



SEA GOOD PRACTICE GUIDANCE

EIANZ SEA Working Group 2018

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Preamble

Over the past two years (2016-2018) the Special Interest Section on Impact Assessment of the Environment Institute of Australia and New Zealand (EIANZ) has convened a Working Group on Strategic Environmental Assessment (SEA). This group has run workshops at annual EIANZ conferences and a topical Symposium in February 2018.

This *Good Practice Guidance* is the work of an Australian National University (ANU) student intern, Tessa Lavers. The Guidance was commissioned by the SEA Working Group and compiles and synthesises the outcomes and recommendations from Working Group discussions, without specific referencing or attribution. Additional references are cited, with links and references listed.

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1.0. Introduction

The main purpose of a Strategic Environmental Assessment (SEA) is to influence decision-making regarding policies, plans, and programs (PPPs) towards more sustainable outcomes. SEA differs from the common Environmental Impact Assessment (EIA), and involves a strategy led approach, encompassing an entire plan instead of being restricted to a project located on a specific site. The aims of a particular SEA can be targeted, from an *assessment* approach that is used to review the impacts of an already developed PPP to a *planning* approach that involves actively developing the PPP to provide recommendations that strategically meet environmental and social outcomes.

The benefits of conducting a SEA include:

- Application to larger areas and plans
- Sustainability-led focus
- Adaptability to suit varying scales, nature, and complexity of different PPP types
- Exploration of alternative approaches to achieve the stated objectives (*planning* SEA)
- Utilisation of systems thinking and cumulative impact analysis to ensure flow-on effects are considered
- Participatory process involving stakeholder engagement and transparency to the wider community
- Usefulness as a strategic tool at the PPP scale to streamline project level assessment processes (*planning* SEA).

While a form of SEA exists in some State planning processes and at the Commonwealth level in Australia, the use of SEA in both Australia and New Zealand has been somewhat slow to progress. There is increasing professional interest in more strategic approaches to impact assessment. A structured approach like SEA is recognised as being able to provide an optimal framework for analysing and developing PPPs, and to enhance engagement in their early stages. SEA can provide a counter balance to the noted shortcomings of conventional PPP making processes and project level EIAs (Fischer *et al.*, 2015).

Box 1: Defining policies, plans and programs

Policy: A general course of action or proposed overall direction that a government is or will be pursuing, and that guides ongoing decision-making.

Plan: A purposeful forward looking strategy or decision, often with coordinated priorities, options and measures that elaborate and implement policy.

Program: A coherent, organised agenda or schedule of commitments, proposals, instruments and/or activities that elaborate and implement policy.
(Sadler and Verheem, 1996; OECD, 2006).

2.0. Purpose

This document is aimed at practitioners who would benefit from engaging in more strategic approaches, and provides clear guidance on how to conduct a SEA in Australia and New Zealand. This includes background, core principles, and a step-by-step guide. The broader purpose is to encourage the wider application of this approach in Australia and New Zealand to enhance environmental and social decision-making.

3.0. Background

SEA is a highly regarded approach to impact assessments used to ensure wider social and environmental consequences of strategic decisions regarding PPPs are addressed before final decisions are made.

There are two primary approaches to SEA applied in Australia; an *assessment* approach and a *planning* approach. The *assessment* approach reviews the impacts likely to be associated with implementing an already developed PPP. Examples of this approach are the Western Sydney Growth Centres, National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) and the NSW roads and traffic management works strategic assessments. While these ranged in geographic specificity from defined boundaries for the Growth Centres to the whole of Commonwealth waters, all three examined the likely impacts on defined environmental matters from implementing a prescribed government approval process. These SEAs used case studies to illustrate how impacts would be avoided, mitigated or offset. Each of the PPP's was revised on the basis of the SEA assessment to ensure better environmental outcomes would be achieved from rigorous implementation of the processes specified in the PPP.

Box 2: Sydney Growth Centres assessment SEA

In 2007 a SEA was undertaken for areas of urban development in western Sydney. These areas were biodiversity certified through a State Environmental Planning Policy (SEPP) planning instrument (DECC, 2007a). The SEA was used to assess details of the conservation package presented, including whether the SEPP would lead to an overall improvement or maintenance of biodiversity values (DECC, 2007b). This was conferred under the NSW Threatened Species Conservation Act and provides an example of *assessment* SEA being used to improve conservation outcomes of an already identified PPP. As part of this process, the NSW Government established a \$530 million conservation fund to protect over 2,000 ha of high quality vegetation within the Growth Centres over the following 25-30 years. This program was also strategically assessed and approved under Part 10 of the EPBC Act.

The majority of SEAs in Australia have been *planning* focussed. *Planning* SEAs include specification of the proposed ‘development,’ as well as proposed compensatory conservation measures. In most *planning* SEAs the entire PPP is set within an adaptive management implementation framework. In any *planning* SEA there may be clear established parameters such as the overall desired development footprint. In this type of assessment what is negotiated as the SEA unfolds are site-specific planning procedures and assurance and commitments for conservation measures.

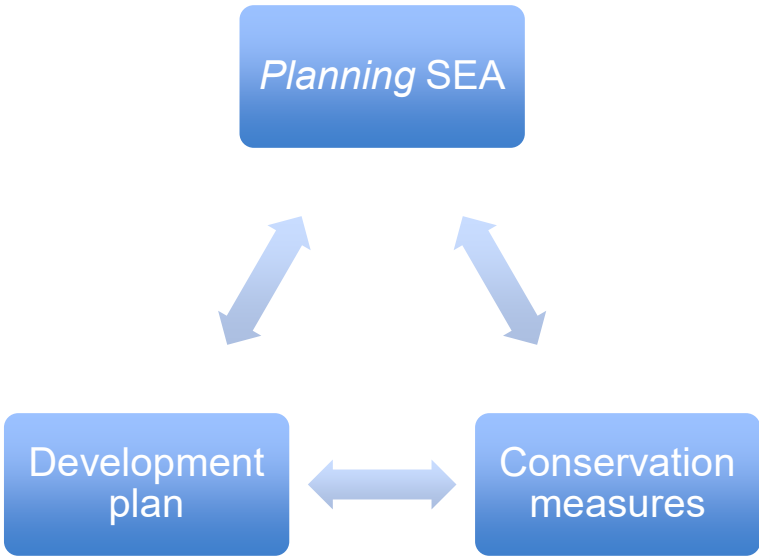


Figure 1: Planning SEA components: set within an adaptive management implementation framework

SEA can be an effective environmental assessment and planning tool and delivers certainty to companies that engage in the process, including streamlining future project level assessment processes. *Planning* SEA provides an optimal framework to understand impacts comprehensively and for considering alternatives to achieve objectives. In addition, the evidence-base provides early indication of risk and success and provides an effective framework to encourage engagement from affected communities and broader stakeholders early in the planning phase. As a critical element of the process, development and approval of a *planning* SEA provides an opportunity to say ‘no’ for potentially impacted communities.

3.1. SEA compared to EIA

SEA addresses some of the long-regarded weaknesses of project-level EIA. EIA is restricted in its remit at the project level and its limit to consider strategic alternatives and cumulative impacts. EIAs focus on mitigating negative impacts of specific proposals and, in so doing, can be reactive rather than proactive. Leaving the environmental assessment process to the project phase also severely limits the strategic opportunities from an earlier planning stage of the process, limiting sustainable outcomes in development (OECD, 2006).

SEA is considered a more comprehensive approach with many strategic benefits that cannot be realised with a traditional EIA approach. Compared with project-level EIA, SEA brings distinct benefits for strategic decision-making, such as:

- Ability to consider a more comprehensive range of environmental issues and sustainability considerations early in the planning process (*planning SEA*)
- Engagement with the community early and often when all options are still open and on the table (*planning SEA*)
- Recognition and better management of cumulative impacts
- More seamless implementation at a regional scale
- Ability to consider uncertainty, and emerging challenges such as climate change and associated community resilience.

Box 3: Planning SEA in South Africa case study

South Africa has been using the methodology of SEA for over 20 years for land use planning at a local and regional level. Some examples of SEAs completed and underway include:

- Shale gas development in the Karoo region
- Square Kilometre Array Telescope
- Aquaculture development
- Port of Saldanha
- Development of a phased gas pipeline network

This case study focuses on the use of SEA to facilitate the development of Renewable Energy Development Zones (REDZs). The process included using scientific research conducted by the Council for Scientific and Industrial Research (CSIR) that involved the use of Geographic Information System (GIS) to conduct negative and positive mapping of key parameters necessary for large-scale wind and solar projects in South Africa. The positive mapping provided spatial analysis of demand, development potential, solar energy availability, and wind availability. The negative mapping provided information on sensitive environmental features including protected areas, sensitive flora and fauna areas, and other incompatible land uses.

This led to the identification of areas with development potential for renewable energy. Public consultation was then facilitated that led to the identification of further possible sensitivities and opportunities. This information was then used to develop energy development protocols for each REDZ, to be used as a tool to align with policies and plans and to streamline development and the authorisation process of renewable energy projects in South Africa (<https://redzs.csir.co.za/>; www.jbsq.com.au; David Blair).

3.2. Comparative environmental assessments

Marsden and Dovers (2002), amongst others, note the distinction between SEA approaches appropriate for policy-level appraisal versus plan and program level appraisal, with both top-down and bottom-up approaches having a role to play, noting “the importance of context in applying SEA requires a targeted, adaptable approach with suitable, principle-based methods” (2002: pg 15). Marsden and Dovers (2002) also make the distinction between ‘traditional reactive’ environmental assessment (an *assessment* SEA - applied at project level, regional and cumulative assessment) and ‘strategic proactive’ environmental assessment (a *planning* SEA - of sectors, programs and policies and various other initiatives).

In this context they suggest that some SEAs can be considered ‘shallow’, and other ‘deep’, with the latter having a main focus on government policies and actions, not on development of proposals from the private sector. They advocate looking at ends and means, noting that SEA is not the only means to achieving sustainable development, and any progress in this sector should consider not only the informational and methodological barriers to e.g. ‘deep SEA’, but also political barriers which can be more critical.

