previously disturbed land.	Detailed design and construction.
Lan-3	Contamination and remediation	0	Site works should be managed to avoid disturbance of known buried contamination. No known contamination remediation works are proposed. Unexpected finds protocol would apply. Contaminated land is discussed in Chapter 22.	Construction-
Lan-4	Flooding design	2	The highest Lan-4 credit level has been nominated. Flood mitigation design is the main design criteria for the Project.	Detailed design and construction.
Was-1	Waste management	2	The highest Was-1 credit level has been nominated. Reducing waste volumes and maximising reuse and recycling reduces Project costs.	Detailed design and construction.
Was-2	Diversion from landfill	1	Reducing waste volumes and maximising reuse and recycling reduces Project costs.	Detailed design and construction.
Was-3	Deconstruction/Disassembly/Adaptability	0	The Project did present opportunities for a deconstruction plan. Future stages of the Project may investigate components or pre-fabricated units that can be easily separate on disassembly / deconstruction into material types for recycling or reuse.	Detailed design and construction -
Eco-1	Ecological value	1	Detailed ecological assessments are being carried out as part of the EIS process. Biodiversity is discussed in Chapter 8, 9 and 10.	Planning, reference design, detailed design and construction.
Eco-2	Habitat connectivity	0	Detailed ecological assessments are being carried out as part of the EIS process. Biodiversity is discussed in Chapter 8, 9 and 10.	Planning, reference design, detailed design and construction.
Hea-1	Community health and well-being	1	Stakeholder engagement is being undertaken as a part of the EIS process. This could be expanded to identify areas for positive contribution to the community health and wellbeing. It is noted that one of the objectives for the Project is reduced flooding risk for the wider Sydney region. Stakeholder engagement is discussed in Chapter 6 and Appendix D Community consultation report.	Planning, reference design, detailed design and construction.
Hea-2	Crime prevention	0	Future stages of the Project will address crime prevention through environmental design.	Detailed design and construction

Credit	Description	Potential level	General Project comment	Project phase(s)
Her-1	Heritage assessment and management	2	Heritage is being assessed as a part of the EIS process and discussed in Chapter 17 and Chapter 18. This includes preparation of interpretation plans which could contribute to improved stakeholder relationships.	Planning, reference design, detailed design and construction.
Her-2	Monitoring and management of heritage	1	Environmental compliance.	Construction.
Sta-1	Stakeholder engagement strategy	1	Stakeholder engagement is being carried out as part of the EIS process and is discussed in Chapter 6 (Consultation) and Appendix D (Community consultation report). The strategy is to be further developed and amended during the detailed design and construction stages.	Planning, reference design, detailed design and construction.
Sta-2	Level of engagement	2	Stakeholder engagement is being carried out as part of the EIS process and is discussed in Chapter 6 (Consultation) and Appendix D (Community Consultation Report). The strategy is to be further developed and amended during the detailed design and construction stages.	Planning, reference design, detailed design and construction.
Sta-3	Effective communication	1	Stakeholder engagement is being carried out as part of the EIS process and is discussed in Chapter 6 (Consultation) and Appendix D (Community consultation Report). The strategy is to be further developed and amended during the detailed design and construction stages.	Planning, reference design, detailed design and construction.
Sta-4	Addressing community concerns	0	Stakeholder engagement is being carried out as part of the EIS process and is discussed in Chapter 6 (Consultation) and Appendix D (Community consultation report). The strategy is to be further developed and amended during the detailed design and construction stages.	Detailed design and construction.
Urb-1	Urban design	2	An urban and landscape design plan will be prepared during the detailed design phase. Visual impacts are discussed in Chapter 25 (Visual amenity) and Appendix P (Landscape character and visual impact assessment report).	Detailed design and construction.
Urb-2	Implementation	1	An urban and landscape design plan will be prepared during the detailed design phase. Visual impacts are discussed in Chapter 25 (Visual amenity) and Appendix P (Landscape character and visual impact assessment report).	Detailed design and construction.
Inn-1	Innovation	0	Open to the detailed designer and construction contractor to bring sustainability innovation to the Project.	Detailed design, construction.

23.3.2 Government Resource Efficiency Policy

The relevant policy measures, targets and minimum standards for the Project and alignment with the IS Rating Tool V1.2 are presented in Table 23-3. An assessment of all policy measures is presented in Table 23-4.

