Draft Terms of Reference for an Environmental Impact Statement (EIS)

Ammaroo Ammonium Phosphate Fertiliser Project

Verdant Minerals Ltd

Ammaroo Station – Barkly Local Government Area

May 2023

ntepa Northern Territory Environment Protection Authority

Proposal :	Ammaroo Ammonium Phosphate Fertiliser Project
Proponent:	Verdant Minerals Ltd
NT EPA Reference:	EP2022/020
Location:	Ammaroo, Barkly Region, Northern Territory
Local Government Area:	Barkly Regional Council
Public consultation period:	Draft Terms of Reference – 15 business days

Further information and guidance on the environmental impact assessment process is available on the NT EPA website at: www.ntepa.nt.gov.au

Document title	Draft Terms of Reference for an Environmental Impact Statement (EIS)
Document type	Terms of Reference
Version	0.2
Date approved	Draft terms of reference approved for consultation on 27 April 2023
TRM number	NTEPA2022/0162-009~0007

Contents

1. Introduction

1.1. Overview

The Ammaroo Ammonium Phosphate Fertiliser Project (the proposal) proposed by Verdant Minerals Ltd (the proponent) is being assessed by the Northern Territory Environment Protection Authority (NT EPA) under the *Environment Protection Act 2019* (EP Act) at the level of an Environmental Impact Statement (EIS).

These Terms of Reference (TOR) set out the matters relating to the environment that are to be addressed in the EIS for this proposal, in accordance with regulations 98(1)(a) and 98(2) of the Environment Protection Regulations 2020 (EP Regulations). The EIS must also address all requirements in the NT EPA guidance: Preparing an environmental impact statement.

The proposal is to develop downstream processing facilities and associated amenity, storage and service infrastructure for production of ammonium phosphate fertilisers at the proposed Ammaroo Phosphate mine, located on Ammaroo Station (NT Portion 1290) approximately 200 km south-east of Tennant Creek and 300 km north-east of Alice Springs, in the Barkly local government area. The ammonium phosphate fertiliser plant consists of:

- phosphoric acid plant,
- sulfuric acid plant,
- ammonia plant
- granulation plant
- storage facilities for fertiliser, hazardous materials and reagents
- expanded borefield to supply an additional 3.9 gigalitres/annum of groundwater
- a phosphogypsum waste storage facility
- upgraded import/ export facilities at the Port of Darwin
- expanded accommodation facilities (800 rooms)
- airfield.

The proposed action is related to the Ammaroo Phosphate Project, which was assessed under the *Environmental Assessment Act 1982*. The NT EPA completed its assessment (Assessment Report 87) on 2 October 2018. The Ammaroo Phosphate Project has not received approval to commence mining under the NT *Mining Management Act 2001*. Approval under the *Environment Protection and Biodiversity Conservation Act 1999* was granted on 19 June 2018.

Further details of the proposal, and the notice of decision and statement of reasons for the NT EPA's decision are on the NT EPA's website.

1.2. Assessment period

The draft EIS is to be submitted to the NT EPA within two years from the date these TOR were issued (in line with regulation 99 of the EP Regulations and in consideration of the matters listed under EP Regulation 99(3)).

2. Matters to be addressed in the EIS

2.1. Executive Summary of the draft EIS

A summary of the draft EIS is required as part of the EIS documentation. The summary should be written as a stand-alone document, able to be provided on request to interested parties who may not wish to read the full draft EIS.

The summary should provide the following at a minimum:

- a clear and concise overview of the proposal including the proponent, proposal lifespan, key components, development stages and activities
- an explanation of the relationship between the proposal and the previously assessed mining project
- an explanation of the environmental approvals process and function of the EIS
- a summary of the site selection process and alternatives considered
- a summary of design options and alternatives considered
- an overview of the existing environment including climate, location and significance of sensitive receptors that may be impacted by the proposal
- a summary of the environmental impacts (proposal-specific and cumulative) of the proposal
- a summary of the social and economic benefits and impacts (proposal-specific and cumulative) of the proposal
- a summary of measures to avoid, mitigate and offset (if applicable) potential impacts of the proposal, with clear and measurable outcomes and commitments for environment protection
- a summary of closure outcomes and the intended future use of the site
- a summary of stakeholder participation and future commitments
- a summary of approval requirements including a description of any licenses, permits or consents.

2.2. Proposal description

2.2.1. Overview

Provide a clear description of the proposal and the full scope of works for which approval is sought. The proposal description should include:

- a summary table listing the key physical components, proposal development stages and associated activities
- distinction between the proposal and the previously assessed mine components, and how they interact
- a description of the proposal footprint (direct) and area of influence (indirect disturbance)
- maps, figures, images, diagrams and flow charts
- any variations or modifications to the proposal since the referral information was submitted
- any constraints that may impact approval or implementation

- where there is uncertainty in the detailed design, footprint, capacity or life of the proposal, a clear explanation of the approach to resolving this uncertainty and the maximum extent for each parameter provided.

2.2.2. Proponent

Provide background to the proponent including but not limited to:

- information on the environmental history of the proponent including, but not limited to, experience in the production and handling of hazardous materials
- partnerships with other organisations or industries as part of the proposal.

2.2.3. Objectives of the proposal

State the rationale and justification for the proposal, considering social, economic and other environmental benefits and costs to the NT, in particular to local and regional communities, during the life of the proposal and post closure.

List the key objectives of the proposal and include a description of how the proposal meets these objectives.

Demonstrate how the objects in section 3 of the EP Act can be met, and address the specific requirements of sections 42 (purpose of environmental assessment) and 43 (general duty of proponents) of the EP Act.

Demonstrate the application of the principles of ecologically sustainable development to decision-making processes as set out in Part 2 Division 1 of the EP Act.

2.2.4. Statutory framework

The EIS must provide information on the statutory framework including a description of any permits, consents, or other approvals that have been granted/obtained and any that will be required from NT and Australian government authorities related to this proposal e.g. titles under the *Mineral Titles Act 2010*, authorisation under the *Mining Management Act 2001*, *Work Health and Safety (National Uniform Legislation) Act 2011*.