The practice of SEA and the choice of assessment method are shaped by different circumstances in which they are applied, and the desired outcomes. There are some universal principles for its application that are adaptable for each circumstance, ranging from shallow to deep SEA (Marsden and Dovers, 2002; OECD, 2006).

This may be viewed as a hierarchy (Figure 2), with different levels of strategic decision-making required depending on whether it is a project, program, plan, or policy (OECD, 2006). Policies are positioned at the top of this hierarchy, because logically they shape subsequent plans, programs and projects, which are used to put those policies into practice. The nature of decision-making changes as you move down the hierarchy, including the environmental assessment process most suitable. More flexibility is required nearer the top of this hierarchy and a narrower EIA approach used at the project level (OECD, 2006).

Additional to SEA and EIA there are other assessment approaches that provide benefits depending on the circumstance, most notably Social Impact Assessment (SIA) and Cumulative Impact Assessment (CIA). SIA emerged to give specific attention to the social impacts of a project, and is particularly important in cases where social considerations take primacy at the project level. It is used either as a stand-alone approach or integrated in an Environmental and Social Impact Assessment.

CIA is a more complex approach and has emerged to address some of the widely acknowledged shortcomings of EIA. This includes its inability to consider the potential aggregate, incremental and synergistic impacts of projects. A CIA is typically conducted at a project level and/or from a wider planning or program level as a sub-set of SEA. It provides useful analysis that effects the conclusions of an assessment, where a project that may have insignificant impacts when considered on its own may instead have significant impacts when

looked at in combination with other factors. The comparative characteristics of each of these assessment approaches are shown in Figure 2 and Table 1.

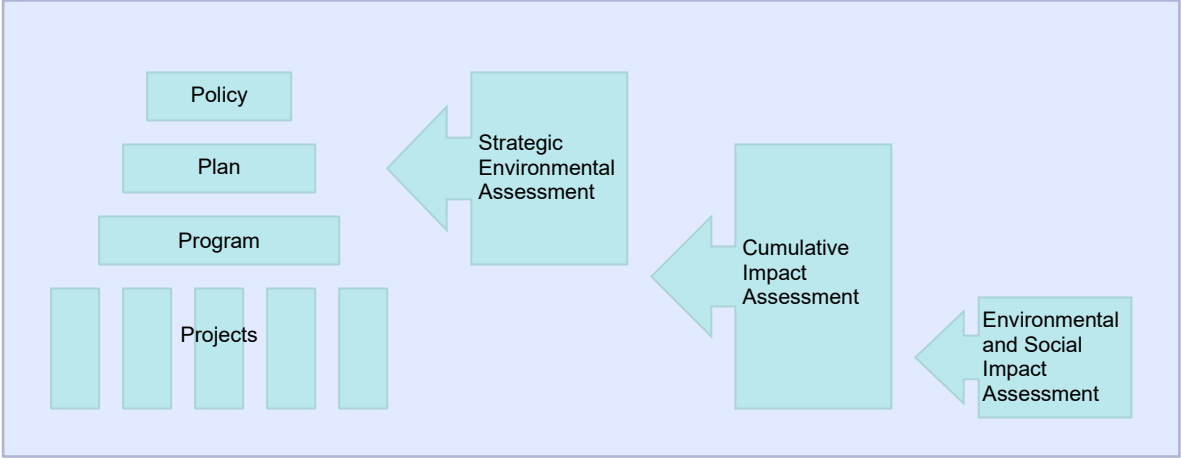


Figure 2: Hierarchy of approaches (adapted from OECD, 2006)

Aspect	Environmental Impact Assessment/ Social Impact Assessment	Cumulative Impact Assessment	Strategic Environmental Assessment (<i>Assessment</i>)	Strategic Environmental Assessment (<i>Planning</i>)
Description	Assessment of project to determine and mitigate environmental and/or social impacts	Assessment of proposed plans, programs, and projects for a particular region to determine cumulative impacts and limit local and regional environmental impacts	Assessment of proposed PPPs against established parameters. Provides certainty for future planning and may streamline future project-level assessment processes	PPP development and requisite conservation measures informed by contemporary assessment of PPP. Provides strategic sustainable outcomes, certainty for future planning and streamlines future project-level assessment processes
Regulatory Characteristics/ Proponent	Usually prepared and/or funded by single or multiple project proponents	Relevant industry sector, Government agency, regional planning or administrative authority governing body	Existing PPP of relevant industry sector, Government agency, regional planning or administrative authority governing body	Critical to have responsible authorities actively engaged and understanding decisions taken within the SEA process
Trigger	Effects of project actions on specified environmental values and/or local communities in the project location	Cumulative effects of project or multiple projects on a region or on specified environmental values. Cumulative effects of proposed or existing plans or development initiatives. Cumulative environmental change of regional land use planning initiatives	Effects of PPP on environment and society including possible cumulative effects of proposal	Effects of PPP on environment and society including possible cumulative effects of proposal
Scope	Non-strategic, project focused	Strategic and less constrained in focus, including focus on values to protect	Strategic and less constrained in focus	Strategic and less constrained in focus with a more proactive approach

Temporal Bounds	Project life cycle including effects at conclusion of project	Past, present and reasonably foreseeable activities, projects, plans; and longer term futures of regional environments and economies using a systems perspective	Applied to PPPs with a broad and/or long-term strategic and systems perspective	Applied to PPPs with a broad and/or long-term strategic and systems perspective
Spatial Bounds	Site specific, focused on direct on-site and off-site impacts	Can be site specific for a project or encompass a larger regional area for planning based on characteristics of the affected values	Boundary as described in PPP; site specific or broader application of a process	Flexible boundary with consideration of alternative sites for most strategic outcomes
Process	Well-defined, linear process with clear beginning and end (e.g. from feasibility to project approval)	Process may be linear or more of a iterative process	Process usually linear but may incorporate iterative process to provide for adequate conservation measures in PPP	Multi-stage, iterative process with feedback loops; set within an adaptive management framework
Environmental Objectives	Defined requirements for mitigation and offsetting	To limit more regionally based impacts/system thresholds and ensure objectives are met for mitigation and offsetting of affected values	To achieve predetermined environmental (and social and economic) objectives.	Can shape PPP to meet environmental objectives, including redesign of mitigation and application of strategic offsets.
Data Requirements	Significant and complex environmental and/or social data of project site required	Significant and complex data required for past, present and reasonably foreseeable future; based on risk	Strategically acquired environmental and social data from relevant sources including stakeholders required; capable of providing for a meaningful impact assessment. Risk based approach to guide critical data collection	Strategically acquired environmental and social data from relevant sources including stakeholders required; capable of providing for a meaningful impact assessment. Risk based approach to guide critical data collection

Table 1: Comparative characteristics for assessment approaches (adapted from OECD 2006; Harriman and Noble, 2008; Kaveney *et al.*, 2015)

4.0. SEA internationally

SEA has been an established global practice for over two decades and is a highly regarded approach to achieve sustainable development outcomes. Many countries have either national legislative requirements or other provisions for SEA, including across the EU and in China, Ethiopia, and South Africa, among others. It is also highly regarded by organisations including for example the International Association for Impact Assessment (IAIA), Oxfam, United Nations (UN), OECD, and The World Bank. The World Bank (2013) stated it recognises SEA as a “key means of integrating environmental and social considerations into policies, plans and programs, particularly in sector decision-making and reform... [and] is committed to promoting the use of SEA as a tool for sustainable development.”

4.1. The EU SEA Directive

One of the most structured approaches to strategic assessment is seen with Directive 2001/42/EC of the European Parliament and of the Council on the assessment of the effects of certain plans and programs on the environment (the EU “SEA Directive”). Under the SEA Directive, SEA may be required for certain plans and programs which set the framework for development consent (and subsequent EIA). The SEA Directive, an *assessment* SEA, provides an example of a well-established legislative requirement for such assessments across multiple countries and in a consistent way (European Commission, 2003).

Article 1 of the Directive sets out two objectives for carrying out an environmental assessment in accordance with the Directive:

- To provide for a high level of protection of the environment
- To contribute to the integration of environmental considerations into the preparation and adoption of certain plans and programs with a view to promoting sustainable development

This is undertaken by ensuring that, in accordance with the SEA Directive, an environmental assessment is carried out for certain plans and programs which are likely to have significant effects on the environment.

The steps in the Directive for conducting a SEA are shown in Figure 3 and typically include:

- Screening plans and programs for whether they are likely to ‘trigger’ the Directive
- Scoping which involves setting the context, objectives, and baseline
- Developing and refining alternatives and assessment effects
- Preparing the report
- Consulting on the draft plan and report
- Monitoring implementation of the plan/program (ODPM et al., 2005; Fischer, 2007)

The topics which must be considered when embarking on SEA under the Directive are broad and include: biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between these factors.

