Australian Government
Department of Climate Change, Energy, the Environment and Water

GUIDELINES FOR THE CONTENT OF A DRAFT ENVIRONMENTAL IMPACT STATEMENT

Environment Protection and Biodiversity Conservation Act 1999

Syngas and Power Generation, Stage 1 Commercial Development, NeuRizer Urea Project, South Australia

EPBC 2023/09538

September 2024

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GLOSSARY

Acronym or abbreviation	Meaning
Amendment Act	*Nature Repair (Consequential Amendments) Act 2023*
Baseline data	24 months of contiguous data collection (that accounts for seasonal variability)
DCCEEW / the department	Australian Government Department of Climate Change, Energy, the Environment and Water
DEM	South Australian Department for Energy and Mining
disturbance footprint	subareas of the 'proposed action area' where earthworks, substrate disturbance, installation of infrastructure (temporary or otherwise) and land clearing may occur
ECASS	the department's Environmental Contamination Advice and Standards Section
EIS	environmental Impact Statement
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
EPBC Regulations	*Environment Protection and Biodiversity Conservation Regulations 2000* (Commonwealth)
EPBC Act Offset Policy	*Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy October 2012*
GDE	groundwater dependent ecosystem
ISG	in-situ gasification
Minister	the Australian Government Minister administering the EPBC Act, including any delegate thereof
MNES	matters of national environmental significance, which are protected under the EPBC Act
NRUP	NeuRizer Urea Project
OWS	the department's Office of Water Science
PEL	Petroleum Exploration Licence
PGE Act	the *Petroleum and Geothermal Energy Act 2000* (South Australia)
PPL	Petroleum Production Licence
proposed action area	the entire area where all activities encompassed by the proposed action will occur
proponent	Leigh Creek Operations Pty Ltd
proposed action	the proposed activities outlined in the 'preamble' (section 1)
SPRAT Database	Species Profile and Threats Database

syngas	synthetic natural gas
tailored guidelines	the guidelines for preparing the draft environmental impact statement (i.e. this document)

1 PREAMBLE

Leigh Creek Operations Pty Ltd (the proponent), a subsidiary of NeuRizer Ltd (NRZ), proposes to undertake in-situ gasification (ISG) of underground coal resources and construct and operate a small-scale (< 5MW) power generation plant, including supporting infrastructure, within the Petroleum Production License (PPL) 269 area at the former Leigh Creek coal mine, 550 km north of Adelaide, South Australia (SA).

The proposed action is the first stage of a commercial ISG project associated with the NeuRizer Urea Project (NRUP). The proposed action is to demonstrate the technical and financial capability of producing syngas at a commercial scale.

1.1 Environmental referrals

On 25 July 2023, the proposed action was referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to the Minister for the Environment and Water (the Minister). On 16 November 2023, a delegate of the Minister determined that the proposed action is a controlled action due to likely significant impacts on the following matters of national environmental significance (MNES) that are protected under Part 3 of the EPBC Act:

- Listed threatened species and communities (sections 18 & 18A), and
- Listed migratory species (sections 20 & 20A).

Consequently, the proposed action requires assessment and approval under the EPBC Act before it can proceed. On 16 November 2023, a delegate of the Minister also determined that the proposed action will be assessed by an Environmental Impact Statement (EIS) with tailored guidelines.

The NRUP will involve two stages:

- Stage 1 – Commercial Development (NRUP site power development), which is the proposed action, that these guidelines have been tailored to suit for assessment by EIS. The purpose of the proposed action is that the syngas produced during this stage will be used for on-site power demand, allowing the NRUP to operate in 'island mode', independently of the electrical grid and in a way that minimises CO2 emissions.

- Stage 2 – the Urea Production Plant (UPP), which is not part of the proposed action, would require the design and construction of a UPP to combine the hydrogen component of a conditioned syngas derived from Stage 1, which would be converted into ammonia (NH3) by reaction with nitrogen. Ammonia would then be combined with carbon dioxide to form urea (CO(NH2)2). The UPP would produce urea in a granular(solid) form for local and export agriculture markets. A portion of the syngas would also be used to provide power for this site.

Stage 2 – UPP will specifically involve:

- early works: construction, installation, or provision of the site preparation activities within the proposed Stage 2 site; and
- above ground infrastructure: construction, commissioning, and operation of the NRUP plant and equipment, including the ammonia synthesis plant, urea synthesis plant, urea granulation warehouse, conveyor and load out facility, and ancillary infrastructure.

Stage 1 is separate to Stage 2. Prior to the NRUP progressing from Stage 1 to Stage 2, the proponent stated they will consult with the Department of Climate Change, Energy, the Environment and Water (DCCEEW) to determine whether Stage 2 will need to be referred under the EPBC Act.

It is important to note that Stage 2 is entirely dependent on Stage 1 being operationally and economically successful.

The department understands that the proposed action (Stage 1 – Commercial Development) is currently subject to the Environmental Impact Report and Statement of Environmental Objectives assessment process under the *Energy Resources Act 2000* (ER Act, South Australia) (formerly *Petroleum and Geothermal Energy Act 2000*) and *Energy Resources Regulations 2013* (formerly Petroleum and Geothermal Energy Regulations 2013), and Stage 2 - UPP is currently being subject to an Environmental Impact Statement assessment under the *Planning, Development and Infrastructure Act* 2016.

1.2 Amended water trigger

On 15 December 2023, the *Nature Repair (Consequential Amendments) Act 2023* (Amendment Act) came into force to amend the water trigger controlling provisions (sections 24D and 24E of the EPBC Act) to protect water resources from additional kinds of unconventional gas developments. Previously, the only type of unconventional gas development covered by the water trigger was coal seam gas developments.

Under the amended water trigger, any activity involving extraction, recovery, or intentional release of gas from coal seams or beds, layers of shale rock, tight gas reservoirs, or any other sources prescribed by regulation, requires approval under the EPBC Act if the activity will have or is likely to have a significant impact on a water resource.

Under Part 2 Schedule 2 of the Amendment Act, the Minister was required to decide whether the amended water trigger provisions are controlling provisions for projects under a certain stage of assessment within which this proposed action fell.

On 2 July 2024, the Minister decided that the amended water trigger applies to the proposed action due to likely significant impacts on water resources as a result of groundwater contamination and changes in the integrity of hydrological or hydrogeological connections. This decision means that Sections 24D and 24E of the EPBC Act as amended by Amendment Act are now controlling provisions for the proposed action. Consequently, the proposed action must also be approved for the purposes of these controlling provisions before it can proceed.

On 2 July 2024, the Minister also decided that the proposed action will continue to be assessed by an EIS with tailored guidelines.

1.3 Assessment process

DCCEEW has developed this set of EIS tailored guidelines (the Guidelines) to guide the preparation of a draft EIS that describes and addresses the relevant impacts of the action, including guidance on the extent of studies and investigations required to adequately assess the impacts of the proposed action on the following MNES:

- Listed threatened species and communities (sections 18 & 18A)
- Listed migratory species (sections 20 & 20A)
- A water resource, in relation to unconventional gas development and large coal mining development (sections 24D and 24E)

The EIS is to provide information about the action and its relevant impacts. This information must be sufficient to allow the Minister to make an informed decision on whether to approve, under Part 9 of the EPBC Act, the taking of the action for the purposes of each controlling provision and inform any conditions that may be required for the protection of MNES. Following the provision of the EIS, the Minister may seek further information to inform the decision-making process.

The department and the South Australian Department for Energy and Mining (DEM) have agreed to conduct a coordinated assessment and approval approach to achieve efficiencies where possible while meeting the legislative requirements of each jurisdiction. The two assessment processes are the EIS under the EPBC Act and the Statement of Environmental Objectives, associated Environmental Impact Report and Activity Notification under the ER Act, where the proponent will provide assessment documentation to meet both the EPBC Act and ER Act requirements.

1.4 Components of the proposed action relevant to the assessment

DCCEEW will assess all components of the proposed action outlined in the proponent's referral submitted under the EPBC Act. The scope of the EIS documentation will cover the components included in each stage of the proposed action.

2 PREPARATION OF THE EIS GUIDELINES

2.1 Specific content of the EIS

2.1.1 Objectives of the EIS

Environmental impact assessments depend on adequately defining which elements of the environment may be affected by a proposed action, and on identifying the significance, risks and consequences of the potential impacts of the proposed action at a local, regional and national level. The EIS will be an important source of information that the public and government decision-makers will use to assess the potential environmental impacts of the proposed action.

It is expected that ecological and socio-economic investigations will be required to be undertaken to provide sufficient information for the EIS. The nature and level of investigations will be related to the likely extent and significance of the potential impacts (likelihood, consequence, magnitude, extent

and scale of impacts, including worst case scenarios). All relevant impacts of the proposed action on MNES are to be investigated and analysed, and commitments to avoid, minimise, mitigate and offset any adverse impacts must be described in adequate detail in the EIS.

The aims of the EIS and public review process are:

- to provide a source of information from which interested individuals and groups may gain an understanding of the proposed action, the need for the proposed action, the alternatives, the environment which it could potentially affect, the impacts that may occur and the measures proposed to be taken to avoid, minimise or compensate for these impacts;
- to provide a forum for public consultation and informed comment on the proposed action; and
- to provide a framework in which decision-makers can consider the environmental aspects of the proposed action including biophysical, cultural, social, heritage, economic, technical and other factors (as applicable).

The EIS will discuss compliance with the objectives of the EPBC Act and the principles of ecologically sustainable development, as set out in the EPBC Act. The EIS will also identify and address, as fully as possible, all matters relevant to the proposed action and their potential impacts.

The EIS will provide a description of the existing environment in the area affected by the proposed action, including as a result of any decommissioning of existing infrastructure needed to provide for the proposed action, construction and commissioning operations and future decommissioning of the proposed action. All potential impacts and risks on the environment are to be investigated and analysed. The EIS will present an evaluation of the potential environmental impacts using an accepted risk-based methodology and describe proposed measures to avoid, minimise, mitigate or offset the expected, likely, or potential impacts. Any prudent and feasible alternatives to the proposed action will be discussed in detail and clear reasons for why any alternative is preferred to another will be clearly given.

While the EIS Guidelines are designed to cover all relevant matters, the EIS will also need to address other issues that emerge during the EIS investigations, especially those relevant to statutory decisions that will be informed by the assessment.

2.1.2 General advice

The EIS should be a stand-alone document that contains sufficient information from studies and/or investigations undertaken to avoid the need to refer to previous or supplementary reports.