2.2.5. Site selection and design

Describe proposal planning and design options considered, reasons for selection of the preferred site and design, and how this avoids and/or mitigates potential impacts and risks to the surrounding environment and its users, and allows for adaptation to a changing climate, e.g. hotter and drier climate, increased storm intensity.

Describe alternatives and options considered in selecting Ammaroo Station as the proposal location, arrangement of the proposal components (phosphoric acid plant, sulfuric acid plant, ammonia plant, granulation plant, hazardous materials storage facilities, airfield, expanded accommodation facilities), meeting water and energy demands, and disposing of tailings, phosphogypsum and other wastes. For each alternative location and design option considered, provide:

- the suitability with regard to potential impacts on environmental values, including sites of cultural significance
- the suitability with regard to current site climatic conditions (e.g. wind, rainfall, evaporation) and a changing climate

- the extent and detail of investigations undertaken to determine the suitability of alternative options
- the reasons for selecting a preferred option.

Describe how potential disruption or damage to existing infrastructure will be avoided and mitigated, especially in the areas where the proposed infrastructure overlaps and is adjacent to existing corridors, including but not limited to Murray Downs road and Taylors Creek road.

Summarise the results of studies/field investigations considered. Discuss the reliability, limitations and uncertainties of the information used in decision-making.

2.2.6. Construction and operation

Provide a detailed description of all construction and operation aspects of the proposal as outlined in Table 1.

Table 1 Minimum information requirements for the proposal description

Topic	Required information

Site layout maps	The description of the proposal must include site layout maps that depict the proposed location and dimensions of the components clearly identifying the areas of:
	• existing disturbance, infrastructure, roads/tracks, natural and modified landforms
	• new disturbance and infrastructure, including (where applicable):
	  ○ all areas to be cleared[1] and disturbed
	  ○ laydown areas, borrow areas, access and haul roads associated with the construction phase
	  ○ service corridors and firebreaks
	  ○ structures to be built
	  ○ infrastructure related to water storage, water treatment (including potable water and wastewater) and electricity transmission
	  ○ erosion and sediment controls
	  ○ stormwater drainage
	  ○ chemical and waste storage facilities
	  ○ load in and load out facilities
	• current land tenure, owner(s) and lease(s) of the land of which the proposal area covers and any other interests including agriculture, petroleum, native title (claims or determined), and Aboriginal freehold land
	• sensitive environment (including permanent and seasonal residential communities, sites where cultural activities are undertaken, and no-go work areas/exclusion zones) overlying the proposal area and surrounds i.e. within the area of influence of the proposal.
	Provide a high-quality contemporary aerial view of the proposal area and area of influence to describe current site conditions including existing disturbance.

Construction	Describe all elements and stages of the construction phase including: • equipment and machinery required

[1] In accordance with the NT Land Clearing Guidelines.

Topic	Required information
	• construction materials required – major types, quantities, qualities, sources, storage requirements and potential hazards • vegetation clearing and site preparation • available and potential sources of fill / borrow material • erosion, sediment and drainage control • location, extent and nature of temporary stockpiles • any new ancillary infrastructure and upgrades required to service the proposal, including road access, and supply of electricity, water and sewerage • waste management including classification of waste streams • maintenance of components and servicing of infrastructure • controls to avoid spills/discharges to the environment • location and size of construction accommodation facility • noise management and control • biosecurity management and control in relation to weeds and feral animals • fire management and control • exclusion/no-go work areas • timeframes for completion. Where multiple alternatives exist, the choice of the preferred option(s) should be clearly explained and a comparison provided against other options in terms of potential environmental impacts
Operation	Describe all elements and stages of the operation phase including: • infrastructure – location, size and type • materials and chemicals required - major types, quantities, qualities, sources, storage requirements and potential hazards • any limitations to the effective operation and management of proposed infrastructure e.g. ore grade, climatic conditions, stack height • timeframes for the commencement and completion of staged operations • ongoing maintenance and upgrades required to service any infrastructure including roads, railways, and erosion and sediment controls • applicable legislation, guidelines, standards and permits • location, shape, size and nature of temporary and permanent stockpiles • erosion and sediment control • weed management • noise management and control • fire management and control • controls to avoid spills/discharges to the environment • information on contaminated materials that will pose a risk to the environment • adequacy and likely effectiveness of mitigation measures and controls for all operational environmental management aspects • details on incident reporting and emergency response measures to be undertaken in the event of a hazardous material spill.
Water requirements	Describe all water requirements relevant to each proposal phase. Provide detailed information on demand/volume required, sources, storage, treatment, management

Topic	Required information
	of water aspects and criteria for discharge (provide a water balance).
Transport and traffic	Describe traffic and transport activities during construction and operation, including but not limited to: • proposed transport methods including locomotive and aircraft • vehicle movements for both mine-related and proposal transport including type, size, number and frequency of movements to and from site • marine vessel movements including type, size, number and frequency of movements to and from Darwin Port • hours of operation • details on access and transport routes including proximity to sensitive receptors (e.g. waterways, townships or communities, sensitive and/or significant vegetation) within 50 metres of access and transport routes • details on traffic management aspects, incident reporting and emergency response measures to be undertaken in the event of a hazardous material spill.
Energy	Provide relevant information with respect to energy during construction and operation, including but not limited to: • energy requirements and sources • options for sourcing energy from renewable and non-renewable sources, with a preferred option and justification for the selected option
Waste	Describe all waste (i.e. type and quantity) that will be generated during the proposal life, including construction and operation phases, on a regular basis. Classify waste in accordance with NSW Waste Classification Guidelines. Provide demonstrated application of the waste hierarchy. Provide relevant information on the disposal/recycling facility that will be used to manage solid wastes. Outline nominated recycling and/or landfill facilities licensed for the waste type, and whether there is sufficient capacity and indicative agreement from those facilities to accept the waste from the proposal.
Ammonium phosphate fertiliser production, material storage and management	Provide a process diagram for ammonium phosphate fertiliser production identifying all inputs and outputs for each proposal component. • Estimate the maximum and annual quantities of inputs (e.g. energy, water, catalysts, reagents) and outputs (e.g. heat, solid/liquid wastes) for each of the ammonium phosphate fertiliser production process components. • Detail environmental management of the whole process (including products and chemicals), ensuring alignment with best practices and standards, including the effectiveness of management methods and potential residual impacts to the environment. • Document applicable legislation, guidelines, standards and permits. Provide a description of the storage facilities for all materials required for the production of ammonium phosphate fertiliser (e.g. catalysts, reagents, wastes). The description must include but not be limited to: • location, extent and nearby sensitive environment • dimensions and storage capacity