Table 23-3. GREP measures, targets and minimum standards and associated IS Rating Tool Credit V1.2

GREP policy measures, targets and minimum standards	IS rating tool credit
E3: Minimum standards for new electrical appliance and equipment	Ene-1 Energy and carbon monitoring and reduction
E7: Purchase 6% GreenPower	Ene-2 Use of renewable energy
W1: Report on water use	Wat-1 Water use monitoring and reduction
W3: Minimum standards for new water-using appliances	Wat-1 Water use monitoring and reduction
P1: Report on top three waste streams	Was-1 Waste management
A1: Air emission standards for mobile non-road diesel plant and equipment	Dis-4 Air quality
A2: Low volatile organic compounds (VOC) surface coatings	Dis-4 Air quality

The relevant GREP measures, targets and minimum standards have been incorporated into the Project's sustainability goals, objectives and initiatives.

A number of targets were considered to be not applicable to the Project. These were as follows:

- E1: targets to undertake energy efficient projects. This target is to undertake energy efficiency projects at sites and not the intent of the Project. The sustainability strategy includes identifying and implementing feasible initiatives relating to energy efficiency.
- E2: minimum NABERS Energy ratings for offices and data centres. This is applicable to owned and leased office buildings and data centres.
- E4: minimum standards for new buildings. This is applicable to the construction of a new buildings.
- E5: identify and enable solar leasing opportunities. This is applicable to small government sites (Contract 776 – Supply of Electricity – Small Sites).
- E6: minimum fuel efficiency standards for new light vehicles. This is applicable to the purchase or lease of new light vehicles. The Project operation will not include the purchase of new vehicles. Potential sustainability initiatives include consideration of lower carbon construction transport options.
- W2: minimum water standards for office buildings. This is applicable to all new and refurbished owned office buildings and leased office buildings with a net lettable area of over 2,000 square metres.

Table 23-4. GREP measures, targets and minimum standards assessment and their applicability to the Project.

GREP measures, targets and minimum standards	General project comment	Applicable to the Project
E3: Minimum standards for new electrical appliance and equipment	Greenhouse and energy minimum standards (GEMS), Energy Star for equipment purchases.	Yes, appliances and equipment purchased may include air to air heat pumps and air conditioners, computers, distribution transformers, electric motors, external power supplies, closed control air conditioners.
E7: Purchase 6% GreenPower	Coverage: All general government sector agencies except NSW local health districts.	Yes, if purchasing electricity outside Contracts 776 and 777, specifications to purchase a minimum of 6% GreenPower are to be applied. ENE-2 Use of renewable energy addresses this measure.

GREP measures, targets and minimum standards	General project comment	Applicable to the Project
W1: Report on water use	Agencies will report on water use where data is available from agency-held accounts.	Yes, Wat-1 Water use monitoring and reduction addresses this measure
W3: Minimum standards for new water-using appliances	All new water-using appliances, shower heads, taps and toilets purchased by agencies must be at least the average Water Efficiency Labelling Scheme (WELS) star rating by product type.	Yes, applicable to any new staff/office facilities.
P1: Report on top three waste streams	All agencies will report on their top three waste streams by total volume and by total cost.	Yes, Was-1 Waste management addresses this measure.
A1: Air emission standards for mobile non-road diesel plant and equipment	All agencies purchasing, leasing or contracting non-road diesel plant and equipment.	Yes, Contractor supplied and government purchased equipment will comply with EU or US EPA standards. Dis-4 Air quality addresses this measure.
A2: Low-VOC surface coatings	All surface coatings will comply with the Australian Paint Approval Scheme (APAS) where fit for purpose.	Yes, Agencies will update standard contract specifications for sub-contractors for work that requires use of general-purpose surface coatings. Dis-4 Air quality addresses this measure.

23.3.3 NSW sustainable design guidelines V4.0

The relevant compulsory requirements (CR) for the Project and alignment with the IS Rating Tool V1.2 are presented in Table 23-5.