The EIS should enable interested stakeholders and the Minister to understand the environmental consequences of the proposed action. Information provided in the EIS should be objective, clear, and succinct and, where appropriate, be supported by maps, plans, diagrams or other descriptive detail. The main volume of the EIS should be written in a clear and concise style that is easily understood by the general reader. Technical jargon should be avoided wherever possible. Cross-referencing should be used to avoid unnecessary duplication of text.

Detailed technical information, studies, or investigations necessary to support the main volume should be included as appendices to the EIS. It is recommended that any additional supporting documentation and studies, reports, or literature not normally available to the public from which information has been extracted be made available at appropriate locations during the period of public display of the EIS.

After receiving the Ministers approval to publish the draft EIS, the proponent is required to make the draft EIS available for a period of public comment. Specific instructions regarding publication requirements will be provided as part of the Minister's direction to publish.

If it is necessary to make use of material that is considered to be of a confidential nature, the proponent should consult with DCCEEW on the preferred presentation of that material, before submitting it to the Minister for approval for publication.

The EIS must state the criteria adopted in assessing the proposed action and its potential impacts, such as: compliance with relevant legislation, policies, standards and best practice; community acceptance; maximisation of environmental benefits and minimisation of risks and harm.

The level of analysis and detail in the EIS should reflect the level of significance of the potential impacts on the environment. All unknown variables or assumptions made in the assessment must be clearly stated and discussed. Further, any claims made (e.g. regarding the presence/absence of protected matters) need to be adequately justified and supported with evidence. The extent to which the limitations, if any, of available information may influence the conclusions of the environmental assessment should be discussed.

The proponent must ensure that the personnel providing information to inform preparation of this EIS have the relevant qualifications and experience in their relevant fields.

2.1.3 Relevant legislative and policy context

The EIS should take into consideration the Significant Impact Guidelines 1.1: *Environment Protection and Biodiversity Conservation Act 1999*, as well as any other relevant EPBC Act policy statements and guidelines such as policies, recovery plans, threat abatement plans, conservation advice documents, management plans, advice and guidance published on the department's website, that can be accessed from the following website: EPBC Act publications and resources - DCCEEW. All relevant guidance documents should be considered in determining and managing likely impacts for relevant species.

For decisions about threatened and migratory species, in accordance with section 139 of the EPBC Act, the Minister must not act inconsistently with a recovery plan or threat abatement plan. The Commonwealth Minister must also have regard to any approved conservation advice. DCCEEW documents relevant for each listed threatened and migratory species can be found by viewing the species profile at: http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl.

When assessing impacts on water resources, the department recommends following the information guidelines developed by the Independent Expert Scientific Committee on Unconventional Gas Development and Large Coal Mining Development (IESC), that can be accessed from the following website: https://www.iesc.gov.au/information-guidelines, to assist proponents in the preparation of

environmental impact assessments. The resources in this website provide guidance on the suggested information and data to be included in an environmental impact assessment.

In accordance with section 131 AB of the EPBC Act, the Minister must obtain advice from the IESC on unconventional gas developments that will or are likely to have a significant impact on water resources before deciding whether or not to approve the action. Providing appropriate information following the IESC's guidelines will enable the IESC to provide robust scientific advice to the Minister on the potential water-related impacts of the proposed action, allowing the Minister to make a well-informed decision based on proper scientific evidence.

The proponent should ensure that the EIS assesses compliance of the action with principles of Ecologically Sustainable Development as set out in the EPBC Act, and the objects of the Act at Attachment 1. A copy of Schedule 4 of the *Environment Protection and Biodiversity Conservation Regulations 2000* (EPBC Regulations), *'Matters to be addressed by draft public environment report and environmental impact statement'* is at Attachment 2.

2.1.4 Format and style

The draft EIS must comprise three elements:

a) the executive summary;

b) the main text of the document, written in concise plain English so it is readily understood by a member of the public; and

c) appendices and/or attachments containing detailed technical information which may include other sensitive commercial or cultural information (if required).

The EIS must be written so that any conclusions reached can be independently assessed and validated. To this end all sources must be appropriately referenced using the Harvard standard. The reference list must include the address of any web pages used as data sources. Publicly available scientific journal articles and externally prepared peer-reviewed reports are preferred wherever possible.

The main text of the EIS should include a list of abbreviations, a glossary of terms, contact details for the proponent and the names of the persons involved in preparing the EIS. The appendices should contain a copy of these Guidelines and a list of persons and agencies consulted in the EIS.

Maps, diagrams and other illustrative material should be included in the EIS, including clear legends, scale and delineation of key environmental features relative to the proposed action area, and appropriately referenced. Also, maps and boundary data should follow the guide to providing maps and boundary data for EPBC Act projects, which can be seen at: https://www.dcceew.gov.au/environment/environmental-information-data/information-policy/maps-and-boundary-data-for-epbc-act-projects. The EIS should be produced on A4 size paper capable of being photocopied, with maps and diagrams on A4 or A3 size and in colour.

The proponent should consider the format and style of the document appropriate for publication on the internet and printing/photocopying, adhering to relevant accessibility guidelines. The capacity of

the website to store data and display the material may have some influence on how the document is constructed.

2.1.5 Executive summary

An executive summary that outlines the key findings of the EIS must be provided. The executive summary must briefly:

- state the background and the need for the proposed action;
- outline the key elements of the proposed action;
- discuss alternatives to the proposed action, and the reasons for selecting the preferred option and rejecting alternatives;
- summarise the site preparation, construction, operation, decommissioning and post-site closure activities associated with putting the proposed action into practice;
- state the proposed schedule for key activities and the expected duration of the proposed action;
- provide an overview of the existing regional and local environments, summarising the features of the physical, biological, social, cultural and economic environment relating to the proposed action and associated activities with each;
- describe the expected, likely and potential impacts of the proposed action on MNES during the site preparation, construction, operation, decommissioning and post-site closure stages;
- summarise the proposed environmental protection measures and safeguards;
- describe any residual significant impacts and any proposed offset measures;
- set out conclusions on the acceptability of impacts on MNES;
- summarise the monitoring procedures to be implemented for the proposed action; and
- provide an outline of the environmental record of Leigh Creek Operations Pty Ltd.

2.2 General information

The EIS must provide the background and context of the proposed action including:

a) the title of the proposed action;

b) the full name and postal address of the designated proponent;

c) a clear outline of the objective of the proposed action;

d) the location of the proposed action, including confirmation of

- the numbers and layout design of gasifiers;

- location and size of the gas processing facility disturbance footprint;
- location and size of the powerplant disturbance footprint; and
- any ancillary components likely to be required to support the proposed action.

e) the background to the development of the proposed action and justification for taking the action, including but not limited to:

- current activities undertaken as part of the mine closure plan and rehabilitation program of the Leigh Creek Coalfield and how they will be incorporated in the activities of the proposed action;
- quantity of coal resources remaining to be extracted; and
- prediction of syngas generated to support the Stage 2 of the NeuRizer Urea Project (NRUP).

f) how the proposed action relates to any other actions (of which the proponent should reasonably be aware) that have been, or are being, taken or that have been approved in the region affected by the action;

g) the current status of the proposed action;

h) the consequences of not proceeding with the proposed action;

i) a brief explanation of the scope, structure and legislative basis of the EIS; and

j) the specific EPBC Act MNES affected by the proposed action.

3 DESCRIPTION OF THE ACTION

The site preparation, construction, operation, decommissioning and post-site closure stages of the proposed action should be described in sufficient detail to understand the proposed action (including interdependencies between stages) and assist in determining the associated potential environmental impacts. This should include the precise location where possible (including coordinates) of all works to be undertaken (including plans, concept designs, and maps), structures to be built or elements of the action that are likely to impact MNES and other social, cultural or economic impacts.

The description of the proposed action must include details on:

- the expected maximum life of the proposed action (including decommissioning);
- information about the total amount of covered emissions of greenhouse gasses from the operation of the proposed action during a financial year in carbon dioxide equivalence considering the life operation of the proposed action;
- how the various stages of the proposed action are defined (i.e. site preparation, construction, operation, decommissioning and post-site closure);

- works to be undertaken during each stage and the anticipated duration and timing of each stage;
- location and design of the ISG infrastructure (including chambers, initiation wells, production wells, instrument and monitoring wells, boreholes to be abandoned);
- description of the system and layout of gasifiers and pipes' network for the gasification process;
- the distribution, number, and size of the gasifiers (i.e. inlet and outlet wells) and other type of wells (e.g. monitoring wells, initiation wells, etc);
- description of the gasifiers and other type of wells' design, integrity and installation;
- detailed explanation of the establishment and operation of multiple power supply gasifiers;
- description of the process to establish and preserve multiple gasifiers for future commercial development;
- development and operation of the small-scale site powerplant;
- location of infrastructure construction (gas pipelines, underground services, and compression lines);
- detailed information of the drilling, operation and decommissioning of the inlet, outlet and initiation wells;
- location and size of the powerplant and gas processing facility;
- arrangements for monitoring during each stage of the proposed action;
- details of associated works/activities, such as waste disposal and storage activities, transport requirements and access routes (including the potential use of road, rail and aircraft) throughout the different stages of the proposed action; and
- the likely outcomes of decommissioning, rehabilitation and the post-site closure, including how they relate to any broader obligations to rehabilitate the former mine site.

The description should include the use of satellite imagery, aerial photographs, maps, figures and diagrams, where appropriate. A general location map should be provided to illustrate the context of the landscape where the action is proposed. Additional site maps should be provided that illustrate the existing and proposed infrastructure, including the location of potential future expansions or new developments. Reference should be made to detailed technical information in appendices where relevant.

Diagrams and maps including but not limited to the geology, vegetation, groundwater dependent ecosystems (GDEs), ground and surface water hydrology of the broader landscape are to be provided to support the EIS.

The EIS must include the location, boundaries and size (in hectares) of the proposed action area and its disturbance footprint and of any adjoining areas which may be indirectly impacted such as GDEs or surface water bodies by the proposed action such that relevant impacts can be understood. If the disturbance footprint is the same as the project site this should be clearly stated.

The various elements of the proposed action must be described in the text and illustrated with maps, diagrams, plans (at a suitable scale) and other information as required to provide sufficient context and basis for the identification and assessment of impacts.