Topic	Required information
	• safety controls and checks.
Workforce	For each phase of the proposal, provide a summary of the: • estimated number of people to be employed • skills base required • likely sources (local, regional, overseas) • on-site facilities provided (including accommodation).

2.2.7. Rehabilitation and closure

Provide details for the proposed decommissioning, closure and rehabilitation of the proposal, with consideration of section 42 of the EP Act. Describe best practices for progressive rehabilitation and closure that restores the proposal area to a safe and stable condition, does not cause environmental harm and can sustain a post-development land use. It should detail:

- the proposed lifespan of the proposal
- options for progressive rehabilitation, decommissioning of infrastructure, removal and disposal of infrastructure at the end of the proposal's life, and final closure, in consideration of biological, cultural, economic and social environmental aspects
- frequency of and areas subject to contaminated land assessments to mitigate risks associated with the proposal, including in the area of influence
- revegetation to original state and blending of disturbed surfaces into surrounding vegetation and topography. Where the area cannot be rehabilitated to a natural and/or a stable condition, state the reasons and the proposed methodology to achieve the best outcomes
- previous and current land use, and proposed land use after closure including alternatives defined by the outcomes of consultations undertaken with key stakeholders
- any legacy benefits of the proposal to the community
- final site design identifying the locations of post-development land use and the areas where rehabilitation is not proposed (if applicable)
- rehabilitation objectives and outcomes to be met
- rehabilitation and closure actions including time-based milestones consistent with SMART[2] principles
- performance indicators and reporting schedule
- environmental constraints, including social and economic, to achieving rehabilitation objectives and milestones.

[2] SMART milestones are:
Specific – it is clear what must be done
Measurable – it must be possible to know when it has been achieved
Achievable – it is capable of being achieved
Reasonable/relevant – there is a reasonable and clear connection between the milestone and the desired outcomes
Time-specific – it is clear when the milestone will be completed.

2.2.8. Changes or amendments to proposal

Describe any changes, amendments or refinements to the proposal since submission of the referral, noting that the NT EPA must be formally notified of any significant variations under section 51 of the EP Act.

2.3. Stakeholder engagement and consultation

Proponents have a general duty under section 43 of the EP Act to provide communities that may be affected by a proposal with an opportunity for consultation to assist community understanding of the proposed action and its potential impacts and benefits.

The proponent must engage and consult with stakeholders[3] who are affected by and interested in the proposal. The proponent must document the following in the EIS:

- identified stakeholders

  (not limited to native title holders and lease holders for surrounding pastoral leases, relevant Aboriginal Corporations, traditional Aboriginal owners of neighbouring Aboriginal land trusts, residents of surrounding communities and outstations, Central Land Council, Barkly Regional Council, relevant Darwin Port stakeholders, Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW), Northern Territory Government authorities)
- stakeholder consultation undertaken to date and the outcomes, including decision-making on the proposal and any adjustments to the proposal as a result of consultation
- how information will be disseminated and extended to stakeholders in a form that will help stakeholders and the public understand the proposal and actions within its scope, potential impacts and benefits, and how stakeholders can provide input
- how input from public participation will be incorporated into or inform scoping of studies and the proposal more broadly
- any future plans and commitments for consultation.

Describe the approach to stakeholder engagement and consultation throughout the environmental impact assessment process consistent with the NT EPA's guidance for proponents: Stakeholder Engagement and Consultation. The proponent is encouraged to refer to best-practice guidance on social and economic impact assessment, including but not limited to:

- NSW Social Impact Assessment Guideline (2021)
- QLD Social Impact Assessment Guideline (2018)
- QLD Economic Impact Assessment Guideline (2017).

2.4. Information requirements for environmental factors

The NT EPA identified five environmental factors in its referral decision that have the potential to be significantly impacted by implementing the proposal (Table 2), identified from the NT EPA's *Environmental factors and objectives - Environmental impact assessment guidance*.

[3] As defined in the NT EPA Guidance for Proponents - Stakeholder engagement and consultation (NT EPA 2021)

Table 2 Preliminary environmental factors that must be addressed in the draft EIS

THEME	FACTOR	ENVIRONMENTAL OBJECTIVE
Land	Terrestrial ecosystems	Protect terrestrial habitats to maintain environmental values including biodiversity, ecological integrity and ecological functioning.
Water	Hydrological processes	Protect the hydrological regimes of groundwater and surface water so that environmental values including ecological health, land uses and the welfare and amenity of people are maintained.
Air	Air quality	Protect air quality and minimise emissions and their impact so that environmental values are maintained.
	Atmospheric processes	Minimise greenhouse gas emissions so as to contribute to the NT Government's target of achieving net zero greenhouse gas emissions by 2050.
People	Culture and heritage	Protect culture and heritage.

For each of the factors listed in Table 2, the draft EIS should consider the significance of the identified potential impacts with reference to section 11 of the EP Act and Significant Impact Guidelines for protected matters under the EPBC Act, where applicable. The EIS should identify and consider the proposal footprint (direct disturbance) and the area of influence (indirect disturbance), and cumulative disturbance in consideration of other known or proposed activities in the region (including the previously assessed mine), to identify the environmental aspects (under each environmental factor) and their specific values that could be impacted by the proposal. Where relevant, the assessment of potential environmental impacts must consider unusual operations, unplanned and emergency shutdowns of part or all of the operations.