Table 23-5. NSW Sustainable Design Guidelines V4.0 compulsory requirements and associated IS Rating Tool Credit V1.2

SDG v4	IS rating tool credit	Potential sustainability initiatives (SDG v 4)
CR 1 - Construction Greenhouse Gas (GHG) emissions.	Ene-1 Energy and carbon monitoring and reduction.	Reduce construction related GHG emissions by a minimum 5% from the Project baseline GHG footprint. The base case will be determined at future stages of the Project.
CR 2 - Operational energy.	Ene-1 Energy and carbon monitoring and reduction.	CR 2 applies only to the building component of the Project. Energy efficiency to be addressed in the detailed design and construction.
CR 2A - Energy efficient appliances.	Ene-1 Energy and carbon monitoring and reduction.	All new electrical equipment (for the final asset) to be at least market average star rating. In categories where no star rating is available, equipment purchased should be recognised as high efficiency either being ENERGY STAR accredited, in a high efficiency band under Australian Standards or being above-average efficiency of Greenhouse and Energy Minimum Standards (GEMS) registered products.
CR 3 - Climate change risk.	Cli-1 Climate change risk assessment and Cli-2 Adaptation measures.	Undertake a climate risk assessment that mitigates all extreme and high residual risks. Mitigate all extreme and high risk, and 25% of medium risks.
CR 4 - Waste diversion.	Was-1 Waste management and Was-2 Diversion from landfill.	Waste management is addressed in Chapter 26. SMP to identify further opportunities.

SDG v4	IS rating tool credit	Potential sustainability initiatives (SDG v 4)
CR 5 - Beneficial spoil reuse.	Lan-2 Conservation of on-site resources.	Waste management is addressed in Chapter 26. SMP to identify further opportunities.
CR 6 - Water sensitive urban design (WSUD).	Dis-1 Receiving water quality.	The SMP to identify WSUD opportunities.
CR 7 - Construction water.	Wat-1 Water use monitoring and reduction and Wat-2 Replace potable water.	Monitor and report water consumption during Project construction and reduce potable water consumption during Project construction and reduce potable water consumption where practicable. Potable and non-potable construction water monitored.
CR 8 - Operational water.	Wat-1 Water use monitoring and reduction and Wat-2 Replace potable water.	The SMP to identify operational water efficiency measures.
CR 8A - Water efficient appliances.	Wat-1 Water use monitoring and reduction.	All new water-using appliances, shower heads, taps and toilets must be at least the average Water Efficiency Labelling Scheme (WELS) star rating by product type.
CR 9 - Low VOC surface coatings.	Dis - 4 Air quality.	All surface coatings to comply with the Australian Paint Approval Scheme (APAS) volatile organic compounds limits where fit for purpose.
CR 10 - Mobile non-road diesel plant emissions reporting.	Dis - 4 Air quality.	All mobile non-road diesel plant and equipment (with an engine greater than 19kW) to report engine conformity with relevant United States Environmental Protection Agency (US EPA), European Union (EU) or equivalent emissions standards and the fitting of any exhaust after-treatment devices.
CR 11 – Vegetation offsets	Eco-1 Ecological value	CR11 is only applicable to projects with non-significant biodiversity impacts.
CR 12 - Sustainable procurement.	Pro 1 Commitment to sustainable procurement, Pro-2 Identification of suppliers, Pro-3 Supplier evaluation and contract award.	Develop a sustainable procurement policy and sustainability management plan to improve sustainability outcomes.
CR 13 - Urban design.	Urb-1 Urban design.	An urban and landscape design plan will be prepared during the detailed design phase. Visual impacts are discussed in Chapter 25 (Visual amenity) and Appendix P (Landscape character and visual impact assessment report).
CR 14 - Innovation and project legacy.	Inn-1 Innovation strategies and technologies.	Achieve an innovation credit or make a contribution to industry and/or the local community. Socio-economic, land use and Property are discussed in Chapter 21 (Socio-economic, land use and property) and Appendix M (Socio-economic, land use and property assessment report).

23.4 Environmental management measures

23.4.1 Environmental and sustainability policy

An environmental and sustainability policy has been developed for the Project. This provides the framework for the sustainable design, construction and operation of the Project and will inform future stages of the Project. The environmental and sustainability commitments are to:

- identify and control environmental risks and impacts where practicable
- influence the activities of ourselves and others to continually improve environmental performance
- establish a strong relationship between environmental performance and project objectives
- conserve or enhance the natural, Aboriginal and non-Aboriginal heritage values of our assets, where practical
- promote environmentally responsible practices to our employees, contractors and stakeholders
- maintain measures for the efficient use of resources and reduction of pollution
- meet all relevant compliance obligations and seek to adopt best practice approaches where practical
- develop and maintain collaborative relationships with our key stakeholders and other important partnerships in order to obtain sustainable outcomes
- evaluate and promote sustainability initiatives throughout the life of the project
- establish, monitor, measure and report on sustainability objectives and targets
- provide appropriate training, information and resources
- report and record all concerns and incidents to prevent harm to the environment
- explore new benchmarks by expecting quality, value for money and benefit maximisation (environment, economic and social) from our designers, contractors and suppliers.