3.1 Approach to international leading practice

The EIS must:

- demonstrate that all activities and materials used will be in accordance with, or exceed, current standards of international best practice;
- provide a process of periodic review throughout the life of the facility to ensure operations continue to be conducted in accordance with, or exceed, contemporary standards of international best practice;
- describe the known challenges of the industry and refer to any significant incidents that have informed the impact assessment of this action;
- describe the activities undertaken for an underground coal gasification process in Australia, including construction, production, storage, conditioning, decommissioning and closure including any impacts on the environment from those operations;
- provide general information on the underground coal gasification process's activities with a similar function to that proposed in Australia and in operation throughout the world, their use, size, age, characteristics, performance and safety and regulatory arrangements. A conclusion should be drawn as to current best practice in this field and its relevance to the Australian experience.

3.2 Feasible alternatives

Provide discussion on any feasible alternatives to the proposed action to the extent reasonably practicable, including:

- if relevant, the alternative of taking no action;
- a comparative description of the impacts of each alternative on the MNES protected by controlling provisions of Part 3 of the EPBC Act for the action;
- where there are likely different environmental impacts associated with the alternatives, sufficient detail to make clear why any alternative is preferred to another; and
- how the choice of alternatives or options ensures impacts to MNES are appropriately minimised and managed to an acceptable level.

Short, medium and long-term advantages and disadvantages of options must be discussed.

3.2.1 Site selection process

The EIS should provide a summary of the process undertaken to select the acquired site as the location for the proposed action. This should include a summary of:

- sites which were nominated;
- consultation on the site selection process, and levels of community support;
- factors identified that informed the site selection process;
- studies undertaken at each of the sites; and
- the reasons for selecting the acquired site over other options.

3.3 Description of the existing environment

The EIS must include a description of the environment of the proposed site and the surrounding areas that may be impacted by the proposed action, both directly and indirectly and in both the short and long term. The description should also include information on the importance and value of potentially impacted environmental features at the local and regional scale, as well as a description of the environment of the proposed site and its vicinity (i.e. immediately adjacent, upstream and/or downstream areas of the proposed action site) that may be affected by the proposed action. The description must be sufficiently detailed to inform the assessment of impacts with greater detail provided for the species, habitats, and environmental features with greatest potential for impact.

The department recommends the description of the existing environment include the following subsections.

3.3.1 Description of the physical and biological environments

This section should include discussions of:

- existing topography of the proposed action site and its vicinity;
- existing geomorphology of the proposed action site and its vicinity;
- existing surface water features and their hydrology, including historic and current flow regime of the proposed action site and its vicinity;
- existing groundwater hydrology and hydrogeology, including historic and current flow regime of the proposed action site and its vicinity;
- existing geology and hydrogeology of the Telford Basin and surrounding areas (including types and locations of fractures, aquifers and their properties), seismic stability, soil types, permeability and hydraulic conductivity (and variability thereof) of each layer (including coal seams within the coal measures) of the proposed action site and its vicinity. It is recommended to use figures or any other visual aid to illustrate the description of the environment requested above for ease of public readability;

- a map indicating the location of historic drillholes within the proposed action area and its vicinity;
- concentrations of any existing chemical contaminants in groundwater or soil which may occur on the proposed action site;
- current and historical surface water and groundwater quality of the proposed action site and its vicinity;
- detailed and representative hydrogeological, hydrological, ecohydrological and hydrochemical baseline data for all surface water and groundwater features that are associated with the proposed action, including data on connectivity and interactions within and between groundwater aquifers and groundwater-surface water interactions;
- existing geological and hydrogeological system conceptualisations (including figures or any other visual aids to explain these conceptualisations) of the proposed action site and its vicinity with specific inclusion of the uncertainties and assumptions inherent in the conceptualisations;
- evidence-based hydrogeological, hydrologic and ecohydrological conceptual models (including figures or any other visual aids to explain these conceptual models) that describe hydrogeological and ecohydrological parameters and processes and outline potential impact pathways associated with the proposed action. Sufficient data and sensitivity analysis must be provided to support the models;
- meteorology of the site, including extreme events that may be relevant to safety aspects of the proposed action;
- incidence of extreme weather events, such as bushfires and floods;
- key conservation areas, GDEs, vegetation communities and relevant watercourses in the vicinity of the proposed action area;
- native flora and fauna (terrestrial, aquatic and subterranean), including the presence or potential presence of species of local, regional, state and national significance potentially affected by indirect impacts from the proposed action;
- key food chains and ecological interactions (particularly relevant to potential contaminated groundwater pathways for threatened and migratory species, their habitats, the water resource in general, people and the environment). If appropriate, it is recommended to use figures, diagrams or any other visual aid to illustrate these interactions;
- conservation significance of the site, buffer zone and region, including proximity to National Parks, Conservation Parks, wilderness areas, wetland areas, locally and nationally significant species, and habitats used by species listed under international agreements relevant to the conservation of MNES.

3.3.2 Description of socio-economic environment

This section should include descriptions of:

- previous and current ownership of the site and adjoining areas, including the historical anthropogenic uses of the proposed action site;
- zoning, land uses and local government planning;
- possible future zoning, planning controls, changes in land use, and nearby developments;
- proximity to areas routinely used by people;
- proximity to hazardous or other potentially incompatible land uses;
- proximity to airports and flight routes;
- demographic characteristics of nearby communities;
- employment levels and characteristics;
- wider community views and attitudes towards the proposal;
- road/rail access, traffic flow and capacity;
- other infrastructure as relevant;
- recreational use of surrounding areas;
- landscape/visual environment;
- sites listed on the Australian Heritage Database, sites listed on the South Australian Heritage Places Database, and any other sites (both listed and non-listed) of Indigenous and non-Indigenous historical significance;
- potential impacts on South Australian agriculture, tourism and other enterprises.

3.3.3 First Nations cultural and heritage significance and identification within the region and site

This section should include discussions of:

- First Nations people's traditional and current connections and history related to the region and the proposed action site;
- past, existing and future land uses, including the ability to generate income from those land uses and management of Country in the area;
- sites of heritage or cultural significance, including tangible and intangible cultural values and connections to the region and proposed action site;
- sites of archaeological significance.

- ownership of the land, land claims and community aspirations.
- First Nations people's views and aspirations towards the proposal.

4 DESCRIPTION OF PROTECTED MATTERS

The EIS must provide a description of the protected matters that are likely to be impacted by the proposed action.

Protected matters must be described at an ecologically relevant scale (local, regional) so that the relative value / importance of the area that will be affected (directly and indirectly) is understood.

Appropriate resources and latest published literature should be reviewed and cited throughout, including all relevant government issued conservation advice and recovery plans, management plans and relevant ecological studies where available.

The EIS must include a habitat assessment for each relevant listed threatened and migratory species. The habitat assessment must include, but not be limited to, the habitat area (in hectares), quality, location and use specifications of known and potential suitable habitat in relation to the project's **indirect impacts** on listed threatened and migratory species and their habitats. If the proposed action will not affect directly on listed threatened and migratory species and their habitats within the proposed action area, the EIS must state this and provide scientific-based evidence to justify the statement.

The habitat assessment must be informed by, at a minimum, a desktop assessment of relevant Commonwealth and State Government databases and the outcomes of relevant field surveys or studies that are applicable to the habitat, communities, GDEs or species in and outside the proposed action area.

The EIS must consider and discuss the value of suitable habitat present within and outside the proposed action area and how it may be impacted by the proposed action.

The EIS must describe the methodology for identifying priority areas for conservation.

The EIS must provide an analysis of the strengths, limitations and expected effectiveness of methodologies used to identify the MNES and identify any key information gaps, further studies needed to address critical information needs.

Specific minimum requirements for the EPBC Act controlling provisions are given below.

4.1 Listed migratory species and threatened species and ecological communities

The EIS must include a description of listed species, which includes listed threatened species and ecological communities (EPBC Act sections 18 and 18A) and listed migratory species (EPBC Act sections 20 and 20A) that are likely to be present in the proposed action and its vicinity (in areas that may be indirectly impacted by the proposed action). From the information provided in the referral documentation, the department considers that the protected matters that may be significantly impacted by the proposed action include, but are not limited to:

<u>Listed threatened species and communities:</u>

- Curlew Sandpiper (*Calidris ferruginea*) – Critically Endangered
- Thick-billed Grasswren (*Amytornis modestus*) – Vulnerable
- Blue-winged Parrot (*Neophema chrysostoma*) – Vulnerable
- Yellow-footed Rock-wallaby (*Petrogale xanthopus xanthopus*) – Vulnerable

Listed migratory species:

- Curlew Sandpiper (*Calidris ferruginea*) – Critically Endangered

The EIS must consider that because the proposed action is likely to impact on a species that has been categorised as a threatened and migratory species (i.e. Curlew Sandpiper), consequently the listed migratory species controlling provision had to be triggered.

It is the proponent's responsibility to ensure that any listed migratory and threatened species at the time of the controlled action decision (16 November 2023), which will or are likely to be impacted by the project, are assessed for the Minister's consideration. Any listing events (e.g. the listing or up-listing of a species) that occur after the controlled action decision (16 November 2023) do not affect the assessment and approval process.

The EIS must identify and describe known historical records of listed migratory and threatened species in the broader region (this may also include downstream of the project site). All known records must be supported by an appropriate source (i.e. Commonwealth and State databases, published research, publicly available survey reports, etc.), the year of the record and a brief description of the habitat in which the record was identified.

The surveys must be of a suitable standard, particularly scope, timing and duration, methods, and frequency, and be undertaken by appropriately qualified or experienced personnel, to be able to detect cryptic or difficult to detect terrestrial and aquatic species potentially affected by the action. Further, the survey effort must also target areas upstream, downstream and adjacent to the project site, particularly species which regularly disperse through the landscape or aquatic environments (particularly seasonally) and/or have large home ranges. The surveys must demonstrate and ensure enough information is available to inform an understanding of the full scope of potential impacts of the proposed action.

The EIS must provide a robust assessment of the potential habitat available such as GDEs within, adjacent to, upstream and/or downstream of the project site for listed migratory and threatened species, including the total amount of each type of habitat (in hectares) within, adjacent to, upstream and downstream of the project site. This must include the assessment of specific habitat requirement/s relevant to each listed migratory and threatened species (e.g. breeding, foraging, dispersal, important habitat, roosting, etc.), to inform the expected, likely and potential impacts of the proposed action. Habitat assessments must be based on information obtained from:

- field surveys and vegetation assessments;
- GDEs field surveys and assessments;

- DCCEEW's Species Profile and Threats (SPRAT) Database;
- the SA Department for Environment and Water's ecological databases including eFlora SA and the Biological Databases of South Australia (BDBSA);
- relevant DCCEEW documents (i.e. approved conservation advices, recovery plans, listing advices, draft referral guidelines, etc.); and
- published research and other relevant sources (where relevant).