The draft EIS is to provide an assessment of how the NT EPA's environmental objective for each factor would be met, as outlined in the NT EPA's *Preparing an environmental impact statement – environmental impact assessment guidance for proponents*.

If additional potential environmental impacts are identified through the environmental impact assessment process, they must also be included in the draft EIS, even if this requires addressing additional environmental factors not specified in Table 2.

The following sections and tables outline the information to be addressed for each environmental factor. The below information requirements should be addressed in an appropriate format within the draft EIS, with technical assessment reports appended to the EIS as applicable. Detailed maps and figures must be included to support the descriptions and findings for each of the relevant environmental factors.

2.4.1. Terrestrial ecosystems

Table 3 Minimum information required for the assessment of Terrestrial ecosystems

Aspect	Specific information required
NT EPA objective: Protect terrestrial habitats to maintain environmental values including biodiversity, ecological integrity and ecological functioning.	
Relevant activities	• Use of groundwater for construction and operational water supply • Use of plant and equipment during construction and operations • Operation of the ammonium phosphate fertiliser plant; and, • Dust generation from operations.
Environmental values	Provide a description of all terrestrial ecological values present or likely to be present within the proposal footprint and area of influence. This must include, but not be limited to, a description of groundwater dependent ecosystems, resident flora and fauna species and their importance in local and regional settings, including to Aboriginal custodians.
Potential impacts and risks	Identify, describe and assess potential direct and indirect impacts and risks of implementing the proposal, and cumulative impacts, on terrestrial ecosystems and identified environmental values including: • loss of flora/ecological communities from water availability/quality, including loss of significant/sensitive vegetation[4]. • impacts to groundwater dependent ecosystems (e.g. deep-rooted vegetation) from drawdown of the water table. • disturbance or degradation of vegetation communities, possibly resulting in a long-term decline or loss over time, for example from erosion, dust and other air emissions, weeds/pathogens, pests, disturbance or acidification of soils, changes in bushfire risk (fire frequency and intensity). • impacts to terrestrial ecosystems, including groundwater dependent ecosystems from spills of hazardous materials (including, but not limited to, sulfuric acid and ammonia) Determine the areas that could feasibly experience those impacts. Using appropriate studies, investigations and relevant information, quantify the extent of impacts and their significance at the proposal level and in regional settings.
Avoidance, mitigation and management	Outline the measures for avoiding, mitigating, or offsetting impacts identified above, with consideration of sections 26 (Environmental decision-making hierarchy) and section 27 (Waste management hierarchy) of the EP Act. Consider measures to enhance or restore environmental quality. Outline the key management plans that would be implemented, and the associated performance indicators, timeframes for implementation, and the roles and responsibilities of the personnel involved. Demonstrate that mitigation measures are in accordance with best-practice, including advice from relevant Government authorities and species experts. The EIS should demonstrate that the proposal has been appropriately sited and has taken into consideration the minimum requirements outlined in the NT Land Clearing Guidelines.

[4] Refer to NT Land Clearing Guidelines

Aspect	Specific information required
	Assess the potential impacts of a changing climate to terrestrial ecosystems in the context of cumulative impacts from the proposal and other activities in the region.
Monitoring and reporting	Provide proposed monitoring and reporting activities related to potential impacts and risks to terrestrial ecological values (including groundwater dependent ecosystems), and mitigation and management measures. Describe clear and measurable outcomes and commitments that will ensure the environmental objective is met and impacts of implementing the proposal will be acceptable. The proposed monitoring and reporting should specify which proposal phase it relates to i.e., construction or operations. Demonstrate that monitoring activities are in accordance with best-practice, including advice from relevant NT Government authorities.
Residual impact	Identify any potential residual impact or risk of the proposal to identified values and the level of certainty underpinning the predicted residual impacts.
Offsets	Where a significant residual impact may remain after applying the environmental decision-making hierarchy, identify offsets and describe how any proposed offset is consistent with the NT Offsets Framework.

2.4.2. Hydrological processes

Table 4 Minimum information required for the assessment of Hydrological processes

Aspect	Specific information required
NT EPA objective: Protect the hydrological regimes of groundwater and surface water so that environmental values including ecological health, land uses and the welfare and amenity of people are maintained.	
Relevant activities	Extraction of groundwater from the expanded borefield
Environmental values	Describe the following for the proposal footprint and the area of influence: • climate and meteorological conditions in the proposal area, the frequency and severity of extreme weather conditions • hydrogeology including groundwater systems, yields, storativity, transmissivity, water movement, recharge rates, recharge/discharge pathways and quantitative water balance • declared beneficial uses, existing users, water quality objectives and environmental values including sacred sites and sites of cultural significance. • extent and value of groundwater dependent ecosystems, including but not limited to culturally significant sites characterised by groundwater dependent vegetation. • current and potential (future) water use potentially affected by the proposed water abstraction (e.g. access to water sources by livestock) • the likelihood of stygofauna occurrence, based on a desktop assessment of the suitability of habitat present. Provide detailed maps to support the above descriptions. Outline studies used in the assessment, including their results, limitations and uncertainties.