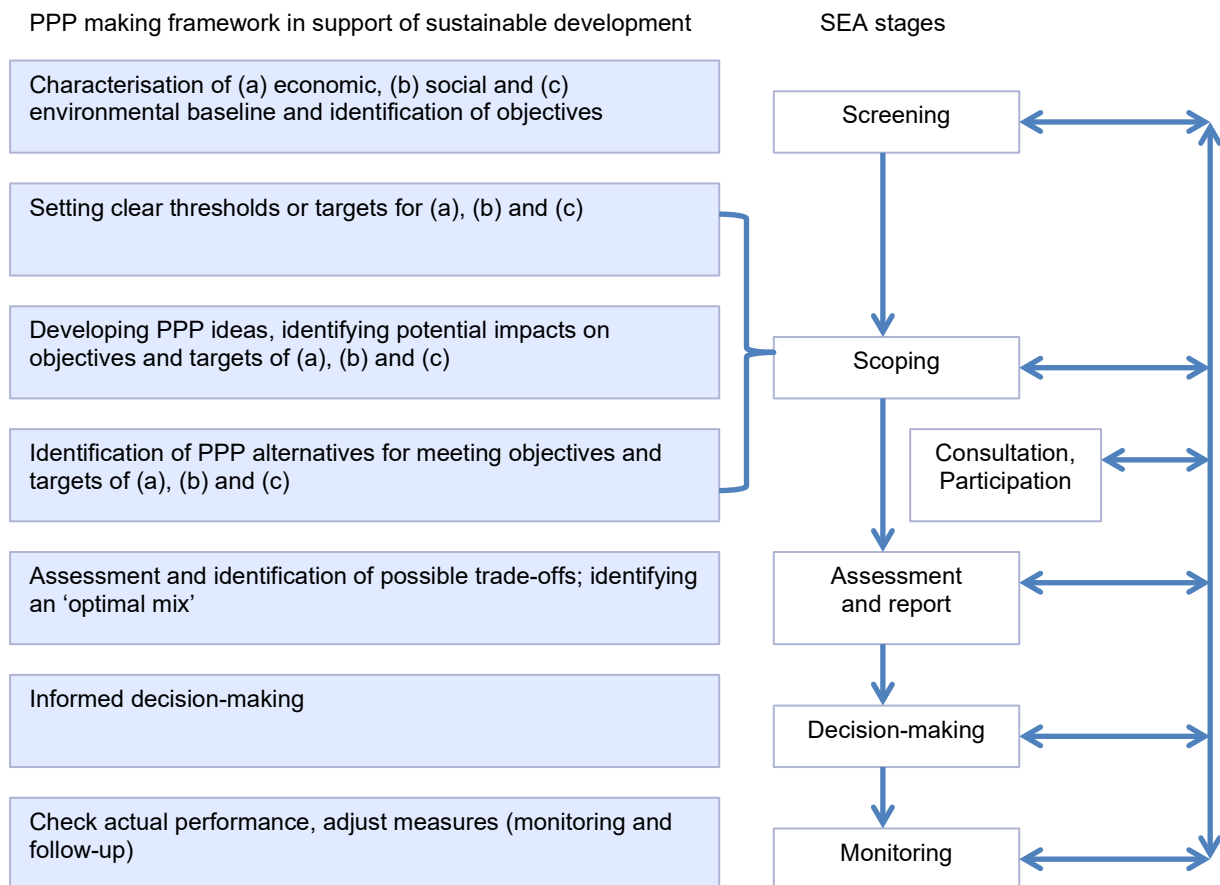


Figure 3: EU SEA Directive process (Adapted from Fischer, 1999)

5.0. SEA in Australia and New Zealand and legislative context

SEA in Australia is included as Strategic Assessments under Part 10 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and in the legislation of some States and Territories. In New Zealand the consideration of the impacts of plans occurs under Section 32 of the *Resource Management Act 1991*. For a full description of legislative context in all jurisdictions see Appendix 1.

5.1. Progress to date in Australia

SEA in Australia has been slow to progress, and non-existent in New Zealand. In Australia, over 20 strategic assessments of PPPs have been undertaken or are underway under the EPBC Act, covering a range of sectors from regional-scale development plans and policies, to industry sector policies, and fire, vegetation/resource policies. This occurred after amendments to the EPBC Act in 2007 that enabled approval of actions under Part 10. While several have not been finalised (LNG precinct, Mt Peter and the Lower Hunter) 12 are endorsed and 10 have classes of action approved. Those with part 10 approvals include plans for urban development in Melbourne and western Sydney, irrigation development in Tasmania, bushfire management in South Australia, offshore petroleum assessment and approval under NOPSEMA and iron ore mining in the Pilbara. The latter was the first

strategic assessment with a private corporation, BHP Billiton, which was recently endorsed with actions approved over the next 100 years. Two parallel strategic assessments of decision-making along the Queensland coast and within the Great Barrier Reef Marine Park received endorsement by the Minister.

Part 10 of the EPBC Act offers the opportunity to strategically assess and approve a wide range of plans or processes. The ability to provide upfront approval for actions is powerful and (if done well) enables:

- Significant reductions in environmental assessment timeframes and costs
- Greater certainty for developers
- Better environmental outcomes.

Box 4: BHP Billiton in the Pilbara case study

A strategic proposal in the mining sector was submitted to the WA government by BHP Billiton Iron Ore (BHP) in 2012 and is currently in the final stages of assessment by the WA Government (report and recommendations stage). The strategic proposal outlined BHP's future operations in the Pilbara for the next 100 years, including further development of existing mines and proposed new mines and associated infrastructure. This proposal was also assessed and approved through Part 10 of the EPBC Act.

In their strategic proposal, BHP estimated that over the life of the plan, 95,000 ha of land would be cleared in the region being assessed. The Environment Protection Authority (EPA) determined that the strategic proposal would be assessed through Public Environmental Review and the preliminary environmental factors that should be considered were water (surface and ground), flora and vegetation, fauna and habitat, rehabilitation and closure, air emissions, and greenhouse gas emissions (EPA WA, 2012). The assessment was completed in March 2016 and identified significant environmental assets and key threatening processes from mining and non-mining activities (BHP, 2016). It looked at cumulative impacts on biodiversity, water, air quality, noise, and landscape and visual amenity.

BHP did not provide detailed engineering for operations and supporting infrastructure at the time of referring the strategic proposal. These details will be provided as each new mining operation is developed as a derived proposal: i.e. the full level of impacts on flora, fauna and water will be confirmed through the derived proposal process. The results from the EPA assessment will be used to inform specific management objectives in each derived proposal. BHP has estimated that derived proposals would require offsetting of 3,000ha of cleared vegetation (BHP, 2015; BHP, 2016).

By engaging in SEA under Part 10 of the EPBC Act, BHP have greater certainty for future planning (with actions approved over the next 100 years), reduced reductions in overall environmental assessment costs, and have the potential to achieve better environmental outcomes than would otherwise be realised had it applied a traditional project-level approach.

Some criticisms of the existing Australian strategic assessment regime are that it needs to build in safeguards in the process of the assessment, such as increasing procedural provisions, improving transparency through greater public involvement, beginning the process early in the formulation of the strategy proposal, and addressing alternatives in early stages (Marsden, 2013). These criticisms are particularly relevant for *assessment* SEAs.

Other recognized strengths and weaknesses are:

- It is driven by streamlining the evaluation of individual project proposals which may then be exempt from subsequent EIA, providing certainty for development proponents and reducing duplication (Hawke, 2009; Marsden, 2013)
- The lack of state legislation undermines the potential benefits of SEA including certainty, transparency and enforceability; and similarly lack of political will limits its use
- The relatively limited trigger for strategic assessment narrows the focus (Hawke, 2009; Marsden, 2013)
- The precautionary approach is not effectively built into the strategic assessment process
- Comment periods are typically too short for effective community input, including environmental NGOs.

6.0. Key principles that underpin SEA

SEA principles have been discussed by various authors and reviewers of SEA practice (Sadler and Verheem, 1996; Tonk and Verheem, 1998; Marsden, 1998; IAIA, 1999; Marsden and Dover, 2002: pg 54; IAIA, 2002).

The principles below demonstrate the core values and ethics to underpin good practice SEA. The process of undertaking a SEA should be:

Sustainability-led – by strategically influencing policy, plans, and programs towards more sustainable outcomes, including incorporating the interconnection between environmental, social, cultural and economic systems.

Practical – resulting in sufficient, reliable and usable information to influence decision-making.

Evidence based – including the use of best science and techniques relevant to the problems being investigated, incorporating an interdisciplinary approach and the use of Traditional knowledge where relevant.

Outcomes focused – by ensuring key issues are considered and significant environmental effects are managed appropriately to deliver effective protection of values.

Fit for purpose – to achieve the objectives of the PPP with realistic use of available time, resources and information.

Adaptive – to suit the scale, nature, and complexity of particular circumstances without compromising the integrity of the process, and to be adaptive of lessons learned throughout the process.

Participatory – by being open and sensitive to the views of stakeholders and the wider community, with regular opportunities to involve interested parties and ensure their input is considered in decision-making.

Transparent – by facilitating ease of access to information for the public, and a clear identification of factors taken into consideration during decision-making.

7.0. Steps in undertaking a SEA

This section provides an overview of the steps required in undertaking a SEA. It is important to note this is not a rigid process, applying adaptive management to enhance effectiveness. It can also be flexible, applied at different scales, for different proposals, and with different aims. These circumstances and availability of data, resources, and time play a role in determining the approach taken and tools used during the process. In this way some SEAs:

- Are integrated into the planning or policy processes while others run parallel
- May be applied to evaluate an existing PPP or be used to develop something new
- Can be conducted over a short timeframe or over a longer period
- May use quick analysis with limited data and others require detailed analysis
- Can be an output based activity (e.g. to produce a report), or form part of a more continuous process integrated into decision-making to strengthen institutional capacity (OECD, 2006)

This diversity of approaches and application of SEA makes it a highly adaptable approach. For this reason, this document provides guidance instead of rigid guidelines, with flexible application key for success.

Figure 4 depicts the generalised steps of a SEA with scope to adapt these steps on a project-by-project basis that may be iterative rather than linear.