This section must include the following details:

- details of the scope, duration and timing (survey seasons), and scientifically robust methodology for studies or surveys used to provide information on the listed species and their habitats (including GDEs field surveys) at the site in the Petroleum Production Licence (PPL) 269 and surroundings at the Petroleum Exploration Licence (PEL) 650 area (i.e. in the project site and its vicinity);
- historical records of listed species within the proposed action and its vicinity, particularly in areas that may be indirectly impacted by the proposed action such as the nearby Retention Dam, Aroona Dam, etc.;
- field habitat assessment surveys for listed species within PPL 269 and PEL 650;
- desktop habitat assessment for listed species in areas outside the proposed action that maybe be indirectly impacted by the proposed action such as identification of nearby GDEs, vegetation communities, relevant surface water features that provide important habitats for listed species;
- identification of the listed species' habitat extension within the proposed action area and within a buffer of 10 km from the proposed action area;
- investigation of GDEs within the proposed action vicinity (i.e., PPL 269 and PEL 650), which should be conducted following approaches within Doody et al. (2019)[1] to appropriately investigate and ground-truth the presence of GDEs;
- investigations to confirm the absence of subterranean GDEs within the proposed action and its vicinity;

[1] Doody TM, Hancock PJ and Pritchard JL 2019. *Information Guidelines Explanatory Note: Assessing groundwater-dependent ecosystems*. Report prepared for the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development through the Department of the Environment and Energy, Australian Government. Available [online]: Information Guidelines Explanatory Note — Assessing groundwater-dependent ecosystems (environment.gov.au).

- how studies or surveys are consistent with (or a justification of divergence from) relevant departmental guidelines or policy statements, or are in accordance with best practice studies or surveys, and include a description of any uncertainties/ limitations, including but not limited to timing, conditions and technology;

- migratory and threatened species' abundances at a local scale and regional scale where relevant, distribution and site fidelity at the proposed action site and in areas that may be impacted by the proposed action (outside the project area), and known habitat utilisation or requirements, including biologically important areas and habitat critical to the survival of the species;

- usage of the proposed action area and in areas that may be impacted by the proposed action (outside the project area) by listed species in regional context including, but not limited to migratory pathways, breeding and foraging behaviours;

- usage of listed species habitat that may be impacted by the proposed action (outside the project area) in regional context including, but not limited to migratory pathways, breeding and foraging behaviours;

- the predicted temporal and spatial variability in occurrence of listed species within the proposed action area and in areas that may be impacted by the project (outside the project area);

- relevant identified threats to the survival, habitat utilisation, site fidelity and essential life functions of listed species, including foraging, breeding or migratory behaviours, and past and projected trends and existing threats to the condition of habitat due to the likely discharge of contaminated groundwater into relevant surface water bodies and GDEs caused by the proposed action.

4.2 Unconventional gas development with impact on water resources

The EIS must include a comprehensive assessment of the hydrogeological and hydrologic properties and behaviours of the proposed action site and its vicinity under pre-development, under development and post-development scenarios.

The EIS must include geological and hydrogeological system conceptualisations with specific inclusion of the uncertainties and assumptions inherent in the conceptualisations. These system conceptualisations are generalisations used to create the proponent's internally consistent realisation of the physical environment based on available data to the proposed action.

Of interest for the department is the articulation of the uncertainties and assumptions when developing a conceptual understanding of the geological and hydrogeological systems relevant to the proposed action. It is recommended to use figures or any other visual aid to illustrate those conceptualisations. The uncertainties and assumptions inform the sensitivities and reliability of the predictive outputs of numerical simulations that are developed based on the conceptualisations. The predictions from the numerical simulations, whether pyrolysis and geo-mechanical simulations or

groundwater flow simulations, will inform considerations of potential impacts and allow prioritisation of potential risks that the proponent should plan for and manage.

In particular, this section must include the following details:

- how are the conceptualisations' assumptions and uncertainties transferred, implemented into, and tested via the groundwater flow predictive simulations or geotechnical modelling;
- description of other aspects of groundwater flow simulation uncertainty, particularly the simplifications and assumptions made in the simulation phases:
  - Building phase, including but not limited to boundary and initial conditions.
  - Calibration phase and parametric sensitivity assessment, and
  - Predictive phase.
- how potential fluid pathways through historic drill holes have been considered to inform the hydrogeological system conceptualisation and subsequent implementation into numerical groundwater flow simulations for predictions of groundwater flow response to the action;
- an assessment of the regional geological stress field to understand implications for structural geology, well integrity, hydrogeological connectivity and pyrolysis chamber integrity;
- comprehensive description of the hydraulic gradients and groundwater flow paths within and between the geological formations of the Telford Basin, including the alluvium and Quaternary deposits and any surface water features;
- detailed baseline data describing surface and groundwater quality and groundwater levels/pressures within the proposed action area and within a buffer of 10 km from the proposed action area; comprehensive assessment of the aquifers' properties including their vertical and horizontal variability within PPL 269 and PEL 650;
- assessment of new and historical hydrochemical and groundwater level/pressure data within PPL 269 and PEL 650 to understand spatial and temporal variability of hydrochemistry, and describe the key hydrogeological processes (such as connectivity or flow paths), and historical contaminant transport within the proposed action site and its vicinity; detailed geotechnical baseline data, including but not limited to:
  - geology and seam definition in the deeper sections of the basin.
  - geotechnical logging of borehole cores through the Main Seam overburden to establish the rock mass condition in terms of Rock Quality Designation Index and Geological Strength Index.
  - a map showing the extension and location of major faults in the overburden strata; and
  - laboratory testing of samples of the Main Seam coal and immediate overburden strata.

- hydrogeological conceptualisation of historical and potential groundwater, surface and free gas connectivity pathways or transport, through modelling, within PPL 269, PEL 650, the Telford Basin and with external formations/aquifers located in the Quaternary deposits;

- comprehensive assessment of potential groundwater and free gas connectivity pathways between the proposed action and:

    - the non-Quaternary aquifers; the aquifers located to the north outside the Telford Basin; and

    - the Quaternary deposits and GDEs, which extends beyond the Telford Basin boundaries.

- detailed description of current relationships between groundwater, surface features, such as water courses or GDEs and geological structures (e.g. major faults, fractures, etc.) within PPL 269, PEL 650, the Telford Basin and with external formations/aquifers located in the Quaternary deposits);

- description of the potential water resources that can be impacted by the proposed action within the proposed action area and a buffer of 10 km from the proposed action area;

- consideration of the IESC information guidelines for preparing an EIS and relevant further studies, surveys, analysis and modelling. This IESC guideline and specific supplementary explanatory notes can be found here.

5 IMPACTS

5.1 General impacts

The EIS must:

- discuss the effects of the overall proposed action on the functioning and condition of water resources and the terrestrial environment, including effects to water resources and the terrestrial environment surrounding the proposed action area based on scientifically defensible study areas;

- identify the source of potential impacts during the site preparation, construction, operation, decommissioning and post-site closure stages of the proposed action;

- discuss potential impacts which may arise through the ISG process such as migration of contaminated groundwater, changes in the hydrology of the area and water quality;

- discuss potential impacts which may arise through the transportation, storage and use of dangerous goods (if any), fuels and chemicals, such as accidental spills;

- consider the application of a waste management hierarchy (e.g. reduce, reuse, recycle, treat, dispose) and potential impacts caused by the need for waste disposal and management of emissions, refuse, effluent and hazardous waste (if any); and

- in discussing potential impacts, consider how the interaction of extreme environmental events (e.g. an earthquake, floods, etc.) and any related safety response may impact on the environment.

5.2 Relevant impacts

The EIS must discuss all the relevant impacts of the action to:

- listed threatened species;
- listed migratory species; and
- the water resource caused by unconventional gas development.

All relevant impacts of the proposed action must be assessed in accordance with relevant DCCEEW policies and guidelines, and information provided in the SPRAT Database and considering the information provided in the IESC's website.

Relevant impacts are impacts that the action will have or is likely to have on a matter protected by a controlling provision (as listed in the preamble of this document). Impacts during the site preparation, construction, operation, decommissioning and post-site closure stages of the proposed action should be addressed, and the following information provided:

a) a detailed assessment of the nature, extent, severity/intensity, seasonality and duration of the likely short-term and long-term relevant impacts;

b) a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible;

c) analysis of the significance of the relevant impacts; and

d) any technical data and other information used or needed to make a detailed assessment of the relevant impacts, including but not limited to:

  - a significant impact analysis on listed threatened species, listed migratory species and water resources (including any impacts of associated salt production and/or salinity);
  - evidence-based assessment of the occurrence of groundwater-dependent ecosystems (GDEs) including ground truthing, to understand the dependence of GDEs on groundwater and surface water features.
  - If GDEs are identified surrounding the proposed action area, baseline condition surveys should be carried out to benchmark future monitoring of these ecosystems;
  - given the disturbed environment, describe and establish the pre-existing earth motion baseline as a reference against which to monitor subsidence;

- consideration of historic drillholes that have not been mined out in the Telford basin in informing the hydrogeological system conceptualization and implications for connectivity of groundwater systems along with potential flow propagation of pyrolysis by-products should there be an over pressure and outward flow from the gasifiers;

- the long-term/steady state flow predictions/assessments need to also account for the uncertainty resulting from the presence of the historic bores. Likewise, the implications for bore completion/closure integrity changes because of any project induced ground movement/subsidence must be considered.

- an adequate and consistent characterisation of rock mechanical properties (e.g. unconfined compressive strength, Young's modulus) as these will impact greatly on cavern and well integrity, and also the degree of subsidence that occurs;

- comprehensive assessment of the aquifers' hydrogeological properties including their vertical and horizontal variability within the proposed action site and its vicinity, coupled with adequate conceptualisation of potential impact propagation pathways and hydrogeological/reservoir model simulation, including sensitivity analysis. This assessment should also include modelling of groundwater and gas transport, and reactive/contaminant transport modelling, which could include considerations of, but not limited to:

    - adequately identify subsurface faulting through a 3D seismic survey within the proposed action area before and after Stage 1 and consequently incorporate these results into the geological and hydrogeological system conceptualisations;

    - detailed description of geomechanical properties and modelling of potential geomechanical responses, including a sensitivity analysis of the possible range of rock properties and their influence on geomechanical responses.