Aspect	Specific information required

Potential impacts and risks	Identify, describe and assess potential direct and indirect impacts and risks of implementing the proposal, and cumulative impacts, on hydrological processes including:
	• drawdown of water table, with likely effects to groundwater dependent ecosystems (e.g. springs, wetlands, deep-rooted vegetation, stygofauna (if likely to be present)), connected surface water systems and related water values
	• impacts from the proposed water abstraction on declared beneficial uses and water quality objectives associated with the targeted groundwater system
	• impacts to other groundwater users.
	The assessment of impacts must use the outcomes of relevant studies and information. As a minimum, the assessment must include:
	• description of groundwater dependent ecosystems and understanding of their interconnectivity and water dependence
	• predictions based on modelling (class 2 model[5]) for relevant characteristics such as:
	  ○ alterations to recharge
	  ○ groundwater drawdown levels, spatial extent and recovery time
	  ○ impacts to declared beneficial uses
	• Modelling should be conducted using best practice precautionary scenarios for arid zone aquifers, and should account for different proposal stages, such as initial conditions (baseline) and relevant intervals in construction, operation and closure phases. Future predicted climatic conditions must also be considered.
	• Assumptions and parameters used in the predictive model and justification for their use, including a description of how the predictions would change in the event critical assumptions (including transmissivity, hydraulic conductivity and porosity) were found to be incorrect.
	• overall water balance of the target groundwater system, including inputs and outputs, and feasibility assessment to illustrate the availability of a sustainable water supply for optimal abstraction of groundwater to achieve the desired abstraction volume while minimising adverse impacts to the environment, and current and future groundwater users.
	Describe any uncertainties and further work required to increase understanding of potential impacts. Quantify the significance and extent of impacts at the project level and cumulatively.
	Quantify the significance of proposal impacts using:
	• the latest draft of the Western Davenport Water Allocation Plan
	• the latest draft of the Northern Territory Water Allocation Planning Framework
	• Relevant guideline thresholds.

Avoidance, mitigation and management	Outline the measures for avoiding, mitigating, or offsetting impacts identified above, with consideration of sections 26 (Environmental decision making hierarchy) and

[5] Barnett et al, 2012, Australian groundwater modelling guidelines, Waterlines report, National Water Commission, Canberra.

Aspect	Specific information required
	section 27 (Waste management hierarchy) of the EP Act. Consider measures to enhance or restore environmental quality. Avoidance, mitigation and offset measures must be developed with consideration given to the following: • proposal design and layout • alternative water supply options • water conservation and efficiency • compliance with any legislation, standards and policies relevant to the proposed measures. Outline the key management plans that would be implemented, and the associated performance indicators, timeframes for implementation, and the roles and responsibilities of the personnel involved. Demonstrate that mitigation measures are in accordance with best-practice, including advice from relevant NT Government authorities.
Monitoring and reporting	Provide proposed monitoring and reporting activities related to potential impacts and risks, mitigation and management measures. Describe clear and measurable outcomes and commitments that will ensure the environmental objective is met and impacts of implementing the proposal will be acceptable. Demonstrate that the proposed monitoring locations/bores are appropriately sited to monitor relevant formations for impacts as a result of the proposed increased water abstraction. The proposed monitoring and reporting should specify which proposal phase it relates to i.e., construction, operations, closure or post-closure. Demonstrate that monitoring activities are in accordance with best-practice, including advice from relevant NT Government authorities.
Residual impact	Identify any potential residual impact or risk of the proposal to identified values.
Offsets	Where a significant residual impact may remain after applying the environmental decision-making hierarchy, identify offsets and describe how any proposed offset is consistent with the NT Offsets Framework.

2.4.3. Air quality

Table 5: Minimum information required for assessment of Air quality.

Aspect	Specific information required
NT EPA objective: Protect air quality and minimise emissions and their impact so that environmental values are maintained.	
Relevant activities	• Construction and operation of ammonium phosphate fertiliser plant and its components • Handling, processing, transport and storage of materials including but not limited to sulfur and phosphogypsum • Power generation

Aspect	Specific information required
	• Rehabilitation and closure.
Environmental values	• Describe the sensitive receptors within the proposal footprint and area of influence, supported by air dispersion modelling • Describe the existing air environment • Describe areas of current and predicted public use (including cultural use) within the proposal footprint and area of influence. • Provide maps and figures to support descriptions as appropriate.
Potential significant impacts and risks	Describe potential impacts on air quality and identify: • emissions which could impact air quality, and their source (including emissions from unplanned upsets, shutdowns and releases from storage tanks due to overpressure) • the impacts from emissions on local air quality and sensitive receptors, including potential incremental impacts on culturally significant sites • the volumes of emissions and impacts from their accumulation (including bioaccumulation and bio-magnification, if relevant) over the 25 year operation, including potential limitations on future land use • the proposal footprint and area of influence that could feasibly experience those impacts. Provide an assessment of potential impacts on air quality using outcomes of investigations and/or other relevant information. As a minimum, the assessment should take into consideration: • methods, equipment, timing and frequency • the likely source, scale and extent of emissions (including emissions from unplanned upsets, shutdowns and releases from storage tanks due to overpressure) • cumulative impacts with other activities or proposals • the duration, magnitude and extent of potential impacts. The assessment must identify and quantify potential impacts on air quality against relevant contemporary guidelines and standards, ensuring that ground level concentrations are compared to the current Ambient Air Quality NEPM standards and account for anticipated amendments to the NEPM in 2025. Assess the potential impacts of a changing climate on air quality in the context of cumulative impacts from the proposal and other activities in the region.
Avoidance, mitigation and management	Outline the measures for avoiding, mitigating, or offsetting impacts identified above, with consideration of sections 26 (Environmental decision making hierarchy) and section 27 (Waste management hierarchy) of the EP Act. Also consider measures to enhance or restore environmental quality. Avoidance, mitigation and offset measures must be developed with consideration given to the following: • design and layout of the proposal • best available technology • emission avoidance, mitigation or management measures • compliance with any statutory or policy basis for the proposed measures.

Aspect	Specific information required
	All mitigation measures should be substantiated and in accordance with best practice, including advice from relevant government advisory agencies.
Monitoring and reporting	Outline any proposed monitoring and reporting activities related to potential impacts and risks, and mitigation and management measures. The proposed monitoring and reporting should specify which project phase it relates to, i.e. construction or operations, and must be sufficiently robust to detect and quantify unplanned releases to the atmosphere. All monitoring activities should be substantiated and in accordance with best practice advice from relevant government advisory agencies.
Residual impact	Identify any potential residual impact of the proposal on environmental values.