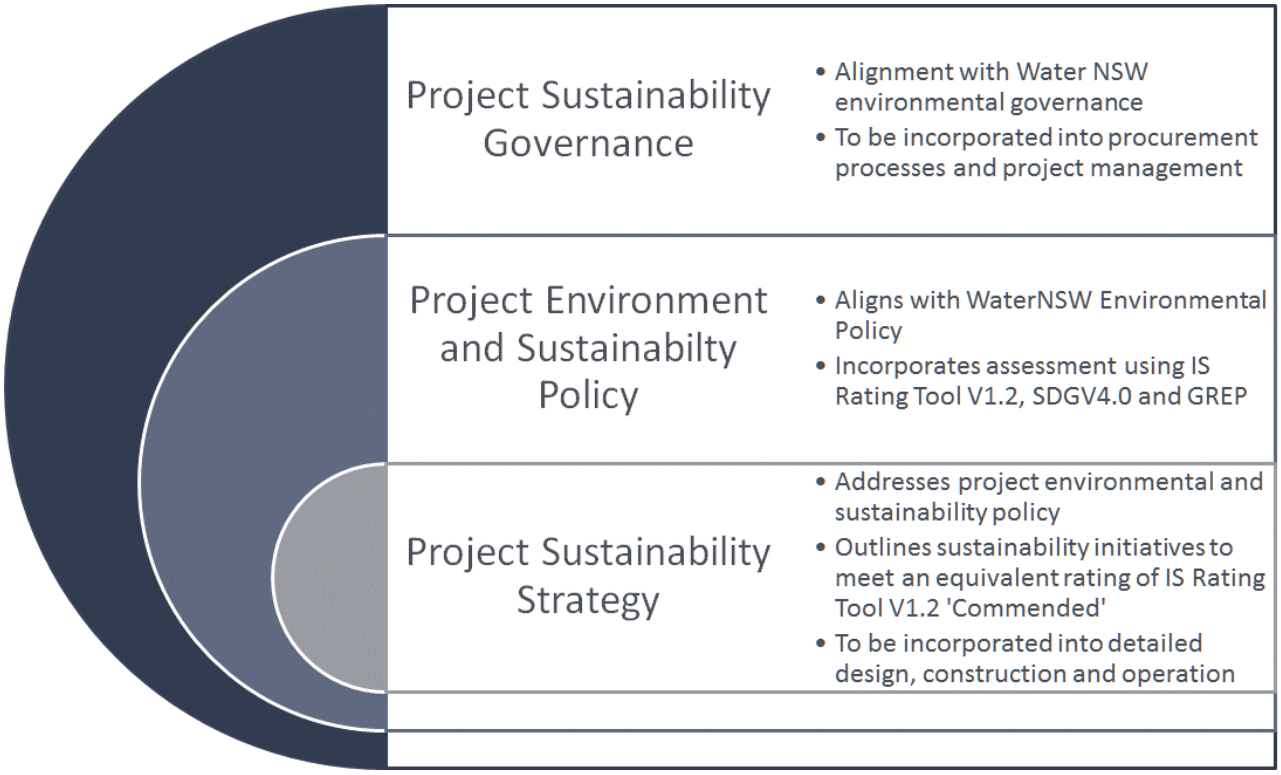
23.4.2 Project sustainability strategy

The Project sustainability strategy was developed to address the existing WaterNSW environmental governance and the Project environment and sustainability policy, as presented in Figure 23-1. The Project sustainability framework provides an alignment with Water NSW environmental governance and an overarching Project environment and sustainability policy that informs the Project sustainability strategy. The purpose of the policy is to provide a clear statement of the Project environmental and sustainability commitments.

The Project sustainability strategy provides a strategic plan of action in response to the policy. The potential sustainability initiatives identified in the Project sustainability strategy will be investigated in detail in future stages of the Project and documented within a Project sustainability management plan for the detailed design and construction.