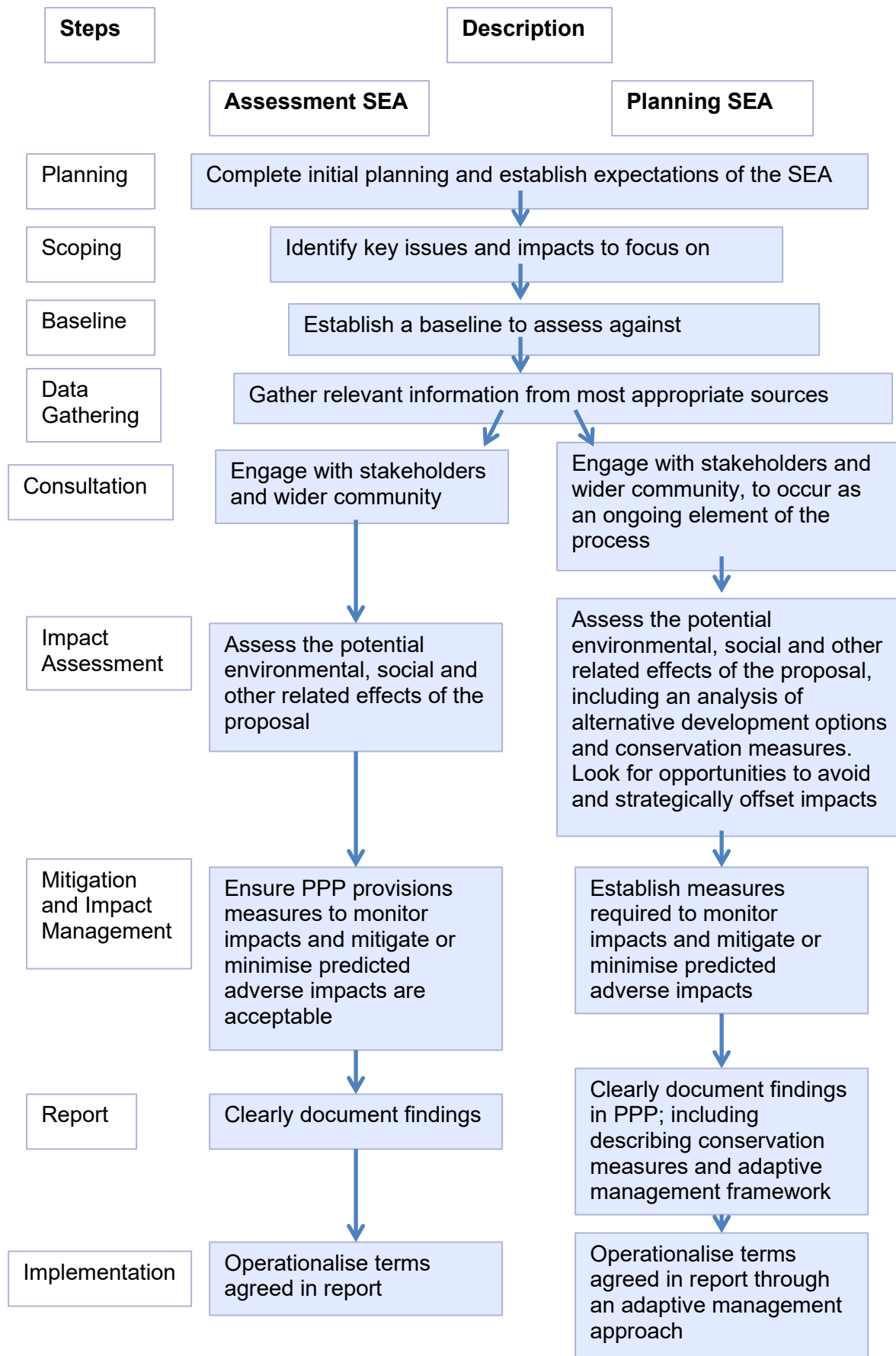


Figure 4: Steps in undertaking a SEA

7.1. Planning

Before proceeding with a SEA, some preparatory tasks are required. If undertaking a planning SEA, articulating the vision and objectives for the PPP will assist in structuring further decisions. Screening to determine whether SEA is the most appropriate approach, or for example, if CIA or EIA should be used. A reflection on objectives and circumstances can be used to achieve this (OECD, 2006).

During this stage a careful stakeholder analysis should be used to identify stakeholders, including preparation of a communication plan with appropriate engagement methods. In cases where the public are likely to be ill informed on the topic, an education component should be included (OECD, 2006).

At the outset it is also important for key stakeholders to establish expectations of the likely outcomes, process, and limitations of the SEA. This may involve developing a clear 'terms of reference', conducting briefings with key stakeholders for input and mutual understanding, and ensuring the limitations of the SEA are identified.

Box 5: Preparatory task checklist

- Establish the terms of reference
- Set up a management team/steering committee and appoint an SEA coordinator/manager
- Clarify and confirm the specific goals and objectives of the SEA in relation to the objectives of the PPP with partners and stakeholders
- Develop communication plan for the SEA
- Determine if the objectives of the PPP are in line with existing (environmental or other) objectives of national/regional/sector authorities
- Check relevant legislature requirements (national, state/territory and/or local)
- Set definite and realistic timescales
- Agree on the required documentation
- Confirm sources of funding and available resources
- Announce the start of the planning process; bring key stakeholders together to agree on problem, objectives, alternatives and measures for quality control

Adapted from OECD (2006).

7.2. Scoping

Scoping is an essential step of SEA and is used to identify the boundaries of the project and the key issues and impacts to focus on. This includes:

- Setting the spatial and temporal boundaries of the project
- Identifying information required to undertake the SEA
- Identifying the environmental and other values, for example threatened species or water sources within the boundaries

- Identifying the potential significant impacts and effects from the proposal, for example how MNES may be impacted
- Incorporation of adaptive capacity in the scope, so that as new information surfaces on impacts (e.g. risk to groundwater and connecting water sources), boundaries can then be adjusted accordingly
- Establishment of the governance structures of the project (Kaveney, *et al.*, 2015)

Key tools that can be useful during the scoping stage include modelling, spatial analysis and mapping, interaction matrices, overlays, case comparisons, and expert opinion (Kaveney, *et al.*, 2015). These can be used to establish environmental implications of proposals and to establish cause-and-effect links between different specific PPPs. Key stakeholders are also a great source of information for identifying the significant issues associated with the proposal and the main alternatives to assess (OECD, 2006).

Once this information is gathered, decision criteria and indicators of the desired outcomes should be identified, based on the relevant issues and objectives of the SEA. These items and the plan for the SEA should then be set out in a 'scoping report', with realistic targets set based on constraints including timeframe, resource availability, and existing knowledge about the key issues. This report should be provided as a draft for stakeholders to provide input, then finalised with an adaptive approach used throughout the SEA.

7.3. Baseline

The collection of baseline data is important because it provides a benchmark to assess against. It can be used to provide details of the existing pressures in the region and to identify the priority areas for impact mitigation and focused management. The baseline may include for example the stock of natural assets, critical habitats, and significant ecosystem components. The targeted collection of baseline data should result in a specified counterfactual (or no-change scenario) to be used to assess the impacts against. Particularly for a *planning* SEA take a risk-based approach to highlight parameters where adequate information is required (OECD, 2006; Kaveney, *et al.*, 2015).

It is important to recognise that baseline data is often representative of conditions caused by existing pressures, and therefore shows an already impacted system. The analysis of the baseline should incorporate recognition of past and ongoing activities including the impacts and an analysis of whether they should be incorporated into the assessment and to what extent. Existing environmental protection measures for the region should also be reviewed (Kaveney, *et al.*, 2015).

Some useful sources of information can include:

- Documentation available from Federal and State Government based on other assessments already undertaken on the topic or in the region
- Environmental databases, e.g. the National Pollutant Inventory and Australian Government Species Profile and Threats Database (SPRAT)
- Land use maps and aerial photographs

- State of the Environment Reports (Kaveney, *et al.*, 2015)

Gathering and accessing useful baseline data can be a significant challenge however. This can be an expensive and time-consuming process, for example it can take many years to establish long-term informative data sets. Thus it may not be possible to get comprehensive information to inform the baseline. It is important to adapt and make decisions based on best available resources and information. Using an adaptive management approach during the process can provide an adequate baseline for assessment by highlighting key future information gathering approaches.

7.4. Data gathering

Additional to baseline data, it is also necessary to collect specific data required to inform decisions critical to a successful SEA. Information should be gathered from the most appropriate sources so that the best available information is used to inform decisions and analysis. Sources may include: expert judgement, historical information, scientific and environmental data, stakeholder knowledge, Traditional knowledge, observation, modelling, forecasts, citizen science, and relevant peer reviewed literature. This also includes collaboration and sharing of data between the different tiers, for example data already held by different Federal, State, or local Government (GBRMPA, 2018).

While gathering data:

- If there are gaps or uncertainty in the knowledge and data this is not necessarily a critical flaw, as long as reasonable estimates can be made to manage and overcome these gaps and understand risk
- If there is uncertainty than a precautionary approach may be required by regulators
- The gathering of data should be focused with an aim for good quality data opposed to a large data set
- The Government should disclose relevant information where it is not commercial in confidence
- Companies, organisations, stakeholders and Government should work together by sharing relevant information to deliver the best possible environmental and social outcomes
- Budget and time constraints need to be recognised and incorporated into the process, including sourcing information strategically to gain best value for effort (Kaveney, *et al.*, 2015)

7.5. Consultation

Public input into environmental decision-making promotes accountability, improves the quality of decisions and provides public confidence in the outcomes achieved. Consultation with stakeholders and the wider community is an essential element of a successful SEA and should occur as an ongoing element of the process for a *planning* SEA. This should begin with drafting a public engagement and disclosure plan at the preparatory stages of the SEA

and during scoping, with public engagement used to identify issues, opportunities and alternatives.

It is important to identify and engage the stakeholders who are most relevant, including the local community members and any relevant special interest groups, for example environmentalists and those affected by the proposal that may be the most vulnerable in society.

One of the challenges is to ensure stakeholder engagement is meaningful and not just a process of providing detailed and technical information. There can be barriers including the technical complexity of the subject matter and a lack of access rights to data. The communication method with stakeholders should promote the timely, accurate, and understandable exchange of information, while also considering if there are any requirements for privacy and confidentiality in information to be shared. Where the nature of the information is complex, care should be provided to ensure stakeholders involved understand and are educated enough for effective input (OECD, 2006; Kaveney et al., 2015).

This process must also provide an opportunity for stakeholders to influence decisions, including an opportunity to comment on the information, with comments taken into consideration in final decisions. A report should be provided that summarises the public comments and demonstrates how they were addressed in final decisions. This process may involve: public meetings or forums, consultation surveys, online feedback mechanisms and/or targeted interviews (OECD, 2006).