    - the potential for collapse of overburden due to degradation of organics in the mudstones or the decomposition of carbonate minerals during pyrolysis, which may induce vertical deformation.

    - the potential for factors such as heat, cavity pressure, and surrounding hydrostatic pressure to change over time during operations and the potential for this to alter influence geomechanical and hydrogeological properties.

    - the potential for hydraulic conductivity and geomechanical properties to change with depth, including the activation of connectivity pathways, particularly along the geological dip and at the basin boundaries, and along faults.

    - the potential for faulting to permit preferential flow paths, particularly along the dip angle where displacement provides contact between gas-bearing areas and coal or faults.

- the continuity of coal and coal seams, given that these properties may change with depth and along the dip angle.
- further evidence (e.g. pump tests and sediment characterisation) of Lower Series hydrogeological properties.
- the potential for connectivity between Basin aquifers, such as along faults, including between:
  - the Upper Series and Main Series aquifers. Given that the Upper Series coal seams are described as significant aquifers with relatively high horizontal hydraulic conductivity, any contaminant or free gas that potentially reaches these aquifers are likely to significantly increase the risks associated with contaminant transport outside the basin.
  - the Main Series and Lower Series, and the potential for operations to induce faulting or fracturing which may create preferential flow paths for water and/or free gas, in particular along the dip angle or vertically to the overlying Upper Series aquifers.

- after conducting the 3D seismic survey and drilling program, interpret the results and indicate how the findings are incorporated into the comprehensive aquifer assessment and the project's detailed designs and operational requirements, including the uncertainties that need to be considered to understand better the groundwater connectivity issues
- modelling simulation to assess the changes to the existing hydrogeological and free gas conditions caused by the activities of each stage of the proposed action, including the incorporation of all geological data (such as faults/fractures) and hydrogeological data into these modelling simulations and appropriate sensitivity analysis. This should include characterisation of the potential consequences of these changes to the water resources (e.g. the extent and severity of any change in the hydrology and hydrochemistry of waters) and its effects on critical habitat and important population of listed species likely to be present outside the proposed action area;
- key information regarding anticipated hydrostatic and gas cavity pressures, and cavity pressure safety margins to account for pressure fluctuations;
- it is recommended to acquire high resolution 4D seismic surveys to identify changes to coal before, during and after gasification process to complement and verify the pyrolysis propagation and extent simulations. This could be extended to include other geophysical subsurface imaging techniques as part of the monitoring regime during the initial Stage 1 phase;
- details of model construction, sensitivity analysis, validation, calibration, and peer review;

- consideration of the environmental and climate impacts of airshed atmospheric discharges from cold vents, flaring, and thermal oxidiser, used to manage gas processing wastes and / or excess syngas production;

- provide further information/data to scientifically validate previous assessments, including on historic flow regime and future flow modelling data;

- The current mechanical modelling study requires more detailed information such as:

    - criteria for assessing the severity of deviations from the predictive mechanical model and how those deviations may affect or change geological and hydrogeological processes or conceptual understanding.

    - what margins of error are inherent in estimation of fracture and constrained zones of the ISG panel design?

    - what are the hydrogeological implications for preferential damage within siltstone-dominant strata of which certain units are identified aquifers?

    - what will the final gasifier array be and how does this compare to the configuration presented in the referral information?

    - has the model been the subject of scenario analysis with respect to potential project layouts that could cause an unacceptable failure?

    - will the Telford Gravel be impacted by shallow tension cracking?

    - should any subsidence reach the surface is it possible to quantify the amount of gas leakage and whether the pyrolysis chambers can be effectively shut-in?

- the Ismet Canbulat and Choushui Xu reports are required to be provided to place the current mechanical modelling study into the necessary context;

- consider undertaking a scenario demonstrating the minimum gasifier panel array that would cause an unacceptable failure of the proposed action;

- the final gasifier layout and associated modelling;

- the geomechanical model must provide sufficient scenarios, sensitivity and uncertainty analysis to understand the final gasifier layout with respect to the proposed action's risks;

- detailed description of the current horizontal extent of the Telford Gravels;

- the potential connectivity between aquifers outside the Telford Basin, and how those aquifers may interact with the Basin and potential GDEs;

- present a comprehensive evidenced-based assessment of the potential hydraulic interactions between different layers within the Telford Basin as well as with the surrounding geological formations;

- comprehensive assessment of the major faults and fractures likely to be present throughout the Main and Lower Series coal seams and their potential to act as transmissive pathways to areas outside the Telford Basin;

- comprehensive analysis of the activation of groundwater and free gas connectivity pathways due to the presence of faults and fractures, collapse of rock matrix, failure of aquitards due to the geomechanical responses of the proposed action's operations. To understand the risk (likelihood and severity/extent) of these potential impacts it is recommended that modelling to inform further scenarios include the following information, but not limited to:

    - major fault structures inside and outside the Telford Basin comprehensively mapped;

    - geomechanical responses comprehensively assessed and modelled, including sensitivity analysis of rock properties;

    - the above incorporated to hydrogeological (groundwater) and reservoir models to understand potential contaminant and connectivity pathways, as well as pressure and groundwater level and flow changes, that may occur during operations; and

    - the potential risk of changes in groundwater flow to hydrostatic pressure and the implications this may have for operations.

- comprehensive assessment of the relationship between GDEs and Quaternary and deeper aquifers to improve the Minister's ability to understand any potential impact pathways associated with GDEs.

- explanation of how current activities of the mine closure plan and rehabilitation program of the Leigh Creek Coalfield will interact with and affect the activities of the proposed action.

The EIS should identify and address cumulative impacts, where potential project impacts are in addition to existing or potential impacts of other activities, including known potential future expansions or developments in the region and vicinity (including developments for the Stage 2 of the NRUP).

The impact assessment set out in the EIS should include proposed defined acceptable levels of impact against which predicted impacts of the action are to be evaluated.

Where applicable, the EIS must use baseline data to support modelling and predictions and evaluation of impacts and conclusions about their acceptability. The EIS must also provide a detailed

assessment of the extent and severity of any likely impact that the proposed action may facilitate (at the local, regional, state and national scale).

When discussing impacts, short-term and long-term effects must be considered with comment on whether the impacts are likely to be known, unpredictable or irreversible. Likely impacts, including direct, indirect and facilitated need to be addressed in the EIS.

In assessing the impacts, including when defining acceptable levels of impact, consideration must be given to:

- EPBC Act Policy Statement - *Significant Impact Guidelines 1.1: Matters of national environmental significance*;
- EPBC Act Policy Statement - *Significant Impact Guidelines 1.3: Coal seam gas and large coal mining developments – impacts on water resources*. Please note that this EPBC Act policy statement is currently being updated to reflect recent changes to the water trigger;
- EPBC Act Policy Statement – *'Indirect consequences' of an action: Section 527E of the EPBC Act*;
- EPBC Act *environmental offsets policy*;
- How to use the Offsets assessment guide;
- Australia's international responsibilities in relation to conservation of biodiversity;
- Australia's international obligations in relation to international agreements (for example – Biodiversity Convention; CITES ; JAMBA; CAMBA; ROCKAMBA; Apia Convention);
- consistency with relevant statutory instruments, including regulations, zoning plans, plans of management and permits;
- relevant approved conservation advices, recovery plans, threat abatement plans, as well as any agreements or plans that cover impacts on MNES;
- non-statutory mechanisms including federal and state policies, position statements and guidelines;
- partnership and collaborative arrangements with South Australian and other Australian government agencies;
- partnership and stewardship programs, including education programs and engagement, with local governments, communities, Indigenous persons, business and industry; and
- findings of relevant research and monitoring programs whether conducted by the proponent or others.

5.3 Indirect impacts on threatened and/or migratory species and/or their habitats due to migration of contaminated groundwater by the proposed action

The EIS must include an assessment of the potential direct and indirect impacts to listed threatened species, listed migratory species and their habitats arising from the activities undertaken during the site preparation, construction, operation, decommissioning and post-site closure stages of the proposed action. This assessment should consider the information requested in section 4.1 and 5.2 (d) of these Guidelines to analyse the significance and likelihood of impacts to listed species. The following impacts must be addressed:

a) the extent, magnitude and duration of impacts to listed threatened species, listed migratory species and their habitats from the likely migration of contaminated groundwater caused by each stage of the proposed action;

b) habitat loss, degradation and fragmentation that may occur outside of the proposed action area from pollution as a result of the discharge of contaminated groundwater into surface water bodies and GDEs that contain habitat critical for listed species caused by each stage of the proposed action;

c) impacts to important populations such as the Yellow-footed Rock-wallaby and Thick-billed Grasswren populations that may occur outside of the proposed action area from pollution as a result of the discharge of contaminated groundwater into surface water bodies and GDEs caused by each stage of the proposed action.

5.4 Direct and indirect impacts on water resources by the proposed action

The department notes that ISG involves the pyrolysis of underground coal seams, a process which produces a large range of organic and inorganic contaminants that, if mobilised have the potential to adversely impact on the environment and human health. These contaminants include a range of hazardous chemicals such as hydrocarbons, phenols, heavy metals, ketones, furans, and soluble gases. The department considers that these contaminants pose a significant hazard to groundwater, surface water, and soils, and can have significant adverse impacts on biota and human health.

Furthermore, the action is proposed to take place in an area with considerable geological dip and significant faulting; both of these factors increase the risk of contaminant transport associated with the in-situ coal gasification development. Therefore, the EIS must identify and evaluate the potential direct and indirect impacts on any water resource caused by any of the activities undertaken during the site preparation, construction, operation, decommissioning and post-site closure stages of the proposed action. This section must consider the information requested in section 4.2 and 5.2 (d) to address the following potential impacts to water resources during each stage of the proposed action:

a) contamination of groundwater due to the release or migration of contaminants produced during the gasification process, including dissolved gases and other chemicals, as well as free gas beyond the gasification zone, including the potential for vertical and horizontal migration;

b) contamination of surface water as a result of the abovementioned contaminant transport reaching surface water systems;

c) changes in water pressure/levels in overlying and adjacent aquifers due to dewatering and/or free gas migration;

d) lowering of groundwater levels which could cause drying out and salinisation of surface water bodies (e.g. wetlands, nearby dams), GDEs, etc, or cause the dewatering of acid sulphate soils;

e) increased contaminant transport risk due to geomechanical changes induced by the ISG activities; changes in the hydrogeological characteristics and behaviour of the area, including geomechanical issues and their effects in the groundwater system and its hydrochemistry;

f) exposure of listed species to ISG contaminants.