2.4.4. Atmospheric processes

Table 6 Minimum information required for the assessment of atmospheric processes

Aspect	Specific information required
NT EPA objective: Minimise greenhouse gas emissions so as to contribute to the NT Government's goal of achieving net zero greenhouse gas emissions by 2050.	
Relevant activities	• Land clearing • Fuel combustion for the operation of heavy machinery, vehicles and diesel generator sets, especially during construction • Ammonia production • Power generation
Environmental values	Describe the current emissions profile for the NT by industry/sector. Describe greenhouse gas emissions trajectories for the NT by industry/sector.
Potential impacts and risks	Estimate the proposal's annual and total Scope 1 and Scope 2 emissions over the life of the proposal (e.g., emissions from land clearing, diesel exhaust/etc. during construction and operation, and fugitive emissions from the ammonium phosphate fertiliser plant and its components) and how these emissions will contribute to the NT emissions profile, in accordance with the NT Government policy: *Greenhouse Gas Emissions Management for New and Expanding Large Emitters*. Estimate the annual and total Scope 3 emissions over the life of the proposal. Provide a breakdown of Scope 1, 2 and 3 emissions according to the emission sources and source locations (i.e. within the NT, elsewhere in Australia or outside of Australia) Provide details on the projected emissions intensity (emissions per unit of production) and benchmarking against other comparable projects, industry standards and best practice. Provide an inventory of projected annual emissions for each relevant greenhouse gas, with total emissions expressed in 'CO_2 equivalent' terms. Provide justification for the suitability of methodologies or surveys used to calculate greenhouse gas emissions. Where any information gaps or uncertainty remains, adopt the precautionary principle. Estimate emissions from upstream activities associated with the proposal, including electricity to be used during construction, operation and decommissioning and briefly describe the methods used to make the estimates.

Aspect	Specific information required
Avoidance, mitigation and management	Outline the measures for avoiding, mitigating or offsetting projected Scope 1 and Scope 2 emissions, with consideration of sections 26 (Environmental decision-making hierarchy) and section 27 (Waste management hierarchy) of the EP Act. Include a description of: • any energy efficiency and mitigation and management measures to reduce or minimise greenhouse gas emissions over the life of the proposal including a commitment to continuous improvement measures • how proposed measures to maximise energy efficiency and avoid and/or reduce/abate greenhouse gas emissions will meaningfully contribute to the NT Government's target of achieving net zero greenhouse gas emissions by 2050 • how the proposal's requirements under the Australian Government's Safeguard Mechanism will affect greenhouse gas emissions reductions over the life of the proposal. Demonstrate that proposed mitigation measures are in accordance with best-practice and capable of achieving stated emissions reductions, including identification of any local conditions or circumstances that might influence the choice of technologies or measures to mitigate emissions. Outline the key management plan/s that would be implemented, and the associated performance indicators (minimum five-year targets), timeframes for implementation, and the roles and responsibilities of the personnel involved.
Monitoring and reporting	Provide proposed monitoring and reporting activities related to potential impacts and risks to atmospheric processes, and mitigation and management measures. Describe clear and measurable outcomes and commitments that will ensure the environmental objective is met and impacts of implementing the proposal will be acceptable. The proposed monitoring and reporting should specify which proposal phase it relates to i.e., construction or operations. Demonstrate that monitoring activities are in accordance with best-practice, including advice from relevant NT Government authorities.
Residual impact	Identify any potential residual impact or risk of the proposal to the current emissions profile and the greenhouse gas emissions trajectory for the NT.
Offsets	Where a significant residual impact may remain after applying the environmental decision-making hierarchy, identify offsets and describe how any proposed offset is consistent with the NT Offsets Framework.

2.4.5. Culture and heritage

Table 7: Minimum information required for assessment of Culture and heritage.

Aspect	Specific information required
NT EPA objective: Protect culture and heritage.	
Relevant activities	• Extraction of groundwater from the expanded borefield • Construction and operation of ammonium phosphate fertiliser plant and its components • Re-alignment of the Murray Downs Road

Aspect	Specific information required
	• Activities with the potential for direct and indirect disturbance of sacred sites, heritage sites and sites of cultural significance.
Environmental values	Identify the Aboriginal communities and traditional owners within (or in proximity to) the proposal area, including the area of influence, and any native title claims. Describe the characteristics and current condition of sacred sites, cultural and heritage values within the proposal area, including the area of influence, which could be impacted. This must include (at a minimum) descriptive and spatial information for the following: • Aboriginal and non-Aboriginal sites, places or objects of natural, historic or cultural heritage significance, current use and spiritual significance e.g. songlines, and sites used for maintaining cultural traditions. • Heritage places or objects protected under the *Heritage Act 2011* includes both the automatic protection of Aboriginal and Macassan archaeological sites and the protection of other declared places • traditional land use or industry within or in proximity to the proposal area • importance of amenity (i.e. visual, noise) to maintaining cultural values • registered or recorded sacred sites under the Northern Territory Aboriginal *Sacred Sites Act 1989* (Sacred Sites Act) taking into account confidentiality requirements. Information sources must include published archaeological and anthropological information, site surveys, respective registers, consultations and other research. Justify the suitability of the methodologies, surveys or processes used to provide information about sacred sites, culture and heritage. Detail any information gaps or uncertainties in relation to sacred sites, culture and heritage, including any further studies or measures required to address these gaps.
Potential significant impacts and risks	Describe potential impacts on cultural and heritage values, including: • disturbance to sites of cultural significance during construction, operation, and maintenance activities • disturbance to traditional and/or contemporary Aboriginal values (including sacred sites) or uses of land (e.g. hunting and ceremonial use) or amenity due to construction and operation activities • predicted exclusion zones /risk contour around infrastructure describing risks to human health from catastrophic release of hazardous materials (e.g. sulfuric acid, ammonia) and how this may impact cultural use of the area • temporary or permanent land access or use restrictions in areas of proposal infrastructure, including exclusion zones around the ammonium phosphate fertiliser plant boundary. Assess the potential for impact to archaeological and cultural sites through: • air pollutants, including dust and chemicals within the proposal area and area of influence • groundwater drawdown from the proposed increase in groundwater abstraction. Determine the proposal footprint and area of influence that could feasibly experience