The IS Rating Tool V1.2, SDG V4.0 and GREP were used to inform the development of the strategy outlining the goals, objectives and potential initiatives for the Project. The potential initiatives address energy and water efficient design and construction, efficient use of resources and minimisation waste generated.

Figure 23-1. Project sustainability framework



The strategy considered each Project phase being detailed design, construction and operation of the proposal. The sustainability goals, objectives and initiatives are aligned to the IS rating tool V1.2 categories and are presented in Table 23-6. The potential initiatives are consistent with achieving an equivalent to an IS Rating Tool V1.2 'Commended' rating and align with the GREP.

The potential initiatives would be reviewed and updated as required during the design process and sustainability performance measures incorporated into the design and construction contracts.

Sustainability performance will be driven through the development and compliance with a sustainability management plan.

As part of the procurement process, contractors would be required to demonstrate satisfactory compliance with the sustainability performance measures and sustainability management plan.

Compliance with the sustainability performance measures will be monitored through environmental inspections, audits and reporting against the sustainability plan and alignment with WaterNSW environmental governance.

Safeguards and management measures have been developed to avoid, minimise or manage potential risks identified in the EIS for each key issue. Relevant sustainability management and mitigation measures have been detailed below in Table 23-7.

Table 23-6. Sustainability strategy - goals, objectives and initiatives

IS rating tool category	Policy statement/sustainability goal	Sustainability objective	Potential initiatives
General	Establish, monitor, measure and report on sustainability objectives and targets/Sustainable design and construction is implemented for the Project.	To achieve the equivalent to an ISCA IS Rating Tool V1.2 'Commended' rating.	Develop a sustainability plan for the Project that incorporates sustainability performance objectives aligning with the policy and strategy. Undertake environmental inspections, audits and reporting against the sustainability plan. Sustainability reporting to senior management.
Management systems	Identify and control environmental risks and impacts where practicable/commitments to mitigating negative environmental, social and economic impacts.	Integrate sustainability into the Project management processes and procedures. Environment, social and economic risks and opportunities are assessed.	Decision-making framework includes environmental, social and economic criteria. Decision making is based on the forecast useful life of the asset.
	Provide appropriate training, information and resources/sustainability knowledge is shared.	Sustainability knowledge is shared beyond the Project boundaries.	Training and knowledge sharing opportunities are documented in the sustainability plan.
Procurement and purchasing	Evaluate and promote sustainability initiatives throughout the life of the Project/sustainability will be integrated into procurement.	Contractors, subcontractors and material supplier's sustainability credentials are known. The use of sustainable products and materials are considered for the lifecycle of the asset.	Develop a sustainable procurement policy and sustainability management plan to improve sustainability outcomes.
Climate change adaptation	Evaluate and promote sustainability initiatives throughout the life of the Project/climate resilience addressed in the design.	Design and operations to be resilient to the impacts of climate change.	Assess climate change risks. Design the infrastructure to be resilient to the impacts of climate change. Design the infrastructure to address the regional impacts of climate change. It should be noted that the raising of the dam wall will mitigate peak flooding events that are associated with increased storm intensity due to climate change impacts
Energy and carbon	Maintain measures for the efficient use of resources and reduction of pollution/Project energy efficiency.	Identify and implement feasible initiatives relating to energy efficiency.	Energy reducing options for construction works are considered and implemented where feasible. Lower carbon construction transport options are considered.

IS rating tool category	Policy statement/sustainability goal	Sustainability objective	Potential initiatives
			All new electrical equipment purchases are at least the market average star rating. Use of renewable energy is investigated.
Water	Maintain measures for the efficient use of resources and reduction of pollution/Project water efficiency.	Identify opportunities for minimising water use during construction.	Implement feasible initiatives to minimise potable water consumption. Optimise location and logistics of concrete batching plants to assist with potable water replacement and overall water use minimisation. Monitor potable water usage during construction.
Materials	Maintain measures for the efficient use of resources and reduction of pollution/Reduce materials consumption.	Identify opportunities to reduce material consumption. Use of sustainable suppliers considered in line with the Project procurement plan.	Maximise reuse of existing materials, and structures where feasible. Design developed to minimise volumes of excavation, concrete and steel. Sustainable suppliers are identified.
Pollution control (water, noise, vibration and air)	Meet all relevant compliance obligations and seek to adopt best practice approaches where practical/Pollution control management is optimised.	Potential sources of pollution are minimised.	Monitoring of pollution controls measures. No major exceedances of pollution control goals. Air emission standards for non-road diesel plant and equipment. Low VOC surface coatings implemented.
Land	Meet all relevant compliance obligations and seek to adopt best practice approaches where practical/Minimise impacts to land resources.	Contamination risks are known. Flooding risk is known. Soil management practices maintain land values where possible.	Remediation of any contaminated sites is undertaken where required. Use of previously disturbed land is considered during design. The re-use of topsoil is maximised. The design addresses flooding risks.