The International Association for Public Participation (IAP2) has developed The Spectrum of Public Participation, which is a widely used international standard for the public engagement process (Figure 5). Assigning stakeholders to the various categories of engagement and then developing a targeted engagement plan will facilitate a robust process of consultation and participation.

	inform	consult	involve	collaborate	empower
Public Participation Goal	To provide the public with balanced and objective information to assist them in understanding the problems, alternatives and/or solutions.	To obtain public feedback on analysis, alternatives and/or decision	To work directly with the public throughout the process to ensure that public issues and concerns are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision-making in the hands of the public.
Promise to the Public	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and issues are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for direct advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.
Example Tools	<ul style="list-style-type: none"> • Fact sheets • Websites • Open houses 	<ul style="list-style-type: none"> • Public comment • Focus groups • Surveys • Public meetings 	<ul style="list-style-type: none"> • Workshops • Deliberate polling 	<ul style="list-style-type: none"> • Citizen Advisory committees • Consensus-building • Participatory decision-making 	<ul style="list-style-type: none"> • Citizen juries • Ballots • Delegated decisions

Figure 5: IAP2 Spectrum of Public Participation (IAP2, 2018)

Box 6: Some examples of tools that could be used in SEA

- ❖ Tools for ensuring full stakeholder engagement:
 - Stakeholder analysis to identify those affected and involved in the PPP decision
 - Consultation surveys
 - Consensus building processes

- ❖ Tools for predicting environmental and socio-economic effects:
 - Modelling or forecasting of direct environmental effects
 - Matrices and network analysis
 - Participatory or consultative techniques
 - Geographical information systems as a tool to analyse, organise and present information

- ❖ Tools for analysing and comparing options:
 - Scenario analysis and multi-criteria analysis
 - Risk analysis or assessment
 - Cost benefit analysis
 - Opinion surveys to identify priorities

(OECD, 2006).

Further information on SEA tools is included in Appendix 2.

7.6. Impact assessment

The impact assessment process is used to assess the potential environmental, social and other related effects of the proposal, including an analysis and recognition of vulnerabilities, risks, and resilience. In a *planning* SEA, the impact assessment process should be used to look for opportunities to avoid and strategically offset effects of the PPP and to examine alternative options. For an *assessment* SEA this process is focused on ensuring the environmental and social effects of the PPP are within acceptable levels.

There are many commonly used analysis techniques including; trend based analysis, cost benefit analysis, comparative risk analysis, and participatory or survey based assessments. A more comprehensive list of techniques is included in Appendix 2.

For a *planning* SEA, in assessing impacts and examining risks, strategically examine alternative options to determine the preferred method for achieving proposal objectives and conservation measures. This process is shown in *Figure 6* using a comparative risk analysis, and involves identifying risks, assessing impacts, and consulting with stakeholders for each option in an iterative rather than linear process. The final assessment results of each option are then compared to determine the most sustainable and strategic approach, with public input and data used to shape the results.

An assessment of the vulnerabilities and resilience of the overall system including ecological and social should be incorporated into this process to properly assess the level of risk, and to evaluate the efficacy of alternative options. This includes an analysis of the likelihood and consequences of each risk to determine the risk level, in accordance with the Australian Standard for Risk Assessment (AS/NZS ISO 31000, 2009).

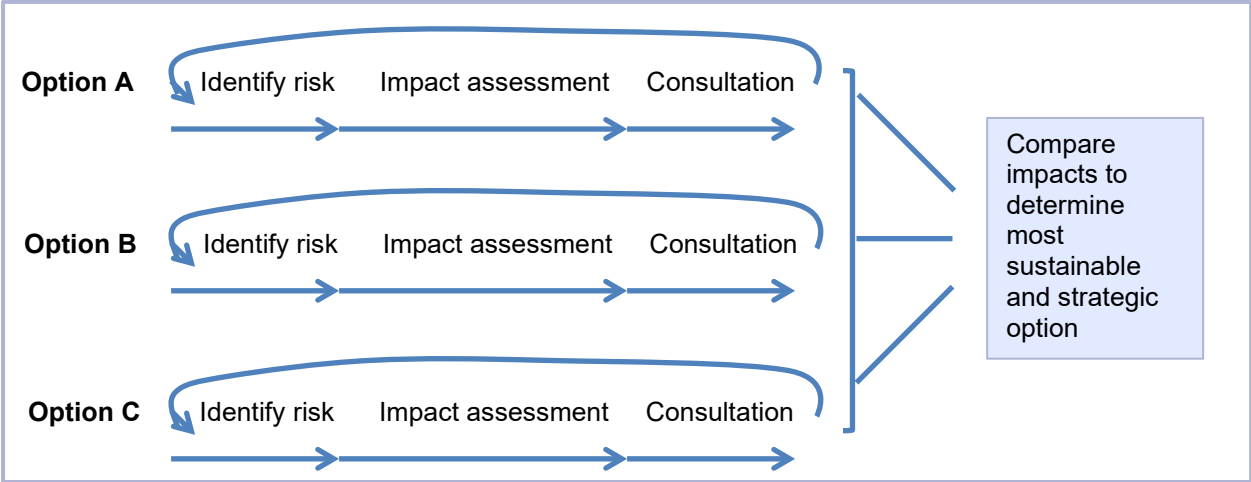


Figure 6: Depiction of iterative process in impact assessment for choosing best strategic alternative

This process should include the utilisation of systems thinking to ensure indirect effects and cumulative impacts are accounted for, including:

- Specifying the time and space scales for drivers, pressures, and impacts, including migratory pathways and impacts from the past, present and reasonably foreseeable future
- Identifying cause-and-effect relationships between the drivers, pressures and impacts
- Identifying and accounting for ecological connections (GBRMPA, 2018)

Systems thinking is also associated with embedding feedback loops into these and the broader assessment processes. In addition, there may have been a relevant assessment in the area undertaken for a different proposal. Data sharing of this information is useful to streamline processes.

7.7. Mitigation and impact management

The SEA should be focused on providing positive opportunities in the PPP and minimising any negative risks. Where a ‘win-win’ scenario is not possible, the trade-offs should be clearly documented. Mitigation and impact management is used to establish measures required to monitor impacts and mitigate or minimise predicted adverse impacts from the proposal. This includes considering the methods that are the most practical and achievable, with emphasis placed on avoiding impacts altogether (Figure 7) (OECD, 2006; GBRMPA, 2018).

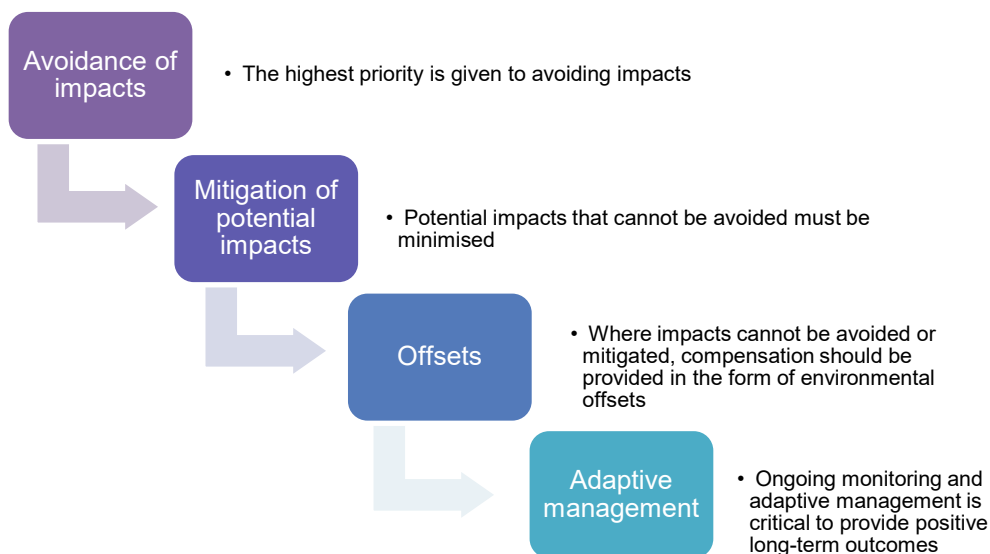


Figure 7: Avoid, mitigate and offset hierarchy (adapted from Australian Government, 2013; GBRMPA, 2018)

For a *planning* SEA avoidance can be achieved by:

- Understanding the location, type and significance of protected values in the area
- Developing several options to deliver PPP objectives
- Designing the PPP in a manner that incorporates conservation of important values during the planning process, particularly to avoid impacts to areas of high value that may be irreplaceable
- Determining conservation areas to maximise the protection of values (Australian Government, 2013).

For an *assessment* SEA, the proposed PPP may need to be modified to ensure effects to identified values are within acceptable limits.

If avoidance is not possible, potential impacts should be minimised through mitigation measures. This involves avoiding unnecessary impacts associated with construction activities, and putting measures in place to minimise the potential direct and indirect impacts of the PPP over the long-term. Mitigation measures to be applied depend on the nature of the PPP and surrounding environment, and may include for example:

- Construction environmental management plans to avoid and minimise potential impacts from construction such as caused by machinery or spread of weeds
- Designing measures to ensure run-off from construction and/or development areas does not impact downstream values
- Ongoing monitoring measures to ensure values are being protected (Australian Government, 2013).

Offsets are used if there are remaining residual significant impacts after applying avoidance and mitigation measures. They provide some form of environmental, social or economic

compensation to address the quantum of effects on the affected matter. Offsets can be divided into:

- Direct offsets – land acquired or retained for conservation purposes
- Indirect offsets – any other measure to improve conservation of values, for example public education, research programs, or breeding programs (Australian Government, 2013).

Specification of governance mechanism for enforcing the identified mitigation measures and ensuring how they will be implemented, monitored and enforced is required.

7.8. Report

The report is written to clearly document findings including potential impacts and recommendations for the proposed PPP. The SEA report typically includes:

- A description of the program
- An assessment of the likely impacts
- Stakeholder concerns including areas of contestation and agreement, and recommendations for keeping stakeholders informed during implementation
- The proposed avoidance, mitigation, offset, and adaptive management approach
- The rationale for acceptance of significant trade-offs
- The proposed plan for implementation, including methods for monitoring, adaptive management and ensuring compliance
- The anticipated benefits
- Guidance to focus and streamline any subsequent SEA or EIA processes, for example in the undertaking of more specific local plans, programs, or projects
-

A report used for a *planning* SEA also typically includes:

- An examination of alternatives with key impacts of each option
- The rationale for the suggested preferred option
- A description of conservation measures
- Adaptive management framework

Often reports are required to include information that is technical in nature, however it should be presented in a clear format with appropriate language for stakeholders to understand. This requires shorter summaries of findings and graphic presentations rather than a long and technical report.