Aspect	Specific information required
	those impacts. The assessment must: • quantify the significance of potential impacts and risks to sacred sites and cultural heritage • identify any effect on intergenerational transmission of cultural traditions • consider cumulative impacts and the reversibility of potential impacts. Assess the potential impacts of a changing climate on cultural and heritage values in the context of cumulative impacts from the proposal and other activities in the region. Identify the uncertainties and provide a detailed description of how uncertainties would be addressed, such as through an adaptive management approach incorporating baseline studies, monitoring and staging. Where uncertainty remains, adopt the precautionary principle and demonstrate how it has been met (section 19 of EP Act).
Avoidance, mitigation and management	Describe the measures for avoiding and mitigating impacts on cultural heritage values and transmission of cultural traditions Avoidance, mitigation and offset measures must be developed with consideration given to the following: • substantial initial and ongoing consultation and engagement with traditional owners/representatives. • best practice, including advice from relevant NTG advisory agencies and traditional owners • appropriate surveys and consultation to identify and characterise any sites, places or objects of cultural significance • requirements for an Authority Certificate that covers all areas of the proposal, in accordance with the Sacred Sites Act Demonstrate the application of the mitigation hierarchy to avoid and minimise impacts on cultural heritage values, including any considerations for rehabilitation and closure. Identify and address the potential impacts on potentially affected Aboriginal people and communities, landholders, tourism and operators as stakeholders. All mitigation measures should be substantiated and in accordance with best practice, including advice from relevant government advisory agencies and traditional owners. Demonstrate and document in the EIS how the NT EPA's objective for this factor can be met and the predicted environmental outcomes.
Monitoring and reporting	Outline proposed monitoring and reporting activities related to potential impacts and risks and mitigation and management measures to culture and heritage and transmission of cultural traditions. The proposed monitoring and reporting should specify which project phases it relates to. All monitoring activities should be substantiated and in accordance with best practice advice from relevant government advisory agencies.

Aspect	Specific information required
Residual impact	Identify the significance of any residual impact or risk of the proposal to identified values.

3. Other requirements

3.1. Whole of the environment considerations

Provide a holistic assessment of the impacts of the proposal on the whole of the environment, including a consistent description of the proposal, connections and interactions between the environmental factors, and cumulative impacts. Succinctly discuss predicted outcomes in relation to the principles of environment protection and management (as set out in Part 2 of the EP Act), and the NT EPA's environmental objectives.

3.2. Consideration of the impacts of a changing climate

The draft EIS must assess how adaptation to a changing climate has been considered in the proposal, with reference to the NT policy *Northern Territory Climate Change Response: Towards 2050* (DENR 2020)[6] and Climate Change in the Northern Territory: State of the science and climate change impacts (NESP ESCC Hub 2020).

Assess the extent to which the outcomes and commitments proposed address any significant vulnerabilities of the proposal and the environmental values in and adjacent to the proposal area under the most current, down-scaled climate projections for the region.

4. Public consultation requirements

The public consultation requirements for the draft EIS are outlined in Part 5 Division 6 of the EP Regulations. Additional specific details are provided below. Terms of the proponent's stakeholder engagement requirements for the draft EIS are outlined in section 2.3 above.

4.1. Submission period

The submission period under the EP Act during which feedback can be given on the draft EIS is between 30 and 60 business days. The duration of the period will be confirmed during the draft EIS pre-lodgement phase.

4.2. Manner in which to publish

The draft EIS must be provided as:

- accessible PDF files that do not exceed 20MB
- ten (10) printed copies for display at the locations in section 4.4 below.

[6] DENR, 2020. Northern Territory Climate Change Response: Towards 2050. Department of Environment and Natural Resources, Darwin.

The draft EIS must:

- be divided into two parts:
    - a main report (with executive summary available as separate document)
    - appendices to the main report
- have a navigable table of contents
- present information in format that is easy to follow
- use hyperlinks to assist with navigation through the document
- generally conform with the Web Content Accessibility Guidelines (WCAG) 2.0 Level AA and material relevant to creating accessible documents on the NT Government website.

4.3. Advertising

An advertisement must be placed in the NT News and Tennant & District Times indicating that the draft EIS is available for comment, the locations where it can be inspected and obtained, the period in which comments/submissions can be made and where they can be made, and contact details for obtaining further information.

4.4. Public consultation locations

The draft EIS must be made available for public viewing at:

1. NT EPA, Level 1, Arnhemica House, 16 Parap Road, Parap, NT 0820
2. Department of Industry, Tourism and Trade, Level 3, Paspalis Centrepoint Building, 48-50 Smith Street, Darwin
3. Central Land Council, main office, 27 Stuart Highway, Alice Springs
4. Central Land Council, regional office, 63 Paterson Street, Tennant Creek
5. Tennant Creek Public Library, 41 Peko Road, Tennant Creek
6. Arid Lands Environment Centre, 90 Gap Road, The Gap
7. Environment Centre Northern Territory, Unit 3, 98 Woods Street, Darwin
8. Northern Territory Library, Parliament House, Darwin
9. Aherrenge Community Store, Lot 1 Amaroo Road, Ampilatwatja
10. Mirnirri Store, 5 Jungarrayi Street, Ali Curung

Appendix A – List of relevant guidance material

The following guidance material is considered relevant to the TOR. This list is not exhaustive, but captures key guidance used in the preparation of these TOR and to inform the preparation of the EIS. The proponent must draw on further relevant industry and best practice guidance as part of developing the EIS.