IS rating tool category	Policy statement/sustainability goal	Sustainability objective	Potential initiatives
Waste	Maintain measures for the efficient use of resources and reduction of pollution/Waste produced during construction is minimised.	Waste volumes to landfill are minimised.	Construction compounds provide facilities that encourage waste type segregation. Recycling targets maximise the recycling of construction waste. Monitor waste volumes.
Ecology	Conserve or enhance the natural, Aboriginal and European heritage values of our assets, where practical/Ecological issues are considered during the Project design, construction and operation.	The ecological values for the site are known and managed.	Establish and achieve targets for biodiversity conservation.
Community health, well-being and safety	Develop and maintain collaborative relationships with our key stakeholders and other important partnerships in order to obtain sustainable outcomes/Community issues are considered during the design and construction.	The community is engaged during design and construction.	Community priority issues are identified and implementation measures considered and implemented where practicable.
Heritage	Conserve or enhance the natural, Aboriginal and non-Aboriginal heritage values of our assets, where practical/protect and promote local heritage through appropriate design, planning and management controls.	Identify opportunities to enhance heritage values.	Prepare and implement Heritage Management Plans where required. Ongoing management and monitoring of heritage values, where relevant. Develop interpretation plans.
Stakeholder participation	Develop and maintain collaborative relationships with our key stakeholders and other important partnerships in order to obtain sustainable outcomes/adopt best practice approaches to community engagement.	The community believe their issues are being considered and addressed.	A comprehensive stakeholder engagement strategy is developed. Stakeholder are informed about negotiable and non-negotiable issues. Project information is provided to the community and stakeholders to assist engagement.
Urban and landscape design	Develop and maintain collaborative relationships with our key stakeholders and other important partnerships in order to obtain sustainable outcomes/Best practice urban design principles are considered	Potential impacts to visual amenity are considered during the design.	An urban and landscape design is prepared for the Project.

IS rating tool category	Policy statement/sustainability goal	Sustainability objective	Potential initiatives
Innovation	Explore new benchmarks by expecting quality, value for money and benefit maximisation (environment, economic and social) from our designers, contractors and suppliers/Innovation in sustainability design and construction is considered.	Innovation is encouraged in the design and construction.	The procurement plan encourages innovation in sustainable design and construction.

Table 23-7. Safeguards and management measures

Impact	ID	Environmental management measure	Timing	Responsibility
Sustainability	Sus-1	A sustainability management plan would be developed that reflects the target in an equivalent IS rating tool V1.2 'Commended' rating.	Pre-detailed design	Proponent
Sustainability	Sus-2	The sustainability management plan would incorporate climate change adaptation measures.	Pre-detailed design	Proponent
Sustainability	Sus-3	The potential sustainability initiatives would be reviewed as the design progresses and updated where required.	Pre-detailed design	Proponent/design contractor/contractor
Sustainability	Sus-4	The sustainability management plan would document the monitoring and reporting requirements to ensure that the sustainability performance targets for the Project are met.	Pre-detailed design	Proponent/design contractor/contractor
Sustainability	Sus-5	The sustainability management plan would be considered in development of the Construction environmental management plan (CEMP) and Operational environmental management plan (OEMP).	Detailed design/pre-construction	Proponent/contractor
Procurement	Sus-6	Procurement activities would align with the sustainability management plan and address the NSW Government Resource Efficiency Policy (OEH 2014d)	Detailed design/pre-construction/construction	Proponent/contractor
Sustainability	Sus-7	Sustainability reporting would be undertaken during detailed design and construction in accordance with the sustainability management plan.	Detailed design/pre-construction/construction	Proponent/design contractor/construction contractor
Sustainability	Sus-8	The sustainability management plan would be reviewed, and the relevant operational sustainability requirements incorporated in WaterNSW's environmental management processes.	Operation	Proponent

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