Stakeholders and the wider public should be provided with an opportunity to read and comment on the contents and findings of the report. The draft SEA report should be available for an agreed period of time as identified in the scoping stages. Meetings can be used to gain public comment, or broader methods such as surveys and online feedback. Once this input has been finalised with comments taken into consideration, the final report can be completed and released.

7.9. Implementation

The implementation phase involves operationalising the terms agreed in the report. For a *planning* SEA an adaptive management approach that is responsive to circumstances and changes should be used (Figure 8). This involves monitoring, reviewing, managing and evaluating the effectiveness of the plan to ensure the desired outcomes are achieved. Information tracking systems can be used to monitor and check the progress of the PPP.

Resources may be required to meet the commitments in the report, for example, funds for ongoing conservation management. Monitoring of cumulative effects may also be required with methods and indicators developed on a case-by-case basis. There should also be regular public reporting to make sure stakeholders continue to be informed. Clarity of responsibilities for ongoing implementation and any provisions for adaptive management between the proponent (which may be a state government) and the Commonwealth government is required.

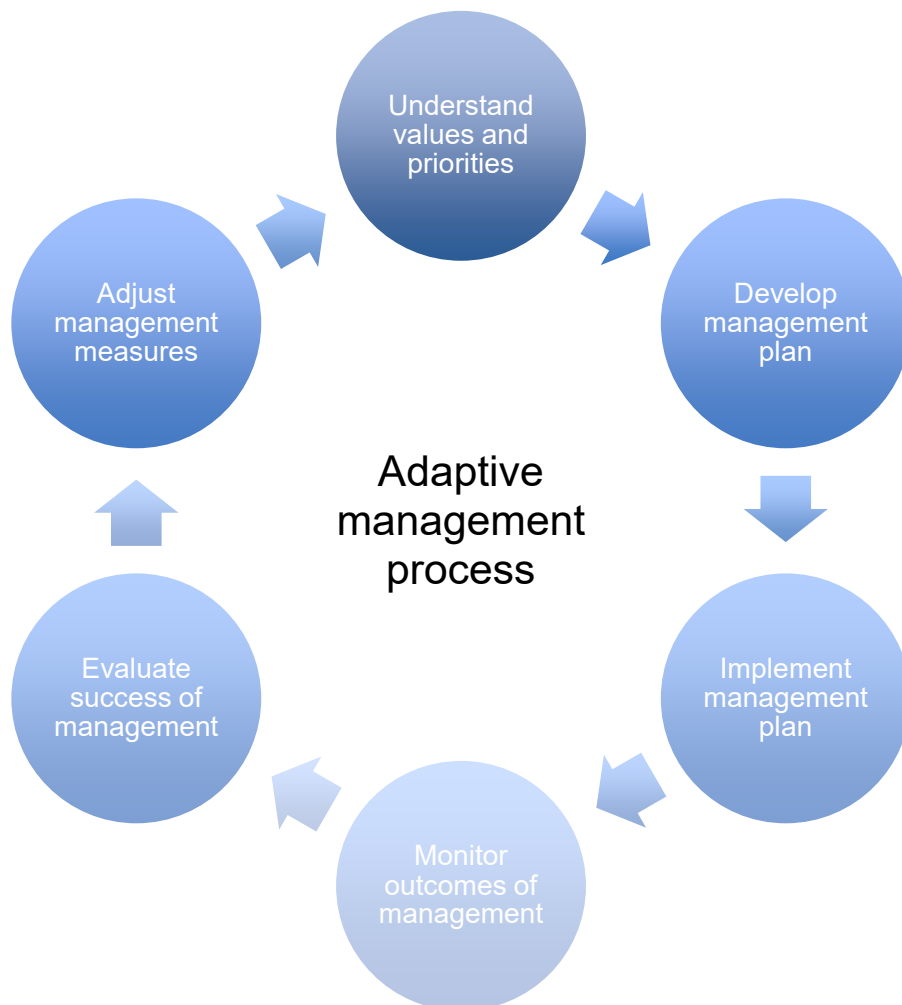


Figure 8: Adaptive management process (adapted from Australian Government, 2013)

8.0. Case study on pumped hydro in Australia

This case study is based on the application of SEA to identify potential sites in Australia for the development of pumped hydro. It was designed in conjunction with the Australian National University Research School of Engineering (ANURSE). The use of SEA in this context provides a streamlined approach to identify constrained and potential sites, leading to a simpler assessment process required at the project-level to approve development. The purpose of this case study is to assess the framework used for the pumped hydro SEA against the principles and steps of a SEA.

The ANURSE has identified that 100% of Australia's energy needs could to be sourced from renewable energy by strategically using pumped hydro coordinated with wind and solar PV energy. There are a number of considerations for site suitability including for example: accessibility, whether the water source was suitable, within a national park, within an urban area, or if there were threatened species or MNES. The framework approach detailed in Appendix 3 shows these considerations and has been designed for desktop analysis with attributes accessible as GIS layers.

This first-cut analysis has been limited to the first few steps of a SEA process, and shows its potential to easily discount thousands of sites. The next stage of the process would involve analysing the identified sites using a *planning* SEA approach. This would include for example stakeholder engagement, impact assessment, and an incorporation of potential opportunities for avoidance, mitigation or offsetting to lessen likely impacts on values.

The following table (table 2) analyses this case study in terms of its success in achieving each of the SEA principles, with 'good', 'reasonable' and 'insufficient' used as indicators. Overall it has demonstrated a reasonable engagement with the SEA principles, however further work is required including stronger emphasis placed on values of importance including threatened species. It provides a suitable method to discount sites in the initial stages, with a more comprehensive framework required to complete a thorough SEA.

Principle	Application of Framework			Comment
	Good	Reasonable	Insufficient	
Sustainability-led	☐			Emphasis placed on choosing sites that are suitable as well as sustainable. Demonstrated awareness of environmental considerations in site locations, for example by discounting sites on rivers.
Practical	☐			The process results in usable information that is already being used by developers to identify potential sites.
Evidence based		☐		Uses suitable techniques and sources for evidence including GIS and Government databases. Further evidence would be required from stakeholders for final sites to determine complete suitability.
Outcomes focused		☐		Considers MNES and values including threatened species, however these are not identified as the major consideration for site suitability. No engagement with mechanisms for avoidance, mitigation, or offsets of effects on values.
Fit for purpose	☐			The process suited the time and resource constraints.
Adaptive		☐		Suited the circumstances and achieved the first few steps of the SEA process, however this adaptive approach compromised on key aspects of a proper SEA. There has been no stakeholder engagement in the process, which is critical for proper SEA. In addition, it could be seen as too simple a process considering the complexity of the issue, with considerations measured equally despite some being more important than others.
Participatory			☐	No engagement with stakeholders so far.
Transparent		☐		Initial site locations provided online, however process not entirely transparent to stakeholders and wider community.

Table 2: Analysis of pumped hydro SEA against principles

9.0. Acronyms

ACT: Australian Capital Territory

ANURSE: Australian National University Research School of Engineering

BHP: Broken Hill Proprietary Billiton Iron Ore

CIA: Cumulative Impact Assessment

CSIR: Council for Scientific and Industrial Research

EIA: Environmental Impact Assessment

EIANZ: Environment Institute of Australia and New Zealand

EPA: Environment Protection Authority

EPBC Act: Environment Protection and Biodiversity Conservation Act 1999

EU: European Union

GBRMPA: Great Barrier Reef Marine Park Authority

GIS: Geographic Information System

IAIA: International Association for Impact Assessment

IAP2: International Association for Public Participation

MNES: Matters of National Environmental Significance. Those matters defined in the EPBC Act.

NGO: Non-government organisation

NOPSEMA: National Offshore Petroleum Safety and Environmental Management Authority

NSW: New South Wales

NT: Northern Territory

OECD: Organisation for Economic Co-operation and Development

PPP: policy, plan and program

REDZs: Renewable Energy Development Zones

SEA: Strategic Environmental Assessment

SEPP: State Environmental Planning Policy

SIA: Social Impact Assessment

SPRAT: Species Profile and Threats Database

UN: United Nations

WA: Western Australia

10.0. Glossary of commonly used terms

Adaptive capacity: The ability for a component of the environment to adapt to impacts to maintain or improve its condition. Includes the environmental component's ability to recover, reorganise or build capacity to learn and adapt in between events (GBRMPA, 2018).

Adaptive management: A systematic process for continually improving management practices through learning from the outcomes of previous management. It includes a monitoring, evaluation, reporting, and improvement cycle. (Adapted from Australian Government, 2013).

Avoiding impacts: Measures taken so that actions have minimal negative effect on the environment. (Adapted from Australian Government, 2013).

Baseline condition: A description of existing conditions to provide a starting point against which comparisons can be made, allowing the change to be quantified (adapted from GBRMPA, 2018).

Cumulative impact: The impact on the environment resulting from the effects of one or more impacts, and the interactions between those impacts, added to other past, present, and reasonably foreseeable future pressures (GBRMPA, 2014).

Cumulative risk: The combined risks to the environment by multiple impacts (GBRMPA, 2014).

Driver: An overarching cause of change in the environment. (Australia State of the Environment Report 2011).

Ecosystem: A dynamic complex of plant, animal and microorganism communities and their non-living environment interacting as a functional unit (EPBC Act).

Environment: Ecosystems and their constituent parts, including people and communities; natural and physical resources; the qualities and characteristics of locations, places and areas heritage values of places; and the social, economic and cultural aspects of the above. (EPBC Act and GBMP Act).

Impact: An event or circumstance, which has an effect, either positive or negative, on a value (GBRMPA, 2014).

Indigenous: For the purposes of the strategic assessment, the term 'Indigenous' should be read to apply specifically to Traditional Owners and Traditional Owner groups (GBRMPA, 2014).