5.5 Consequential and facilitated impacts

The EIS must provide a detailed assessment of any likely impacts that the proposed action may facilitate on MNES at the local, regional, state or national scale. Assessment of consequential and facilitated impacts must consider:

- any other known development proposals which may be facilitated by or interact with the proposed action (positively or negatively);
- the potential to disturb contaminated land (including in relation to unexploded ordnance);
- whether the proposed action will cause intensified development in the region, or an increase in workforce or in local and regional community population changes; and
- any requirements of the proposed action for further development of regional infrastructure that is needed for the proposed action to go ahead.

5.6 Cumulative impacts

The EIS should identify and address cumulative impacts where potential project impacts are in addition to existing impacts of other activities, including known potential future expansions or developments by the proponent (e.g. Stage 2 of the NRUP) and other proponents in the region and vicinity that are approved or where development applications have been submitted. Cumulative impacts must be considered in terms of the potential overall consequence or magnitude of impacts on each of the MNES. The assessment of cumulative impacts must include:

- potential cumulative impacts of multiple pyrolysis chambers within the PPL 269 and PEL 650;
- review and analysis of residual impacts (after avoidance and mitigation measures applied) of the proposed action and of other known proposals where there may be a spatial or temporal overlap;
- consideration of the potential for cumulative impacts on the resilience of any important populations of listed threatened and migratory species and on overall habitat quality and availability; and

- discussion of the potential for existing pressures and threats to water resources and listed species to be exacerbated by the proposed action.

The EIS should also address the potential cumulative impact of the proposed action on ecosystem resilience. The cumulative effects of climate change impacts on the environment should also be considered in the assessment of ecosystem resilience and listed species attributes where scientific information on the effects of climate change on ecosystem resilience is available.

The discussion of cumulative impacts must include an evaluation of the likely short term and long-term cumulative impacts on the general environment and ecosystem function where relevant to MNES. In this regard consideration must be given to the potential magnitude of effects and the duration and reversibility of effects.

The EIS must refer to the IESC information guidelines to provide specifics about considering potential cumulative impacts from past, present and reasonably foreseeable actions.

5.7 Impacts and risks to First Nations people heritage and community aspirations

Additional to the above (section 3.3.3), the EIS must specifically describe and assess the impacts on First Nations people's cultural and heritage values applicable to the site and region. The results of any studies and consultations should also be reported in the EIS, as relevant. Issues to be considered may include:

- likely impacts of the various stages (site preparation, construction, operation, decommissioning, and post-site closure) on First Nations people's cultural and heritage values;
- impacts on sites of archaeological and cultural significance;
- impacts on current or foreseen First Nations people's uses of land or other resources in the region;
- impacts on First Nations people's aspirations, ownership and land claims in the region;
- details of relevant legislation, policies and guidance that apply to the proposed action and its impacts on first nations cultural values and a demonstration of how those will be met;
- First Nation people's views concerning the proposal.

6 PROPOSED AVOIDANCE, MITIGATION AND MANAGEMENT MEASURES

The EIS must discuss all the relevant proposed avoidance, mitigation and management measures.

Management and mitigation measures must reduce the level of impact and risk to an acceptable level in consideration of the EPBC Act. Measures include any practices that will reduce the impacts and risks in order to meet the performance criteria, any relevant legal requirements (related specifically to the impact/risk), internal company requirements, and any requirements that are identified through the stakeholder consultation process.

In accordance with the environmental risk and impact assessment guidance in Section 5, where a risk is assessed to be low, this risk will be deemed acceptable, and no further management is required. Where the risk level is higher than low, additional management and mitigation measures are required to be considered and implemented.

Sources of scientific uncertainty in predictions of impacts and the effectiveness of management measures must be identified in the impact assessment and where possible addressed through appropriate measures such as environmental monitoring and adaptive management measures during implementation.

Proposed avoidance, mitigation and management measures must include the following elements:

- a description of each proposed avoidance, minimisation or mitigation measure in relation to the likely impacts identified in section 5;
- an assessment of the expected or predicted effectiveness and achievability of each proposed avoidance or mitigation measure including timeframes for achieving and maintaining effectiveness; and
- an evaluation of whether residual impacts (following the application of mitigation measures) are consistent with the defined acceptable levels of impact relevant to the action.

For each stage of the proposed action, the EIS must include a consolidated list of measures proposed to be undertaken to prevent, minimise, mitigate or compensate for the relevant impacts of the action, including:

- a description of the environmental outcomes the measures are expected to achieve including details of any baseline data, environmental indicators and proposed monitoring to demonstrate progress towards achieving these outcomes;
- a description of proposed mitigation measures to mitigate relevant direct and indirect impacts of the action, including avoidance measures to avoid areas of high conservation value as far as possible;
- a description of the measures proposed to be undertaken by the proponent that have been proposed by State or local governments; and
- details of ongoing management of the construction, operation, decommissioning and post-site closure stages of the proposed action, an analysis as to the effectiveness of these management measures, and monitoring programs to determine the effectiveness of the measures proposed, and a framework for adaptive management including:
    - management strategies that will be implemented if mitigation and management measures are insufficient and/or ineffective;
    - adequate monitoring regimes and defined trigger levels that will prompt further management and/or remediation actions to prevent unacceptable impacts to protected matters occurring, and so that environmental outcomes continue to be met; and

- who will be responsible for such measures and the extent of their responsibility.

Specific and detailed descriptions of proposed measures must be provided and substantiated, based on best available practices, appropriate standards and supported by scientific evidence.

Proposed management measures must include, but not limited to:

- a description of the consideration of uncertainty as it is essential to the consideration and support of the precautionary risk assessment process and likely inform failure and trigger points of proposed management measures;
- a description of the consideration of potential fluid pathways through historic drill holes in the proposed management measures;
- subsidence/deformation monitoring (e.g. LIDAR, InSAR);
- time-lapse (i.e. 4D) geophysical surveys that involve repeatedly acquiring 3D geophysical data over the same formation/area/mine with the fourth dimension being over time. The acquisition must be suitably repeatable – preferably identical source and receiver locations, otherwise it will need to be fixed in processing, or by re-processing of previous surveys.
- for 4D Seismic, some attributes to analyse include variance, amplitude, impedance, velocity;
- in addition, or alternately to 4D seismic data acquisition, other potential geophysical methods that can be applied for 4D surveying may include induced polarisation, electrical resistivity, or electromagnetics to geophysically image the sub-surface and the formation of the gasifiers and any changes to the overlying strata;
- groundwater contamination management measures to avoid or reduce contaminants escaping:
  - from the gasifier chamber during pyrolysis;
  - through preferential pathways from fractures around the gasifier chamber;
  - through the natural permeability of the rock layers and geological preferential pathways including faults and discontinuities;
  - post-operations from the gasifier chamber as it cools and fills with water; and / or
  - via bores that can act as conduits for contaminant migration; and
  - post either stage or operation shutdown, from water pumped from the gasifier chamber to the surface prior to treatment and disposal.
- detailed descriptions of management measures for hydrostatic pressures during ISG operations, including a pressure control hierarchy, pressure safety margins and responses should optimal hydrostatic pressures not be achieved or maintained;

- detailed information of the construction, maintenance and integrity of wells;
- If GDEs are identified surrounding the proposed action area, baseline condition surveys should be carried out to benchmark future monitoring of these ecosystems, including monitoring plans for gas, groundwater, surface water, and air compartments;
- decommissioning, rehabilitation and closure plans, including how the contaminant transport risk will be managed post operations (including, but not limited to, contaminant migration in the absence of the hydraulic and pressure gradient towards the gasifier);
- a commitment that fire suppression systems will not utilise products containing per- and poly-fluoroalkyl substances (PFASs);
- management protocol to contain contaminants in the gasifier chambers;
- detailed monitoring and mitigation plans for each stage of the proposed action, including:
  - monitoring wells, boreholes to be abandoned, anticipated hydrostatic and gas cavity pressures, cavity pressure safety margins to account for pressure fluctuations;
  - monitoring proposed, and how the proponent will account, for the development of and changes in cavity geometry including any vertical extension of gas-filled cavities;
  - detailed baseline data describing surface and groundwater quality, to ensure changes over time can be detected and operations modified or shut down;
  - indication of what contaminants and their proxies will be monitored;
  - frequency, location, and quality assurance / quality control protocols.

The EIS must not just state proposed management plans and/or broad objectives to describe avoidance, mitigation and management measures but must include detailed measures that will be implemented to avoid, mitigate and manage impacts on MNES. Committed language (i.e. 'will') rather than non-committal language (i.e. 'may', 'where possible', 'if required', etc.) must be used.

The EIS must detail the ongoing monitoring and reporting during site preparation, construction, operation, decommissioning, and post-site closure stages. These measures should enable the department to assess any local or wider impacts of the proposed action.

If responsibility for implementation or management of mitigation measures during the operation of the project is proposed to be transferred to parties other than the proponent, the EIS must detail the stages at which such transfer would occur and how ongoing mitigation measures will be managed.

The EIS must consider the environmental outcomes that will be achieved by the proposed action. This must include consideration of the department's Outcomes-based conditions policy and guidance documents, which are available at: https://www.dcceew.gov.au/environment/epbc/publications/outcomes-based-conditions-policy-guidance.

The EIS must demonstrate how a net benefit will be achieved for MNES, including the water resource more broadly through the implementation of avoidance, mitigation and offset measures in a timely, transparent and scientifically robust manner. These measures must be additional to what is already required under existing laws or schemes. This may include actions which will improve existing habitat, create new habitat, reduce threats to habitat, and avert the loss of habitat under threat.

The entities responsible for undertaking the proposed measures must be included as well as a description and a map to clearly define the location and boundaries of any proposed additional conservation areas. This must be accompanied by net benefit attributes and shapefile/s.

The EIS must include detailed costings for the measures that will be implemented to achieve net benefit outcomes. Timeframes and key milestones for implementation of net benefits and a discussion of risks and uncertainties associated with the proposed net benefits must also be included.

The EIS must include mechanisms to ensure that net benefits are maintained for the duration of the impacts. There must also be mechanisms for monitoring and reporting of net benefit milestones and outcomes. The EIS must detail the timing and frequency of any monitoring and reporting activities.