- Barnett et al, 2012, Australian groundwater modelling guidelines, Waterlines report, National Water Commission, Canberra. https://www.groundwater.com.au/media/W1siZiIsIjIwMTIvMTAvMTcvMjFfNDFfMzZfOTYwX0F1c3RyYWxpYW5fZ3JvdW5kd2F0ZXJfbW9kZWxsaW5nX2d1aWRlbGluZXMucGRmIl1d/Australian-groundwater-modelling-guidelines.pdf
- Commonwealth of Australia 2008. Threat Abatement Plan for predation by feral cats. Department of Agriculture, Water and the Environment. https://www.dcceew.gov.au/sites/default/files/documents/tap-cat-report.pdf
- Commonwealth of Australia, 2013. Significant Impact Guidelines 1.1: Matters of National Environmental Significance. Department of Agriculture, Water and the Environment: https://www.environment.gov.au/epbc/publications/significant-impact-guidelines-11-matters-national-environmental-significance
- Commonwealth of Australia, 2013. Significant Impact Guidelines 1.2: Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies Department of Agriculture, Water and the Environment: http://www.environment.gov.au/system/files/resources/a0af2153-29dc-453c-8f04-3de35bca5264/files/commonwealth-guidelines_1.pdf
- Department of Sustainability, Environment, Water, Population and Communities 2012. Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy.: https://www.dcceew.gov.au/environment/epbc/publications/epbc-act-environmental-offsets-policy
- DENR 2000. Northern Territory Water Allocation Planning Framework. Northern Territory Government. https://depws.nt.gov.au/__data/assets/pdf_file/0011/476669/nt-water-allocation-planning-framework.pdf
- DEPWS 2021. Northern Territory Offsets Framework. Northern Territory Government: https://depws.nt.gov.au/environment-information/northern-territory-offsets-framework/northern-territory-offsets-framework
- DENR, 2020. Land clearing guidelines. Department of Environment and Natural Resources: https://nt.gov.au/property/land-clearing
- DENR, 2020. Northern Territory Climate Change Response: Towards 2050. Department of Environment and Natural Resources: https://depws.nt.gov.au/__data/assets/pdf_file/0005/904775/northern-territory-climate-change-response-towards-2050.pdf
- EU IPPC - Reference Document on Best Available Techniques for the Manufacture of Large Volume Inorganic Chemicals – Ammonia, Acids and Fertilisers. August 2007: https://eippcb.jrc.ec.europa.eu/reference/large-volume-inorganic-chemicals-ammonia-acids-and-fertilisers
- NESP Earth Systems and Climate Change Hub, 2020. Climate change in the Northern Territory: state of the science and climate change impacts. National Environment Science Programme, Earth

Systems and Climate Change Hub: http://nespclimate.com.au/building-understanding-of-climate-change-in-the-northern-territory/

- National Environmental Protection (Assessment of Site Contamination) Measure (NEPM) 2013: https://www.nepc.gov.au/nepms/assessment-site-contamination
- National Environmental Protection (Ambient Air Quality) Measure (NEPM) 2021: https://www.nepc.gov.au/nepms/ambient-air-quality
- Northern Territory Government, 2017. Preventing weed spread guide, Weed Management Branch: https://nt.gov.au/environment/weeds/how-to-manage-weeds/prevent-weed-spread-industry-and-recreation
- NSW DPIE, 2021. Cumulative Impact Assessment Guideline for State Significant Projects. NSW Department of Planning, Industry and Environment: https://www.planning.nsw.gov.au/-/media/Files/DPE/Guidelines/Policy-and-legislation/GD1259-RAF-Assessing-Cumulative-Impacts-Guide-final.pdf
- NSW DPIE, 2021. Social Impact Assessment Guideline for State Significant Projects. NSW Department of Planning, Industry and Environment: https://shared-drupal-s3fs.s3.ap-southeast-2.amazonaws.com/master-test/fapub_pdf/SIA+Guideline+20210622v6_FINAL.pdf
- NSW EPA (2022) Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales: https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/air/22p3963-approved-methods-for-modelling-and-assessment-of-air-pollutants.pdf?la=en&hash=79991C3AD2F7A1FAEC34EBAA857E7D0CCDDD1B24
- NSW Waste classification guidelines at https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/waste-classification-guidelines
- NT EPA, 2013. Guidelines for Assessment of Impacts on Terrestrial Biodiversity. Northern Territory Environment Protection Authority: https://ntepa.nt.gov.au/publications-and-advice/environmental-management
- NT EPA, 2013. Guidelines for the Preparation of an Economic and Social Impact Assessment. Northern Territory Environment Protection Authority: https://ntepa.nt.gov.au/publications-and-advice/environmental-management
- NT EPA, 2013. Guidelines for the Siting, Design and Management of Solid Waste Disposal Sites in the NT. Northern Territory Environment Protection Authority: https://ntepa.nt.gov.au/__data/assets/pdf_file/0006/284685/siting_design_landfills.pdf
- NT EPA, 2015. Waste Management Strategy for the Northern Territory 2015-2022. Northern Territory Environment Protection Authority: https://ntepa.nt.gov.au/publications-and-advice/environmental-management
- NT EPA, 2020. Environmental impact assessment guidance: NT EPA Environmental Factors and Objectives. Northern Territory Environment Protection Authority: https://ntepa.nt.gov.au/publications-and-advice/environmental-management
- NT EPA, 2020. Environmental impact assessment guidance for proponents: Stakeholder Engagement and Consultation. Northern Territory Environment Protection Authority: https://ntepa.nt.gov.au/publications-and-advice/environmental-management
- NT EPA, 2021. Environmental impact assessment guidance for proponents: Preparing an environmental impact statement. Northern Territory Environment Protection Authority: https://ntepa.nt.gov.au/__data/assets/pdf_file/0009/818217/preparing-an-environmental-impact-statements.pdf

- NT EPA, 2023. Ammaroo Ammonium Phosphate Fertiliser Project. Northern Territory Environment Protection Authority: https://ntepa.nt.gov.au/__data/assets/pdf_file/0020/1203725/notice-of-decision-and-statement-of-reasons-for-decision-on-accepted-referral-ammaroo.pdf