Indirect impact: An impact that is not the direct result of a particular action but has been made possible by that action. These include downstream or upstream impacts, as well as facilitated or consequential impacts resulting from further actions (including actions by third parties). (Adapted from Australian Government, 2013).


Mitigating impacts: Measures put in place to reduce the level of impact arising from an action, including indirect and cumulative impacts. (Adapted from Australian Government, 2013).

Offsetting impacts: Measures intended to compensate for the residual adverse impacts of an action on the environment. (Adapted from EPBC Act and Environmental Offsets Policy, 2012).

Plan: A purposeful forward looking strategy or decision, often with coordinated priorities, options and measures that elaborate and implement policy (Sadler and Verheem, 1996 and OECD, 2006).

Policy: A general course of action or proposed overall direction that a government is or will be pursuing, and that guides ongoing decision-making (Sadler and Verheem, 1996 and OECD, 2006).

Precautionary principle: The principle that lack of full scientific certainty should not be used as a reason for postponing a measure to prevent degradation of the environment where there are threats of serious or irreversible environmental damage. (EPBC Act and GBRMP Act).

Pressure: An activity or group of activities that cause an impact on a value (GBRMPA, 2014). 

Program: A coherent, organised agenda or schedule of commitments, proposals, instruments and/or activities that elaborate and implement policy (Sadler and Verheem, 1996 and OECD, 2006).

Resilience: The capacity of an ecosystem to recover from disturbance or withstand ongoing pressures (GBRMPA, 2014).

Risk: The possibility of something happening that impacts on objectives. It is the chance to either make a gain or a loss and is measured in terms of likelihood and consequence. (Australian Standard for Risk Assessment (AS/NZS ISO 31000:2009).

Sensitivity: The degree to which a component of the environment is responsive to a specific impact (GBRMPA, 2018).

Sustainable development: The interconnection and balance of environmental, social, and economic outcomes in development (GBRMPA, 2014).

Threshold: The breaking point above which an ecosystem or a component of an ecosystem can no longer sustain natural processes and remain in a healthy condition (GBRMPA, 2014).

Trigger: A point, which, if exceeded, would mean there was a significant risk of adverse effects on an ecosystem or a component of an ecosystem. Exceeding this point would 'trigger' action to address contributing impacts and/or review the trigger point (GBRMPA, 2014).

Value: Those aspects or attributes of an environment that make it of significance (GBRMPA, 2014).

Vulnerability: The degree to which a system, organism or community is susceptible to, and unable to cope with, an impact (GBRMPA, 2014).

11.0. References

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11.1. Further sources on SEA

CIDA (www.acdi-cida.gc.ca/ea). Provides various publications on SEA and environmental assessment

International Association for Impact Assessment (www.iaia.org). This site provides useful resources including publications and reference material for conducting SEA.

Institute for Environmental Management and Assessment (IEMA) (www.iam.net). IEMA provides guidelines, training, research and projects on environmental assessments.

International Institute for Environment and Development (www.iied.org/Gov/spa). This website provides resources on EIA, SEA and related subjects.

Netherlands Commission for Environmental Impact Assessment (NCEIA) (www.eia.nl). This website provides advisory services to support the development of SEA in a country including advice on the terms of reference for SEA. It provides coaching on SEA processes and a database with a broad array of easily accessible information.

OECD DAC Task Team (www.seataskteam.net). This website provides resources and tools for conducting SEA.

Transport Research Laboratory, UK (www.sea-info.net). Provides information on SEA and Sustainability Appraisal.

UNECE (www.unece.org/env/eia). Provides information on EIA and SEA on the context of the Espoo Convention of Environmental Impact Assessment.

UNEP (www.unep.org). Has information available on conducting SEA (Sadler and McCabe, 2002) and has issued guidance on EIA and SEA good practice (Abaza *et al.*, 2004).

UN University (www.onlinelearning.unu.edu). This site provides a link to a SEA course that describes a range of SEA tools and provides other valuable information.

World Bank (www.worldbank.org/sea/). This website provides structured guidance on SEA.

12.0 Appendix 1: Legislative context - National (EPBC Act)

Part 10 of the *Environment Protection and Biodiversity Conservation (1999) Act* (EPBC Act) provides for strategic assessments of the impacts of implementing a Plan, Policy or Program on matters of national environmental significance (MNES). The EPBC Act also provides for other strategic approaches including fisheries assessments, conservation agreements and bioregional plans on Commonwealth land, which includes the Commonwealth marine area.

The Commonwealth Department of the Environment and Energy highlights the benefits and potential effectiveness of strategic assessments, which is seen as “a systematic process for evaluating the environmental consequences of proposed policy, program or plan initiatives in order to ensure they are appropriately addressed at the earliest age in the planning process” (<http://www.environment.gov.au/protection/assessments/strategic>), applied as ‘landscape-scale’ assessments examining a much larger set of actions or ‘classes of actions’ (Australian Government, 2013: pg6).

The Department suggests strategic assessment offers potential to deal with cumulative impacts on MNES and to look for both conservation and planning outcomes on a much larger scale than can be achieved through project-by-project EIAs. The process is regarded as “flexible”, providing the opportunity to “reach a negotiated outcome for the benefit of both parties”. (see also webpage: <http://www.environment.gov.au/protection/assessments/strategic>).

12.1. The process

There are both legislative and non-legislative steps to follow while undertaking a strategic assessment under the EPBC Act, as shown in Figure 9. A formal agreement is made between the party responsible for implementation of the Program and the lead department. The department in the lead varies across the country, but is often Environment and/or Planning. Occasionally the complex, multi-disciplinary nature of the task is allocated to State Development or the Premier’s departments. The exception was the NOPSEMA assessment where Industry was also heavily involved. Interdepartmental committees are established to incorporate the objectives of other portfolios into the decision-making.

After the formal agreement is made, a draft Terms of Reference draft incorporating requirements for the strategic assessment report may go out for 28-day public comment. The draft Strategic Assessment Report is compiled and released for a minimum period of 28 days for public comment. In practice due to the complexity most Reports have been out for six to eight weeks. Often there is a series of targeted consultations with key stakeholders from industry, community and environmental groups. The final Strategic Assessment Report is then completed, with public comments taken into consideration, and the Minister able to

recommend any changes to the Program. The Program is finalised and endorsed so it can be implemented. The Program specifies approval processes to be undertaken by the 'party'/State, commitments for protection of MNES and any monitoring or auditing requirements.

After endorsement of the Program, actions, or classes of actions, may be approved if undertaken in accordance with the Program. This is a unique and powerful feature of Australian law when compared to international decision-making about SEAs. The Act specifies that for Part 10 approvals, the Minister is taken to have approved under Part 9, for the purposes of each controlling provision for each controlled action, the taking of actions described in the Program. Strategic Assessment Reports of endorsed Programs must be considered in granting approvals under Part 9.

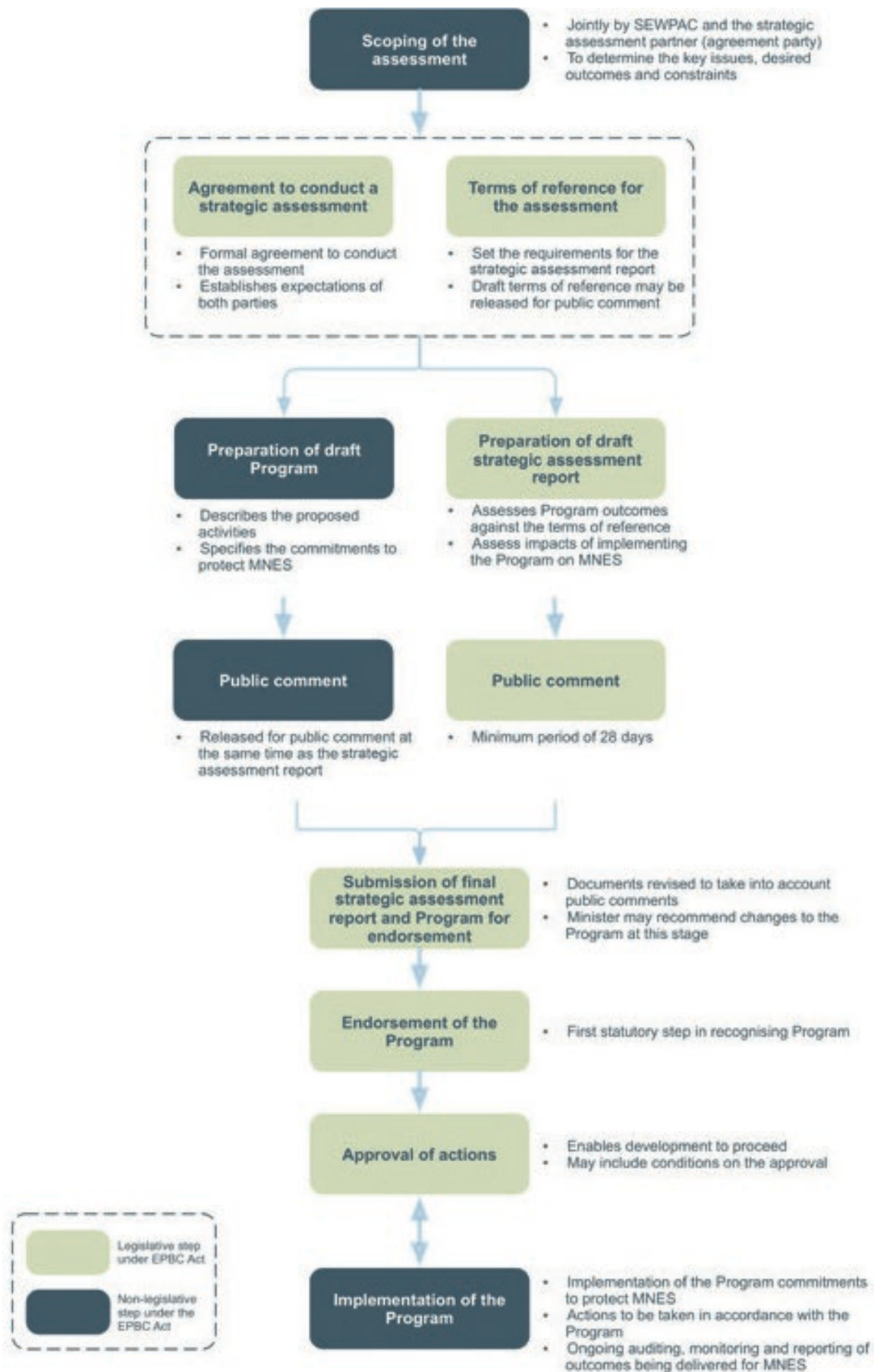


Figure 9: Strategic assessment process (Australian Government, 2013)

12. 2 Ingredients for Success

The Australian Government (2013) developed a guide to undertaking strategic assessments under the EPBC Act. This document provides useful information for undertaking SEA in Australia including guidelines on the process. They identify certain **ingredients for success** that are important for ensuring strategic assessments proceed smoothly (Table 3). These are broadly applicable to any strategic assessment process.