The EIS must include an analysis of the likely effectiveness of the mitigating measures in protecting MNES outcomes at the regional landscape, including associated regulatory and policy arrangements to implement commitments.

The EIS must include an analysis of how the mitigation measures are in accordance with any statutory or policy requirements, including but not limited to:

- any relevant threat abatement plan for listed threatened species and communities;
- any relevant recovery plan for listed threatened species and communities; and
- Australia's international obligations in relation to international agreements (for example – Biodiversity Convention; CITES; JAMBA; CAMBA; ROKAMBA; Apia Convention).

6.1 Environmental Management Plans

The EIS must include a detailed outline of any Environmental Management Plans (EMPs) that sets out the framework for management, mitigation and monitoring of relevant impacts of the action, including any provisions for independent environmental auditing.

The EMPs need to address the project phases (site preparation, construction, operation, decommissioning and post-site closure) separately and any staging of each stage. Each EMP must state the environmental objectives, performance criteria, monitoring, reporting, corrective action, responsibility and timing for each environmental issue.

The EMPs must also describe contingencies for events such as well integrity issues, contaminants leaks from production wells, failure of gasifiers operating pressures, failure of containment of contaminants in the gasifier chambers, intrusion of contaminants into the groundwater system, spontaneous combustions and heavy or prolonged rainfall.

The name of the agency responsible for endorsing or approving each mitigation measure or monitoring program must be provided.

All EMPs must be in accordance with the department's *Environmental Management Plan Guidelines, Commonwealth of Australia 2014*, available at: https://www.dcceew.gov.au/environment/epbc/publications/environmental-management-plan-guidelines.

6.2 Adaptive management: addressing uncertainty and managing risk

The EIS must identify key adaptive management measures addressing uncertainties and inherent or residual risks. Uncertainties could, for example, include limitations of predictions or assumptions, knowledge gaps in scientific understanding and baselines status of the project's hydrogeological condition, and the timing, effectiveness, or capacity to implement, maintain, operate and enforce management measures.

The EIS must describe how the adaptive management strategies will be implemented to ensure MNES are effectively protected over the life of the proposed action. This includes how:

a) changes to international best practice will be adopted; and

b) monitoring of the quality of water resources including groundwater, surface waters and GDEs will occur, including monitoring of progress in achieving the desired environmental outcomes identified in the EIS; and

c) monitoring of listed migratory and threatened species and the quality of their habitats will occur; including monitoring of progress in achieving the desired environmental outcomes identified in the EIS; and

d) how the environmental monitoring data will be collected, analysed and interpreted throughout the life of the proposed action and how the results of the monitoring will influence the project's execution and environmental management; and

e) criteria or thresholds (that may be either empirical or narrative) will be defined and used to interpret environmental monitoring data to inform decisions about whether to trigger investigation of potential problems and/or adaptive management actions to prevent unacceptable impacts from occurring;

f) an explanation of how monitoring and adaptive management will be effective in detecting and managing potential impacts on MNES and throughout the life of the proposed action; and

g) new information relating to MNES or the EIS is to be assessed and accounted for in management of the area affected by the proposed action.

7 OFFSETS

Environmental offsets are broadly understood to mean actions taken outside a development site that compensate for the significant residual impacts of that development. Offsets are not intended to replace avoidance and mitigation which are expected to be the primary strategies for managing the potential impacts of development proposals, which should be exhausted before offsets are applied. The EIS must provide details of:

- residual significant impacts on MNES that are likely to occur after the proposed avoidance and mitigation measures for all impacts are taken into account; and
- why avoidance or mitigation measures are unable to reduce the severity of impacts to below the 'significant' threshold (wherever applicable).

The EIS must provide an offset strategy to compensate for all residual significant impacts on MNES that will likely be caused by the proposed action that cannot be avoided or mitigated. The offset strategy must analyse how the proposed offset package meets all requirements of the department's *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy October 2012* (EPBC Act Offset Policy).

Offsets must directly contribute to the ongoing viability of the MNES impacted by the proposed action, be based on scientifically robust information and deliver an overall conservation outcome that improves or maintains the viability of the MNES as compared to what is likely to have occurred under the status quo, that is, if neither the action nor the offset had taken place.

The outcomes of the offset strategy need to be specific, measurable, and achievable, based on robust baseline data and demonstrate with a high degree of certainty that predicted outcomes will be achieved.

Where offset area/s have been nominated, include an offset strategy as an appendix to the EIS which includes information to demonstrate how the environmental offset/s compensate for residual significant impacts of the action on relevant MNES, and/or their habitat, in accordance with the principles of the EPBC Act Offset Policy.

In developing an offset strategy, the proponent is encouraged to identify opportunities to engage with First Nations stakeholders to develop and deliver environmental offsets. The proponent must consider that offsets on Indigenous owned lands, should include a commitment from Traditional Owners to accept and manage the offset, in accordance with the EPBC Act Offset Policy.

The offsets strategy must:

- quantify the scale of all impacts on each MNES that are being compensated for with metrics including: habitat quality at impact site, degradation in habitat quality caused by impact, size of impact in hectares and number of species affected;
- explain the availability and suitability of offsets and provide evidence that the relevant MNES, and/or their habitat, is present in the proposed offset site(s);

- provide information about how the proposed offset site(s) provide a conservation benefit for each MNES;
- set specific environmental outcomes that will be achieved with the offset, and explain why these outcomes are appropriate with reference to relevant statutory recovery plans, conservation advice and threat abatement plans;
- provide details of the proposed mechanism to legally secure the offsets (under South Australian legislation or equivalent) to protect the offset site(s) against development that is incompatible with conservation;
- explain how any proposed staging of the overall development will impact the delivery of offsets;
- clearly specify the roles and responsibilities of implementing each component of the offsets strategy;
- propose auditing and review mechanisms for the offsets; and
- provide an analysis of how the offset package meets the requirements of the EPBC Act Offset Policy.

8 STRATEGY FOR SAFETY AND SECURITY

8.1 Emergency preparedness and response

Risk management is a key component to early identification of risks. This ensures preventative measures are put in place, or risks are addressed in a timely manner before they have significant impacts on the water resource and have major implications for the proponent.

The EIS must provide an Emergency Management plan developed in consultation with Emergency Services at a local and state level for all plausible scenarios that may impact the facility. The plan should include Prevention, Preparedness, Response and Recovery planning. Scenarios should include but not be limited to:

- Hazmat Emergency
- Bushfire
- Fires from spontaneous combustion
- Heatwave
- Earthquake
- Infrastructure (e.g. wells, pipes, etc.) failure
- Operational management (i.e. scape of toxic gases and/or intrusion of contaminants into the groundwater system) failure

- Flood/Storm
- Electricity disruption

The Emergency Management plan must provide details of proposed safety arrangements, including:

- the relative likelihood for an accident or incident to occur;
- the ability of emergency service organisations to cope with any incidents that occur, such as along, transport routes, and response times for areas remote from cities and towns;
- the training of personnel and suitability of equipment of these organisations;
- a description of the emergency clean-up and rehabilitation programs to be in place;
- the suitability of wells and their ability to survive high pressure impacts and high temperatures.

8.2 Site access and intrusion prevention

The EIS must address reasonably possible scenarios involving inadvertent human intrusion into the facility throughout all stages of the proposed action, and the resulting impacts to human safety and the environment if intrusion were to occur.

The EIS must adequately describe the mechanisms that will be in place to reduce or avoid incidents of inadvertent human intrusion into the disposal facility, including:

- provisions for preventing unauthorised access to the site during site preparation, construction and operation stages;
- arrangements for ensuring security and intrusion prevention during decommissioning and post-site closure stages;
- site access and intrusion prevention arrangements once institutional control ceases.

9 OTHER APPROVALS AND CONDITIONS

9.1 Commonwealth, State, and local Government approvals

The EIS must set out as far as practicable at this stage of the proposed action, the scope and likely schedule of applications and assessment requirements and whether the proposed action is in accordance with the various Commonwealth, State and local government statutory processes.

9.2 Other requirements

The EIS must include information on any other requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply to the proposed action. This must include:

a) details of any Commonwealth, state or local government planning scheme, or plan or policy under any local or state Government planning system that deals with the proposed action, including:

- what environmental assessment of the proposed action will be, is being, or has been carried out under the scheme, plan or policy; and
- how the scheme provides for the prevention, minimisation and management of any relevant impacts;

b) a description of any approval that has been obtained from a state or Commonwealth agency or authority (other than an approval under the EPBC Act), including any conditions that apply to the action;

c) a statement identifying any additional approval that is required before the proposed action can proceed; and

d) a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply to the proposed action.

Relevant legislation under which additional approval may be required includes but is not limited to the following:

- *Aboriginal and Torrens Strait Islander Heritage Protection Act 1984*;
- *Environment Protection and Biodiversity Conservation Act 1999*;
- *Native Title Act 1993*;
- South Australian *Energy Resources Act 2000;*
- South Australian *Aboriginal Heritage Act 1988*;
- South Australian *Environment Protection Act 1993*;
- South Australian *Planning, Development and Infrastructure Act 2016*.

10 ENDORSEMENT CRITERIA

The EIS must set out how the project meets the objectives of the EPBC Act. In determining whether or not to approve the proposed action, the Minister will apply and comply with the relevant parts of the EPBC Act, and have regard to the extent to which the project meets the objectives of the EPBC Act including how the proposed action:

a) protects the environment, especially MNES;

b) promotes ecologically sustainable development;

c) promotes the conservation of biodiversity;

d) promotes a cooperative approach to the protection and management of biodiversity and MNES; and

e) assists in the co-operative implementation of Australia's international environmental responsibilities.

In determining whether or not to approve the proposed action the Minister must be satisfied that commitments to protect and manage MNES must be enforceable and achievable over the life of the proposed action. The EIS must demonstrate an effective system of:

- establishing measurable environmental outcomes that reflect acceptable levels of impact and risk;
- establishing effective management strategies to ensure that impacts and risks remain within acceptable levels of impact;
- robust monitoring and adaptive management that addresses uncertainty and contingency management;
- procedures for monitoring, auditing;
- procedures for public reporting of monitoring, auditing and implemented management measures; and
- establishing effective stakeholder engagement strategies to ensure that all stakeholders have an opportunity to provide input at all stages of the proposed action.

11 PROMOTING ECOLOGICALLY SUSTAINABLE DEVELOPMENT

The EIS must describe how the following principles of ecologically sustainable development have been applied in the proposed action:

a) decision making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.

b) 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.

c) the principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

d) the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision making.

The EIS must also describe how the proposed action will not be inconsistent with Australia's obligations under each of the international agreements relevant to the conservation of MNES.

12 MONITORING, AUDITING AND REPORTING

The EIS must set out:

a) a program of baseline reporting on the current status and condition of the proposed action site and its vicinity;

b) a program of monitoring, public reporting and independent or third-party auditing that will be undertaken over the entire lifespan of the proposed action;

c) a process that will incorporate the findings of the monitoring, reporting and/or auditing just mentioned into ongoing management;

d) who is responsible for overseeing and taking these actions; and

e) record keeping and review processes that will be followed under an approval.

13 REVIEW, MODIFICATION OR ABANDONMENT

The EIS must identify, analyse and declare the likely circumstances and procedures that may trigger the review, modification or abandonment of the proposed action. This section must include a discussion of how commitments under the EIS will continue to be met.

14 CONSULTATION

The EIS must include details of any consultation about the proposed action, including:

a) any consultation that has already taken place;

b) proposed consultation about relevant impacts of the action with persons, groups or organisations that may be directly affected by the proposed action;

c) proposed consultation about relevant impacts of the action with interested parties;

d) if there has been consultation about the proposed action, identification of any objections or claims about the proposed action and a documented response to, or result of, the consultation;

e) identification of affected parties, including a statement mentioning any communities that may be affected and describing their views; and

f) a summary of how and when stakeholders will be notified of the commencement of the key phases of the development and how any ongoing consultation after approval will be undertaken.

For your information, after the public consultation period of the draft EIS has finalised, the Minister must be provided with a report on the public submissions received on the draft EIS, together with proposed final drafts of the EIS, incorporating any revisions made in response to public comments.

14.1 Engagement with First Nations people

The EIS must include a process for ongoing consultation (for information and engagement) with First Nations peoples whose rights, claims, interests, and aspirations may be affected by the proposed action. This process must be for the life of the project and include:

- identification of the relevant First Nations people and information on how they have been identified;
- details of the level and type of engagement and participation sought by the First Nations stakeholder individuals and groups;
- identification of the rights, interests and other concerns expressed by the First Nations stakeholder individuals and groups in relation to the proposed action, including but not limited to native title rights, and any areas and objects that are of particular significance to First Nations people and communities possibly impacted by the proposed action and the potential for managing those impacts;
- information on the views, aspirations and concerns expressed by the First Nations people about the project;
- a description of any state requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action with regards to First Nations people and communities;
- details of past and planned future communication, engagement, agreements, partnerships, benefit sharing arrangements and relationship building with the First Nations people; and
- information on how this First Nations communication and engagement has been, and will be, conducted in a culturally appropriate manner and in accordance with stakeholders' preferences.

This process must provide evidence on whether First Nations people consider that they have been adequately engaged on matters that may affect their rights and interests, and include evidence to show:

- the steps taken to inform First Nations people about the proposal and its potential impacts and opportunities;
- whether the First Nations people consider they have been adequately informed about the proposal; and
- the views of the First Nations people regarding the proposal and its potential impacts and opportunities.

This process must also provide information on the steps taken to address the First Nations peoples' views and concerns, including:

- how their feedback has been incorporated into project planning and implementation;
- any First Nations feedback that has not been incorporated or addressed and the reasons for not doing so; and
- any project-related agreements, arrangements and partnerships developed with the First Nations people.

The process for consultation with First Nations people must be undertaken consistent with the department's guidelines and or any First Nations engagement standard (if one is in force). The department's current guidance is the *Interim Engaging with First Nations People and Communities on Assessments and Approvals under the Environment Protection and Biodiversity Conservation Act 1999*, but an update is expected in the coming months. The EIS must also consider the following documents:

- *Engage Early Guidance for proponents on best practice Indigenous engagement for environmental assessments under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act),* (Commonwealth of Australia 2016);
- *Dhawura Ngilan: A Vision for Aboriginal and Torres Strait Islander Heritage in Australia* (Heritage Chairs of Australia and New Zealand, 2020); and
- *Best Practice Standards in Indigenous Cultural Heritage Management and Legislation* (Commonwealth of Australia 2021).

15 ENVIRONMENTAL RECORD OF PERSON PROPOSING TO TAKE THE ACTION

The information provided must include details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:

a) the person proposing to take the action; and

b) for an action for which a person has applied for a permit, the person making the application.

If the person proposing to take the action is a corporation, details of the corporation's environmental policy and planning framework must also be included.

16 ECONOMIC AND SOCIAL MATTERS

The economic and social impacts of the proposed action, both positive and negative, must be analysed. Matters of interest may include:

- details of any public consultation activities undertaken, and their outcomes;
- projected economic costs and benefits of the project, including the basis for their estimation through cost/benefit analysis or similar studies;

- information on the amount of domestic and/or overseas investment for capital infrastructure (versus alternatives);
- employment opportunities expected to be generated by the project (including construction and operational phases);
- consideration of economic opportunities and social benefits for First Nations people, communities and businesses in the region, including any related plans and agreements developed in collaboration with First Nations people. This may include opportunities in environmental and cultural heritage management, project management, construction and operational activities, and apprenticeships for First Nations people.

Economic and social impacts should be considered at the local, regional and national levels. Details of the relevant cost and benefits of alternative options to the proposed action, as identified in section 3.3.2 above, should also be included.

17 INFORMATION SOURCES PROVIDED IN THE EIS

For information given in a draft EIS, the draft must state:

a) the source of the information;

b) how recent the information is;

c) how the reliability of the information was tested; and

d) what uncertainties (if any) are in the information.

18 CONCLUSION

An overall conclusion as to the environmental acceptability of the proposed action must be provided, including but not limited to:

- discussion on compliance with principles of ecologically sustainable development and the objects and requirements of the EPBC Act;
- justify the reasons for undertaking the proposed action in the manner described; and
- restate the measures proposed or required to compensate (offset) any unavoidable impacts on MNES and the relative degree of compensation.

ATTACHMENT 1

THE OBJECTS AND PRINCIPLES OF THE

ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

SECTIONS 3 AND 3A

3 Objects of the Act

(a) to provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance;

(b) to promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources;

(c) to promote the conservation of biodiversity;

(d) to promote a co-operative approach to the protection and management of the environment involving governments, the community, landholders and indigenous peoples;

(e) to assist in the co-operative implementation of Australia's international environmental responsibilities;

(f) to recognise the role of indigenous people in the conservation and ecologically sustainable use of Australia's biodiversity; and

(g) to promote the use of indigenous peoples' knowledge of biodiversity with the involvement of, and in co-operation with, the owners of the knowledge.

3A Principles of Ecologically Sustainable Development

The following principles are principles of ecologically sustainable development.

(a) Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.

(b) 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.

(c) The principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

(d) The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.

(e) Improved valuation, pricing and incentive mechanisms should be promoted.

(f)

ATTACHMENT 2

MATTERS THAT MUST BE ADDRESSED IN AN EIS

(SCHEDULE 4 OF THE EPBC REGULATIONS 2000)

1. General information

1.01 The background of the action including:

(a) the title of the action;

(b) the full name and postal address of the designated proponent;

(c) a clear outline of the objective of the action;

(d) the location of the action;

(e) the background to the development of the action;

(f) how the action relates to any other actions (of which the proponent should reasonably be aware) that have been, or are being, taken or that have been approved in the region affected by the action;

(g) the current status of the action; and

(h) the consequences of not proceeding with the action.

2. Description

2.01 A description of the action, including:

(a) all the components of the action;

(b) the precise location of any works to be undertaken, structures to be built or elements of the action that may have relevant impacts;

(c) how the works are to be undertaken and design parameters for those aspects of the structures or elements of the action that may have relevant impacts;

(d) relevant impacts of the action;

(e) proposed safeguards and mitigation measures to deal with relevant impacts of the action;

(f) any other requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action;

(g) to the extent reasonably practicable, any feasible alternatives to the action, including:

i. if relevant, the alternative of taking no action;

ii. a comparative description of the impacts of each alternative on the matters protected by the controlling provisions for the action; and

iii. sufficient detail to make clear why any alternative is preferred to another.

(i) any consultation about the action, including:

i. any consultation that has already taken place;

ii. proposed consultation about relevant impacts of the action; and

iii. if there has been consultation about the proposed action — any documented response to, or result of, the consultation.

(j) identification of affected parties, including a statement mentioning any communities that may be affected and describing their views.

3. Relevant impacts

3.01 Information given under paragraph 2.01(d) must include

(a) a description of the relevant impacts of the action;

(b) a detailed assessment of the nature and extent of the likely short term and long term relevant impacts;

(c) a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible;

(d) analysis of the significance of the relevant impacts; and

(e) any technical data and other information used or needed to make a detailed assessment of the relevant impacts.

4. Proposed safeguards and mitigation measures

4.01 Information given under paragraph 2.01(e) must include:

(a) a description, and an assessment of the expected or predicted effectiveness of, the mitigation measures;

(b) any statutory or policy basis for the mitigation measures;

(c) the cost of the mitigation measures;

(d) an outline of an environmental management plan that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action, including any provisions for independent environmental auditing;

(e) the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program; and

(f) a consolidated list of mitigation measures proposed to be undertaken to prevent, minimise or compensate for the relevant impacts of the action, including mitigation measures proposed to be taken by State governments, local governments or the proponent.

5. Other Approval and Conditions

5.01 Information given under paragraph 2.01(f) must include:

(a) details of any local or State government planning scheme, or plan or policy under any local or State government planning system that deals with the proposed action, including:

i. what environmental assessment of the proposed action has been, or is being carried out under the scheme, plan or policy; and

ii. how the scheme provides for the prevention, minimisation and management of any relevant impacts;

(b) a description of any approval that has been obtained from a State, Territory or Commonwealth agency or authority (other than an approval under the Act), including any conditions that apply to the action;

(c) a statement identifying any additional approval that is required; and

(d) a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.

6. Environmental record of person proposing to take the action

6.01 Details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:

(a) the person proposing to take the action; and

(b) for an action for which a person has applied for a permit, the person making the application.

6.02 If the person proposing to take the action is a corporation — details of the corporation's environmental policy and planning framework.

7. Information sources

7.01 For information given the EIS must state:

(a) the source of the information; and

(b) how recent the information is; and

(c) how the reliability of the information was tested; and

(d) what uncertainties (if any) are in the information.