Ingredient	Comment
Timing	The timing has to be right to start a strategic assessment. For example, there needs to be a clear outcome in mind that can be delivered through a strategic process.
Imperative	There needs to be a clear imperative to enter into and complete the assessment. Lack of imperative may result in the process drifting.
Leadership	Leadership is critical. Management of the process at an 'inadequate' level has major risks as the process unfolds. Governance arrangements involving senior engagement should be established early in the process.
Collaboration at all levels	Strategic assessments are a collaborative process. Collaboration at all levels is necessary to move the process forward and deal with the difficult issues.
Honesty	Developing and maintaining an honest approach to the assessment is critical. This is the approach that is most likely to generate trust and provide opportunities to achieve the best outcomes.
Expectation management	Parties to the strategic assessment need to set and then meet clear expectations. Clear communication around the ability to meet expectations is critical throughout the process.
Outcome focus	An ongoing focus on the outcomes to be achieved is vital. Outcomes need to be developed early in the project and referred to throughout.
Agreed timelines and project management	Having clearly agreed timelines and proactively managing the project throughout the process are vital.

Table 3: Ingredients for success for strategic assessments (adapted from Australian Government, 2013)

13.0. Appendix 2: SEA tools

Network analysis (also called cause-effect analysis, consequence analysis, systems analysis or causal chain analysis) aims to identify the causal pathway from an initial action to ultimate environmental outcome that may be several stages removed from the activity. This method is useful for identifying cumulative impacts and involves using expert judgement to draw direct and indirect impacts of an action as a network of boxes and arrows (activities/outcomes and interactions) (European Commission, 1999; Therivel, 2004).

Geographical Information System (GIS) is a computerised mapping tool that can be used to organise and present information. It is a valuable analytical tool that can show links between data sets and can be used to superimpose maps of different features (European Environment Agency, 1998).

Modelling (also called forecasting) are techniques used to predict likely future environmental conditions, and can be used to compare scenarios with and without certain actions (European Commission, 1999; Therivel, 2004).

External compatibility matrix is used to analyse proposed strategic actions against higher-level relevant strategic actions. The matrix cells are filled by listing the strategic action of the proposal where it fulfills requirements of the higher-level strategic action. If there are no actions that fulfill the other's requirements, or if there is conflict, a new approach may be necessary (Therivel, 2004).

Cost-benefit analysis is a widely used technique that can be used to compare the net benefit of different options. The value of the benefits are added and associated costs subtracted. This involves placing a financial value on environmental goods and services and social benefits, which can be intangible and difficult to accurately value. Guidance on this method available at www.mindtools.com/pages/article/newTED_08.htm.

Scenario analysis/ Sensitivity analysis is used to forecast the impact of proposed strategic action across different possible futures. Sensitivity analysis measures the effect on forecasting predictions of changing one or more of the key input values where there is uncertainty. The Stockholm Environment Institute has developed the Polestar Manual for scenarios
<http://sei.se.master.com/teaxis/master/search/?q=scenarios&xsubmit=Search%3A&s=SS>.

Multi-criteria analysis is a technique used to assess a variety of options according to a variety of criteria. There are three common components: a set of alternatives; a set of criteria to compare the alternatives; and a method for ranking them based on how well they satisfy the criteria. A manual is available at www.cifor.cgiar.org/acm/methods/mca.html.

Opinion surveys are used to identify priorities based on community/stakeholder input. For methods go to <http://gsociology.icaap.org/methods/surveys.htm>.

Risk analysis or assessments is a commonly used tool for environmental assessments to manage risk level. See Calow (1998) for the basic principles of environmental risk assessment and for guidelines see the Australian Standards on risk assessment and www.defra.gov.uk/environment/risk/eramguide/index.htm.

Vulnerability analysis is used to assess the impacts of a planned activity based on the degree of vulnerability on selected targets (e.g. people, landscape, water, flora and fauna). GIS can be used to overlay maps to indicate areas of high vulnerability, and relate this to expected impact associated with different development options. This reveals locations with most and least impacts. For further information see van Straaten (1999).


Public participation is a core component of a SEA, with general information and techniques available online for methods to ensure full stakeholder engagement, e.g., www.iap2.org/associations/4748/files/toolbox.pdf; www.rtpi.org.uk/resources/publications/ConsultationGuidelines_web.pdf; www.unece.org/env/eia/publicpart.html.

Stakeholder analysis is used to identify those affected and involved in the PPP decision and to analyse their position, view, influence on others, and interest in a particular PPP. Go to <http://www1.worldbank.org/publicsector/anticorrupt/PoliticalEconomy/stakeholderanalysis.htm>.

13.1. Sources of further information on SEA tools

Therivel, R. (2004), *Strategic Environmental Assessment in Action*, Earthscan: London, contains an Appendix with SEA techniques, including: expert judgement, overlay maps, land use partitioning analysis, GIS, quality of life assessment, network analysis, cost-benefit analysis, modeling, multi-criteria analysis, scenario/sensitivity analysis, life cycle analysis, carrying capacity, ecological footprint, vulnerability analysis, risk assessment, and compatibility appraisal.

Rauschmayer, F. and N. Risse (2005), A Framework for the Selection of Participatory Approaches for SEA, *Environmental Impact Assessment Review*, 25(6): 650-666, covers: mediation, mediated modeling, consensus conference, citizens' juries and cooperative discourse.

Finnveden, G., M. Nilsson, J. Johansson, A. Persson, A. Moberg and T. Carlsson (2005), Strategic Environmental Assessment methodologies – Applications within the Energy Sector, *Environmental Impact Assessment Review*, 23(1): 91-123. This paper covers: future studies, life cycle analysis, environmentally extended input/output analysis, risk assessment of chemicals and accidents, impact pathway approach, ecological impact assessment, multiple attribute analysis, environmental objectives, economic valuation, surveys, and valuation methods based on mass, energy and area. 

14.0. Appendix 3: Framework for SEA of pumped hydro sites

The ANU School of Engineering has identified over 20000 sites across Australia with potential for developing pumped hydro as a storage solutions for variable renewable energy sources, primarily wind and solar photovoltaics (PV) (<http://re100.eng.anu.edu.au>).

Several criteria have been incorporated into the initial determination of site suitability. Sites have been ruled out if they were

- within a national park
- within an urban area
- did not meet minimum technical requirements: >200m head, >1 Gigalitre storage capacity and steeper than 1:15 slope between upper and lower reservoirs.

In addition there are a number of further considerations to provide information on potential acceptability of a particular site. The framework approach below structures a desk-top screening analysis as Stage 1 of a strategic environmental assessment. Most information is readily accessible as GIS layers.

The concept for Stage 1 is to estimate the likely presence of each criteria on a 1 (least likely) to 5 (most likely) scale. This will highlight which sites – with the lowest relative scores- are the least constrained. In some cases like ‘view sheds’ application of an appropriate algorithm will be required. Note that some responses are binary (Yes or No) such is the land privately owned.

For some criteria investigators are referred to a specific website. For example, under the [national environmental law](#), *The Environment Protection and Biodiversity Conservation Act (1999)*, an action is not permitted to have a significant impact on a Matter of National Environmental Significance (MNES) without approval of the Australian government. Available on-line mapping tools such as the Protected Matters Search Tool identify likely MNES within a specified polygon, <http://www.environment.gov.au/arccgis-framework/apps/pmst/pmst.jsf>.

This Stage 1 analysis does not :

- weigh the criteria – they are considered the same in developing the overall score
- incorporate potential opportunities for avoidance, mitigation or offsetting to lessen likely impacts on environmental, cultural or visual values
- consider economic or temporal constraints associated with reducing impacts or
- flag if any constraints are fatal flaws.

The Stage 1 framework below serves as a first-cut, comparative analysis highlighting sites with the highest scores as the most constrained. Issues like access to infrastructure, land tenure and impacts on surrounding land uses maybe readily overcome with sufficient expenditure. Time taken in construction or in negotiation may also prove to be a constraint and a differential between sites.

Criteria for environment- decision making:	Highly unlikely to be present /*'No' Score =1	Unlikely to be present Score =2	May be present Score =3	Likely to be present Score = 4	Highly likely to be present / *'Yes' Score = 5	Score
Is it the site a known habitat/ location of MNES?						
Check the threatened species data base in your jurisdiction. Are there any listed habitats or species at your location?						
Check mapped resources in your jurisdiction for cultural heritage sites. Are there any mapped cultural heritage sites at your location?						
Using an algorithm to determine if the view shed is vulnerable to impact ?						
Are there any other sensitive receptors near your site?						
Check land tenure maps - Is the proposed site on land under Native Title?	* NO				*YES	
Check land tenure maps - Is the land owned privately?	*NO				*YES	

Check aerial photos of surrounding land uses within the sub catchment - Are there any that rely on surface water flows?						
Check an appropriate date base for road infrastructure (for construction and operation)?	Access is excellent	Access is good	Access is fair	Access is poor	Access is non-existent	
Check an appropriate date base for electricity transmission infrastructure. (and capacity?)						
Check proximity to towns for construction and permanent worker accommodation.						
					TOTAL SCORE for SITE	

Table 4: Framework considerations for a strategic environmental assessment of pumped hydro sites